Stakeholder Engagement in Sustainable Entrepreneurship and Innovation

An exploratory study on start-ups from Germany and Sweden in renewable energy and energy efficiency

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Summary

Sustainable entrepreneurship is increasing in importance because it can lead to a socially, economically, and environmentally sustainable society. Firms can solve social and environmental problems and be economically self-sustaining at the same time. Innovation is seen as key to find new solutions for environmental sustainability. Furthermore, scholars see stakeholder engagement as a new solution to create innovations for sustainability and environmental sustainability in particular. Since there have only been few empirical studies in sustainable entrepreneurship and current literature does not sufficiently answer the question how stakeholders are engaged to create innovations for environmental sustainability, we dedicated our study to answer the following research question:

*How are stakeholders engaged in the creation of an innovative product and/or service for environmental sustainability in sustainable entrepreneurial start-ups from the perspective of the firm?*

We define sustainable entrepreneurial start-ups as self-sustaining and independent companies that discover, evaluate and exploit opportunities to transition to an environmentally sustainable society. Reviewing the literature on sustainable entrepreneurship, innovation and stakeholder engagement results in a tentative model, which shows the process of stakeholder engagement in sustainable entrepreneurial start-ups. Since the field of study is relatively new, there are some question marks and themes in the model that need to be researched further. We conduct a qualitative exploratory study on German and Swedish start-ups in the fields of renewable energy and energy efficiency with different characteristics to research stakeholder engagement from several perspectives. The data collection technique is semi-structured interviews. We use the abductive approach and the visual mapping strategy in addition to timescales in order to develop understanding of stakeholder engagement. Based on our analysis, we revise the model and show how stakeholders are engaged in sustainable start-ups. Our findings show how different groups of stakeholder such as the team, feedback givers, financial resources givers, technology developers and promoters are engaged to develop the start-ups’ business and innovation throughout the idea- and product development and commercialization. Not only the type of innovation but more aspects such as the relationship to stakeholders and secrecy influence how stakeholders are engaged. Our study has several contributions. For instance, it contributes to stakeholder (engagement) theory and an increased awareness of sustainable entrepreneurial start-ups and their innovative solutions in society. It provides guidelines to start-ups to improve engagement with stakeholders for making their innovations more successful. We recommend further research and give examples of research questions on the topic stakeholder engagement.

Key words: stakeholder engagement, sustainable entrepreneurship, innovation, start-ups, stakeholder theory, sustainability, Germany, Sweden, renewable energy, energy efficiency
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The process of writing this thesis can be compared to a journey on a sailing ship that has to cross the ocean to reach the next harbor safely. We have been the explorers of this journey and the captains of the ship. The trip has been full of adventures. Sometimes we wanted to throw each other over board, other times we were throwing a lifesaver to each other but most of the times we pulled on the same ropes and we were steering the helm together.

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1. Introduction

1.1. Background

We cover problems in practice and theoretical approaches related to the current challenges in today’s world. We shortly introduce the main concepts of our thesis, the area of research and stress how our topic is related to business administration and sectors outside business administration. In addition, we describe our research question, the purpose of our thesis and the theoretical, societal and practical contributions we make.

1.1.1. Today’s challenges connected to sustainability

Alert! Global capitalism causes huge imbalances in today’s world, resulting in a torrent of social, economic, environmental and political changes (Googins & Esudero, 2012, p. 1). The energy consumption is increasing all around the world. According to the Energy Information Administration (Energy Information Administration [EIA], 2013, p. 1), the world energy consumption will increase by 56 percent between 2010 and 2040. Energy consumption is responsible for the majority of greenhouse gas emissions (European Commission [EC], 2011). The problem often lies in inefficiency and extensive usage of non-ecological fossil fuels. Therefore, the world calls for further energy efficiency and an increased usage of renewable energy.

Even though sustainability has increased in importance to governments, NGOs and businesses after a clear definition of sustainable development was presented at the conference of the World Commission on Environment and Development (WCED) (Redclift, 2005, p. 212; Luke, 2005, p. 229; Hopwood, 2005, p. 39; Mebratu, 1998, p. 501; Schlör et al., 2012, p. 327; Lélé, 1991, p. 611) statistics do not display any improvements in lowering energy consumption or decreasing greenhouse gas emissions (EC, 2011; EIA, 2013) and scholars do not see a significant progress in solving social, economic and environmental problems (Googings & Esudero, 2012; Porter & Kramer, 2011).

Even though more energy-efficient technologies are continuously explored and used, it is expected that carbon dioxide intensity will decline by only 1.9 percent per year in the OECD economies and by 2.7 percent per year in the non-OECD economies from 2010 to 2040 (EIA, 2013, p. 8). The European Union is aware of this problem. Consequently, it created a common framework called 2020 whose aim is to reduce the energy consumption and CO2 emissions by 20% and to increase energy efficiency by 20% by 2020 (European commission [EC], 2013). According to the European Commission and Energy Information Administration (EC, 2013; EIA 2013) these results will be difficult to accomplish.

In order to improve energy efficiency, high investments in technology and R&D are necessary. Innovation is seen as a key driver for the development and competitiveness of countries. Germany and Sweden are among the most innovative countries in the world and they spend most of their resources in R&D. (Battelle Memorial Institute, 2013, p. 7) Despite the increasing investments in innovation, however, investments in the energy sector were at historically low levels in 2013 (EIA, 2013, p.3). One reason could be that governments try to save money due to the economic crisis. Porter and Kramer (2011 p. 4) go deeper and claim that governments have been losing their power and influence. This has also been expressed by Googings and Escudero (2012, p. 6). Consequently, it is questionable who is taking the responsibility for and is taking care of making the world more sustainable with, e.g. energy
efficiency and renewable energy. There are several start-ups that have created innovative solutions and/ or products for sustainability. In our study, we define start-ups as new business creations from the very start: meaning that the start-ups are not initiated by already existing companies (Luger & Koo, 2005, p. 19). The number of start-ups that decrease the usage of energy and resources with new technologies and the Internet has been increasing. 107 Million Euro were invested in young companies in Germany by the Venture Capital in 2012. (Tönnesmann, 2013, p. 84) In conclusion, there is an increased attention on start-ups in the industry and they are seen as key in energy efficiency and renewable energy.

1.1.2. What could be done to cope with these challenges?
While businesses are frequently blamed for the majority of social, economic and environmental problems, they can also help to solve them. Cohen and Winn (2007, p. 30) even claim that business may have the potential to lead the world into a new industrial revolution, which would result in reversing negative environmental trends. Therefore, sustainable entrepreneurship is important. “Sustainable entrepreneurship explores the process of discovery, evaluation, and exploitation of opportunities that simultaneously address economic, environmental, and social market failures” (Thompson et al., 2011, p. 218). It leads to economic and non-economic gains to both individuals and society (Shepherd & Patzelt, 2010). “These opportunities may be sought through organizations that create economic profit, or through non-profit organizations but the organization must be economically self-sustaining” (Thompson et al., 2011).

Start-ups play a key role in sustainable entrepreneurship. They have an impact on large firms. Since they have to compete with incumbents, they bring new innovation towards sustainability in order to be successful. Consequently, incumbents follow up with corporate sustainable entrepreneurship and innovate as well. As a result, new entrants manage to change the whole industry to become sustainable. (Hockerts & Wüstenhagen, 2010). We call them sustainable entrepreneurial start-ups based on the definition of sustainable entrepreneurship by Thomson et al. (2011). We define them as new business creations that have an impact on large firms. Since they have to compete with incumbents, they bring new innovation towards sustainability in order to be successful. Consequently, incumbents follow up with corporate sustainable entrepreneurship and innovate as well. As a result, new entrants manage to change the whole industry to become sustainable. (Hockerts & Wüstenhagen, 2010). We call them sustainable entrepreneurial start-ups based on the definition of sustainable entrepreneurship by Thomson et al. (2011). We define them as new business creations that are economically self-sustaining and examine opportunities to transition to a socially, economically, and environmentally sustainable society.

There are several research gaps with reference to sustainable entrepreneurship. Further research is required for motivations of sustainable entrepreneurs, opportunities for “simultaneous positive outcomes for social, economic, and environmental benefits”, “how noneconomic motivators impact entrepreneurial decision-making” (Thompson et al., 2011, p. 224) and how “social and environmental motivations of entrepreneurs combine in the process of sustainable entrepreneurship” (Thompson et al., 2011, p. 213). Moreover, there have only been few empirical studies in sustainable entrepreneurship (Thompson et al., 2011, p. 217).

In addition to the concept of sustainable entrepreneurship, the shared value concept by Porter & Kramer (2011) has received a lot of attention from business and scholars (Aakhus & Bzdak, 2012; Szmigin & Rutherford, 2012; Spitzeck & Chapman, 2012; Schmitt & Renken 2012; Maltz & Schein, 2013; Escudero & Googins, 2012, etc.). “Shared value involves creating economic value in a way that also creates value for society by addressing its needs and challenges” (Porter & Kramer, 2011, p. 4). In contrast to Thompson’s (2011) definition of sustainable entrepreneurship, the creation of profit is regarded as essential in the shared value concept. While the shared value concept has received high recognition from scholars (Spitzeck & Chapman, 2012; Schmitt & Renken 2012), it has also been criticized in academic literature (Aakhus & Bzdak, 2012; Szmigin & Rutherford, 2012). For instance, Szmigin & Rutherford (2012, p. 172-173) point out that Porter and Kramer (2011) only highlight success
stories but that they do not “answer fundamental questions regarding the role of business in society”. In addition, only the cases of large firms are discussed. Maltz and Schein (2013, p. 72), regard this as a limitation in their research on shared value. Research on shared value in the context of small German firms in the apparel industry, however, show that shared value is important for small firms; “shared value as a differentiation strategy offers valuable business opportunities, especially for small and medium-sized enterprises (SMEs)” (Schmitt & Renken, 2012, p. 96).

In addition, Porter and Kramer (2011) do not answer the question how stakeholders are engaged in creating value for the business and society (Spitzeck & Chapman, 2012, p. 508). Stakeholder engagement is under theorized (Greenwood, 2007, p. 318) and there is no consensus on the definition of stakeholder engagement in academic literature (Sloan, 2009; Greenwood, 2007). Moreover, little is researched about the relationship between firms and stakeholders (Greenwood, 2007) and so empirical evidence about how stakeholders are engaged is scant. Therefore, the need for further research on and the importance of stakeholder engagement in the creation of shared value for sustainability and environmental sustainability in particular has been highlighted by, e.g. Spitzeck and Chapman (2012, p. 508), Escudero and Googins (2012) and Szekely and Strebel (2013). In addition, Ayuso et al. (2006, p. 486) have pointed out that even less attention has been given on the outcome of the relationships between firms and stakeholders, e.g. learning and innovation.

Furthermore, it is important to stress that there is a more traditional view of stakeholder management, which is mainly concerned with stakeholder engagement for the mitigation of risks and a more forward thinking perspective: stakeholders as active collaborators and partners (Rodriguez et al., 2002; Prahalad & Ramaswamy, 2004; Sloan, 2009; Ayuso et al., 2011; Lee et al., 2012; DeFillippi & Roser, 2014). To stimulate innovation, however, collaboration with stakeholders and an active integration of stakeholders into the core business and strategic processes is needed (Sloan, 2009).

In particular, external stakeholders are increasingly seen as co-creation partners by scholars to create innovations for sustainability and environmental sustainability in particular (Escudero & Googins, 2012; Pedersen & Pedersen, 2013; Szekely & Strebel, 2013). Not mere improvements (incremental innovation) but the creation of new products and services (radical, breakthrough innovation) is seen as key for finding new solutions to overcome societal and environmental challenges (Szekely & Strebel, 2013; Escudero & Googins, 2012). In addition, scholars have recognized the benefits of engaging a wider group of stakeholders in co-creation literature (Hatch & Schultz, 2010; Guillart, 2014; Leavy, 2014). For instance, Guillart (2014, p. 8) argues that the more stakeholders are involved the more value is created and Szekely and Strebel (2013, p. 476) point out that engaging a variety of stakeholders is important for the creation of new products and services. The latter is also stressed by Escudero and Googins (2012) in the model of “Shared Innovation”, where innovation together with a wider group of stakeholders, is seen as key in solving social, economic and environmental issues. Similarly, Pedersen and Pedersen (2013, p. 7) point out that “companies and NGOs can create social, environmental and economic value: for example, through co-development of new products and services that address societal needs”. Nevertheless, there is a lack of research on secondary stakeholders (“e.g. NGOs/activists, communities, governments”) in particular (Ayuso et al., 2011, p. 1403) but they are regarded as relevant for sustainable development innovation (Hall & Vredenburg, 2003, p. 64).
In conclusion, increased attention is given to the role of business for a more sustainable society, where businesses simultaneously create economic, environmental and social benefits. Research is scant about small firms but the findings by Schmitt and Renken (2012, p. 96) indicate that creating shared value is beneficial for them. Stakeholder engagement, meaning the active integration of a wider group of stakeholders to create innovative (new) products and services is increasingly seen as important to increase environmental sustainability. To our understanding, however, there is a lack of research on how start-ups engage stakeholders to create innovative solutions for sustainability (see Ayuso et al., 2011). We have stressed that stakeholder engagement is under theorized (Greenwood, 2007) and that there is a lack of research on how stakeholders are engaged in new business creations (start-ups) to create innovative solutions for sustainability (see Ayuso et al., 2011). This leads us to our research question.

1.2. Research question
How are stakeholders engaged in the creation of an innovative product and/or service for environmental sustainability in sustainable entrepreneurial start-ups from the perspective of the firm?

Stakeholder engagement refers to the active integration of stakeholders into the business to create innovative (new) products and/or services. We also regard the product and/or service launch as part of the creation. Taking the research gaps into account, we are not limiting our research to any particular stakeholder group but we regard a wider group of stakeholders, which include NGOs, governments, the media, customers, suppliers, etc. as important for our study. Innovative solutions can be in the form of products and/or services and the start-ups must not necessarily be sustainable and innovative themselves. The start-ups main focus is the exploitation of opportunities to transition to an environmentally sustainable society.

1.3. The purpose
The purpose of our study is to provide a better insight into the area of sustainable entrepreneurship and innovation. In particular, we want to explore how sustainable entrepreneurial start-ups involve stakeholders in the creation of innovative solutions and/or products for environmental sustainability. By researching this we want to give insights into the reasons for how the founders of the start-ups engage stakeholders.

1.4. Contributions
With regard to theoretical contributions, we contribute to the closure of the identified research gaps in academic literature. With reference to societal contributions, we contribute to an increase awareness of sustainable entrepreneurial start-ups and their innovations for environmental sustainability in society. Concerning practical contributions, we give some guidelines to start-ups about important aspects to consider in stakeholder engagement and how it could eventually be optimized.

Our study is relevant to business administration since it delves deeper into the area of sustainable entrepreneurship and innovation, which are seen as key for the future development of business to create an environmentally sustainable society. Our study delves deeper into stakeholder engagement, which has the potential to be an important means for business to achieve the latter. Examples of sectors within business administration that are affected by and related to the topic are stakeholder management, innovation, product development and sustainability. Examples of sectors outside business administration that are affected by and related to the topic are public policy and the media.
2. Literature Review

We have divided our literature in three parts, which are in line with the purpose of our study and our research question. Our literature review is conducted as a funnel. It starts at a more general level before we narrow it down to our research question. The first two parts go from general definitions to the core of sustainable entrepreneurship in start-ups and stakeholder engagement for innovation. As there is often no consensus on the definition of our concepts in academic literature, we introduce several definitions from different authors and then provide our own definitions of the concepts. The first part serves to increase understanding of sustainable entrepreneurship, start-ups and sustainable entrepreneurial start-ups, while the second part is concerned with innovation, stakeholder engagement and stakeholder engagement for innovation (for sustainability). The third part highlights the linkages between the first two parts and introduces a model with those elements and linkages to theory that could help to answer our research question.

2.1. Sustainable entrepreneurship and start-ups

In order to understand sustainable entrepreneurship, it is essential to provide an insight into entrepreneurship theory and sustainable development first since sustainable entrepreneurship combines these two fields. Afterwards, we delve deeper into sustainable entrepreneurship. We provide its definition and explain its importance and incentives. We also address start-ups and define sustainable entrepreneurial start-ups.

2.1.1. Sustainable entrepreneurship

In this section, we define sustainable entrepreneurship by joining the definitions of entrepreneurship and sustainable entrepreneurship. We explain its importance and motivators for engaging in it.

Entrepreneurship
The term entrepreneurship obtained the first economic meaning in the 18th century when Richard Cantillon explained the principles of the early market economy based on individual property rights and economic interdependency (Landström et al., 2012, p. 1155). In the 20th century, interest in entrepreneurship grew, especially because of two famous economists: Schumpeter and Kirzner. The importance of invention and innovation1 in connection to entrepreneurship was mentioned by Schumpeter. He argues that “the function of entrepreneurs is to reform the pattern of production by exploiting an invention or more generally, an untried technological possibility for producing a new commodity or producing an old one but in a new way.” (Schumpeter, 1950, p. 132). Kirzner (1973, cited in: Landström et al., 2012, p. 1155) has another view on entrepreneurship. He regards an entrepreneur as a person who is aware of market imperfections and can take advantage of them in a way that resources are coordinated more effectively thanks to superior information about the needs and resources of different actors. In other words, he says that entrepreneurs see opportunities and that they are able to exploit them thanks to their superior knowledge or resources. Entrepreneurial opportunities are situations in which new goods or services, and organizing methods can be introduced and sold at a higher profit than their production costs (Casson, 1982).

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1 We will define innovation and go more in depth into the concept in the second part of the literature review.
These definitions influenced that entrepreneurship started to be seen as a field of study. However, entrepreneurship lacked a conceptual framework for a long time until Shane and Venkatamaran (2000) created one, which is accepted by most of the scholars, today. Their article is the most cited paper in the field of entrepreneurship theory (Wiklund et al., 2010, p. 1). According to them, an entrepreneur is not necessarily a person who establishes a new organization. Entrepreneurship is rather concerned with the exploration, discovery and exploitation of opportunities. They claim that entrepreneurship involves the connection of two phenomena: the presence of lucrative opportunities and the presence of enterprising individuals who discover, evaluate and exploit them. It is important to mention that not everyone can discover these opportunities. The opportunities are obvious only to entrepreneurs because they either possess prior information necessary to identify an opportunity or they have cognitive properties necessary to value the opportunity. (Shane & Venkatamaran, 2000, p. 221-222) It means that entrepreneurship is much more than just the creation of a new business. The exploitation of opportunities and introduction of innovations is the focus of entrepreneurial activity and entrepreneurs make a change thanks to their innovations.

**Evolution of sustainable development and our definition**

The aim of sustainable development is to use renewable resources as much as possible and to reduce or recycle non-renewable resources in order to prevent environmental degradation (Hall et al., 2010, p. 440; Shepherd & Patzel, 2010, p. 138-140). The problems related to sustainability occurred much earlier than one would think. Environmental archaeologists claim that the Babylonian Empire may have collapsed because of environmental degradation. Lead pollution is considered to be one of factors that resulted in the fall of Rome. (Mebratu, 1998, p. 496) Schlör et al. (2012) claim that all energy systems tend to end up in a crisis when the systems exceed their limits as it happened in the hunter-gather society 10 000 years ago and agrarian society in the 18th century. Nowadays, the fossil fuel energy system is approaching its limits too. Therefore, coordinated worldwide policies are necessary in order to increase sustainability.

Until the 1970s the term sustainability was restricted to forestry only (Schlör et al., 2012, p. 326). However, awareness of environmental issues such as ecosystem degradation and global climate change was increasing (Hall et al., 2010, p. 440; Lélé, 1991, p. 612). Consequently, sustainability questions started to be raised. The first step towards a definition of sustainable development occurred at the Conference on Human Environment in Stockholm in 1972. Even though the term itself did not occur, it was proclaimed that natural resources must be protected for the benefit of both present and future generations. (Mebratu, 1998, p. 500-501; Schlör, 2012, p. 326) A clear definition of sustainable development was presented later at the WCED conference and in the Brundtland Report “Our common future” (WCED, 1987, p. 43). “Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 43). The definition brought sustainable development to the discourse on the national and multinational level and it has been broadly accepted by governments, NGOs and businesses ever since (Redclift, 2005, p. 212; Luke, 2005, p. 229; Hopwood, 2005, p. 39; Mebratu, 1998, p. 501; Schlör et al., 2012, p. 327; Lélé, 1991, p. 611).

Despite clear benefits of the definition, such as its acceptance on the global level with respect to our planet’s future (Mebratu, 1998, p. 494), some scholars criticize the definition because they think that is unclear. For instance, Redclift (2005, p. 213) argues that needs change. Moreover, he argues that needs are defined differently in different cultures. Luke (2005, p.
228-229) asks further questions which the definition fails to answer, such as whose needs, whether or not they are needs or desires, how development is understood, etc.

If we look at other definitions of sustainable development, there are many interpretations of the term among scholars but the definitions are vague (Lélé, 1991, p. 607-608; Mebratu, 1998, p. 503; Hoopwood, 2005, p. 38). Lélé (1991, p. 608) researched the interpretations of the terms and found out that their meanings vary from “ecologically sustainable or environmentally sound development” to “sustained growth, sustained change” or simply “successful”. Moreover, Hopwood et al. (2005) map the views of sustainable development and take environmental and socio-economic perspectives into account. In some instances, importance is given to human well-being and equality. In other instances, priority is given to the environment. Due to the vagueness of the definitions, we adopt the definition by the famous Brundtland Report despite the fact that it is criticized to be unclear, since this definition brings together both environmental and socio-economic questions (see Hopwood et al., 2005, p. 39). We also accept the definition because it stresses that environmental problems are not local but global and because the definition was adopted not only by governments, NGOs and businesses but also by scholars (Hall et al., 2010; Cohen & Winn, 2007; Dean & McCullen, 2007; etc.).

**Sustainable entrepreneurship**

After approaching the definitions of entrepreneurship and sustainable development, we advance to the definition of sustainable entrepreneurship. Sustainable entrepreneurship combines the goals of entrepreneurship and sustainable development (Thompson et al., 2011, p. 210; Dean & McCullen, 2007; Cohen & Winn, 2007; Schaltegger & Wagner, 2011, p. 226). The field of sustainable entrepreneurship is rather complex because of two reasons. First, there are no clear boundaries between sustainable, environmental and social entrepreneurship. Second, the definitions of sustainable entrepreneurship that exist in academic literature are ambiguous. (Thompson et al., 2011) To make the selection of our definition more clear, we enhance the understanding of sustainable entrepreneurship and highlight the differences between sustainable, environmental and social entrepreneurship. We also summarize the definitions of sustainable entrepreneurship, which were used in previous academic literature. We present our definition of sustainable entrepreneurship at the end.

The differences between sustainable, environmental and social entrepreneurship can be summarized as follows: Social entrepreneurship examines social opportunities that relate to social issues. The primary goal of the organizations is their social mission, which is helping people. Sustainable entrepreneurship is concerned with opportunities that should lead to a socially, economically, and environmentally sustainable society. With regard to environmental entrepreneurship, the firms’ goal is to create economic profit and environmental improvement at the same time. The aim of sustainable entrepreneurship is to balance the triple bottom line of people, planet, and profit. (Thompson et al., 2011) The triple bottom line was first mentioned by Elkington (1999). According to him, the triple bottom line focuses on economic prosperity (profit), environmental quality (planet) and social justice (people – the aspect which was overlooked before by previous research) (Elkington, 1999, p. 70). Consequently, the term sustainable entrepreneurship is broader than environmental and social entrepreneurship. This is why we focus on sustainable entrepreneurship in our thesis.

There is no consensus in academic literature on the definition of sustainable entrepreneurship. Therefore we made a review of the most cited articles about the different definitions of sustainable entrepreneurship (see Table 1 below).
**Table 1: Sustainable entrepreneurship definitions**

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dean &amp; McCullen (2007, p. 58)</td>
<td>“Sustainable entrepreneurship as the process of discovering, evaluating, and exploiting economic opportunities that are present in market failures.”</td>
</tr>
<tr>
<td>Cohen &amp; Winn (2007, p. 35)</td>
<td>“Sustainable entrepreneurship as the examination of how opportunities to bring into existence future goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social, and environmental consequences.”</td>
</tr>
<tr>
<td>Choi &amp; Edmund (2008, p. 559)</td>
<td>“successful sustainable entrepreneurs, in our view, not only create profitable enterprises but also achieve certain environmental and/or social objectives. They pursue and achieve what is often referred to as the “double bottom-line” or “triple bottom-line”.”</td>
</tr>
<tr>
<td>Cohen et al. (2008, p. 108-109)</td>
<td>Sustainable entrepreneurship examines “…why, when and how opportunities for the creation of goods and services in the future arise in an economy; why, when, and how some are able to discover and exploit these opportunities while others cannot or do not; and finally what are the economic, psychological, social and environmental (added) impacts of this pursuit of a future market not only for the pursuer but also for the other stakeholders and for society as a whole.”</td>
</tr>
<tr>
<td>Hockerts &amp; Wüstenhagen (2010, p. 482)</td>
<td>“Sustainable entrepreneurship as the discovery and exploitation of economic opportunities through the generation of market disequilibria that initiate the transformation of a sector towards an environmentally and socially more sustainable state.”</td>
</tr>
<tr>
<td>Shepherd &amp; Patzelt, (2010, p. 142)</td>
<td>“Sustainable entrepreneurship is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society.”</td>
</tr>
<tr>
<td>Schaltegger &amp; Wagner (2011, p. 224)</td>
<td>“sustainable entrepreneurship can thus be described as an innovative, market-oriented and personality driven form of creating economic and societal value by means of break-through environmentally or socially beneficial market or institutional innovations.”</td>
</tr>
<tr>
<td>Thompson et al. (2011 p. 218)</td>
<td>“Sustainable entrepreneurship examines opportunities to transition to a socially, economically, and environmentally sustainable society.” “These opportunities may be sought through organizations that create economic profit, or through non-profit organizations but the organization must be economically self-sustaining.” “These organizations balance the triple bottom line of people, planet, and profit”.</td>
</tr>
</tbody>
</table>

Most of the definitions (Shepherd & Patzelt, 2010, p. 142; Thompson et al. 2011 p. 218; Hockerts & Wüstenhagen 2010, p. 482; Cohen et al. 2008, p. 108-109; Cohen & Winn, 2007, p. 35) combine the goals of entrepreneurship and sustainable development. These definitions are concerned with the exploration, discovery and exploitation of opportunities as seen in the definition of entrepreneurship (Venkatamaran, 2000). They also underline the importance of both environmental and socio-economic goals (see WCED, 1987, p. 43). Some nuances can be seen between the definitions.

Hockerts and Wüstenhagen (2010) focus on the transformation of market disequilibria but they vaguely define the scope. Cohen and Winn (2007) provide a more detailed definition because they explain the scope of economic, psychological, social, and environmental consequences. Shepherd and Patzelt (2010) based their definition on constructs to be developed and constructs to be sustained. They add processes to the definition. Only Thompson (2011) describes which type of organization is concerned. This is one of the reasons why we choose his definition. We also adopt the definition of Thompson et al. (2011) since it matches the goals of both entrepreneurship and sustainable development. Nevertheless, we are not including the triple bottom line concept in our definition because we focus more on an environmentally sustainable society instead of a socially sustainable society in our study.
The definitions do not give sufficient information where the opportunities can be found. Only Dean and McCullen (2007, p. 58) indicate that opportunities “are present in market failures” and Hockerts and Wüstenhagen (2010, p. 482) point out that they come from market disequilibria. According to Cohen and Winn (2007) and Dean and McCullen (2007), market failures provide opportunities for sustainable entrepreneurs who are about to resolve them and can achieve profitability while reducing environmentally degrading economic behaviors at the same time.

We are now describing the market failures inefficient firms, externalities and information asymmetries because we consider them to be most relevant for our study. With reference to the first, markets are working below perfect efficiency and inefficiency leads to environmental degradation. (Cohen & Winn, 2007, p. 38-40) Another reason why environmental degradation occurs is due to negative externalities. A negative side effect of the firms’ production can be pollution, for instance. (Cohen & Winn, 2007, p. 40-41) Another market failure is caused due to difficulties in obtaining information. The presence of imperfect information leads to unsustainable production and consumption patterns. (Cohen & Winn, 2007, p. 43-44)

According to other scholars, opportunities can be seen in governmental actions (Meek et al., 2010) and societal and environmental challenges (Escudero & Googins, 2012; Szekely & Strebel, 2013, p. 476-477). Ambec and Lanoie (2008, p. 58), e.g. claim that sustainable investments can lead to opportunities for increasing revenues and reducing costs, consequently to connect environmental and economic performance. This is one of the reasons why businesses take advantage of getting involved in environmental improvements. Cohen and Winn (2007, p. 30) argue that sustainable entrepreneurs may have the potential to lead the world into a new industrial revolution, which would result in reversing negative environmental trends. This is why sustainable entrepreneurship is important.

Sustainable entrepreneurship is also important because it brings economic and non-economic gains. The economic gains can lead to the development of society (enhancing socioeconomic status, improved emotional, psychological and physical health). Non-economic gains can be brought to individuals, e.g. improved well-being and to society. (see Shepherd & Patzelt, 2010).

Incentives for sustainable entrepreneurship
According to the definition of sustainable entrepreneurship suggested by Thompson et al. (2011, p. 218), there are two kinds of sustainable organizations. They differ in their non-profit and for-profit goals. Parrish (2010) further explores the motivation of sustainable entrepreneurs and contrasts them between opportunity-driven and sustainability-driven entrepreneurs. The goal of the former is mainly to exploit opportunities to make profit, the latter to solve sustainable issues and keep the enterprise viable at the same time (Parrish, 2010, p. 510).

Meek et al. (2010) argue that political factors can have an influence on sustainable entrepreneurship. They look at political factors in the external environment and scrutinize the broader institutional context of sustainable entrepreneurship. Despite their focus on the solar sector in the United States only, they show interesting findings. They claim that both centralized (governmental) and decentralized (socially determined) organizations influence the founding of new companies significantly. Government sponsorships (subsidies) are
effective in promoting the founding of firms in particular. The authors show that it is necessary to also take these institutions into account because they can be a great motivator to start a new business.

With respect to entrepreneurship in general, research by Shane et al. (2003) shows that there are also other motivational and non-motivational factors. Shane et al. (2003) claim that human action is the consequence of both motivational and cognitive factors. People must not only have the abilities, intelligence and skills (cognitive factors) to be able to exploit opportunities but they must also be willing to exploit them (motivational factors). Besides motivational factors, also the willingness is influenced by other incentives: non-motivational factors and external factors. We summarize them in Table 2 based on the article by Shane et al. (2003).

<table>
<thead>
<tr>
<th>Motivational factors</th>
<th>Non-motivational factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for achievement</td>
<td>Opportunity cost, stocks of financial capital, social ties to investors and career experience</td>
</tr>
<tr>
<td>Locus of control</td>
<td></td>
</tr>
<tr>
<td>Drive and passion</td>
<td></td>
</tr>
<tr>
<td>Desire for independence</td>
<td></td>
</tr>
<tr>
<td>Goal setting, self-efficacy</td>
<td>The belief in ability. It can be characterized as task-specific self-confidence</td>
</tr>
</tbody>
</table>

**Table 2: Incentives for entrepreneurship**

It remains to be studied to which extent these can also be seen in sustainable entrepreneurship.

### 2.1.2. Start-ups

In our study we focus on entrepreneurial activity in starting young businesses, not on corporate entrepreneurship, which occurs in the mature firms (See Corbert et al. 2013). Therefore, we introduce the term start-up. Moreover, we regard it as important to stress the distinction of entrepreneurial start-ups compared with “other start-ups” because we are concerned with the former in our thesis.

There is a lack of a more precise definition of start-ups. Johnson et al. (2011) regard a start-up as the first stage of entrepreneurial life cycle. They claim that this stage is followed by growth, maturity and exit. However, their definition lacks a proper description. Bessant and Tidd (2007, p. 271) provide an insight into the stages of creating a new start-up. Typical stages according to them include: assessing an opportunity, developing a business plan, acquiring resources and funding, including expert support and potential partnership, growing and harvesting the venture (Bessant & Tidd, 2007, p. 271). We adopt the definition of start-up by Luger & Koo (2005) because it summarizes definitional criteria of a start-up which were used in previous literature: “new”, “active” and “independent” and incorporate them into their definition: “A start-up can be defined as a business entity which did not exist before during a given time period (new), which starts hiring at least one paid employee during the given time period (active), and which is neither a subsidiary nor a branch of an existing firm (independent).” (Luger & Koo, 2005, p. 19). We choose this definition since it includes a new business creation.
There are differences between entrepreneurial start-ups and small businesses (Carland et al., 1984; Runyan et al., 2008). The difference is that entrepreneurial start-ups have a strong commitment to products and technological innovation, risk taking, and proactivity (see Miller, 1983, p. 771). Carland et al. (1984, p. 358) emphasize that entrepreneurs show innovative behavior. This behavior is key to ensure sustainable competitive advantage. In contrast, small business owners are not entrepreneurially oriented since they do not actively engage in any new or innovative practices. They regard leisure time as more important after reaching an “acceptable” business performance level. (Runyan et al., 2008, p. 570; Carland et al. 1984, p. 358).) A small business owner utilizes the business as a main source of income for the family (Carland et al. 1984, p. 358) and this explains why they are less prone to taking risks to grow the business eventually. We have explained the differences to stress that start-ups as defined in our study are entrepreneurial because they want to be the driver for change, take advantage of opportunities and engage in innovations by taking risks and showing proactivity in reaching their ambitious goals.

Start-ups face many challenges in order to survive the first stages of their existence. A lot of businesses are started every year but only a few survive the first years of their existence. (Bessant & Tidd, 2007, p. 256, Cressy 2006, p. 103, Johnson et al., 2011, p. 311). According to Cressy (2006, p. 103), half of randomly selected start-ups do not survive the first two and half years and they claim that the peak failure rate is around 18–24 months of age. Another challenge is that the start-ups are not innovative and creative enough (Bessant & Tidd, 2007, p. 256). They must adopt entrepreneurial orientation in order to achieve competitive advantage, which usually leads to the longevity of the start-up.

A big challenge is acquiring sufficient resources and funding according to scholars (Bessant & Tidd, 2007, p. 275; Beck, 2013). At the beginning, it is difficult for entrepreneurs to obtain external capital. Consequently, they must rely on self-funding and family and friends. In later stages, they can ask for a loan, contact business angels and individuals who offer risk capital and other value added activities to unlisted firms, which are not within family connections (Politis, 2008, p. 127), venture capitalists or governmental funding. (Bessant & Tidd, 2007, p. 275-276) In addition, financial bootstrapping plays an important role, which is a way of securing the usage of resources without relying on external financial means (Winborg, 2009). It is a way of how start-ups can be financed by “minimizing outflow, eliminating outflow, delaying outflow and speeding up inflow of financial means” (Winborg, 2009, p. 72).

**Sustainable entrepreneurial start-ups**

Entrepreneurial start-ups and sustainable entrepreneurship can be linked. Our definition of sustainable entrepreneurial start-up combines the definition of an entrepreneurial start-up (see Section 2.1.2) and our definition of sustainable entrepreneurship (see Section 2.1.1). We define sustainable entrepreneurial start-up as a new, active and independent company, which has a strong commitment to products and technological innovation, risk taking, and proactivity. It examines opportunities to transition to a socially, economically, and environmentally sustainable society. These opportunities may be sought through a start-up that creates economic profit, or through a non-profit start-up but the start-up must be economically self-sustaining (or have the goal to be economically self-sustaining in the long run).

Sustainable entrepreneurial start-ups are important because they have a big influence on large firms. Hockerts & Wüstenhagen (2010) compare the contribution of new entrants (start-ups) and incumbents (older firms) to sustainable entrepreneurship. According to them, new
entrants are very important. They pursue sustainable opportunities and stimulate disruptive innovation at the beginning of an industry change towards sustainability. Consequently, as the new entrants are successful, incumbents follow with corporate sustainable entrepreneurship. As a result, new entrants manage to change the whole industry to become sustainable. (Hockerts & Wüstenhagen, 2010).

2.1.3. Summary and conclusion
Sustainable development has been increasing in importance since the definition by the WCED was introduced. Entrepreneurship drives change by actively discovering and exploiting opportunities. Therefore, it is obvious that it can also contribute to sustainable development. Research by Hockerts and Wüstenhagen (2010) shows that sustainable entrepreneurship of start-ups can have a big impact on large firms and therefore on the whole industry to increase sustainability, in particular.

Research on sustainable entrepreneurship has been increasing in the last years. There are different definitions and only few authors clarify where the opportunities can be found. It was researched that opportunities come from market failures and market disequilibria by scholars. However, it remains to be studied where the opportunities can be seen from the perspectives of firms. Furthermore, entrepreneurship research examines influential motivational factors of entrepreneurs but based on our research we argue that more could be researched about how sustainable entrepreneurs are influenced and what motivates them.

2.2. Stakeholder engagement and innovation
This part is separated in three sections. The first serves to give a general understanding of innovation at firms. The second defines stakeholders and stakeholder engagement. Last, we join the first and second part to discuss different concepts of stakeholder engagement for innovation.

2.2.1. Innovation
We will define innovation and explain different reasons to innovate, challenges related to innovation and types of innovation.

There are many different definitions of innovation and approaches to define innovation in academic literature (see Michelini, 2012, p. 9; Baregheh et al., 2009, p. 1334, Castellacci et al., 2005, p. 92). Baregheh et al. (2009, p. 1326) collected 60 definitions across disciplinary literatures alone. Based on their extensive literature review, Baregheh et al. (2009, p. 1334) have proposed a general multidisciplinary definition of innovation, which can be seen in Table 3. Based on our literature review on the definition of innovation, we identified five elements that are reoccurring in different definitions: change, process, transformation (of an idea into new a product, process, service), market acceptance, and improved firm performance/success. We therefore argue that these elements are important in the definition of innovation. The elements will now be explained in more detail:

The definitions by Damanpour (1996, p. 694), the OECD (2005, p. 34), Kline and Rosenberg (1986, p. 275), Thompson (1965, p. 2) and Crumpton (2012, p. 98) highlight that innovation implies a change for the firm and its context. In addition, innovation is seen as a process by Baregheh et al. (2009, p. 1334), Damanpour (1996, p. 694), Bessant and Tidd (2009, p. 29) and Kline and Rosenberg. In the quotes by Crumpton, Baregheh et al., Bessant and Tidd and Thompson (1965, p. 2), it becomes apparent that new (or improved) products, services or processes are generated and Baregheh et al. and Bessant and Tidd specifically stress the
transformation of an idea into the latter. All three authors also highlight the market acceptance or the new/improved product, service or process with the words “marketplace” (Baregheh et al.), “used” (Bessant and Tidd) and “acceptance” (Thompson) in the context of their definitions. Last, a positive effect for the firm is underlined with the words: “to advance, compete, differentiate themselves successfully” (Baregheh et al.), “improving the firm’s performance” (OECD), “capacity to change or adapt” (Thompson) and “greater efficiency” (Crumpton) that can make the firm more competitive. The different definitions of innovation, including the authors’ names, year and page number can be read in Table 3 below.

<table>
<thead>
<tr>
<th>Source</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Crumpton (2012, p. 98)</td>
<td>“Innovation is defined as creating better or more effective or more efficient processes and services or generating the ideas or culture that will breed this creativity. This is coupled with the willingness to implement changes to existing methods or techniques in order to gain the benefits of greater efficiency.”</td>
</tr>
<tr>
<td>Baregheh et al. (2009, p. 1334)</td>
<td>“Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.”</td>
</tr>
<tr>
<td>Bessant &amp; Tidd (2009, p. 29)</td>
<td>“the process of translating ideas into useful and used new products, processes or services”</td>
</tr>
<tr>
<td>OECD (2005, p. 34)</td>
<td>“Innovation in firms refers to planned changes in a firm’s activities with a view to improving the firm’s performance”</td>
</tr>
<tr>
<td>Damanpour (1996, p. 694)</td>
<td>“(…) a process that includes the generation, development, and implementation of new ideas or behaviors. Furthermore, innovation is conceived as a means of changing an organization, either as a response to changes in the external environment or as a pre-emptive action to influence the environment.”</td>
</tr>
<tr>
<td>Kline &amp; Rosenberg (1986, p. 275)</td>
<td>“Innovation is complex, uncertain, somewhat disorderly, and subject to changes of many sorts. (…) The process of innovation must be viewed as a series of changes in a complete system not only of hardware, but also of market environment, production facilities and knowledge, and the social contexts of the innovation organization.”</td>
</tr>
<tr>
<td>Thompson (1965, p. 2)</td>
<td>“By innovation is meant the generation, acceptance, and implementation of new ideas, processes, products or services. Innovation therefore implies the capacity to change or adapt.”</td>
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</table>

Table 3: Definitions of innovation

As the definition by Baregheh et al. (2009, p. 1334) is the most comprehensive, also taking the fact into account that not only new but also improved products, services and processes are included, we have chosen to base our definition on the definition by Baregheh et al.. We have not chosen the definition by the Oslo Manual (OECD, 2005, p. 34) because we argue that in new business creations, innovation can refer to the creation of something new from the start. The wording of the definition by the OECD “planned changes in a firm’s activity” leads us to conclude that only established firms are referred to. In addition, our definition could be expanded to include the creation of a new organizational or marketing method (OECD, 2005, p. 46) but they are not the focus of our study. In general, however, the innovation can be technological and non-technological.

Furthermore, innovation is systemic and interactive (see Kline & Rosenberg, 1986, Rothwell, 1994; Varis & Littunen, 2010, p. 133; Von Stamm, 2008, Tether, 2002). In the chain-linked model by Kline and Rosenberg
(1986, p. 289-291), for instance, a series of feedback paths link from “perceived market needs and users” back to the different stages of the development processes and there are also several connections between research done outside the firm at, e.g. universities, institutes, etc. and development. The authors, however, stress that the firm first uses its own resources and knowledge for the development process before consulting experts in the field or doing further research (Kline & Rosenberg 1986, p. 291). Consequently, opening up the development process can provide several benefits for the firm, e.g. it can accelerate the development of a new product, process or service and increase the chance of market acceptance. In fact, connections outside the organization, e.g. with customers, suppliers, etc. are becoming more and more important for having a successful innovation (Von Stamm, 2008, p. Xii-Xiii). The latter is especially important for innovation in small and medium-sized enterprises (SMEs) because they often depend on an “efficient interaction with other firms and public research institutions for R&D, exchange of knowledge, and potentially, for commercialization and marketing activities”. (OECD, 2005, p. 39)

In summary, we define innovation as a systemic and interactive multi-stage process whereby an organization converts ideas into new or improved products, processes and/ or services that are accepted by the market place.

Types of Innovation
There exist different types of innovation and different approaches to categorize innovation in academic literature (Benner & Tushman, 2003, p. 242-243; Francis & Bessant, 2005, p. 142). It can be differentiated between service, product, process and technical innovation (see Baregheh, 2009), as well as market(ing) and organizational innovation (OECD, 2005, p. 46), also referred to as “new organizational forms” (Ettlie & Reza, 1992, p. 795), “new organization structure or administrative systems, or new plans or program pertaining to organization members” (Damanpour, 1996, p. 694). Nevertheless, we will only define product and process innovation because we consider them to be more relevant for the purpose of our study.

There are different definitions of product innovation (see Hoonsopon & Ruenrom, 2012, p. 251). In our study, we define product innovation as the creation of a new product or service “to meet an external market or user need” (Damanpour, 1996, p. 698). Product innovation, in our study, can also refer to significantly improved functional or user characteristics of a good or service (OECD, 2005, p. 48). Process innovations concerns the integration of new elements, such as input materials or work flow in the production process or service operation to make a new product or service (Ettlie & Reza, 1992; Utterback & Abernathy, 1975 cited in Damanpour, 1996, p. 698 and Reichstein & Salter, 2006, p. 653). The difference between product and process innovation is sometimes not very clear because an innovation can be a product and process innovation at the same time (see OECD, 2005, p. 53).

We add a short definition of social innovation as a type of innovation to our study because it is regarded as important for firms that want to find innovative solutions to not only environmental but also societal challenges (see Osburg & Schmidpeter, 2013). There is currently no unified definition of social innovation (see Michelini, 2012) but a “general agreement on the idea that social innovation refers to innovations that have been made with the explicit intention of finding solutions for current social problems or future challenges”. Social can refer to the interaction between humans and to something that is good for society but “good for society” can be interpreted differently. (Fifka & Idowu, 2013, p. 310) Consequently, social innovation is still a fuzzy concept but we define it as an innovation that
can change how people communicate and behave and that aims at overcoming societal challenges.

Furthermore, the different types of innovation can further be distinguished between the impact and novelty of innovation. With regard to the impact of innovation, it can be differentiated between innovation that brings improvements (incremental innovation) and innovation that creates something new (see Varis & Littunen, 2010, p. 130-131). The latter can be called radical (see Harmancioglu et al., 2009, p. 233), disruptive (Afuah, 2009) or breakthrough (Zhou et al., 2005) because it can change a market and the activities of firms (see Zhou et al., 2005). For example the automobile can be considered a disruptive technological innovation because it has replaced horse carriages (Afuah, 2009, p. 200). In addition, there exist different degrees of novelty in innovations (see Harmancioglu et al., 2009). We have chosen to adopt those defined by the OECD because they are very well defined and the Oslo manual serves as an international source of guidelines for studies in the field of innovation. The three degrees of novelty are: new to the firm, new to the market and new to the world. A product or process can be new to one firm even though other firms have already implemented it and “new to the firm” also refers to a significantly improved product, process, marketing and organizational method. Innovations that are first introduced to the market (the market that the firm operates in) by the firm are called “new to market innovations”. The highest novelty of innovation is achieved when the innovation is new to the world, which means that “the firm is the first to introduce the innovation for all markets and industries, domestic and international” (OECD, 2005, p. 57-58).

**Reasons for firms to innovate**

We point out reasons for firms to innovate because it can be helpful to understand what drives firms in their activities to innovate. Based on our literature review we conclude that the main underlying reasons for innovation are related to a positive change. This positive change can be learning and increased competitiveness (Baregheh, 2009, p. 1334; Tödtling & Trippl, 2005, p. 1203; Dobni, 2008, p. 43), improved dynamic capabilities because the firm can be more adaptive by implementing new ideas (Thompson, 1965, p. 2) and increased efficiency (Crumpton, 2012, p. 98). In addition, new knowledge and ideas are generated that help to improve business processes and to “create market driven products and services” (Plessis, 2007, p. 21). Reasons for new or improved processes, e.g. in delivery and production regard efficiency but also cost reduction and an increase in quality, whereas reasons for creating new or improved products in particular concern accessing new markets, increasing the market share and the quality of products (see OECD, 2005, p. 106-107).

In addition, firms, such as the global technology company 3M, innovate because they want to increase value for their customers (Bell, 2013, p. 36) and find new solutions against environmental degradation (Bell, 2013, p. 37). In addition, a quantitative study on SMEs from Finland revealed that a firm’s growth is related to innovation (Varis & Littunen, 2010). Innovation for growth is also argued for by Von Stamm but at the same time, she criticizes this underlying reason for innovation and calls for innovation to increase the well-being of society (2012, p. 49). The latter brings us back to our definition of social innovation, which has the aim to find solutions for societal challenges at the core.

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2 It is important to keep the different types of innovation in mind when reading the subsequent chapters because we will come back to them when describing different types of stakeholder engagement, for instance.
In conclusion, underlying reasons for innovation are related to a positive change for the firm, society, and the environment. As the product- and process innovation can also result in environmentally friendly solutions or increased societal well-being, it is to find out in our study, what the motivation for innovation of our start-ups are and whether this has an influence on how start-ups engage stakeholders.

Challenges related to innovation
As indicated in the section above, innovation can have several benefits for the firm. Nevertheless, many firms face a number of challenges, also referred to as obstacles, constraints, and barriers to innovation in academic literature (Dalton, 2009; Mohnen et al. 2008; Blanchard et al., 2012; Larsen & Lewis, 2007, etc.). In fact, “the nature of innovation makes it an uncertain output. There is no guarantee that a firm investing in R&D or other innovation inputs will generate innovations” (Blanchard et al., 2012, p. 680) and research by Mohnen et al. (2008, p. 212) shows that obstacles to innovation can have “a major negative impact on innovative activity”. Common challenges that we have identified in literature are a lack of financial resources (Larsen & Lewis, 2007, 142; Blanchard et al., 2012, p. 680; Mohnen et al., 2008, p. 203), to obtain skills and resources that the firm does not have itself (Von Stamm, 2004, p. 16; Dalton, 2009, p. 56; Mohnen et al., 2008, p. 203), high risks and costs (Mohnen et al. 2008, p. 203; Von Stamm, 2004, p. 16), appropriability (“to capture the profits generated by an innovation” (Teece, 1986, p. 287) and the successful commercialization of innovation (Teece, 1986, p. 287; Larsen & Lewis, 2007, 143).

Financial resources are a big obstacle for young and SMEs in particular (Mohnen et al., 2008, p. 202; Larsen & Lewis, 2007, 142). Nevertheless, problems of appropriability can hinder firms to give information about their innovations to investors (Mohnen et al., 2008, p. 202) and that can be an obstacle to get financial resources in itself. There are several possibilities to protect an innovation from imitation, such as patents, copyrights and trade secrets. Nevertheless, patents do not guarantee “perfect appropriability”. One of the reasons is that “legal requirements for upholding their validity or for proving their infringement are high”. In general, however, codified knowledge is easier to imitate than tacit knowledge. (Teece 1986, p. 287)

Having sufficient financial resources and protection for an innovation does not guarantee its success, however. For the successful commercial exploitation of innovation, for instance, the reduction of time to market (Von Stamm, 2008; Larsen & Lewis, 2007, 143), “market segment focus” (Dalton, 2009, p. 56) and good marketing skills, as well as after-sales support (Teece, 1986, p. 288) play an important role. In addition, Larsen and Lewis (2007, p. 143) stress that for successful commercial exploitation, especially SMEs “need to be customer-driven providing customers with what they want and not what inventors think the customer needs”. Knowing the expectations of customers to position their product on the market successfully is also underlined by Hoonsopon and Ruenrom (2012, p. 251). Consequently, market research and communicating with potential users and customers can be crucial. In conclusion, there are several challenges that a firm faces when innovation and most of them are related to lack of resources and skills.

2.2.2. Stakeholders and stakeholder engagement
We avoid the term stakeholder theory because there are several theories and not only one concerning the stakeholder concept (see Freeman, 1994; Donaldson & Preston, 1995, p. 66). In the past years, stakeholder theory in combination with sustainability has received increased attention in academic literature (see Ayuso et al., 2006; Spitzeck & Chapman, 2012; Escudero
In particular, stakeholders are increasingly seen as co-creation partners by scholars to create innovations for environmental sustainability in particular (Escudero & Googins, 2012; Pedersen & Pedersen, 2013; Szekely & Strebel, 2013). We will go more in depth on how stakeholders have been involved to create innovations for sustainability in the section stakeholder engagement for innovation.

Freeman (1984, p. 46) defines stakeholders as ‘any group or individual who can affect or is affected by the achievement of the organization’s objectives’ (Freeman, 1984, p. 46). We adopt Freeman’s definition of stakeholders because it shows the interdependency between the firm and the stakeholders and it is the most cited in literature (to our knowledge). Examples of stakeholders are financiers, customers, employees, communities (Freeman, 1994, p. 417), shareholders (Freeman et al., 2004, p. 365), “persons, groups, neighborhoods, organizations, institutions, societies and the natural environment” (Mitchell et al., 1997, p. 855). Freeman’s definition is broad and indeed, there has been a debate in academic literature on the definition of stakeholders (see Mitchell et al., 1997, p. 855, p. 858).

There are numerous ways for classifying and identifying stakeholders. They are commonly grouped into two main groups: primary and secondary stakeholders. (see Buysse & Verbeke, p. 458, 2003; Ayuso et al., 2006, p. 476). As these are generally known and because we do not attempt to classify stakeholders in a straightjacket but rather acknowledge that the perception of managers plays a role we would like to go more in detail with respect to Mitchell et al.’s (1997) approach to classify stakeholders. Mitchell et al. (1997) suggest a stakeholder classification based on the attributes power, legitimacy and urgency. Mitchell et al. (1997, p. 854) put forward that the classification and salience of stakeholders come from the perception of the firm manager; “(1) the stakeholder's power to influence the firm, (2) the legitimacy of the stakeholder's relationship with the firm, and (3) the urgency of the stakeholder's claim on the firm” mainly determine to which stakeholders a firm manager pays attention to. The latter lets us conclude that relationships to stakeholders are flexible because managers’ perceptions can change based on changes in and influences from the firm’s environment, including people.

It is to highlight that “not all stakeholders or firms have the same characteristics” and that the relationship to stakeholders can change over time and differs between firms. (Rodriguez et al., 2002, p. 140). Furthermore, it is up to business managers to decide how they aim to do business (what the purpose of the business is) and what relationship they want and should have with their stakeholders to provide value for them (Freeman, 2004, p. 364). At this point, we want to give special attention to the proactive role of business in developing relationships with stakeholders. Freeman (2004, p. 364) stresses that managers have the main responsibility for developing good relationships with stakeholders to create value and profit as a result of value creation; “Managers must develop relationships, inspire their stakeholders, and create communities where everyone strives to give their best to deliver the value the firm promises”. A proactive approach from stakeholders that take initiative to develop good relationships with the firms is not discussed.

**Defining stakeholder engagement**

Due to the novelty of stakeholder engagement in academic literature, there is no common understanding of its meaning. Furthermore, it can be seen from different perspectives and interpreted differently. (Sloan, 2009, p. 26; Greenwood, 2007, p. 315). According to Greenwood (2007, p. 315), stakeholder engagement is seen as “practices that the organization undertakes to involve stakeholders in a positive manner in organizational activities”. Despite
being precise that the involvement is “in a positive manner” she remains unclear to which extent stakeholders are involved by the organization. Sloan (2009, p. 26) differentiates between active and passive involvement. She states that stakeholder engagement can be understood “as the process of involving individuals and groups that either affect or are affected by the activities of the company”. Her definition refers to a wide stakeholder group: shareholders, employees, customers, suppliers, local communities, politics, activist groups and governmental organizations. From her definition, it follows that stakeholders can either play a passive or proactive role in the company’s activities.

This is in line with a more traditional view of stakeholder management, which is mainly concerned with stakeholder involvement for the mitigation of risks and a more forward thinking perspective: stakeholders as active collaborators and partners (see Escudero and Googins, 2012). The latter becomes evident in the two models of stakeholder engagement that Sloan (2009, p. 37) developed. The control model (outward-looking) has a goal to control and manage stakeholder risks by monitoring, listening and telling, while the collaboration model (inside-looking) targets organizational learning and transformation by collaborating and partnering with stakeholders. In the first model, stakeholders are seen as a threat, while in the second model stakeholders are seen as opportunity. The collaboration model is argued to be more effective because transformational change and innovation are stimulated. (Sloan, 2009)

Based on Sloan’s models one can say that stakeholder engagement can either be defined as a risk mitigating activity where stakeholders are used as a tool for “legitimizing” corporate activities or as an active integration of stakeholders into the core business and strategic processes. In general, however, the integration of stakeholders can take many forms. For instance, Greenwood (2007, p. 18) points out that the engagement of stakeholders does not mean that there is always a moral treatment of stakeholders and that there is equality between both parties because “in reality, however, it is likely that the organization and its stakeholders are not of equal status and that the terms of any co-operation are set by the more powerful party”.

Consequently, stakeholder engagement is a fuzzy concept whose definition can take on many directions based on who is involved, whether the involvement is more active or passive, what the power difference is, how stakeholders are treated and who initiates stakeholder engagement. The fuzziness of the concept can partly be explained by the fact that stakeholder engagement is under theorized (Greenwood, 2007, p. 318) and that companies make a choice of who and how to involve based on a specific purpose and that the purpose can vary (see DeFillippi & Roser, 2014, p. 31). The latter suggests that companies take the first step in involving stakeholders, which is also pointed out by Ramaswamy (2009, p. 32).

Despite the novelty of “stakeholder engagement”, the concept of co-creation that was introduced by Prahalad and Ramaswamy (2004) more than 10 years ago, is strongly related. Similarities between co-creation and Sloan’s collaboration model can be seen because Prahalad and Ramaswamy (2004, p. 6) highlight that dialogue means interactivity and engagement, shared learning and communication on both sides. In contrast to Greenwood, however, they describe companies and stakeholders as “equal problem solvers” but no reflection on reality is made. Moreover, our literature review on co-creation has shown that a transformation of the concept has occurred in the direction of actively involving multiple stakeholders, including external stakeholders and that co-creation is used as a synonym for stakeholder engagement. For instance, while Prahalad and Ramaswamy (2004, p. 8) mainly put emphasis on the co-creation between companies and their customers in 2004, a more extensive stakeholder group, namely “customers, stakeholders, partners, or other employees”,


is mentioned by Ramaswamy in 2009. In addition, Hatch and Schultz (2010) criticize that in the context of co-branding, the focus has been mainly on consumers and marketers and stress the importance of including a bigger variety of stakeholders and the engagement of all stakeholders. In addition, Guillart (2014, p. 8) argues that the more stakeholders are involved the more value is created. Today, the engagement of external stakeholders in co-creation is explicitly emphasized by Guillart (2014, p. 7) and by Ramaswamy in the interview by Leavy (Leavy, 2014, p. 10). The direct citations from the authors can be seen in Table 4.

<table>
<thead>
<tr>
<th>Source</th>
<th>Citations by scholars on which and how stakeholders are engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prahalad &amp; Ramaswamy (2004, p. 8) - co-creation with the consumer</td>
<td>The company–customer relationship is a “set of interactions and transactions focused on a series of co-creation experiences”.</td>
</tr>
<tr>
<td>Ramaswamy (2009, p. 33)</td>
<td>“Becoming a co-creating organization is about changing the very nature of engagement and relationship between the institution of management and its employees, and between them and co-creators of value-customers, stakeholders, partners, or other employees.” (p. 33)</td>
</tr>
<tr>
<td>Hatch &amp; Schultz (2010, p. 591, 594, 601) - co-creation with multiple stakeholders (in the context of branding)</td>
<td>“However, in spite of the importance these researchers place on considering all stakeholders to be co-creators, the only stakeholder groups branding researchers have empirically examined thus far have been consumers and marketers. Thus, the work of describing how brands are co-created with their stakeholders has barely begun.” (p. 591) “Organizational boundaries are redrawn to include a greater number and variety of stakeholders and the networks in which those stakeholders are embedded.” (p. 594)</td>
</tr>
<tr>
<td>Lee et al. (2012, p. 817, p. 828) - co-creation for co-innovation, value creation for all stakeholders</td>
<td>“Co-innovation is a new innovation paradigm where new ideas and approaches from various internal and external sources are integrated in a platform to generate new organizational and shared values. (…) Co-creation can create shared value for all stakeholders” (p. 817) “in a co-creating process of value creation, the enterprise works in cooperation with all the stakeholders, especially the customers” (p. 828)</td>
</tr>
<tr>
<td>Ramaswamy &amp; Ozcan (2013, p. 7, p. 9, p. 10) - co-creation with all stakeholders</td>
<td>“in more and more firms, strategy-making has become a joint process of co-creative discovery, as enterprises devise and develop new opportunities together with customers, partners, and other stakeholders” (p. 7) “strategy has become: joint aspirations &gt; joint resources. The managerial changes from this shift toward embracing all stakeholding individuals as co-creators” (p. 9) “Co-creation has arrived and it is the future of strategy and innovation.” (p. 10)</td>
</tr>
<tr>
<td>Gouillart (2014, p. 7, p. 8) - co-creation of value with stakeholders, external stakeholders</td>
<td>“Many observers believe that the pressure of continuous innovation is challenging firms to further open up their traditional functions and processes and engage external stakeholders (…)”. (p. 7) “The network value being created will increase exponentially as more and more stakeholders join the network. The economics of the network, as well as of each firm in the network, will exhibit exponential economics or “increasing returns”. During the next ten years a key challenge for leaders will be managing this journey” (p. 8)</td>
</tr>
<tr>
<td>Leavy (2014, p. 10, p. 13) - co-creation with external stakeholders</td>
<td>“As leaders begin exploring value creation as a co-creation with their peers, employees, customers, suppliers, partners, financiers and other stakeholders, their thinking and actions will begin to change and they can elevate their enterprises to a higher orbit of value creation.”(p.10) (Ramaswamy)</td>
</tr>
</tbody>
</table>

Table 4: Stakeholder engagement in the co-creation literature

While the concept of co-creation has expanded to include an increasing number of internal and external stakeholders, DeFillippi and Roser (2014, p. 30) stress that there is “no one-size-fits-all approach to co-creation” (DeFillippi & Roser, p. 30) and so it is up to the company to decide on which stakeholders are involved and how the co-creation activities are designed and implemented.
Taking the different perspectives on engaging stakeholders and the fuzziness of the concept into consideration, we have created a general definition of stakeholder engagement for our study to clarify what we mean by stakeholder engagement for the progress of our literature review and our empirical study. We define stakeholder engagement as follows:

**Stakeholder engagement is an active integration of stakeholders into the business.**

We will now explain our definition more in detail. Active integration does not mean listening and telling but involvement, collaborating and learning. The integration into the business can be related to the core business, business strategies and the creation of products and/or services. Considering the evolution of co-creation and our definition of stakeholder engagement, we see them as the same but choose to use the term stakeholder engagement. In addition, the stakeholders can be of all types and the firm decides which stakeholders to involve based on the purpose.

### 2.2.3. Stakeholder engagement for innovation

*We will now explain what stakeholder engagement for innovation is. First, concepts related to the co-creation literature are introduced before some concepts for stakeholder engagement for innovation for sustainability are described. Last, advantages and disadvantages of stakeholder engagement are explained.*

Stakeholder engagement can help to create innovations. According to Ayuso et al. (2011), stakeholder engagement and innovation are generally treated as separate processes but the challenge lies in finding mechanisms and routines that combine an active conversation with stakeholders and innovation strategies, as well as enable the firm to successfully exploit the generated knowledge. In fact, active engagement of stakeholders can be the basis for innovation (Sloan, 2009, p. 37). Nevertheless, good relationships with stakeholders are a prerequisite for stakeholder engagement for innovation (see Ayuso et al., 2011, p. 1411). The importance of stakeholder engagement for innovation is pointed out in the section advantages of stakeholder engagement.

Stakeholder engagement for innovation has been discussed in the co-creation literature (see DeFillippi and Roser, 2014; Lee et al. 2012). Lee et al. have developed the concept of co-innovation, which is based on the convergence of ideas, collaboration and co-creation with a variety of stakeholders including external stakeholders (“suppliers, partner organizations, outside collaborators, customers, and the general public at large”) (Lee et al., 2012, 826).

DeFillippi and Roser (2014) go more in depth concerning which stakeholders are engaged for which type of innovation. In the section defining stakeholders, we have pointed out that the firm decides which stakeholders to involve (Freeman, 2004, p. 364) and that its decision is based on the manager’s perception of salience (Mitchell et al., 1997, p. 854). This also includes the level of influence from the stakeholders and the stakeholders’ relationship to the firm. In line with these arguments, DeFillippi and Roser (2014) stress that it is the company’s decision who and how to involve for the creation of innovations. This will now be explained in more detail.

DeFillippi and Roser (2014) suggest that a company has to make several strategic decisions for the co-creation of innovation. For instance, the company has to ask itself for which reasons there should be co-creation (purpose), which stakeholders should be involved and where co-creation should occur in the innovation process. If the purpose is to create new
products and services (called co-innovation), strategic clients and supply chain partners should be involved across all stages of the innovation process. The engagement should be deep, multiple and trust building. If the purpose is incremental innovation, lead users and communities of users should be involved across some stages, e.g. marketing. The engagement is more limited and selective in comparison to the first and the duration of engagement can vary. It is important to note, however that co-creation for innovation can take on many forms because each firm has different product and service offerings and firms’ business models are unique.

Two approaches, the model of “Shared Innovation” and Szekely´s and Strebel´s framework will be discussed that specifically highlight stakeholder engagement for innovation to create sustainable solutions (products and services). While the first stresses an active integration of stakeholders, the second is less specific. Both, however, argue for breakthrough, radical innovation to find new solutions to social and environmental challenges.

**The model of “Shared Innovation” by Escudero and Googins (2012)**

In the working paper “Towards a new era of sustainable business“, Escudero and Googins (2012) argue that the direct impact of sustainability was only targeting direct stakeholders (employees, customers and suppliers) but the scope of positive impact should be broadened to include society at a local and global scale. This is why the authors propose the model of “Shared Innovation” for sustainable business. (Escudero & Googins, 2012, p. 3-4)

The model includes innovation because innovation helps businesses to grow and to find new solutions to solve social and environmental challenges. Breakthrough innovation is like disruptive innovation helping businesses to create value with new solutions, e.g. with new products, technologies and business models. (Hamel, 2000, cited in Escudero & Googins, 2012, p. 4). The model is called “shared” “because we seek to transcend the current notion of stakeholders: stakeholders are there not only to prevent corporate misbehavior, but to enlighten companies about the needs and aspirations of citizens concerning new products and services” (Escudero & Googins, 2012, p. 4). The latter can be interpreted in two different ways, however. Either the stakeholders are no longer seen as the policemen/women to prevent harm through corporate actions (risk mitigation) but as active participators who communicate their needs and aims in the creation of new services and products or by also actively participating in the process in the form of co-creation. The second interpretation is assumed because the authors suggest co-creation with stakeholders to find new solutions for “products, services, new business models or new arrangements of the value chain which benefit the “core” business of the company while providing new solutions to the needs of society” at the firm level. The argument for why the model could be called “Shared Innovation” is given below:

“And finally we call it “shared innovation” because the dominant mechanism currently in play – partnerships,- is neither shared, except on a conceptual level, nor innovative in that it is not focused on the one asset that is most likely to produce the breakthrough necessary to result in sustainable impacts and solutions – innovation.” (Escudero & Googins, 2012, p. 4-5)

The citation does not specify the type of partners but we assume that stakeholders are meant as in the definition of “shared”. To our understanding, business and stakeholders should both contribute to a joint effort in creating breakthrough innovation that have a sustainable impact and provide sustainable solutions.
In conclusion, the model of “Shared Innovation” is a proactive approach for (already) sustainable business towards having a direct impact on the well-being of society that actively involves the business’ stakeholders in the creation of breakthrough innovation for sustainability. The stakeholders can be seen as catalysts for innovation.

The framework by Szekely and Strebel (2013)
Szekely and Strebel (2013) have created a framework that promotes innovation for sustainability with the engagement of stakeholders. They argue that for successful innovation for sustainability, the company’s approach must be integrative and based on partnerships and strong visionary leadership. “These practices address two of the main challenges companies face in innovating for sustainability, namely actively engaging with the wider dynamic context in which they operate, and spanning boundaries they are not used to crossing.” (Szekely & Strebel, 2013, p. 467)

Partnerships “need to be integrated into the core business strategies” to be effective and valuable for business. They play an important role and are often indispensable in innovation for sustainability. While a single company-single NGO collaboration is the common form for incremental innovation that usually focuses on a specific topic, e.g. energy efficiency, deep and multiple partnerships with a variety of stakeholders are crucial for radical innovation, e.g. sustainable Lipton tea, where the impact of change can go beyond the organization. (Szekely & Strebel, 2013, p. 457-458)

Consequently, which partners to involve depends on the type of innovation. While incremental innovation is easier for firms, radical or breakthrough innovation is more likely to lead to changes that overcome social and environmental challenges (Szekely & Strebel, 2013, p. 476-477). This is also suggested by the model of “Shared Innovation”. Unfortunately, Szekely and Strebel (2013) do not give further information about how actively the partnerships in their framework are contributing to innovation.

In conclusion, stakeholder engagement for innovation (no matter whether the goal is to create a sustainable product or service or not) can give the firm a competitive advantage. Which stakeholders and how stakeholders are involved depends on the type of innovation. The more radical the innovation is, the more stakeholders and intensive engagement are likely to be necessary. This argument is based on Szekely and Strebel (2013), Escudero and Googins (2012) and DeFillippi and Roser (2014).

Advantages and disadvantages of stakeholder engagement
Stakeholder engagement can have advantages and disadvantages for the firm. First we will highlight the advantages of stakeholder engagement before describing some disadvantages. This section is mainly based on the articles from the authors mentioned in the previous sections because while writing about stakeholder engagement, they also talked about important advantages and disadvantages of stakeholder engagement. We would now like to point these out in order to contribute to a more holistic view on stakeholder engagement.

There are several benefits of stakeholder engagement. For instance, actively involving stakeholders can help the firm to develop new opportunities (Ramaswamy & Ozcan, 2013, p. 7) and innovations (DeFillippi & Roser, 2014, p. 30; Sloan, 2009, p. 25; OECD, 2005, p. 41-42). Stakeholder engagement for innovation can lead to a competitive advantage because it is difficult for other firms to imitate how a firm involves its stakeholders. In addition, intangible
resources in the form of knowledge are difficult to copy by competitors ("no other firm can establish the same relations with the same stakeholders and create the same knowledge"). (Rodriguez et al., 2002, p. 143)

Moreover, stakeholder engagement can promote the organization through “positive word-of-mouth recommendation”. Speed to market can be increased. (DeFillippi & Roser, 2014, p. 30) For instance, if suppliers and users are actively involved from the early innovation process onwards and if they already have ideas and prototypes in their mind, development costs can be reduced and speed can be increased (Rothwell, 1994).

An advantage of engaging in collaborative agreements with, e.g. other firms is helpful to receive resources (including knowledge) that the firm itself does not have (Tether, 2002, p. 951). Knowledge that can be accessed from stakeholders can be a very valuable asset to create innovations (Rodriguez et al., 2002, p. 143; Rothwell, 1994, p. 18-19). As a matter of fact, knowledge factors, such as insufficient information about technology and markets and design, as well as qualified personnel can be an obstacle to successful innovation (OECD, 2005, p. 113). From this it follows that if the firm opens up and has the ability to access information and involve people with more expertise from outside the firm, these obstacles and threats to innovation are likely to be reduced. For instance, universities can be engaged for “basic and long-term strategic research” (Tether, 2002, p. 953).

An additional benefit for the firm is learning through the interaction and the exchange of knowledge with external relations during the development and implementation process of innovations (Rothwell, 1994, p. 27; OECD, 2005, p. 78). In general, one can speak of learning because of the reflection processes that happen during the interaction (see Leavy, 2014, p. 13).

One can also argue that stakeholder engagement increases value for stakeholders and that stakeholders are more likely to accept and demand the products and services that the firm creates. This argument is based on Tether (2002), DeFillippi and Roser (2014), Rodriguez et al. (2012) and Leavy (2014). Tether (2002, p. 951) and Rodriguez (2002, p. 143) state that innovations that were co-created with stakeholders, e.g. with the customer are more likely to be accepted. Furthermore, DeFillippi and Roser (p. 30, 2014) stress that co-creation with stakeholders is more focused on customer experience, creates value instead of only "offering technological solutions" and improves "communication of customer needs and interests". In addition, Leavy (2014, p. 13) points out that in co-creation, the stakeholders are “the means and end of their own value creation process”. To our understanding, the latter means that products and services are created which stakeholders value and so they are more likely to accept them on the market.

Furthermore, firms can use stakeholder engagement to control risks for the firm and for its stakeholders (Sloan, 2009), as well as to mitigate risks for innovation (Tether, 2002, p. 951). Stakeholders “provide and control critical resources needed for firm survival and success, including financial capital, knowledge, skills and reputation” and so the firm aims at fulfilling their interests and needs (Sloan, 2009).

Only few disadvantages of stakeholder engagement were identified in academic literature. For instance co-creation with the customer costs resources, e.g. time (Prahalad & Ramaswamy (2004, p. 6) even though development costs can be reduced (Rothwell, 1994) and speed to market can be increased (DeFillippi & Roser, 2014) on the other hand. In addition, engaging
stakeholders can mean a lack of control for the firm (Prahalad & Ramaswamy, 2004, p. 6) and if managed badly, it can have negative consequences for the firm (see Sloan, 2009, p. 30). For instance, it can harm the company’s image or not lead to satisfactory results. Another disadvantage is that customers have different demands and only a limited amount of customers can be involved or those that are involved do not have the same demands as the majority of their target group. In addition, it is not clear where the legal responsibility begins and ends for the stakeholders involved and how liable the company is for the risks. (Prahalad & Ramaswamy, 2004, p. 6)

In conclusion, the advantages of stakeholder engagement are related to develop innovations successfully and to increase the chances of their acceptance on the market. Furthermore, value is increase for the firm and its customers. Taking the benefits of stakeholder engagement into account one can understand why Von Stamm (2008, p. Xii-Xiii) argues that connections outside the organization, e.g. with customers, suppliers, etc. are becoming more and more important for successful innovation. Ramaswamy and Ozcan even point out that co-creation is the future of innovation (2013, p. 10). General disadvantages are related to negative consequences for the firm and the success of its innovation.

2.2.4. **Summary and conclusion**

Stakeholder engagement helps to develop innovations and innovations for sustainability to overcome environmental challenges in particular. It is a recent trend in the co-creation literature to speak about the involvement of many stakeholders and that the more stakeholders are involved the more value is created. This trend is not only seen in stakeholder engagement but also in the positive impact that firms should have. In fact, as the model of “Shared Innovation” suggests, the scope of positive impact should be broadened to include society at a local and global scale and not only direct stakeholders. This is mirrored in the new type of innovation “social innovation” which is seen as important for firms to find innovative solutions to societal challenges. Based on the second part of the literature review, we conclude that a change in thinking in literature has taken place and that we are about to enter a new era that goes beyond risk mitigation, be it in the creation of sustainable products and/or services or in the way that stakeholders are engaged.

As only few disadvantages of stakeholder engagement were found, it remains to be studied whether there are more disadvantages of stakeholder engagement and which impact they have on the innovation of a firm. In addition, literature does not give any insight into why firms do not engage stakeholders. We highlighted that there are several barriers to innovation but it is not clear how the engagement of stakeholders can help small firms to conquer these challenges. Different concepts revealed that the more novel the innovation the more stakeholders are engaged. Nevertheless, the reviewed literature does not give sufficient information about the reasons and the benefits of involving many stakeholders when the innovation is more radical, for instance. Furthermore, we stressed that the perception of managers plays a role in the classification and salience of stakeholders for their firms. This also refers to which stakeholders the firm engages for innovation. It remains to be studied, however, to which extent stakeholders are proactive too.
2.3. Stakeholder engagement for innovation in sustainable entrepreneurial start-ups

In the previous parts, we have discussed sustainable entrepreneurial start-ups and stakeholder engagement for innovation. In this part, we want to make clear linkages between these two parts and point out what remains to be studied. Based on this we provide a tentative model at the end which shows the research gaps.

In section 2.2.1, we have found many reasons why innovation is important for firms such as increased learning and competitiveness. (Tödtling & Trippl, 2005, p. 1203; Dobni, 2008, p. 43). We want to point out that innovation is a key ingredient also in sustainable entrepreneurial start-ups. Innovation is a key source of competitive advantage (Carland et al., 1984, p. 358) and it helps start-ups to survive and increase their chance of longevity (Bessant & Tidd, 2007, p. 256). It also helps to decrease environmental degradation through environmental improvements, such as decreasing emissions (Bell, 2013, p. 37).

Several scholars are seeing a great potential in very novel innovations to increase not only environmental sustainability but also societal well-being at the same time (Von Stamm, 2012, p. 49, Escudero & Googins, 2012; Szekely & Strebel, 2013, p. 476-477). Furthermore, Schaltegger and Wagner (2011, p. 224) point out the importance of breakthrough innovations for sustainable entrepreneurship to “create economic and societal value”.

Stakeholder engagement can be regarded as important for sustainable entrepreneurial start-ups. It can provide new opportunities (Ramaswany & Ozcan, 2013, p. 7) and these opportunities can be found in market failures, for instance. To give some examples, the market failure of imperfect information (see Dean & McCullen, 2007) could be resolved by obtaining access to new information about the market from stakeholders (see Rothwell, 1994, p. 18-19). Other opportunities can be seen in overcoming societal and environmental challenges when firms and stakeholders find new solutions together (Escudero & Googins, 2012; Szekely & Strebel, 2013, p. 476-477). Moreover, scholars argue that stakeholder engagement can be seen as an opportunity to provide more value for stakeholders, society and environment, nowadays (DeFillippi & Roser, p. 30, 2014; Leavy, 2014, p. 13; Lee et al., 2012, p. 828).

Furthermore, it can be assumed that stakeholder engagement can help start-ups to create innovative products and solutions because stakeholder engagement has several advantages for the creation and diffusion of innovation. For instance, stakeholder engagement could help start-ups to develop higher innovation ability because access to information and knowledge, as well as organizational learning is increased (Rothwell, 1994, p. 18-19; Leavy, 2014, p. 13). In addition, stakeholders’ needs and wants can be better understood (see Sloan, 2009, p. 36) in the co-creation process and that can lead to a higher market acceptance of new products and/or services (see DeFillippi & Roser, p. 30, 2014; Rodriguez et al., 2002, p. 143).

Start-ups face several challenges, such as a lack of financial resources (Beck, 2013), and they can be obstacles in the new product and/or service development. Engaging stakeholders can help to overcome these challenges because development costs are reduced, speed to market is increased (DeFillippi & Roser, 2014; Rothwell, 1994) and stakeholders “provide and control critical resources needed for the firm’s survival and success, including financial capital, knowledge, skills and reputation” (Sloan, 2009, p. 36). Furthermore, the lack of skills can be reduced through learning in the interaction and the exchange of knowledge with external relations during the development and implementation process of innovations (Rothwell, 1994,
From this it follows that a good relationship to stakeholders is vital for start-ups. The latter can be crucial to increase the brand awareness of start-ups because DeFillippi and Roser, (p. 30, 2014) claim that engaging stakeholders can promote the organization through “positive word-of-mouth recommendation” if stakeholders are satisfied with how they are treated and involved by the firm. Moreover, Ayuso et al. (2011, p. 1411) point out that not only innovation but also stakeholder engagement for innovation can create a competitive advantage.

Despite these advantages that engaging stakeholders could provide for the start-ups’ innovation, there are also some disadvantages. Prahalad and Ramaswamy (2004) have pointed out some disadvantages and challenges of co-creation that could be an obstacle in the start-ups’ innovation process. For instance, while co-creating with stakeholders can save time, the dialogue with consumers can also cost development time, which would reduce speed to market (Prahalad & Ramaswamy, 2004). Keeping the challenges of start-ups in mind, the latter could all be reasons for start-ups not to engage stakeholders in the creation of innovative products and/or services.

Figure 1 shows the linkages between our concepts, as well as questions and themes that remain to be studied in order to increase understanding of stakeholder engagement.

**Figure 1: The Model of stakeholder engagement**

We will now explain the figure more in detail (we call it the Model in our thesis). The external environment can have an influence on all stages of the innovative product/service creation. For instance, we explained that sustainable entrepreneurs could take advantage of opportunities they see in the environment and that external stakeholders can be a source of financial resources. With reference to the firm level, it is unclear who/what influences the
founder’s idea generation for the innovative product/service and motivation to create a sustainable entrepreneurial business (this includes where the founder sees the opportunities).

Our literature review revealed that there are different motivations for sustainable entrepreneurship but theory does not give information about whether these motivations are connected to how and why sustainable entrepreneurial firms might engage or not engage stakeholders. If there is a connection, it remains questionable whether the founders who are more sustainability-driven/opportunity-driven engage stakeholders or not. The founder has two choices in the product/service development. He/she can either engage stakeholders that are internal and external to the company in the product/service development (way 1) or not (way 2). The different possibilities are illustrated in Figure 2 below.

**Figure 2: How motivation could be connected to (not) engaging stakeholders**

Going back to Figure 1: if the founder chooses way 1, it is unclear how stakeholders are contacted and approached by the firm (proactivity arrow) and if the stakeholders might also actively contact the companies to get engaged in the product/service innovation development process. We pointed this research gap out in the second part of our literature review.

There is a potential for sustainable entrepreneurial start-ups to take advantage of innovation and involving stakeholders for innovation to overcome their own, as well as environmental and societal challenges. Nevertheless, the concepts we researched about stakeholder engagement do not give any empirical evidence for how stakeholders are engaged in sustainable entrepreneurial start-ups that offer innovative solutions for sustainability. From our theory we derive that the purpose of co-creation and the type of innovation can have an influence on which stakeholders are involved and how intensively they are engaged. Nevertheless, empirical evidence and an in-depth understanding of the latter are scarce in academic literature.

Our literature review revealed that certain elements are important for stakeholder engagement, such as a good relationship to stakeholders and good management of stakeholder engagement. Nevertheless, there is no strong theoretical and empirical evidence for the latter. Furthermore, the co-creation literature, as well as the concepts described in stakeholder engagement address firms in general and there might be differences in the context of start-ups.

Based on the advantages and disadvantages of stakeholder engagement and the challenges that start-ups have with/without stakeholder engagement, it is questionable which way is less time-consuming and beneficial for the firm. It also remains to be studied why stakeholders are engaged and whether the mission and vision of the firms influence stakeholder engagement. This was not discussed by literature but they could influence stakeholder engagement.

No matter which way the founder chooses in Figure 1, we assume that both ways will end up in an innovative product and/or service for sustainability.
3. Research Methodology

First, we will present a reflection on the choice of literature and argue for our philosophical standpoints. Second, we explain our choices of the research method, research approach, research design and research strategy. Afterwards, we address our data collection technique and present our interview guide and interview procedure. We also talk about our sampling strategy, selection criteria and participants in the study. Furthermore, we explain how we deal with collecting, presenting and transcribing the data. The last sections concern quality criteria and research ethics.

3.1. Reflection on the choice of literature

It is important to make a thorough literature review to find out which theories are relevant (Ghauri & Grønhaug, 2010, p. 50). Hart (1998, p. 19) stresses that one needs to “be flexible and search more widely or use more complex combinations of words and phrases”. For instance, the word start-up was replaced by new business creation, young company, new venture, new business, etc. to yield a higher number of search results. Since stakeholder engagement did not reveal sufficient search results, we also researched the literature on co-creation. Our main focus is the engagement of our different concepts. There is a trade-off because we cannot go in very much depth on all concepts. Furthermore, our results suggest that other concepts and theories, such as networks and social capital could have been added to our literature review on stakeholder engagements. Nevertheless, one has to take into account that our study is exploratory and that our literature review was done before the study was conducted.

A good judgment and choice of literature is important. The literature should be chosen based on how relevant it is for the purpose and how useful for the research. (Hart, 1998, p. 19) We have mainly used peer-reviewed scientific articles for reviewing the literature and we also used well-referenced books for the research method chapter. Furthermore, we used reports, e.g. from the European Commission for the literature review to describe the state of the art of the challenges related to renewable energy and energy efficiency in Europe. We have used the Oslo Manual, which was jointly published by the OECD and Eurostat, in the innovation part of the literature review. We have chosen to include this report because they present European-wide “guidelines for collecting and interpreting innovation data” (OECD, 2005), there is no consensus on definitions related to innovation in academic literature and our research is set in Europe. In addition, we have critically reviewed the literature and present tables that show the depth of our research and that underpin the conclusions we make.

Some of our articles related to co-creation are not traditional articles. For instance, we use an interview from Ramaswamy (Leavy, 2014, p. 10) who is outlining future developments in co-creation. The authors, e.g. Prahalad and Ramaswamy are recognized authors and in the co-creation literature, however. In addition, these articles were published in the peer-reviewed journal “Strategy and Leadership”. We have decided to include conceptual papers on co-creation with a wider group of stakeholders and innovation because they are at the front of stakeholder engagement research. Consequently, we considered the sources as useful for our research. With reference to stakeholder engagement, one of the most useful sources was the working paper by Escudero and Googins (2012). We also contacted authors directly, e.g. Bradley Googins and Susan Müller to receive their forthcoming papers and ordered the book “Social Innovation” (Osburg & Schmidpeter, 2013) to be at the front of the research concerning social innovation, as it is a new field of research.
At the start of the thesis course, we booked a personal meeting with a librarian to learn about which databases are most appropriate to use, how to search for different terms and how to refine a search in the database. We searched for literature on the databases Scoopus, Ebsco and Business Source Premier. We based our search for literature on two factors: the most recent and the most cited articles. We made this choice to cover all the most important articles in the field and to get the newest insights into the topics. Google Scholar was used to get a broad overview of the most frequently cited sources but not all were relevant to our research. In general, only those sources that we consider to be most relevant for our study were used.

3.2. Philosophical standpoints

Ontology
Ontology refers to the nature of reality. We take on a subjectivist view instead of an objectivist view because we believe that “reality is determined by people rather than by objects and external factors” (Easterby-Smith et al., 2012, p. 23). In line with social constructivism, we believe that the world is socially constructed and that reality does not exist external to social actors but that reality and knowledge are constructed through the dynamics of social interaction. (Burr, 2003, p. 9; Saunders et al., 2007, p. 110-111) We see stakeholder engagement as socially constructed, as the result of the interaction between the firm and the stakeholders, as well as the interaction between the founders of the start-ups and society. In addition, we regard as important to show views on stakeholder engagement from the perspectives of the founders based on their experience and feelings instead of explaining behavior through single interpretations, fundamental laws and facts. (see Easterby-Smith et al., 2012, p. 24).

Epistemology
Epistemology concerns the concepts of knowledge (Fumerton, 2006, p. 1; Saunders et al., 2007, p. 112). It “is about different ways of inquiring into the nature of physical and social worlds” (Easterby-Smith et al., 2012, p. 21). With respect to our research question, we adopt the view of critical realism. One could argue that an interpretivist standpoint would be suitable for our study because we enter the social world of our research subjects, namely the founders of the start-ups to understand how stakeholder engagement looks like from their standpoint. Nevertheless, we accept that “the world is socially constructed but not entirely so”; “The real world breaks through and sometimes destroys the complex stories that we create in order to understand and explain the situations we research”. (Easton, 2010, p. 120) In fact, social life is not only generated through the interaction of people but social life also has an influence on them (Ackroyd & Fleetwood, 2000 cited in: Easterby-Smith et al., 2012, p. 29). Examples of the real world breaking through could be related to incidents, e.g. laws, regulations, natural catastrophe and environmental pollution that determine the actions of the founders and what stakeholder engagement is concerned with, e.g. whether it is rather engagement for risk mitigation or not.

In addition, three levels can be differentiated in critical realism. The empirical domain is about people’s perceptions and experience, the actual domain includes actions and events taking place whether they are observed or not and the real domain is about causal powers and processes that have consequences for society but that might not be seen directly. (Bhaskar, 1978, p. 13) Our semi-structured interviews could give an insight into how the founders think (empirical domain) but there might be actions and events taking place in stakeholder engagement that we might not able to get to know during our research (actual domain). In addition, there might be some powers and mechanisms involved in stakeholder engagement but their consequences could become apparent only after the research is conducted.
Critical realism sees causality as potential (Easterby-Smith et al., 2012, p. 29) and the subjects of study “have powers or liabilities to cause events to occur” and make things happen (Easton, 2010, p. 120). We believe that the founders have the power to make stakeholder engagement occur and to influence the engagement of stakeholders by start-ups. “Interpretivists deny the possibility of knowing what is real and reject the possibility of discerning causality. They can only provide their own interpretation.” (Easton, 2010, p. 118) We do not reject that causalities can be discerned. This means that we do not rule out that some regularity or comparison can be seen in our study, e.g. when comparing stakeholder engagement in start-ups in Sweden and in Germany. “Critical realists also believe that the non occurrence of an event when one is expected not only requires explanation but may also provide very useful insights.” (Easton, 2010, 120) For instance, we believe that if we found out that some start-ups do not actively involve stakeholders, this could lead to useful insights why this is so. We adopt the critical realist view and not the direct realist view because we believe that the world is changing constantly since also social interaction can change, e.g. between the stakeholders themselves and between the stakeholders and the firm (see Saunders et al., 2007, p. 115).

Axiology
According to Heron (1996, p. 286), values guide human actions and so values of human beings should not be omitted in research, since they are complementing and balancing the ontological, epistemological and methodological questions about the truth, e.g. the nature of truthful knowledge and what is reality. We therefore aim to show axiological skill by communicating our values so that better judgments of our choices can be made. We divide our statement of values in the choice of the research area, topic, philosophical approach and data collection technique.

Our research area sustainable entrepreneurship and innovation was chosen based on our fields of interests. Jaromír Zaoral has an interest in entrepreneurship and Alexandra Dembczyk in innovation. We are both interested in how innovation can help to overcome societal and environmental challenges. In addition, the choice of our topic: stakeholder engagement, is not value free because we were inspired by the model of “Shared Innovation” and Laura Albareda who is a lead researcher at Deusto Global Center for Sustainable Research. We believe that active co-creation with stakeholders might play an important role in the future to find innovative solutions for sustainability and so we aim to reveal more insight into the topic with our study. In addition, our choice of studying start-ups is also to some extent based on our values. For instance, we regard start-ups as important for the future of business and as catalysts for finding new solutions for societal and environmental challenges. Furthermore, we choose a method that allows us to get an in-depth understanding of the participants in our study; We highly value their opinions, experience, background, feelings and motivations to increase understanding of stakeholder engagement. In addition, our philosophical approach is based on our values as pointed out in the description of our epistemological and ontological point of view.

3.3. Research method
According to Patton (1987, p. 8), a researcher should make a decision on which method to choose based on answering the questions: What kinds of information are needed? How is the information to be used? Some of the concepts in our thesis are novel and there is often no consensus on their definitions in academic literature, such as stakeholder engagement (Sloan, 2009, p. 26; Greenwood, 2007, p. 315) and sustainable entrepreneurship (Thompson et al., 2011).
These concepts must be explored further. Consequently, we need to take a holistic view to gather in-depth information and to develop a nuanced picture of the issue of stakeholder engagement in sustainable entrepreneurial start-ups. We need to gather individuals’ stories, and hear their voices to interpret and describe the problem (Creswell, 2007, p. 45) in order to answer our research question. This is why we need to gather rather qualitative than quantitative data because qualitative data is concerned with meanings and using words instead of numbers (Silverman, 2011, p. 4).

3.4. Research approach

Our goal is to validate the Model which we developed in the literature review and to answer the question marks in order to create a comprehensive picture of how stakeholders are engaged in sustainable entrepreneurial start-ups. Therefore, we aim to develop and revise the Model based on our findings. Since our goal is neither to test hypotheses (deductive approach) nor to develop a completely new theory based on our empirical data (inductive approach), we have chosen to follow an alternative way: the abductive approach. (see Dubois & Gadde, 2002)

In abduction, “data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth” (Saunders et al., 2012, p. 144). In our study, we first carried out a literature review on sustainable entrepreneurship, innovation and stakeholder engagement. Afterwards, we identified themes and the connections between concepts, which we illustrated in a conceptual framework, called the Model. However, there were also some question marks and themes. These were explored further with the help of our empirical data. Throughout the analysis we did abductive matching, which is “about going back and forth between framework, data sources, and analysis” (Dubois & Gadde, 2002, p. 556). This means that we went back and forth between the literature review, the Model and our data, in the analysis. We were also actively searching for patterns. For instance, we were searching for patterns concerning the number of stakeholders engaged and how technology intensive an innovation is and how much engineering is involved. It was a continuous process that enabled us to revise the Model at the end.

We have also chosen the abductive approach because it can take us in various directions based on unanticipated results (Dubois & Gadde, 2002, p. 556). This matches well the exploratory nature of our study (see section 3.5). The approach enabled us to be flexible depending on how the results unfold and to help us with answering our research question. For instance, our results show that secrecy and the relationship to stakeholders are influencing factors on how stakeholders are engaged.

3.5. Research design and strategy

The purpose of our research is exploratory since we want to get a good understanding of what is happening and because we want to get a proper insight into our topic (see Patton, 1987, p. 15). Exploration helps to develop concepts more clearly and to improve the final research design (Cooper & Schindler, 2011, p. 143). Consequently, it can help to answer our research question. Adams and Schvaneveldt (1991) compare the exploratory study to activities of a traveler or an explorer. The traveler is flexible and able to change direction if needed, e.g. due to changeable weather. Similarly, a researcher must be willing to change direction in case new data or new insights occur. This approach enabled us to keep an open mind and to constantly reflect on our research to “explore” the answer to our research question.
Our aim is to visualize our exploration in the Model. Therefore, we decided to use the visual mapping strategy introduced by Langley (see 1999, p. 700-703) because we regard it as the most suitable strategy for processing data to answer our research question and it is in line with our methodology. The strategy serves as a means to verify and develop theoretical ideas in relatively little space, e.g. with a matrix, etc. – in our study we use the Model. We appreciate the advantage of this strategy because the mapping strategy is useful when analyzing multiple cases. We use a visual presentation of the Model because it allows a simultaneous representation of a large number of dimensions. (Langley, 1999, p. 700-703) We believe that this strategy will help us to explain the complex picture of how stakeholders are engaged. In addition, since stakeholder engagement could evolve during different stages of development we decomposed the timeline into three periods (idea development, product development and launch) to structure the description of events (see Langley, 1999, p. 703). This is called temporal bracketing strategy (see Langley, 1999, p. 703-704). It means that we aim to visualize what we explore in the Model while focusing on three periods (idea development, product development and launch).

It would probably be very interesting and helpful to provide a deeper insight into the problem by carrying out a longitudinal study (Cooper & Schindler, 2011, p. 142) by interviewing the founders during different stages of their start-up to see whether changes in the engagement of stakeholders occur. Due to our limited time constraint, we are unable to carry out a longitudinal study. Our study is cross-sectional. This means that our results represent a snapshot of one point in time (Cooper & Schindler, 2011, p. 142). However, we provide a “longitudinal snapshot in time” because we use our data collection technique to ask questions about the whole process of engaging stakeholders from the very first idea of creating the product/service and business to the stage they are now in, e.g. product development.

### Data collection

Interviews are one of the most common approaches in data collection in qualitative research (Kvale, 2007; Saunders et al. 2009, p. 320, Yin, 2009, p. 106; Silverman, 2011, p. 161; Ghauri & Grønhaug, 2010, p. 126, Patton, 1987, p. 108). We decided to use interviews because it enables us to access directly what people are doing and what is happening in the world (Silverman, 2011, p. 166). Consequently, we believe that interviews help us to explore best the interviewees’ perspectives, including emotions, stories, arguments, relationships and connections between incidents, to get a good understanding of stakeholder engagement.

There are three kinds of interviews: structured interviews, unstructured interviews and semi-structured interviews (Berg, 2004, p. 79; Saunders et al. 2009, p. 320-321, Silverman, 2011, p. 162). In order to answer the questions in the Model, we chose to use semi-structured interviews. Semi-structured interviews involve a set of predetermined questions and topics which serve as a guideline (Berg, 2004, p. 80-81). We see it as a strength to first let the interviewee tell their stories by answering general questions, e.g. “how do you engage stakeholders?” and then to ask tailored follow-ups questions. In this way, the interviewee is not lead in a certain direction which could influence the answers to some extent.

Compared to structured interviews, where the interviewer must follow a predetermined set of questions, a semi-structured interview will enable us to change directions during the interview (Berg, 2004, p. 80-81, Saunders et al. 2009, p. 320-321). For instance, if a start-up has only involved few stakeholders in the process of creating the innovation, we can ask the founder more detailed questions about the reasons to enrich our understanding of stakeholder engagement.
engagement. In line with our philosophical standpoint, this will help us to see the viewpoints of the founders on our themes.

3.7. Selection criteria
We chose purposeful sampling because its aim is to find information-rich cases for study in depth (Patton, 1987, p. 51-52). It allows the researcher to use his/her own judgment to select cases (Silverman, 2011, p. 388, Saunders et al. 2009, p. 237). Even though this sampling method enables to choose any case of the population, each case must be selected carefully to provide detailed information (see how we searched for such cases in the last two paragraphs of 3.9) (Silverman, 2011, p. 388). We focus on sustainable entrepreneurial start-ups in our thesis. Since the definition is complex, we chose several selection criteria in order to ensure that the cases fit to our definition.

First, the firms are classified as small enterprises according to the definition of the European Commission, which ensures that the start-ups are small. We avoid the definition of SMEs because the scale of a medium-sized enterprise is too broad. (EC, 2003) We have adopted the definition of the European Commission because our study is set in Europe. Second, the companies are not older than 10 years, which ensures that the start-ups are not old. Third, the firms are independent which means that they are not a subsidiary of an existing firm.

Fourth, we have decided to concentrate on firms, which provide products and services for sustainability with renewable energy and energy efficiency. “Energy efficiency refers to using less energy to produce the same amount of services or useful output” (Patterson, 1996, p. 377). If the time period for renewal of energy is within the time frame of our lives it is said to be renewable (Afgan et al., 1998, p. 237). We consider our focus as a strength because it gives us the possibility to make better comparisons between the start-ups and to study one industry sector in depth. The firms contribute to sustainable development and fit to our definition of sustainable entrepreneurship. In the introduction we have shown that they are increasing in importance for this industry and so it is interesting to study them more in depth.

Fifth, the companies are innovative. This means that they offer an innovative product and/ or service (product innovation), which is not only new to the firm but new to the market or even new to the world. Sixth, we focus on companies from Sweden and Germany. We focus on two countries because we want our cases to be diverse. By focusing on two countries, we might be able to get a richer set of data due to cultural or governmental differences. We do not focus on more than two countries due to the time constraint. We assumed that we would not have been able to gather enough data to get an in-depth insight into, e.g. cultural or governmental differences with the time we had available. The reason why we focus on Germany and Sweden is because these countries are very ambitious in their sustainable projects and goals. As stated in the introduction, Germany and Sweden belong to the most innovative countries in the world and spend most of their resources on R&D (Battelle Memorial Institute, 2013, p. 7). Sweden had the second highest R&D spending in Europe relative to the GDP in 2010. It was 3,62%/GDP and the third highest spending in the world (after Finland and Israel). Germany invests most of the money in R&D in Europe. In 2010, it invested 2,940 bn. US dollars, which was the fourth highest investment in the world (after US, China and Japan). (Battelle Memorial Institute, 2013, p. 7).

We acknowledge that a country’s R&D spending is not an indicator for the production of successful innovations but they show that Germany and Sweden regard innovation as very important for the development and competitiveness of their countries. Moreover, Sweden has
the highest share of renewable energy sources in energy consumption in the European Union (Eurostat, 2011) and Germany has high ambitions to reduce greenhouse gas emissions by 80% until the year of 2050 with the help of energy efficiency and renewable energy (Pregger et al., 2013). We provide Table 5 to make our selection criteria more transparent below.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small enterprise</td>
<td>As a small enterprise is regarded a firm, which has less than 50 employees and their turnover is lower than 10 million EUR a year (EC, 2003).</td>
</tr>
<tr>
<td>Young</td>
<td>The start-up is not older than 10 years.</td>
</tr>
<tr>
<td>Independent</td>
<td>The firm is neither a subsidiary nor a branch of an existing firm.</td>
</tr>
<tr>
<td>Industry</td>
<td>The company delivers products or services in energy efficiency or renewable energy.</td>
</tr>
<tr>
<td>Innovative</td>
<td>The start-up offers an innovative product and/or service (product innovation) for sustainability with renewable energy and energy efficiency that are new to the market or new to the world.</td>
</tr>
<tr>
<td>Country</td>
<td>The company is based either in Sweden or Germany.</td>
</tr>
</tbody>
</table>

**Table 5: Selection Criteria and definitions**

We interview one of the founders because we think that the founder can give us the best insight on how stakeholders have been engaged throughout all stages of the business and product/service creation from the perspective of the firm. Based on our philosophical standpoint, we acknowledge that interviewing all founders and employees of the companies would be beneficial to understand different points of view on how stakeholders are engaged. We will leave this for further research with a longer time frame and more resources, however. In addition, it is important to note that the founder is not interviewed in two cases. In the first case (Solarkiosk), Sasha Kolopic and not Andreas Spieß (one of the founders) is interviewed, since he is frequently traveling. Nevertheless, Sasha Kolopic has been with the company from its beginnings and he could answer all questions with reference to the idea generation and why the business was founded. This is why we do not regard it as a limitation to our research. In the second case (Rehact), Svante Bengtsson was interviewed. He is a CEO at the moment but he did not found the company. However, he has an in-depth knowledge about the company and its beginnings since he has been working closely together with the founder Jerzy Hawranek as a partner for five years.

We focused on looking for information-rich cases. We have searched for start-ups on the Internet. We found most of the Swedish innovative start-ups at the Nordicgreen website (NordicGreen, 2012), which gathers information about innovative start-ups in the Nordic, Baltic and Arctic region. There is a list of start-ups engaged in renewable energy and energy efficiency on the website. We selected the cases that fulfill our selection criteria and which we regard as most interesting for our study. Afterwards, we contacted Comfort Window System, Exibea, SootTech, Snowpower. In addition, we got to know one company (Bioendev) on the job fair Uniaden in Umeå. Moreover, we got inspired by the paper Climate entrepreneurs (GLOBALfocus, 2008) whose aim is to accelerate the transition from a fossil-fuel based economy to a low-carbon economy. It focuses on cases in Sweden. In this paper, we found two companies which suit our conditions: Ecoera and Rehact. One start-up chose to be anonymous after the interview. This is why we are not disclosing where the start-up was found because it could be a trace leading to the discovery of the start-up eventually. We call this start-up Company X and the founder Interviewee X throughout the thesis. All the founders that were contacted by us agreed on being the participants in our study.

With regard to Germany, the start-ups were found on several websites that reported on innovative start-ups in renewable energy and energy efficiency. Out of the start-ups we contacted, eight accepted to become interviewees. Timbertower was found on energyawards.de (Ambo Media GmbH, 2013), Blacksquared GmbH was spotted on the
handelsblatt.com (Guldner, 2013) and Greenpocket, Solarkiosk and Ecotastic were found on energynet.de (Kühl, 2013). Moreover, we utilized snow-ball sampling to some extent because Ana Yukiko Bickenbach recommended us some start-ups. Out of these we chose those that meet our requirements: Crowd.Ener.gy, NTS New Thechnology System GmbH, Codeatlier and yetu AG. In addition, she recommended us Solarkiosk GmbH but we had already made contact with them. Four start-ups declined to participate in the research because of a lack of time. The start-ups explained that they are currently very busy with the development of their innovations. One start-up indicated reasons related to the company.

3.8. Participants in the study
All 17 start-ups which were chosen satisfy the selection criteria the six selection criteria (see Table 5). We have chosen similar cases in energy efficiency and renewable energy to facilitate a comparison between different groups of companies. On the other hand, we tried to select cases with different aspects in order to have information-rich cases and to contrast the cases. We selected companies involved in the B2B and B2C markets and companies offering both products and services. The cases differ in the types of innovation: new to the world/ new to the market and product/social innovation. The type of innovation is according to our definitions in the literature review and based on our knowledge of the products and/or services. In the table, we also indicate whether their innovative solutions tend to be rather a product or a service. Some start-ups have already launched their products and services, while some have not (at the point of interview). Furthermore, we show whether the innovative solution rather involves software development because the product and/or service is digital or whether engineering is needed. The founding date of each company can be seen below the names of the companies. Based on the founding date one can see that the companies are not older than 10 years. Table 6 shows the different characteristics of the companies and their products and/or services.³

<table>
<thead>
<tr>
<th>Company name, founding date</th>
<th>B2B/ B2C</th>
<th>Type of innovation</th>
<th>Engineering vs. software development (digital)</th>
<th>Tendency product/service</th>
<th>Renewable Energy, energy efficiency</th>
<th>Launched?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTS GmbH 2006</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Renewable (wind)</td>
<td>No</td>
</tr>
<tr>
<td>yetu AG 2010</td>
<td>B2B</td>
<td>Product, new to the market</td>
<td>Digital</td>
<td>Service</td>
<td>Efficiency</td>
<td>No</td>
</tr>
<tr>
<td>Codeatelier GmbH 2012</td>
<td>B2C</td>
<td>Product, new to the market</td>
<td>Digital</td>
<td>Product</td>
<td>Efficiency</td>
<td>No</td>
</tr>
<tr>
<td>crowdEner.gy GmbH 2012</td>
<td>B2C</td>
<td>Product, new to the market, social innovation</td>
<td>Digital</td>
<td>Service</td>
<td>Renewable (solar)</td>
<td>Yes</td>
</tr>
<tr>
<td>Timbertower GmbH 2008</td>
<td>B2B</td>
<td>Product, new to the world, disruptive</td>
<td>Engineering</td>
<td>Product</td>
<td>Renewable (wind)</td>
<td>No</td>
</tr>
<tr>
<td>Blacksquared GmbH 2010</td>
<td>B2C</td>
<td>Product, new to the market, social innovation</td>
<td>Digital</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
</tbody>
</table>

³ Please note that we are not including AB for the Swedish start-ups and GmbH or AG for the German start-ups when mentioning the start-ups’ names in the text throughout the thesis. In addition, we shorten NTS New Technology Systems GmbH to NTS. We argue that both increase readability.
<table>
<thead>
<tr>
<th>Company name, founding date</th>
<th>B2B/ B2C</th>
<th>Type of innovation</th>
<th>Engineering vs. software development (digital)</th>
<th>Tendency product/service</th>
<th>Renewable Energy, energy efficiency</th>
<th>Launch-ched</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenpocket GmbH 2009</td>
<td>B2C</td>
<td>Product, new to the market, social innovation</td>
<td>Digital</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
<tr>
<td>Ecotastic 2012</td>
<td>B2C</td>
<td>Product, new to the world/ new to the market, social innovation</td>
<td>Digital</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
<tr>
<td>Solarkiosk GmbH 2011</td>
<td>B2C</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Service</td>
<td>Renewable</td>
<td>No</td>
</tr>
<tr>
<td>Swedish Start-ups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowpower AB 2006</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Renewable (snow)</td>
<td>No</td>
</tr>
<tr>
<td>SootTech AB 2007</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
<tr>
<td>Rehact AB 2005</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
<tr>
<td>Ecoera AB 2006</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Renewable (soil)</td>
<td>No</td>
</tr>
<tr>
<td>Comfort Window System AB 2010</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Efficiency</td>
<td>No</td>
</tr>
<tr>
<td>Company X 2014</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Efficiency</td>
<td>No</td>
</tr>
<tr>
<td>Bioendev AB 2007</td>
<td>B2B</td>
<td>Product, new to the world</td>
<td>Engineering</td>
<td>Product</td>
<td>Renewable (biomass)</td>
<td>No</td>
</tr>
<tr>
<td>Exibea AB 2008</td>
<td>B2C</td>
<td>Product, new to the market</td>
<td>Digital</td>
<td>Product</td>
<td>Efficiency</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 6: List of companies

Moreover, we summarize the exact dates, the name of the interviewees, how and how long the interviews were held. This can be seen in Appendix 3.

3.9. Interview guide

The questions in the interview guide were developed based on our literature review and the Model. We use a funnel-shaped interview (see Kvale, 2007, p. 57), which asks indirect questions first. The reasons were explained in the data collections.

We developed two interview guides with researcher questions, which address the thematic dimension, and interviewer questions, which address the dynamic dimension. The thematic dimension concerns the production of knowledge. The researcher questions are formulated in theoretical language and are supposed to directly answer our research question. The dynamic dimension concerns interpersonal relationships. With regard to the latter, the interviewer questions are translated into a colloquial language that is easy to understand by the interviewees and can generate spontaneous and rich descriptions from them (Kvale, 2007, p. 56-60). Furthermore, they help to keep the conversation going in a friendly and nonthreatening tone (see Yin, 2009, p. 106-107). Appendix 1 shows the interviewer questions and the researcher questions.
3.10. Interview procedure and data collection

We made the first contact with the interviewees via phone in February/March. In some cases the first contact was established via e-mail because the telephone number was not indicated online. We saw the telephone call as an important opportunity to establish a first good impression, trust and credibility of us as researchers. Each telephone contact was followed up by an e-mail in which all information given on the phone was presented in text, e.g. our background, the interviewee’s choice to make the case anonymous, the fact that the thesis will be published online etc. Every case received the same information.

A follow-up e-mail with more details and the interviewer questions were sent to the start-ups at least one week before the interview (see Appendix 2). We sent the themes (general questions) in advance because it was not only requested by the participants in the study but we also considered it as appropriate for our research. For instance, we thought that it would be helpful if the participants have some more time to think about their motivations and are not pressed to answer right on the spot. A disadvantage of sending the interview questions in advance is that the answers might not be given spontaneously and that the interviewee might be less inclined to listen to the researcher. Nevertheless, we prepared several follow-up questions in advance that we did not send to the interviewee.

The interviews were held in the period between March 17th and 31st, 2014. The interviews were collected within 11 working days, which means that we held more than one or two interviews per day. The availability of the respondents was mainly determining our interview schedule but we tried not to schedule more than two interviews per day and to have a break of at least one hour between interviews. The latter had the purpose to ensure that our level of concentration is very high. Furthermore, we wanted to take the time to have a brainstorming session and to enter memos, our reflections, interesting insights and ideas into a logbook. Moreover, we made comparisons between interviews and reflected on our performance as interviewers to increase learning.

Video calls via Skype were chosen as the best alternative to face-to-face interviews due to the geographical spread between the interviewees, the long distance between us and the interviewees and general time constraints. Using Skype enabled us to make more interviews since the interviewees did not regard this as time-consuming as a face-to-face interview. In addition, we used the time that we would have spent traveling to start directly with the transcription and analysis of interviews. When the interviews were conducted via Skype we used a webcam in order to ensure a more personal and friendly atmosphere and to also get some clues about the facial expressions and body language of our interviewees. The latter was helpful in analyzing their answers. In one case, we conducted a face-to-face interview because the interviewee lives in Umeå and personal contact was already established at Uniaden 2014. In another case, the interviewee personally preferred a telephone interview. In few cases, the start-ups did not have a Skype account and so the interviews were conducted via phone. We were informed about this when calling the start-ups to hold the interviews with them. A summary of the exact dates, the name of the interviewees, how and how long the interviews were held can be seen in Appendix 3.

We utilized websites and other secondary data from the start-ups, e.g. newspaper articles, videos, etc. to get an overall picture from different perspectives of the start-ups before the interview. This was done, e.g. to be able to cross-check data during/after the interviews (see Guba, 1981, p. 85) to enrich the overall picture of the start-ups before the interviews (see Patton, 1987, p. 60-61). In addition, our preparation helped us to focus on important topics...
that are relevant for our study during the interviews. (see Berg, 2004, p. 80-81, Saunders et al. 2009, p. 320-321)

During the interviews we used our follow-up questions to delve deeper into topics and designed the interview questions in a flexible way based on the interviewee’s answer and flow of the conversation. All founders answered all questions during the interview. There was no rush because every founder took enough time to answer our questions. The interviews were carried out in English, so that both of us can be present at the interviews. The advantages are related to investigator triangulation, which will be explained in section 3.1. We did not experience the language to be a problem for the start-ups to express themselves. Only in very few cases, some German interviewees did not know how to translate certain words from German to English but these were translated during the interview with the interviewee together or the interviewee described the meaning of the words in English. The interviews were recorded by a tape-recorder for making the transcriptions afterwards. All the participants agreed on it.

Ghauri and Grønhaug (2010, p. 20) suggest that interviews should be conducted until no new information is delivered. Saturation is a strong word but we started to see reoccurring answers after carrying out the sixth German and the 4th Swedish interview. However, we continued with all interviews as scheduled because according to our epistemology and ontology, we wanted to take the perspectives of as many start-ups as possible into account. Each start-up helped us to see patterns, to receive ideas about the connectivity between our concepts and to see a topic from a different point of view.

3.11. Our approach to presenting and analyzing data

Transcribing the interviews

Our 17 interviews resulted in over 12 hours of recorded voice. Even though transcriptions are very time-consuming, we decided to make them on our own. As Merriam (2009, p.175) noted, transcribing is a great means of generating insights and hunches about the data. Our transcription consists of over 66.300 transcribed words on 140 pages. According to Alldred and Gillies (2002, p. 159-161), it is important to consider the tone of voice, filling words used and the way the interviewee is speaking in the transcriptions. Therefore, we made short notes when the interviewees laughed or expressed any other kind of emotion. For instance, we wrote words in italics when the interviewees emphasized certain words. This also includes the transcription of words that are repeated, e.g. “very very very important”. The latter reminded us of the weight the interviewee put on certain facts when analyzing the data. We transcribed the interviews word by word without improving the language, style and grammar to truly capture the interviewees’ responses in their own words. We used these details to interpret the quotes and we will refer back to some incidents in the analysis, e.g. the frequent use of the word “yeah”. In order to make the quotes shorter, more understandable and suitable for presenting them in the text, we omitted some words and inserted the sign (…) instead.

In one case, our tape recorder broke down so we lost the data after the sixth minute of the interview. Unfortunately, this was found out when the interview was already finished. However, we noted down immediately all the information we both remembered from the interview and transcribed the minutes we had recorded. This ensures that the data are still reliable.
Our approach to retrieving and analyzing empirical data

Data collection and analysis is often a simultaneous process in qualitative research (Merriam, 2009, p. 169). In order not to be overwhelmed with too much data after the interviews are finalized, we began with the analysis when the interviews were still conducted. We used the first transcriptions and our logbook entries for the latter. After the first half of the interviews, we developed the first revision of the Model from the literature review. All these actions helped us to deal with the data when the interviews were finished.

According to Merriam (2009, p. 193-197), data can be coped with manually or with the help of software. The main reason why we decided to handle the data manually is because a computer program would have caused an uncomfortable distance between us and the data (Cresswell, 2007, p. 165). Moreover, it would have taken us time to learn how to use it. Consequently, we decided to use the time that we would have spent on the software to delve directly into the analysis.

In order to cope with a large amount of data, researchers suggest creating different categories (Merriam 2009, p. 178; Saunders et al., 2007, p. 492). Therefore, we made categories according to the following themes which are very closely related to the Model that we designed after the literature review in the first excel sheet: mission, vision, idea generation, reasons for business initiation, motivation for the product/service, influences on the business, role of sustainability, role of profit, reasons for stakeholder involvement, when and why stakeholders were not involved, relationship between start-up and stakeholders, how stakeholders are involved, proactivity, advantages and disadvantages of engaging stakeholders, challenges, secrecy (including patents) and cost and time.

After the categorization of quotes, we started to unitize the data. This means attributing sets of data from the interviews to the categories, which we described above. These units are the potential answer to our research question. (Merriam, 2009, p. 176) For the unitization, we used an excel sheet as a tool because it made the quotes more transparent and it enabled us to summarize what the interviewees said about the topics. During the process of data unitization, we did not only concentrate on the direct answers of the interviewees to specific questions related to the different themes but we also took all responses of the interviewee into account because the context is important. The unitization of our data helped us to make a cross-case comparison later.

After the categorization and unitization, we summarized the quotes so that we could compare them across cases. (See Saunders et al., 2007, p. 491-492). This enabled us to make detailed cross-case comparisons for each theme respectively and to see patterns. We searched for patterns in each theme and created smaller tables where we assigned quotes from each interviewee to certain topics, or sub-themes. For example, we found the following patterns for the theme idea initiation: seeing a problem and opportunity, family and friends, industry experience, potential in the industry, other people. Since these tables fill 25 pages, we have decided to put them in the appendix (see Appendix 4) and to only present examples of quotes for each pattern in the text. We have chosen to put the tables in the appendix to increase the transparency of our results and to enable the reader to follow our way of thinking and categorization. We also want to show all interviewees’ different points of view, which is in line with our epistemology and ontology.

In addition to the first excel sheet, we created a second excel sheet where we captured the different kinds of stakeholders and their engagement in different phases (idea generation,
product/service development and launch) of all companies. We placed them into different tables in a Word document. As this document has 53 pages, we did not decide to include it in the appendix. We only present examples of quotes in the text and a table, which illustrates when which stakeholders and groups of stakeholders were involved by each company (see Appendix 5).

According to Merriam (2009, p. 176-178), data analysis is the process of making sense out of data in order to answer the research question. Based on her definition, the results chapter served as the beginning of the analysis because the categorization and summarization of the quotes enabled us to delve deeper into their meanings and to answer how and why stakeholders are engaged. Later in the analysis, we were looking for more patterns between our results and the different characteristics of the start-ups presented in Table 6. We combined different patterns to show processes and linkages between themes. Afterwards, we tried to answer why and how this is happening to delve deeper into the topics which were unclear in the Model. We developed stories, which explain our conclusions. Throughout the results and analysis section, we took special care to present data from all cases in order to show a variety of perspectives. In the end, we revised the Model based on our findings.

3.12. Quality/truth criteria

There are several aspects of trustworthiness that we have taken into account during and after data collection to establish (1) credibility, (2) transferability, (3) dependability and (4) conformability (Guba, 1981).

Credibility

With reference to credibility, prolonged engagement in the form of being present at the start-ups’ site helps to test perceptions and bias concerning stakeholder engagement from us as researchers and from the interviewees. (see Guba 1981) Due to the geographical spread, time frame and number of start-ups we were not able to do a thorough on-site engagement. Regular peer debriefings with our supervisor gave us the possibility to detach ourselves from our research and to increase the quality of our work with her constructive feedback. (see Guba 1981)

In addition, triangulation can be helpful to cross-check interpretations and data and to increase credibility (Guba, 1981, p. 85). We have chosen triangulation because it can enrich the findings due to the fact that multiple perspectives are taken into account (see Patton, 1987, p. 60-61). The latter is also in line with our ontology and epistemology because we believe that the world is socially constructed and that different perspectives exist. Patton (1987, p. 60) distinguishes between four types of triangulation: data triangulation, investigator triangulation, theory triangulation and methodological triangulation. The first concerns “using different kinds of data on the same question”, the second using more than one interviewer and evaluator to avoid bias by one person, the third refers to using different perspectives (theories to interpret data) and the fourth is about using multiple methods, e.g. interviews, observations and documents to interpret data. (Patton, 1987, p. 161, p. 60)

With regard to data triangulation, we have used secondary and primary data about the start-ups. Secondary data was compared with primary data to enrich understanding and scrutinize confirmability. With reference to investigator triangulation, we carried out all interviews together, to ensure that important questions and follow-up questions are asked and that the interviewee’s responses are understood in the same way by both of us. Theory triangulation
was done by researching different theories and authors during our literature review and by analyzing the findings in the light of different perspectives presented in theory.

With reference to the methodological triangulation, we used semi-structured interviews but also secondary data to triangulate the data. In fact, we made comparisons as far as possible based on what the interviewees said and what we found in secondary data to check consistency and obtain a richer set of data. (See Patton, 1987) The latter is also called “establishing referential adequacy” and suggested by Guba as a means to increase credibility (1981, p. 86). The main comparisons were done directly during the interviews because we prepared the interviews very well. In this way, for instance, a misunderstanding was sorted out concerning a technology used by Blacksquared.

In addition, credibility can be established through “member checks” by cross-checking the data with the interviewees (Guba, 1981, p. 85). We offered all interviewees the possibility to read their transcripts but only one company requested the transcript (no changes were made to the transcript afterwards). Moreover, we sent the result chapter to three start-ups that had requested it after the interview was conducted. The content sent only referred to the requested start-ups. Two companies made changes. These mainly referred to correcting grammar mistakes, e.g. of the quotes used in the text or small adjustments to the description of the company and product. The changes did not change our content.

Furthermore, “structural collaboration or coherence” can establish credibility by “testing interpretations against all others to be certain that there are no internal conflicts or contradictions” (Guba, 1981, p. 85). According to Patton (1987, p. 159-160), there are different ways for validating and verifying the results of qualitative analysis. One way is to inductively seek for rival and competing themes and explanations inductively and logically. As expressed in our philosophical standpoints, we believe that these can enrich the findings, e.g. we searched for cases where financial resources are not a challenge to get a better understanding of why they could be a challenge in the analysis.

Transferability
According to Guba (1981, p. 86) there are different ways of increasing the transferability of the research, which concern sampling, data collection and context. In line with naturalist beliefs, we argue that “social/behavioral phenomena are context-bound” and so we believe that “it is not possible (...) to develop "truth" statements that have general applicability” but that the context counts. Our sampling is governed by emergent insights about what is important and relevant and “intended to maximize the range of information uncovered”. (Guba, 1981, p. 86) Based on the latter, we have chosen cases that are in different countries, offer different products and services and that are in the B2B and B2C or both sectors, etc. to receive more information about stakeholder engagement.

Moreover, we increase the transferability of our study by providing background information about the start-ups’ products and/or services and our selection criteria, so that other researchers can make a decision on the “degree of fittingness” for their own research (see Guba, 1981, p. 86). We also make the interview guide available in the appendix to enable other researchers to compare their themes and questions with ours.

Dependability
With reference to dependability, stepwise replication was used by splitting in half and interpreting the data separately but also in communication with each other on a continuous
and daily basis “in order to cross-check developing insights and to decide on appropriate next steps“ (Guba, 1981, p. 87). We documented our communication sessions in a logbook and used the logbook to follow up on insights received during the interviews in the results and analysis chapter.

**Data (and interpretational) Confirmability**

Investigator predilections leading to bias are reduced by doing triangulation, so that confirmability and investigator-free findings are reached (Guba, 1981, p. 83). As already described in the section credibility, our data is triangulated in different ways to test our predilections as much as possible. Furthermore, we practiced reflexivity by describing our philosophical standpoint and our axiology as detailed as possible.

With regard to transparency, we provide a thorough description of how our interviews were transcribed and which steps we took to present the results and to analyze the results. Concerning the results chapter, for instance, we provide a large number of tables with the quotes from our interviewees, so that the readers of our thesis can follow our argumentation.

### 3.13. Research ethics

Research ethics is complex (see Punch, 1986, p. 80) but it is important in business studies and social sciences in order not to “lose respect or credibility” (Ghauri & Grønhaug, 2010, p. 20) and to spoil the field for other researchers (Punch, 1986). The importance of making well-reasoned ethical decisions in research has been further stressed by the Swedish Research Council (2011). Consequently, we are now revealing our ethical considerations and decisions made, which are in line with our values of honesty and openness, in order not to spoil the field for future researchers and to increase the credibility and transparency of our research.

Certain elements such as “ethical reflection on research, including consent, deception, privacy, identification, confidentiality, causing harm” (Punch, 1986, p. 29) have received special attention in literature concerning ethics in research (Punch, 1986; Diener and Crandall, 1978; Berg, 1989; Saunders et al. 2007; Silverman, 2011, etc.). Especially Punch (1986) and Diener and Crandall (1978) are providing an in-depth description of the latter. Based on our literature review on business ethics and inspired by figure 6.1 “ethical issues at different stages of research” by Saunders et al. (2007, p. 188), we have designed Figure 3 below to explain how we have taken ethical concerns into account at different stages in our research. As our own values, such as open communication, honesty, respect for the individual and causing no harm have had an influence on all stages, the surrounding bubble is labeled axiology in Figure 3.

![Figure 3: Topics of ethical concern in our study](image)
Grant
Diener and Crandall (1978, p. 170-172) have made aware of ethical concerns that can arise when researchers receive grants for their research. These concerns are related to, e.g. “improper demands” by the funding institution, such as falsification of results and when the grant is not used for the study by the researchers. We applied for and received a part of the JAK Memberbank’s scholarship for studies in sustainable economy because the interests of the JAK Memberbank are in line within our area of research. We used the scholarship to finance expenses that occurred during our study, e.g. skype credit, print outs, etc. and the JAK Memberbank will receive our study for the first time after it is handed in to the thesis grading committee. Therefore, there cannot be any “improper demands” (see Diener & Crandall, 1978, p. 170-172) by the funding institution.

Research purpose and topic
Mason (1996, p. 29-30; cited in Silverman, 2011, p. 101) and Ghauri and Groenhaug (2010, p. 22) suggest that ethical matters should also be taken into account by the researcher at an early stage, i.e. when the problem is formulated and the purpose and topic are chosen. We have not only chosen to shed more light on the intersection of sustainable entrepreneurship and innovation because of our personal interests but also because we believe that research in this area could help society to become more sustainable and that stakeholder engagement for innovation could help to overcome societal and environmental challenges. Consequently, it was important to us that the purpose and topic of our study could help research and society to advance when we made our decisions at the beginning of the study. In addition, we formulated our research question in a way that it would not be an ethical challenge for us to receive and for the participants to reveal information. The latter may also explain why only one of the research participants asked for anonymity and why our study can be very transparent.

Communication with interviewees (researcher – respondent relationship)
The communication with our interviewees concerns gaining access to the interviewees, which information they received before the interviews took place and how we communicated with them during the interview.

Invading the privacy of (potential) participants in a study is a concern in research ethics (see Punch, 1986; Diener & Crandwall, 1987, p. 54-71, etc.) In order to get access to the start-ups’ founders, we did not invade their personal space. For instance, we contacted the founders of the start-ups by calling the phone number provided on the start-up’s website only. Moreover, we did not ask any questions that could trespass upon their privacy during our interviews. According to Silverman (2011, p. 89-90), deception is a “particular feature in qualitative research” and can involve lies, not giving sufficient information, fraud and deceit (Diener & Crandwall, 1987, p. 72; Punch, 1986, p. 38) but it is not likely to be a problem when it does not lead to harming the participants (Silverman, 2011, p. 91). Therefore, we do not regard it as very important in our study. However, since we highly value honesty and transparency, we gave some information about us, e.g. where we are from, our area of research, etc. (see reflexivity in Doucent & Mauthner, 2002, p. 125). We did not reveal our research question and purpose in detail in order not to “contaminate” our research. In fact, “one need not be always brutally honest, direct, and explicit about one’s research purpose (…)” (Punch, 1986, p. 41). Furthermore, we made the participants aware that more follow-up questions might be asked during the interview. We also offered the participants to contact our supervisor or us in case any further information is required but no interviewee asked for any further details.
Informed consent is strongly related to deception. Informed consent means that participants in the research know that it is their free choice to participate in the research and that they are “free from any element of fraud, deceit, duress, or similar unfair inducement or manipulation” (Berg, 1989, p. 56). To be more specific, informed consent means that research participants have a “continuous free choice to participate that lasts throughout the study” (Diener & Crandall, 1987, p. 34). Diener and Crandall (1987, p. 35, p. 51, p. 52) argue that informed consent is not a requirement in social science research where subjects are not exposed to danger or harm. Nevertheless, we have chosen informed consent because we have respect for our interviewees’ right to freedom and value openness. This is why the participants of our research were informed about their right to withdraw from the research at any time without giving any reason.

They were also informed that our study would be published online but that their case can be made anonymous. The latter refers to “confidentiality”, meaning that everything that could lead to reveal a person’s identity or identifying the start-up is removed and “anonymity”, meaning that no names are provided (see Berg, 1989, p. 57). With respect to the latter, we have taken special care throughout the study that no quote or description of the product and/or service reveals too much information about the start-up that wants to be anonymous. The start-up requested “full” anonymity, meaning “confidentiality”. Terms related to the consent can change throughout the study (Bell & Miller, 2002, p. 65) and “consent needs to be ongoing and renegotiated between researcher and researched” (Bell & Miller, 2002, p. 67). For this reason, we left some room to discuss about the consent again at the end of each interview. The start-up requested anonymity after the interview was held. The others still did not ask to be anonymous. This has more advantages than disadvantages for our study because the start-ups have very innovative solutions and so they could be identified quickly if kept anonymous. We wanted to show the start-ups’ quotes and to describe their products and services, so that the reader can read about the different perspectives and develop a better understanding of the results and analysis. We acknowledge that the latter could also have several disadvantages because the start-ups might refrain from speaking about some issues, e.g. the disadvantages of stakeholder engagement. This is why we did not ask the start-ups for specific names and kept our questions concerning disadvantages and financing as general as possible.

Furthermore, the interviewees were asked for permission to use a tape recorder. They were informed that the tape recorder would only be used to record the interviews. We told the interviewees that the recorded data would remain in our hands and that it might only be revisited by the supervisor and members of the thesis grading committee.

In addition, we informed them that the interviewee material would only be used for our thesis and not for any other study. Moreover, it is important that no harm is made to research participants (Diener & Crandall, 1987, p. 17-33). No harm was made to the participants, e.g. no psychological harm. For instance, interviewees were not pressured to answer our questions and some interviewees were interviewed via phone instead of via Skype because they preferred that.

Reporting of results and findings, as well as data storage
Ethical issues also concern how results and findings are evaluated and presented, as well as how data is stored. Concerning the latter, the recordings were saved on our personal laptops only to avoid the unauthorized usage and distribution of data by someone else. With regard to
the former, objectivity and truthfulness have been discussed in academic literature (see Patton, 1987, p. 166-167; Guba & Lincoln, 1994). Taking our epistemological and ontological view, as well as our qualitative research method into account, there is no “one truth” and objectivity is not clear-cut. In fact, one can “assume multiple perspectives and multiple “truths” depending on different points of view” and there are doubts that “real objectivity” exists in research (Patton, 1987, p. 166). Patton (1987, p. 167) argues that objectivity concerns should be better replaced by neutrality concerns in qualitative research but we argue that neutrality is difficult to achieve since the researcher’s values and view of the world cannot be entirely separated from the study. We rather “replace the mandate to be objective with a mandate to be fair and conscientious in taking account of multiple perspectives, multiple interests, and multiple possibilities” (Patton, 1987, p. 167). During the presentation, evaluation and analysis of results, we have aimed to balance between the start-ups interviewed and we were not predisposed towards certain findings. We have taken several steps to establish credibility and trust between the research participants and us to receive honest answers with informed consent and openness towards our research participants.
4. Results

The results chapter is structured according to the Model which we designed in the literature review. For a better illustration, we provide Figure 4 below. It points out the areas we want to study more in depth.

![Figure 4: Structure of the results chapter](image)

The description of the results is structured in two parts. The first part concerns the initiation and development of the business idea and the founding of the business itself. The second part focuses on those elements of the Model that are related to stakeholder engagement. Each part contains a short introduction in which we describe what will be discussed in detail. Due to the high number of cases, we have not chosen to present each case in depth. Both parts are supported with examples of quotes from the start-ups. The initials of the founders are used. We have chosen the initials IX for the founder that wants to stay anonymous (Interviewee X). J and A stand for us as interviewers: J stands for Jaromír, A stands for Alexandra. Sometimes, a shortened version of a quote is used to stress some key points. Appendix 4 contains all quotes for each category. The quotes are presented in tables and in full length, so that it is easier for the reader to place the quote in its context. Each section contains a footnote that leads to the matching tables in the appendix. The chapter closes with a short summary.

Before starting with part one, however, we would like to describe the start-ups’ innovative solutions below to increase the overall understanding of the results. As the description of Company X’s product and/or service could lead others to know which business it is, we have decided not to disclose any information.

**German Start-ups**

*TimberTower GmbH, Hannover and Hamburg:* It is the first company in the world that produces wooden towers for wind energy plants. These wooden towers are higher, more energy-efficient and cheaper to transports than ordinary towers. In addition, the company uses...
renewable materials and involves the local community in the construction of the towers. (TimberTower GmbH, n.d.)

**Solarkiosk GmbH, Berlin**: This start-up designed a kiosk, called solarkiosk, which generates energy with solar panels to make (renewable) energy accessible to remote communities. It operates in Ethiopia and Kenya. The start-up offers energy services to locals, e.g. citizens can recharge their electronic equipment at the kiosk. The energy is cheaper and more sustainable than the energy substitutes. (Solarkiosk GmbH, 2013)

**NTS New Technology Systems GmbH, Berlin**: Wind energy is generated with kite technology. The wind energy system is more effective than that of conventional steel towers because it can take advantage of the wind currents at 500m altitude, which are stronger and more consistent. Building material that is necessary to construct steel towers is also saved. (NTS Energy and Transportsystems GmbH, 2014)

**Ecotastic, Berlin**: The start-up has created an app, also called Ecotastic that encourages environmentally friendly behavior. People can take pictures of their actions that are related to, e.g. saving energy and receive points for these from other app users. The points can be exchanged for gift cards from stores that promote sustainability. (Ecotastic, 2014)

**Greenpocket GmbH, Cologne**: The start-up offers smart meter and smart home software solutions that help households and businesses to measure and control their energy consumption. It is the world’s first business that has developed a smart meter app for Facebook, where users can encourage each other to live as energy efficiently as possible. (Greenpocket GmbH, 2013)

**yetu AG, Berlin**: yetu AG offers smart home solutions. Its energy management application promotes energy efficiency by, e.g. giving advice on how to save more energy to users. It is worth mentioning that the start-up was awarded with the German Energy Efficiency Prize Perpetuum 2014 for the new Home Energy Management System. (yetu AG, n.d.)

**Blacksquared GmbH, Berlin**: The start-up has designed a solar charger that people can use to capture energy from the sun and charge their mobile devices with. Users receive credits for watt hours saved. These can be exchanged for gift cards for environmentally-friendly products and services. In addition, there is a community for users to encourage each other. (Blacksquared GmbH, 2012)

**Codeatelier, Burgstetten**: Codeatelier provides intelligent software solutions. Homee is a smart home smartphone application that helps the user to control his or her energy consumption. (Codeatelier, 2012) According to Jochen Schöllig, Homee’s system is modular which facilitates Codeatelier to integrate a new technology quickly.

**CrowdEner.gy GmbH, Berlin**: The start-up has designed a crowdfunding platform which gives citizens the opportunity to invest in solar energy projects starting from €500. The projects are mostly in Germany but a few are also abroad, e.g. in Tansania. The investors receive their money back in case the funding is not successful. (CrowdEner.gy GmbH, 2012)
Swedish Start-ups

*Bioendev AB, Umeå:* The company creates high-tech systems and innovative techniques to efficiently process biomass. Their system facilitates black pellets generation, the conversion of biomass into solid energy carriers for further production of power and green chemicals. It has a pilot plant in Umeå and it is currently building a demonstration plant in Holmsund. (Bioendev, 2014)

*SootTech, Gothenburg:* The start-up is a global supplier of technology for boiler optimization. Its HISS technology helps to optimize the steam soot blowing system of its customers. The power and recovery boilers’ steam consumption is reduced by 50%. In addition the energy efficiency and electricity production of the boilers is increased. (SootTech, 2014)

*Snowpower AB, Luleå:* The company’s business idea concerns the storing of snow in the winter and using snow as a cooling system in the summer. Snowpower replaces electrical chillers with renewable and innovative snow cooling solutions. These can reduce electricity consumption by 90-95% (Skogsberg, n.d.). According to Kjell Skogsberg, their snowcooling plant is very unique and more efficient than existing snowcooling plants in Japan.

*Ecoera AB, Gothenburg:* Ecoera has created the soil amendment biochar for sustainable agriculture that can reduce the amount of CO₂ while simultaneously enriching the soil (Ecoera, 2012; Anderson, 2009). It “enables the use of agricultural waste products – resources otherwise not utilized – to produce agro pellets that can be burned for energy (…)” (GLOBALfocus, 2008, p. 28-29).

*Rehact AB, Stockholm:* Rehact offers HVAC services. The Rehact Energy System technology reduces external energy dependencies “for heating, cooling, hot water and fresh air” in buildings by up to 85%. In comparison to traditional systems, it does not only use 85% less energy but also improves the indoor climate and ventilation. (Rehact, n.d.)

*Exibea AB, Gothenburg:* The start-up offers user-friendly energy management products for households. The eliq energy display permits users to see their energy usage in real time and it also has a child-friendly touch screen. Comparisons with other Eliq users can be made. Thanks to these devices, households have the possibility to reduce their electricity costs by 25%. (Eliq, 2014)

*Comfort Window System AB, Västra Frölunda:* The start-up has developed a window which can be closed and locked in the turned opposite position. They claim that “by that, the “comfort window” will drastically reduce heat radiation from the outside in hot periods and, when turned “in and out”, solar heat can enter in cold periods.” (Comfort Window System, 2010). Consequently their window helps households to increase energy efficiency.
4.1. Motivation and influences
This part covers what influences the founder in the creation of a sustainable entrepreneurial start-up and how the idea is initiated. Furthermore, we describe why the business is started and the motivation for the creation of a product and/or service for environmental sustainability. We also highlight which start-ups are rather sustainability- and/or profit-driven including a description of the latter in combination with the start-ups’ mission and vision statement.

4.1.1. Influences on the business creation
There are different influences on the founder to create a sustainable entrepreneurial start-up. The influence takes place on different levels: the first area of influence concerns people that have a close connection to the founder, such as family and friends and people in the start-up community and industry that the founder is often communicating with and surrounded by. For instance, Company X, NTS and crowdEner.gy were influenced by their family and Bioendev, Blacksquared, Ecora and SootTech were inspired by other entrepreneurs and people in the industry. For instance, the daughters of Uwe Ahrens were asking him for an environmentally sustainable solution and SootTech’s founder was influenced by the atmosphere and other people in the incubator “Chalmers Innovation”.

UA, NTS: “(...) my daughters are very active in climate change and everything else. And they said Papa you are an inventor so you have to find something that is invisible and that is not influencing the climate”
ED, SootTech: “I was working at Chalmers Innovation with a company and that community is very inspiring which makes possible to start company. (...) If I have been in a normal situation, I would not start a company. But I was in this community and it was very natural and very entrepreneurial attitude in that incubator so it was very natural to start the company and to try it (...) You are inspired by people around and inspired by environment.”

The second area of influence concerns the founders’ personal background and experience in the industry. Four Swedish (Company X, Bioendev, Exibe, Rehact) and one German start-up (Ecotastic) indicated that their educational background had an influence on the creation of the innovation. For instance, Anna Yukiko Bickenbach from Ecotastic who studied environmental management feels that she can make a difference and Anders Nordin is striving for realizing and making use of some of all the written reports and papers produced and studied.

AB, Ecotastic: “Especially if you’ve studied environmental management you sometimes feel like there is nothing to do to make the difference because it is such a large scale and you sometimes can have an influence even if it is a little pin drop (…)”
AN, Bioendev: “We’re taught from when we’re young ok science we are doing that and it’s for real you shouldn’t mix it you shouldn’t even consider that you’re close to reality. It’s a trigger to show everyone also that is can be used also in like that (…)”

The influence of personal experiences and background in the industry can be seen on the examples of NTS, yetu, Timbertower and Solarkiosk. In the case of Timbertower, it was a matter of working in the industry already and becoming aware of problems.

HG, Timbertower: “(...) during this work designing towers the idea came up that the wind energy business has to face some specific problems with towers.”

The third area of influence are changes in the market, which can be seen in the case of Greenpocket and Exibe on the example of smart meters in Sweden and Germany.

4 Please see tables 1-6 in Appendix 4.
TP, Greenpocket: “Yes, of course, because at this time, especially in Germany, a new legal and political framework came up, and that was the start of the so called smart meters which are digital meters for measuring the energy consumption (…).”

The fourth area of influence is the environment in general and environmental challenges related to the industry, as in the case of Blacksquared, yetu, Ecotastic from Germany and Bioendev from Sweden.

AN, Bioendev: “That’s also influenced by long time in (…) growing up I think a lot of most of us or all of us has a strong interest in nature, sustainability, environment, environmental issues. The reason is the greenhouse gases and the oil gap.”

Many of the German start-ups are located in Berlin, Germany. The environment has an influence on the start-ups. The low cost of living encourages them to start a business because as stressed by Blacksquared “you can really try and fail without falling too hard”. In addition, crowdEner.gy points out that the city is well-connected to other cities in Europe which enables the start-up to visit (potential) stakeholders. Quotes by Blacksquared and crowdEner.gy indicate that the city can be a source of people who give feedback. The citizens act as triggers for new ideas, which makes the city attractive. They are open for new ideas too.

SK, Solarkiosk: “we have access to a lot of creative spirit (…). (…) access to all these amazing people. It is just a natural evolution that these ideas develop there. That is my romantic explanation.” DS: “(…) I think that this is one of the most positive things about this ecosystem that’s there is that actually people are very very willing to help and to share their knowledge and they take time to actually talk to you. (…) people that get attracted to Berlin are people like my basically see things differently that have a certain open-mindedness (…).”

4.1.2. How the idea was initiated

We will now explain different reasons for why the idea was initiated. In more than half of the total cases (5 German, 5 Swedish), the idea initiation of a product and/or service for sustainability is based on a problem in which the founders see an opportunity for an innovation. In the case of Solarkiosk, for instance, the founder spotted a market gap, while in the case of Rehact, there was a demand for a product but the product was not available.

SK, Solarkiosk: “(…) he realized that many things were not reaching the internal market as far as solar energy product so he tried to come up with a way of bridging that gap and through that came the idea for solar kiosk.”

SB, Rehact: “Actually it’s my partner who came up with the idea. (…) he was missing this product on the market and he couldn’t find any similar products that’s why he invented this product.”

Other ideas are sparked because of family and friends (crowdEner.gy and NTS), other people (Ecoera and Comfort Window System) and experience in the industry (SootTech and yetu).

ED, SooTech: “I started my career in the industry in 93, in optimization industry so after I ended in another business industry, the idea come up. So it is based on industry experience in the field, not research (…).”

In one case, in the case of Greenpocket, a potential for starting up a company was seen in the industry. Market research was carried out to find the idea.

TP, Greenpocket: “I was part of the business development team. We were four people altogether, and we worked for several months to find a compelling business idea. We had a look at different markets and then step by step we realised that it would be great to start a company which connects the energy market with the internet market. Because four years ago both industries were just about to join up and that was what made this new market interesting for us. We thought that there is much potential to start a successful business.”

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5 Please see tables 7-11 in Appendix 4.
4.1.3. **Why the business is started**

We will now explain why the founders start the business. For four German (Greenpocket, Timbertower, Yetu and Ecotastic) and three Swedish start-ups (Sunpower, SootTech and Exibea), the business is created because a business opportunity is seen in the creation of an innovative product and/or service for environmental sustainability. In the case of Timbertower, for instance, it was a matter of giving the idea a chance to be successful on the market by creating a new business.

HG, Timbertower: “(…) what we saw was when we want to have a chance on the market so we have to do only one thing, only do towers and this was all that we were saying so we said ok let’s forget the engineering office, let’s focus on wooden towers and this was the point where we were saying ok we are going to found Timertower GmbH.”

Money plays a secondary role in general. For two German (Blacksquared and NTS) and three Swedish start-ups (Rehact, Ecoera and Snowpower), a change in the job meaning to have a personal change and to make a positive change in the environment played a leading role in the creation of the business. For instance, the founder of NTS worked in another industry for 14 years and he wanted a change, so he decided to work on a completely new sustainable project. This also becomes clear in the case of Rehact:

SB, Rehact: “For me it was interesting. It was a new line of work so to speak. I used to work with computers before and I wanted to change my area where I worked so I liked the idea of producing a more environmentally friendly product and also hopefully making a big company out of it.”

4.1.4. **Motivation for the product and/or service creation for sustainability**

All founders are intrinsically motivated. The motivation to create an innovative product and/or service for sustainability can be divided in two groups: motivation related to sustainability and motivation which is rather related to other personal motivation. The motivations related to sustainability can be split in four groups. The first one is creating a solution to a problem that concerns sustainability. The Swedish start-ups Rehact and Ecoera, as well as the German start-ups Timbertower, NTS and Codetalier expressed motivations that belong to that group. For example, the founder of Ecoera was living on a farm his whole life and he saw that the techniques used in agriculture are very unsustainable. Consequently, he decided to make a change and to restore the soil to have a better agriculture in the future.

DA, Ecoera: “Yes one is that I have grown up on a farm myself and I have seen that today’s agriculture is very unsustainable. I’ve also seen that all over the world we have soils that are becoming more and more like deserts and need help to restore them. This technology can help that so that’s partly because of that why I work with this right now (…) Yes, partly it’s because it feels good to do something for others.”

The second group is to make a positive change in the world for sustainability, as in the case of two German start-ups (yetu and Solarkiosk) and two Swedish start-ups (Company X and Ecoera). The founder of yetu, for instance, has a strong ambition to change the world with smart energy applications.

CS, yetu: “I am personally motivated to change the world a little bit and that is my motivation. It is not money or fame or something.”

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6 Please see tables 12-13 in Appendix 4.
7 Please see the tables 14-20 in Appendix 4.
The third group is to provide others with the opportunity to make the world more sustainable. Solarkiosk is making renewable energy accessible to remote communities in less developed countries. Another example is crowdEner.gy. The owner was often asked by friends whether they could participate in renewable energy projects even though they do not have enough resources. Therefore, he decided to create a platform where everybody could participate.

SK, Solarkiosk: “It is meant to provide quality products, like solar energy products as well as energy services to communities that never had access to solar products or energy services even though those are good communities that those products were designed for originally. So we wanted to create access to the product but also access to the services to the locals.”

PP, crowdEner.gy: “And what we had always a lot of questions by friends and families how they could join or participate in these very profitable renewable projects so the motivation was we created a platform where everybody can participate and not only the big players and this is what we did and a lot of friends and families now are investors in these kinds of project (…)”

The last group related to motivation towards sustainability is about changing people’s behavior. The German start-ups Ecotastic, Greenpocket, Blacksquared and yetu belong to this group. Ecotastic and Blacksquared are motivating people to change their behavior with the help of a community, while Greenpocket and yetu want the consumer to care more about saving energy. For instance, Blacksquared decided to change the behavior of people by creating a community where users receive points for environmentally friendly behavior.

AB, Ecotastic: “We’re trying to do it with actual environmentally friendly behavior and change behaviour (…)”

DS, Blacksquared: “Well, it was the question we asked ourselves how to motivate people to change their behavior to make it in the long term. (…) and that was basically the why we started with the community, what’s the credit etc.(…)”

TP, Greenpocket: “We wanted to engage the consumer to care more about energy efficiency. That was the main motivation for us to use web technologies to make saving energy much easier for everybody.”

Personal motivation that is not related to sustainability refers to do something good for and to be recognized by society. For instance, yetu and Exibea expressed these motivations.

JO, Exibea: “I think it is inspiring to be in a field where you feel that what you’re doing is something for the future and in some way provide to society and you can really stand for what you’re doing. Most people you talk to think that it is a good thing and that’s one of the most important things.”

The founders from SootTech and Ecoera are motivated because they think it is fun to run a business.

ED, SootTech: “That is one of the main driver to have fun and enjoy it. You can’t make business for money or sustainability. That is impossible.”

The last motivation, which we found, is to create something new. This motivation occurred only in one case, in the case of Bioendev.

AN, Bioendev: “We need to produce something we need to build something we are creative we want to build something we want to show that it works in reality.”

4.1.5. Sustainability-driven/ profit-driven

Some start-ups are more sustainability-driven while others are more profit-driven. Most of the start-ups (7 German, 5 Swedish) claimed that they are more sustainability-driven than profit-driven. They regard the creation of a product and/or service for sustainability as important and part of their motivation.

8 Please see tables 21-24 in Appendix 4.
AB, Ecotastic: “Sustainability is the main motivator to keep working because you are not doing it for yourself but for everyone else and you are doing it because you see there is a need for it.”

TP, Greenpocket: “And having a vision means to believe that you are able to produce a product which can improve the world, because without such a vision it would be very difficult to keep up your motivation.”

DA, Ecoera: “(…) it’s definitely first of all sustainability then we can have profits not the other way around.”

However, these start-ups regard profit as important as well because they stress that a company can neither be sustainable, nor grow or develop without profit. For instance, the founder of Comfort Window System said that he ran the company for seven years without any profit but he also pointed out that profit is crucial to be self-sustaining. The quotes by Christopher Schläffer and Sasha Kolopic also express the importance of profit for the development and success of their business:

CS, yetu: “You have to have profit. Otherwise you can’t grow and develop (…). We need to have profit but it is like you are checking your pulse. It needs to be there otherwise you cannot live. But it is not what life is all about.”

SK, Solarkiosk: “(…) profit needs to play a part in it in order to make it sustainable chain because so many non-profit projects failed.”

The minority, the two Swedish start-ups Company X and Exibea, express that sustainability and profit are equally important.

JO, Exibea: “Both of them. I mean a profitable company is important. If you are not profitable, you can’t exist… Yeah, company needs to be profitable. Then, it is matter how profitable… It is important that the company is sustainable.”

Only two founders of the German start-ups think that profit is more important. Codeatelier, for instance is planning an exit after two years and Blacksquared regard profit as important to drive change (environmental change).

DS, Blacksquared: “(…) I have a company and the only way I see that you can actually drive change is to make money and profit. (…) We are definitely profit-driven because we are a normal company.”

In addition, for SootTech, the driver is neither sustainability nor profit but the challenge to create something.

ED, SootTech: The main driver is the challenge to create something. That is something what drives you- to do something successful, something that matters. You have changed and accomplished something. But I think if you start a company, it is not the idea of getting rich. It is that you have a challenge and you want to accomplish something. The challenge is the real driver.

4.1.6. The drive for sustainability and profit in the light of the start-ups’ mission and vision statements.

In this section, we will highlight to which extent the importance of sustainability and profit is reflected in the start-ups’ mission and vision statements.

More sustainability- than profit-driven start-ups

In the case of those companies that are more sustainability-driven than profit-driven (Ecotastic, Greenpocket, yetu, NTS) the mission and in the case of Ecotastic and Greenpocket, also the vision expresses the motivation and drive to increase environmental sustainability and environmentally friendly behavior with the products and/or services.

9 Please see tables 25-27 in Appendix 4.
AB, Ecotastic: “(...) mission is to motivate individuals to become environmental friendly. (...) Vision in the long run would be to kind of become a market force so we can help open up the green market and make it more accepted in terms of shifting the market to more environmentally friendly companies as well as behaviors.”

In the case of Rehact, however, the overall drive for environmental sustainability is not obvious in the mission statement as profitability is highlighted.

SB, Rehact: “To bring the products in the market and make the company grow revenue wise and make the company profitable.”

There is a lack of data and useful data for the companies Solarkiosk, Timbertower, Snowpower, Bioendev, Comfort Window System and Rehact.

Start-ups that are profit- and sustainability-driven
In the case of Exibea which is both profit- and sustainability-driven, the “vision is to enable people to live (...) everyday in more sustainable way (...)” and “the aim is to increase awareness of the energy consumption and therefore to reduce energy” but profit is regarded as important for the company to exist. This is also why Exibea is stating that they are equally profit- and sustainability-driven. No data is available for Company X which pointed out that sustainability and profit are equally important.

More profit-driven than sustainability-driven start-ups
Concerning the companies that regard profit as more important than environmental sustainability, we noted that the vision and the drive do not always match. In the case of Codeatelier, the vision does not indicate that the company is trying to increase environmental sustainability but to provide software solutions for customers and profit is more important to the company. In the case of Blacksquared, which is “definitely profit-driven”, however, the vision is actually to change people’s behavior to become more environmentally friendly. In the case of SootTech, where the real drive is to create something, the mission of the company is to sell the company:

ED, SootTech: “The mission is to sell the company to a large company.”

4.2. Stakeholder engagement
Part two of the results chapter includes all aspects related to stakeholder engagement. First the level of proactiveness in stakeholder engagement is discussed, then which stakeholders are engaged and in which phases before going on to the relationship to stakeholders. In addition, we address the role of secrecy and the advantages and disadvantages. The effects of cost and time on the product/service development, as well as the challenges that start-ups face and reasons for when and why a company is not involving stakeholders and when it is involving many and a wider group of stakeholders are presented.

4.2.1. Level of proactivity in stakeholder engagement
We will now describe the level of proactivity in stakeholder engagement. First we will approach the cases where there was a high level of proactivity from the company side and then those where the stakeholders were more proactive. We will also highlight in which cases there was an equal level of proactivity and where one could see a change in the level of proactivity.

10 Please see tables 28-31 in Appendix 4.
High level of proactivity from the company side
In four cases (yetu, Rehact, NTS and Blacksquared) the companies stressed that they were the ones who showed a high level of proactivity in contacting and involving stakeholders. yetu contacted the stakeholders because the start-up kept its identity secret and so no stakeholder could know about them and contact them.

CS, yetu: “In our case it was us all the time because we were very secretive about what we were doing so nobody could approach us as nobody could know. So it was us. We did research, we thought about whom to approach and it was basically always us approaching people. (…)”

Rehact blames the passivity of the stakeholders for the high level of proactivity from the company side even though Rehact has received several awards and recognitions, which means that it is recognized in the industry and their product is already launched.

SB, Rehact: “Most of them, I initiated the contact with. (…) It is hard work. Most of the stakeholders are relatively passive so you have to be the initiative taker in many cases.”

In the case of NTS, Uwe Ahrens took the first step to contact people in his network and he did research to choose stakeholders that match best what he was looking for (as in the case of yetu and Blacksquared).

High level of proactivity from the stakeholder side
Only two companies, namely Codeatelier and Snowpower stressed that they were contacted by the stakeholders.

JS, Codeatelier: “(…) normally, the company comes to us and says: Ok, we want to get in touch with you, know more about you (…)”

In the case of Snowpower, the media played a leading role in being contacted by the stakeholders as the following quote shows. Snowpower is the only company in Sweden that is offering energy through snow. That could be an explanation for why it is mainly contacted by the stakeholders. In fact, the start-up might be very attractive to the stakeholders, since it could offer the stakeholders a solution that they cannot find anywhere else and that might be better than already existing products and/or services.

KS, Snowpower: “No I think mostly we have been contacted and did you know that if one organization writes about this then another organization that works with this question and they contact us and see.”

In the case of Codeatelier, one can assume that they also showed proactivity by searching for user groups:

JS, Codeatelier: “You need the user groups and you have to interact with them and ask them for their feedback of course”.

Consequently, the level of proactivity can vary depending on the kind of stakeholders as the quotes by Codeatelier show. In addition, Codeatelier participated in and won a lot of prices in business competitions, which made them known among their customers:

JS, Codeatelier: “We did a lot of business awards things where you can submit your idea and win something. We won a lot of prices. Out of this, we got in contact with energy providers“.

Equal level of proactivity
In the case of Company X and Bioendev, the level of proactivity goes both ways, meaning that the company contacts stakeholders but that the company is also contacted by
stakeholders. The network and reputation of the company’s founders play a role. Being often present at conferences in the industry gives the possibility to present ideas and to meet others that could become partners, customers. Anders Nordin also stresses the words “very strong energy network in the North of Sweden”. This network can facilitate that information about the start-up is spread and that contact from the stakeholder side is initiated.

AN, Bioendev: “As I have scientific background, I am often present at conferences. And at a lot of the conferences we meet. And we have a very strong energy network in the North of Sweden so we need a lot of scientists.”

NTS, which showed a high level of proactivity, also mentioned that their network was useful for getting in contact with stakeholders. Company X mostly has to contact stakeholders which Interviewee X assumes is because they do not have a website where stakeholders could get aware of the company. Due to having contacts in the industry and because one of Interviewee X’s family members is known in the industry, however, stakeholders (manufacturers) are also contacting Company X.

IX, Company X: “Let’s see… Sometimes, it has been like that someone heard about it and they wanted to see the demo, for example business angels. But also it was because my (name of family member) was in (…) industry and he had contacts with manufacturers so when they heard about it they wanted to know more. It was both ways but mostly I have to contact people and maybe because we don’t have our website.”

*Change in the level of proactivity*

In addition, a change in the level of proactivity can be seen over time and over stages of product development in the Swedish start-ups Exibea and Ecoera and the German start-ups Ecotastic, Blacksquared, Timbertower and crowdEner.gy. At the beginning, the founders had to actively contact the stakeholders but as soon as the start-up became more known, the company also started to be contacted by the stakeholders. For example, in the case of Ecotastic, Blacksquared and Timbertower, the companies were more active in the first stages of product development and then stakeholders were increasingly contacting them during the product development and pre-launch/launch stage.

HG, Timbertower: “I think both. At the beginning it was more that we contacted people and companies from the wooden side and also from the wind energy side and it changes during the time. During the company development more companies came to us and where asking can we do anything for you (…) at the moment I think it is 50/50 (…).”

crowdEner.gy and Ecoera actively had to build up their brand and their reputation to be contacted by stakeholders.

DA, Ecoera: “Yeah, in the beginning it was like that. But now, we have built the brand and reputation from where we can get information to us and we get contacted from external stakeholders. In the beginning, it was certainly that you have to be out there, selling.”

4.2.2. *Which stakeholders are engaged and in which phases*

In this part, we describe which stakeholders are involved and for which reasons within the three stages classified in the figure at the beginning of this chapter: idea creation, product development and launch (commercialization).11 We base this section of the results on 53 pages of quotes that we have gathered and grouped according to the different stakeholders identified. Consequently, we categorized the stakeholders into five groups according to their function: feedback givers, financial resources providers, technical developers, promoters and

11 Due to the extensive amount of quotes, the quotes cannot be presented in the appendix.
the team. Each group plays a special role for the start-up. Some stakeholders are involved in more groups since they contribute to the firm in more than one way, e.g. in the case of Snowpower, the business angle does not only provide financial resources to the company but also feedback concerning the business development, etc. We will now describe the groups in more detail and give examples of stakeholders for each.

Feedback givers provide feedback, which is very important for the start-ups. In our definition, they validate the idea, encourage founders, give assurance and provide help. Financial resources providers as it follows from the name provide financial resources. Technical developers help with development of the technical aspects of the product and/or service. They can be related to both engineering and technology. Another group is promoters. They make the product and/or service and business known in public as well as in the industry. They help to promote the product and/or service in order to obtain contact to people in the industry as well as potential partners and customers, which help to bring the product to the market.

The last group is the team. It is the core of the business. By team, we mean the founder(s) and people working in the company. The team is of course utilized throughout all the stages. We were not focused on the team in particular. We were focusing on external stakeholders. However, some of the interviewees talked a lot about the importance of their team for the company. Therefore, we decided to include the team as well.

TP, Greenpocket: “Well, I think to become a successful company it is most important to have a very good team of employees. You need outstanding people with different professional backgrounds to build a start-up company (…). I think all in all we were very serious about building up an excellent team.”

J: “So your team plays also very important role.” UA, NTS: “Yes, of course we have, as you can imagine there is no education for building airborne wind energy plants (laugh) so we have a mixture of all sciences that are necessary to develop such a plant like air aeronautics engineers, like mechanical engineers, like physics and we have a meteorologist, we have sensor technologists, we have electronics engineers, so it’s a mixture of all of it.”

The different groups of stakeholders and examples of stakeholders for each group that the start-ups mentioned are summarized in Table 7 below.

<table>
<thead>
<tr>
<th>Feedback givers</th>
<th>Financial r. g.</th>
<th>Technical d.</th>
<th>Promoters</th>
<th>Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family, friends, university (mentors or students), business competitions, incubators, end users, customers, business angels, partners, consultants and potential competitors, etc.</td>
<td>Business angels, banks, shareholders, venture capital, governments, administrative centers, customers, investors, etc.</td>
<td>Universities, research institutes, clusters, freelancers, technology center, suppliers, customers, other partners, etc.</td>
<td>Rewards, competitions, clusters, media, politicians, partners, etc.</td>
<td>Founder(s), employees, etc.</td>
</tr>
</tbody>
</table>

Table 7: Stakeholder groups and examples of stakeholders for each group

To increase transparency, we have made two tables that summarize which stakeholders are involved from which stakeholder group and in which development phase by the start-ups. The tables can be seen in Appendix 5.

It is important to note that the start-ups might engage more stakeholders belonging to the groups but our study only takes into considerations those that were explicitly mentioned by
the start-ups during the interview. We acknowledge that the start-ups might have engaged more stakeholders during the product and/or service development but these are the stakeholders that the start-ups considered to be worth mentioning and important for the different phases of development.

The tables distinguish between German and Swedish start-ups to illustrate differences between countries and to have a better overview of the cases. The differences between countries will be explained in the following description of stakeholder engagement in different development phases:

**Phase 1: Idea generation and development**

During the first stage when the idea is generated and developed, the team plays the most important role. In the case of Codeatelier, for instance, the founders were classmates at a university and they generated the idea with their team only. They had the know-how to develop the idea and wanted to save as much money as possible.

JS, Codeatelier: “No, we tried to do it (...) in very small steps with less money. We started in our team building the idea (...)”

The idea is also developed and validated with the feedback givers (families and friends, business competitions, mentors from university, incubators, potential customers and users). Differences between the German and Swedish start-ups can be seen. Incubators, family and friends were mentioned more often in Sweden. For instance, the founder of SootTech was very positively influenced and supported by the incubator because he met a lot of other entrepreneurs who inspired him and gave him valuable feedback. Interviewee X from Company X discussed his/her idea first with his/her family. In addition, the business competitions and university mentors helped to develop the idea further and to validate the idea in Sweden. In the case of Snowpower, the founder was influenced by his professor who gave him a lot of insights into snowcooling. Moreover, the founder participated in a business competition and received a lot of positive feedback, which assured him that the business idea has potential. Examples of the quotes regarding the different stakeholders can be seen below:

**Incubator:** ED, SootTech: “(...) I was in this community and it was very natural and very entrepreneurial attitude in that incubator so it was very natural to start the company and to try it (....)”

**AB:** “It was a place to work. Working environment is important when you starting. You have a place where you can go to. They did give us a mentors (....).”

**Family and friends:** IX, Company X: “Yeah, he (family member/friend) was the first time I spoke about the idea.”

**Business competition:** KS, Snowpower: “We participated in business plan competition. (....) We didn’t really succeed in the competition. There were a lot of compliments. Everybody liked the idea but they saw it was very big and we were very small company.”

**University mentor:** KS, Snowpower: “(...) I was doing Master thesis on rock cooling and heating and this professor was my supervisor. He asked me to do a literature survey. So I did. The experiment went well and then they decided to build this plant. The professor asked me if I want to be a PhD student and I said yes. So I followed this 5 years of preparation of this plant. It was working very well, saving 95% of electricity, comparing other chillers.”

In Germany, many different feedback givers are used to validate the idea. In the case of Ecotastic, the idea was validated by, e.g. a university mentor, family and friends, etc. Another way of getting feedback are business competitions. For instance, Timbertower received positive feedback on his idea when he participated in a business competition, which provided him an external proof and encouraged him to continue with the development of the idea. In some other cases, also customers or partners were engaged. Greenpocket states that it is important to engage stakeholders at the very beginning. Another interesting case is yetu. The
founder travelled around the world to validate the idea and to see what is the current situation in the market and industry.

**Family and friends**: AB, Ecotastic: “First is family and friends. First, people that are closest to you. You have to talk about the idea. You need a feedback. You feel someone accepted (…). This is the first bubble. Then, there is the second bubble during product development, you are starting to reach friends of friends or people from old university or certain Facebook groups (…). Of course, you can say entry to market is when you bring the app and strangers start to download. But for us, it was being at CEBIT and we came into contact with about 800 people within 5 days who are strangers but at the same time, it was the phase when we needed completely different opinion. We needed opinion without bias. They wanted it to work for us (…). That’s the three rings: family and friends, then their family and friends and the third one- somewhere from the outside.”

**University mentor**: AB, Ecotastic: “We had coaches. We had some mentors. (…) she was a mentor for us.”

**Business competition**: HG, Timbertower: “What we needed at the moment was money to create the company and this was the reason why we were participating in these competitions and to get a feedback (…).”

**Customers**: TB, Timbertower: “I think that this connection to your customers is very very important and the feedback of your customers is very important well in the early stage of the start-up company.”

**Partners**: DS, Blacksquared: “You have a lot of discussions with partners (…). We were quite close to the topic of renewable energies, had a lot of contacts from clients.”

**Travelling**: CS, yetu: “We travelled the world. I went to Silicon Valley, to Israel and to Asia and there were a series of companies in the domain worth evaluating, where they are and what they do (…) but it is a sensitive process because you can’t disclose fully your idea yet (…). That is what you have to do first.”

### Phase 2: Product development

After the idea generation is finished and the business is founded, the start-ups tend to engage more stakeholders in the product development phase. Unlike the idea generation when only feedback givers are involved, the start-ups also engage technical developers, business developers and promoters. Feedback givers are still important. More stakeholders are engaged for the business development than for the product development.

**Feedback givers**

With regard to feedback givers, there is a difference in involving stakeholders between Germany and Sweden. In Sweden, the most important stakeholders are incubators and business angels. They do not only provide feedback but also business help and consultancy. The most important feedback giver is the incubator, seven out of eight Swedish start-ups are a part of an incubator and receive a lot of help, such as mentoring, support with paper work as well as financing, inspiration, motivation, acquiring new skills and knowledge and getting in contact with possible partners and customers. Thanks to the incubators, the companies are developing their ideas in an entrepreneurial environment, which is a great motivator for the founders. The founders can receive feedback from business coaches, help and know-how to conduct business plans, find potential partners etc. Snowpower praised being part of an incubator. As he did not have a business background he learned a lot. He had a lot of discussions with other companies and courses for the business development.

KS, Snowpower: “We were also a member of the business incubator and there we met potential customers and different financers (…). My background is not from business sector so I have learned a lot about running a company from both discussions and courses and also it is a situation where you have other companies, start-ups and you can learn from them.”

DA, Ecoera: “They gave us advice for instance in becoming a knowledge partner together with the customer. Those type of improvements.”

Business angels are important as well. They occurred in three cases in Sweden: Snowpower, SootTech and Company X. They provide crucial business help, not only financial resources. For instance, the business angel helps Company X with his experience in marketing and is therefore an important asset in the business development of the start-up from both, the financial and marketing point of view. In addition, the business angel has a background in
engineering and understands the industry. In the case of Snowpower, the business angel is even actively working on the product development in the company and the start-up can benefit from his connection to customers.

IX, Company X: “(…) He (business angel) comes from the sales side of the company. He is an engineer but he has all his life working with sales organizations and so on and now that we are getting more and more in contact with building entrepreneurs and developers (…)”

KS, Snowpower: “We learned a lot. His (the business angel’s) own company (...) seem to be in the energy sector and their customers can be also a customer of Snowpower – the municipalities (...). We can have the same customers. And of course, he has a lot of knowledge about how to work with these companies and the business model (...) but since he is working in the field, he has a lot of ideas so it’s been working as an advisor but also doing real work in the company (...).”

Customers are also providing feedback. They are mainly asked to test the product and to give feedback on it, so that the start-up can tailor their products to the customers’ needs and wants.

SB, Rehact: “Well the customers have been involved in order to test the product to see how they accept or not accept the product.”

With respect to the product development in Germany, differences can be seen in comparison to the feedback givers involvement in Sweden. To our knowledge, only Ecotastic has been a part of an incubator in Germany. As in the Swedish cases, the importance of mentorship and gaining more skills and knowledge about developing a business is stressed.

AB, Ecotastic: “It was a place to work. Working environment is important when you starting. You have a place where you can go to. They did give us a mentor (…) it was very helpful because he gave us insights from business perspective. That’s the two things which come from social impact lab.”

In Germany, users and customers are often engaged in the testing of the product and development. Users and customers were mentioned for testing the products in five cases. Codeatelier and Solarkiosk are using the feedback from the end users to improve their products as much as possible before bringing them to the market (the official launch).

JS, Codeatelier: “We had a Betatest and we did a lot of research in this field (...) we had a few tests over six months were we installed more than 200 beta systems of Homee where we get that feedback.”

SK, Solarkiosk: “Absolutely. We are not done. Optimizing the business model of the kiosk. As a technology it is pretty set. There might be minor changes in order to improve efficiency (...) but the input for the locals is how to operate the business.”

Furthermore, there is a bigger spread of additional feedback givers in Germany in comparison to Sweden. Business competitions, partners, potential competitors and one consultant, etc. are used as feedback providers. For instance, in the case of Codeatelier, the business competition helped to validate the idea and to become part of a mentoring program.

Business competitions: JS, Codeatelier: “(...) We won the competition and then, we get a mentoring program.”

Partners: CS, yetu: “We got a lot of feedback when we were talking to potential consumers but also customers, partners.”

Consultant: CS, yetu: “Secondly, you have to involve people who help you in developing a business model. We had to reconcile with a series of parties, in particular stakeholders from consulting and the financial services industry in order to understand how strong it can be.”

Potential competitors: CS, yetu: “You also talk with potential competitors and validate that.”
**Financial resources givers**

Concerning financial resources givers, there are also differences between Germany and Sweden. The government is the most common source of funding in Sweden. It is mentioned in seven cases and so it plays a very important role for financing the start-ups. SootTech, Rehact, Ecoera, Comfort Window System, Company X, Exibea, Bioendev have received some financial help from the governments.

DA, Ecoera: “Yeah, that early financing from public grants and from regional grants in the west of Sweden. Those we have got to that stage.”

SB, Rehact: “We have succeeded in getting government investors into the company.”

ED, SootTech: “I would say without Chalmers innovation, it would be impossible. They had the network (…). The Chalmers Innovation was the key. They made the financing possible (…) we got regional money, it is a loan. We needed also to finance the pilot project and that was the energy agency who co-financed.”

Business angels are also important in Sweden. They were mentioned three times.

ED, SootTech: “Then, it was another investor climate, to get business angel.”

Besides business angels and governments, also banks, shareholders, venture capital and private investors were mentioned. However, they were only mentioned once among all Swedish cases.

**Banks, venture capital**

IX, Company X: “We have for the financing: a government, venture capital, and (…) an investment bank.”

**Shareholders**

SB, Rehact: “Rehact is a public company right now so have many smaller private individuals who have invested maybe between 500 and perhaps 5000 Euros each into the company. So it’s a sort of I would say it’s the traditional way of actually doing a crowd what’s actually called crowdfunding today. It’s going public and raising money from the public audience.”

In comparison to Sweden, financial resources from the government and business angels were not mentioned as often in Germany. In general, however, financing is provided by the government, business angels, partners, banks, shareholders and investors. The quote by Holger Giebel from Timbertower also shows that different financial resources givers can be used in different rounds of financing.

**Governments, other investors, banks**

HG, Timbertower: “We had several different financers of the company. In the first round we had the players with the start-up fond. We had the Mittelständische Beteiligungsgesellschaft Niedersachsen. We had the start-up in (…), a venture forum original here from Hannover (…) we had some private investors.”

SK, Solarkiosk: “We are currently financed by private money, we have investors and shareholders and the financing has been used to three pilot projects in three different countries (…)”

**Business angel**

JS, Codeatelier: “(…) his sister was marrying somebody who had a company with a lot of money and it was the business angel.”

**Technical developers**

Technical developers are engaged by start-ups in Germany and Sweden, e.g. universities, freelancers, suppliers, customers, etc. No major differences in the type of technical developers can be seen. The technical developers are helping the start-ups to improve the technical aspects of their products and/or services to make the development and testing of prototypes successful. For instance, in the case of Timbertower, the university helped in obtaining the permission to build the first prototypes.

**Freelancers**

TB, Timbertower: “Yeah, well at the beginning we had freelancer ja who worked for us as developers (…) especially at the beginning when you’re building the company you’re building your software core ja and it is very helpful (…) to have all these experienced people.”
Suppliers, partners: KS, Snowpower: “We had a lot of exchange with different companies (...) how to build this plants as cheap and efficient as possible, with humping companies, selling systems for sealing this pit to make it waterproof, and some more companies (...).”

IX: “(...) each technical stage we have reached we have been in contact with the manufacturers and building developers and entrepreneurs just to see it from their view and it has been really important because (...) manufacturers (...) it was them who told us how important is it with the durability because I mean you will put the product there (...).”

Universities: UA, NTS: “(...) they develop with us. For instance the Frauenhofer Institute in Stuttgart developed one of our steering units, the Technical University developed a software to calculate the effectiveness of the systems and so on.”

HG, Timbertower: “They (universities) mainly did some research works and they did technical research and (...) they had to write expertises for the permission authorities (...).”

Customers: ED, SootTech: “It’s very open the relationship to the customer (...) we are doing something together (...) In that perspective it’s not a commercial project it’s more something like we are doing something fun (laugh) something developing together so that is the thing and so they are putting in their resources and when something goes wrong they protect us.”

Promoters
Promoters are mainly getting important later (compared to other groups of stakeholders) after the company is founded. However, their importance increases in the process of commercialization and especially after the launch of the product and/or service. In Germany, rewards and competitions were mentioned more often. Moreover, media, politicians and partners are used for purposes of promotion, e.g. to make the start-up more known in the industry, to attract customers and to speed up the process of obtaining permissions to build prototypes from local authorities. In the case of Blacksquared, for instance, more users are attracted if they regard the offers from the start-up’s partners attractive. Similar to Germany, the Swedish start-ups made use of their connections to politicians, media and rewards to increase awareness of their products and/or services and to have some influence concerning the laws that affect their industry, for instance.

Rewards and competitions: JS, Codeatelier: “We did a lot of business awards things where you can submit your idea and win something. We won a lot of prices. Out of this, we got in contact with energy providers. Then, we were in discussion with them and we got some ideas to Homee and say ok: We have to realize and then, it becomes more attractive for customers, business partners, strategic partners who could invest in the project.”

SB, Rehact: “We had to build this credibility of the company. That’s what we tried to involve as many stakeholders to look at the business idea. Getting an award is kind of getting recognition that something is interesting. (...) Media is good usually for us. Can be bad, that’s right but for us, it was good. The idea is that media also create interest in the company- it attracts investors and buyers.”

Media: HG, Timbertower: “(...) we were advertising sometimes in the newspaper or on the website that we were searching for prototype sites to build up wind energy plants and this was from the beginning of the company the point that we have talked to stakeholders (...).”

JO, Codeatelier: “(...) but it’s important not to have like one article of a coverage at one time you need to continuously and systematically work with the public relations so in the long run you create a lot of positive media around your company (...).”

Politicians: AN, Bioendev: “Yeah. Of course, nothing would happen with replacing coal if you don’t get political incentives, the same with liquid fuels.”

DA, Ecoera: “Politicians.” A: “Why?” DA: “Because we need a better carbon you can say better greenhouse gas reduction tools in the world right now. So we propose a new system to politicians that for instance instead of putting subsidies to the agriculture you can give the farmers money if they harness carbon in their soils for instance so they can get the carbon tax back so to say.”

Partners: DS, Blacksquared: “(...) the more attractive the offers and the market place are the better people feel when they produce their credits, sure.”

Phase 3: Launch
Regarding the launch, we do not have as much data as in the other stages because many of the start-ups have not launched their products and/or services yet. Some start-ups mentioned that they will open up even more after the launch, which means that they will engage more
stakeholders. For instance, the owner of Comfort Window System has kept his company closed during the idea generation and product development but he is going to involve more stakeholders after the launch. Similarly, yetu and Company X will engage more stakeholders, e.g. after the website is launched in the case of Company X.

CS, yetu: “Let me be clear here: We were still a company in the development stage which means that our stakeholder engagement was limited to a certain extent here.”

IX, Company X: “There are many websites there with products and you can’t order them and we don’t want to have too long time between launching website, telling about the product and when you can order it (...). The website would be dead for long time.”

4.2.3. The relationship to stakeholders

This section explains the different aspects concerning the relationship to stakeholders and different types of relationships. All the start-ups from which we have data about the relationship to their stakeholders (8 German, 5 Swedish) indicated to have a good relationship with their stakeholders. Timbertower even stresses that a good relationship to stakeholders is part of their success. Nevertheless, they claim that being in frequent contact with stakeholders is taking a lot of energy, time and work, too.

HG, Timbertower: “(...) the big stake in our success is the relationship work to all the stakeholders. We’re in very good contact nowadays also with the Wirtschaftsförderung here in Hannover. We’re in good contact with politicians we’re in good contact with the stakeholders. They have sites or they plan to build wind energy plants. And we’re always talking to them, we’re visiting them and this is big part of our work to have good contact to all the stakeholders.”

There was no start-up that pointed out to have a negative relationship with the current stakeholders that are involved (the cases are also not anonymous (except for one), which could be one of the reasons for not getting negative remarks).

Some start-ups, such as Codeatelier and Bioendev describe their relationship to stakeholders to be close. Bioendev stresses that one must be close to the stakeholders to be productive, whereas Codeatelier points out a difference in how close a relationship is depending on how important the stakeholder is for the business. Being close to stakeholders takes time, however.

AN, Bioendev: “It is interesting, also it takes to get close to be really productive. It takes 10-15 meetings, maybe some travelling when you can be really open and honest and be very productive, very close. (...)”

JS, Codeatelier: “The only thing which we are very close with our stakeholders is when we have a new big development contract or want to work with other big company”.

On the other hand, one Swedish start-up (Rehact) expressed not to have very close relationships with the stakeholders and that the relationship can be simply described as professional. Besides being close in terms of trust and how the stakeholders work together with the company, Ecotastic underlines that a common vision is important for a good relationship no matter which type of stakeholder one works with:

AB, Ecotastic: “(...) it’s more are you able to align your visions with whomever you are trying to work with”.

In the case of yetu and Comfort Window System, trust, meaning that there is only open communication in a small and closed community of the company and its stakeholders, is needed to talk openly with stakeholders. Comfort Window System only engaged with stakeholders in their network and yetu was very selective concerning the amount of information that is given to stakeholders.

12 Please see table 32 in Appendix 4.
CS, yetu: “(...) we involve external stakeholders but we bound them to an ecosystem which was at that stage a closed innovation in that system so a series of open elements but within that boundary.” A: “And you choose who gets which information and who helps you with which development?” CS: “Exactly.”(...)“When we talk about the scientific institutions, our customers, or trial users, all of them were part of the project so far and we openly communicating in the community but not beyond that. (...) It’s not that we put out a pizza application and let the world use it. That’s not our system.”

**Different types of relationships**

In addition, a distinction can be made between different types of relationships. The first type of relationship is more functional. This means that the relationship has the purpose to accelerate the product development and to bring the product to the market because the start-up is lacking know-how, reassurance, connections or resources. This phenomenon was observed in the case of Greenpocket because they engaged the media as a “strong partner” from the start to increase the chance of making the product accepted by the market. As in the case of yetu, they engaged with customers to receive feedback on their product and to reassure that they are on the right track. Furthermore, Solarkiosk regards the relationship to different stakeholders as different because it is purely functional, e.g. some help to advance the technology, while others provide feedback that is valuable for the business development. In the case of Solarkiosk and Codeatelier, however, also a two-way dependency can be seen in the functional relationship. Solarkiosk is dependent on the operators’ feedback to optimize the solarkiosk and the operators also profit from it. The feedback goes both ways. The two-way dependency in the case of Codetalier is best expressed in this quote:

JS, Codeatelier: “Yeah, so one company is still our manufacturer. He helped us with tools and so on because we are just a software company. We don’t have know-how and how we do the production, how much it costs and so on. We are in very good contact. They are building all the tools for us, find suppliers and so on (…). At the same time they use us as a software developer.”

The second type of relationship concerns engaging stakeholders in the strategic decision-making of the business, which can be seen in the case of Codeatelier, crowdEner.gy and Company X. Company X, for instance chose a business angel that does not only provide money but also experience in marketing and sales and crowdEner.gy would choose to develop the business further with the users together. For Codeatelier, this type of relationship is helping the start-up to avoid risks:

JS, Codeatelier: “If we are not sure, we take them and do the decision together. Then, we are sure that a lot of people decide to go this way and if it is wrong, we all are responsible for that.”

PP, crowdEner.gy: “(...) what we are considering is the possibility to make an own crowdfunding for our own platform (...) first have to convince our users but then also we we we need to do it with them ja and not alone and ja, we’re open to it but in the day-to-day business what kind of projects, what kind of returns and how to what kind of project to bring on the platform it’s actually mine, our, it’s our decision and it should we this (...)”

The third type of relationship is more business-oriented because it refers to jointly developing the business or product by working together on a more equal level, as it is described by Codeatelier and NTS. In the case of NTS, all cooperation partners were working together to complete a failure management system and in the case of Codeatelier, there is equality despite a difference in company size.

JS, Codeatelier: “It is not like: We are the big one and you are the small one and do what we say. It is more like: You are small company but you are innovative. We are old company, we are big (...) and if they are really good chiefs they know what their company (...) can do and what not. If they want to do an innovative product which is very separated from their normal field, then, they need some external experts with skills and very young team and so on. They know that. That’s how you work together. You are at the same level of discussing. (...) It is the same level (...)”
In addition, not only the benefit or purpose of the relationship is important for the start-ups but also certain feelings related to the relationship, such as trust, enthusiasm, “chemistry”, equality and a certain feeling of security that determine the co-development. For instance, Anders Nordin from Bioendev points out that the relationship is even better if there is a right match, “chemistry”.

AN, Bioendev: “If the chemistry is also right, then it is excellent. It happened with all our partners. The chemistry is founded because every one loves developing new process. Everyone likes environmental issues, the economics and benefits. There is a lot of things that are in common what everyone likes so it becomes very positive projects. It is very hard to have negative feeling.”

Furthermore, NTS and Bioendev stress that the relationship is good if the stakeholders involved enjoy working on the product with feelings of enthusiasm and love for what they do.

UA, NTS: “It was very good because all of these are enthusiasts in the idea. They are keen to develop it. (…)”

4.2.4. The role of secrecy in when and how stakeholders are engaged

Now the role of secrecy in stakeholder engagement will be described. In five instances, three German and two Swedish start-ups, the companies do not regard secrecy as an obstacle in stakeholder engagement, meaning that it does not keep them from engaging with stakeholders. They are open to the stakeholders because they believe in their skills, know-how and inimitability as in the case of Codeatelier and Ecoera. Exibea stresses that sharing their ideas with others is important.

JO, Exibea: “(…) in the beginning you need to be a bit you have to be know what you tell other people and what you don’t tell them but I think in general that it’s better to speak as much as possible and to share your ideas because if it’s only an idea it’s not the idea that is more important it’s the execution of the idea and how you make it (…)”

JS, Codeatelier: “They know that they don’t have the opportunity to build the software on their own (…). They don’t have skills to do software (…). They have to hire people to do the software for them and they can hire directly us and give us a development contract.”

DA, Ecoera: “We have been quite open. Just at the beginning, secret database with the recipes for pallets and I would say that our current knowledge, we have a lot of know-how that is ours and that is what makes us strong now.”

In eight cases (4 German, 4 Swedish) a change can be seen in how the start-ups deal with secrecy. At the beginning, they are more closed and keep their ideas confidential but then they open up more. In the case of yetu, for instance, the start-up is opening up more in the later stages of product development because sufficient competitive advantage is reached:

CS, yetu: “We are now coming to a phase where we completely open up, because we feel the system is mature enough and has sustainable competitive advantage so that we can fully open it up and put the product in beta zone and stuff like that.”

In three cases (Timbertower, NTS and Bioendev), the start-ups are confidential at the beginning until they file patents and secure their invention. In the case of Bioendev, trust between the partners is established and so fear of leaking information is reduced:

UA, NTS: “We are very open for everything because we have patents of 80% of the world market so we are very open with information and what they can do (…)” A: “Did you make the patents first? And then you cooperated with stakeholders?” UA: “Yes, first patents and then cooperating.”

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13 Please see tables 33-35 in Appendix 4.
AN, Bioendev: “As soon as the patent is filed, there’s no fear… Right now, the partners are so familiar with each other so it is not any issue. We will not steal anything from the other partner.”

In addition, confidential agreements were signed in some cases. In the case of Blacksquared, the agreements were signed because the start-up feared that someone might steal their idea but today the start-up is more relaxed because there is still no competitor.

DS, Blacksquared: “(…) at the beginning, it was very very close circle and at these times, looking back you have to laugh about us, that somebody will steal our idea. We didn’t talk to anybody without signing NDAs. Literally, I have two folders like this (showing the size with her hands) with signed NDAs. Now, looking at it I say oh my G*. Ok, at this point, we were really scared that some big corporations will take the idea and just walk away (…). Still, we don’t have a real competitor in terms of hardware and this certification system (…)”

In the case of yetu, being fast to market is regarded as more important than having patents. Not only to be careful but also to be fast with bringing the product to the market is also seen as important for Exibea when asked about secrecy.

CS, yetu: “(…) let’s face it you know this is not a world where you can only protect a patent, you have to be fast and being fast and time to market is important. (…) the best recipe to be protected it’s not filing patents. This is a lawyer’s game and we’re not lawyers.”

JO, Exibea: “You have to be quick and make sure to work in the right direction at times (…)”

In one case, Greenpocket, the company is still regarding secrecy and trust as very important to keep ahead of competition. Documents are kept top secret.

TP, Greenpocket: “You have to rely on that the people you talk to won’t share your ideas with other business people. All the documents you send to them have to be treated as strictly confidential. But in the end you always have to trust in the people you share your ideas with. Otherwise you can’t talk to potential partners or investors about your business and you can’t show them that you’re working on it seriously and that you have for example an usp and that you are ahead of your competitors - of course, it’s always a bit risky.”

4.2.5. The advantages and disadvantages of stakeholder engagement

The engagement of stakeholders has advantages and disadvantages.14 Some interviewees do not talk about any disadvantages from engaging stakeholders even when they were directly asked whether they have experienced any disadvantages when involving stakeholders. More than half of the start-ups mention more advantages than disadvantages. Some interviewees directly say that stakeholders bring more advantages, e.g. in the case of Greenpocket.

TP, Greenpocket: “In general you can say that there are much more advantages than disadvantages… to be honest, I think it is wrong to focus on the disadvantages, because ultimately it is very important to talk to your stakeholders.”

Some start-ups even state that the more stakeholders are involved, the better. We will talk about why start-ups involve many stakeholders and a variety of stakeholders in section 4.2.10 in more detail.

The most common advantages which were mentioned are related to getting feedback, help, know-how, learning and assurance with what they are doing from the stakeholders. In the case of Codeatelier, for instance, cooperating with stakeholders helps the start-up to concentrate on their work.

JS, Codeatelier: “They are for us like a big brother for us who is doing all the stuff that we don’t like to work with like bills and whatever, normal mechanism what you have to do as the company. We can concentrate on

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14 Please see tables 36-40 in Appendix 4.
what we are good at and this is software developing, creating creative process and not spending time on bills or whatever.”

Other advantages from engaging stakeholders are the driving force, getting financial resources and publicity. For instance, the incubator Chalmers Innovation helped to apply for financial resources in the case of SootTech. Teaming up with other companies gave Anders Nordin personal strength and Timbertower profited from the attention received from the media.

ED, SootTech: “Without Chalmers Innovation nothing has happened there never started a pre stadium of the market and so on pre commercial studies initializing on and we haven’t been able to financing. If at the beginning the initial financing we have not been able to continue financing. Too tricky to of these small organizations to do financing to do installations and everything in parallel (…).”

AN, Bioendev: “Financing, complementing partnerships and also the driving force. It is tough to do it alone but if you are more companies who are strong in team, it is much stronger.”

HG, Timbertower: “Another advantage of stakeholders was that sometimes stakeholders they’re not from the wind business they were like a wave that we were surfing on because we had so many press articles we had some television interviews, we had radio interviews and we had so many help from the press and also from the wood industry.”

Regarding the disadvantages from engaging stakeholders, some start-ups claim that they get too much feedback because stakeholders tend to talk into the business and so the start-ups feel they are losing freedom, creativity and flexibility. It is important for the start-up to select the most useful feedback. Another disadvantage is that stakeholder engagement is very time-consuming.

AB, Ecotastic: “Disadvantages perhaps you have to be able to hear out the right things as well cause you’re gonna get a lot of opinions, and comments and then you have to really figure out how you’re gonna (…) filter them out correctly.”

IX, Company X: “The single most bad part of all stakeholders when comes from the start-up company is that everything takes so much time and time costs money.”

4.2.6. The positive and negative effects of stakeholder engagement on the cost and time of the product/service development

The engagement of stakeholders can positively and negatively affect the cost and time of product development. Several companies (5 German, 1 Swedish) claim that engaging with stakeholders is time-consuming because it takes a lot of time to get in contact and to have a relationship with them. In the case of Ecotastic, for example, the preparation for meetings and the high bureaucracy at large companies was an obstacle in the product development and this is also why Ecotastic decided not to engage with large companies anymore.

AB, Ecotastic: “It’s a really cool feeling, however it takes them (here: big companies) a really long time to get stuff done cause there are all these legal aspects and so for us we lost a lot of time because you know you’re preparing for all these meetings (…) in the end, nothing is ever guaranteed until you have it in writing so get things in writing (…) And even when you’re with the person on the top they gotta check with finances and they’re got to check what the other projects what they’re doing and you know there are all these different hurdles and they also have to look at legal aspects and until they finish all of that even one little thing could get up and you know great idea but we guess we can’t do it, so it’s just really time-consuming.”

In addition, Snowpower mentions that the handling of different application forms from organizations that support start-ups and to explain what they are doing was time-consuming. It was a big obstacle for Snowpower (the interviewee emphasized the words “very challenging”) because the founder spent half of his time discussing with these organizations. Consequently, Snowpower lost time on the product and business development. Furthermore,
only two out of 40 organizations the company contacted helped to speed up the product development and to bring it to the market.

KS, Snowpower: “There are a number of different organizations involved in helping start-ups and especially cleantech and there are so many of them and they have all their special application forms. It’s really a jungle and it takes so much time to keep track on all of these.”

crowdEner.gy avoided engaging stakeholders to increase the speed of product/service development. The same can be seen in the case of Ecotastic. Furthermore, crowdEner.gy said that not engaging many stakeholders enabled them to be more open for ideas from outside.

PP, crowdEner.gy: “No normally you are spending a lot of money and a lot of time, if you’re raising money or if you are working together with external stakeholders like you call it normally you use a lot of time. As we did everything by our own we were much more faster to do this and much more open to discuss with externals (…).”

NTS and crowdEner.gy point out that searching for financial resources costs a lot of time.

UA, NTS: “(…) it takes a lot of time to collect money for developing new ideas. This is also what I am telling my daughters always: If you want to find out the value of money, try to get it (…).”

On the other hand, in four cases (3 German, 1 Swedish) the interviewees say that engaging stakeholders speeds up innovation because they argue that without stakeholders they would have hardly developed the product/service. The stakeholders gave the start-ups input, e.g. knowledge and resources needed. It would have taken the start-ups a lot of time to acquire them by themselves. In the case of Greenpocket and Company X, receiving financial resources was helping the start-ups to develop their prototypes, whereas technical know-how to improve the product played an important role for Solarkiosk.

IX, Company X: “I don’t know if they speeded it up. They probably have. Yes, they have. Because without them (…). The thing which slows it down is the lack of money and cashflow.”

SK, Solarkiosk: “Yeah, we had to move fast. Technology is changing so quickly and we really want to be pioneers in establishing these projects in rural areas and that’s our main drive and technically we have a good support, from the stakeholders (…).”

It is important to note, however that Ecoera and Rehact stated that the effect of stakeholder engagement on the cost and time of product development was not measurable in their cases.

4.2.7. The challenges that start-ups are facing

When we asked the start-ups about the biggest challenges they faced, some answers were related to stakeholders, while other concerned innovation and the founders themselves. 16

Most of the start-ups (5 German and 6 Swedish) claim that the biggest challenge is financing. For instance, Greenpocket mentions that it is difficult to ask for more money from investors and Blacksquared stresses that the troubles that investors have are directly negatively affecting the financial situation of their company.

TP, Greenpocket: “(…) sometimes you have to ask your investors to spend more money and you have to explain them why and convince them. That might be a very serious challenge, of course, because sometimes more venture capital is the only way to grow your business successfully.”

DS, Blacksquared: “A lot of big companies had to go to the clearance (…) That also happened to our investor. They had a bad time. They got to troubles, we got to troubles so we had to declare insolvency in 2011 (…).”

16 Please see tables 43-47 in Appendix 4.
In addition, financial problems are also related to the degree of novelty of the product and risk avoidance. This can be seen, for instance, in the case of yetu:

CS, yetu: “(…) if you come up with disruptive innovation which is not so close to market but maybe two or three years ahead of it, investors are very risk averse.”

Blacksquared, SootTech, Company X and Greenpocket point out that the negative consequences of a lack of financial resources are related to bankruptcy, the lean way the company has to work and difficulties to take the company to the next level in the development process.

ED, SootTech: “It was regarding financing. (…) financing…you must work extremely lean.”
IX, Company X: “(…) the hardest side has been the financial side because when you have a start-up really from the beginning you don’t even have a functional prototype (…”

We have given a few examples of how start-ups have been engaging stakeholders to overcome the challenge of not having enough financial resources. Some start-ups did not indicate that a lack of financial resources was one of their main challenges (Ecotastic). They financed the app only from their own savings and some money that they received at a business competition (about €1000). We will give more explanations for why the start-up did not engage stakeholders for receiving financial resources in section 4.2.9.

Six companies (4 Swedish, 2 German) pointed out some challenges that refer to bringing the product to the market and getting it accepted by the market. This is highlighted by Anders Nordin from Bioendev, for example. He compares the gap between the idea and commercialization to the Valley of death.

AN, Bioendev: “The gap between idea and commercialization is huge. We describe it often as the Valley of death. It is a long way from the university idea to commercial product.”
IX, Company X: “The biggest challenge (…) if you look at the technology of course there has been the challenge to work it out and when we have met the market I mean (…”

Some companies, such as Company X and crowdEnergy did not mention that bringing the product to the market was a challenge. Company X involved many stakeholders, such as politicians to influence the laws, customers as feedback givers and a governmental institution to get contact to potential customers, e.g. one potential customer pointed out that the product has to be very durable to be successful on the market. For crowdEnergy, bringing the product to the market was not one of the biggest challenges. They claim to have been faster by not engaging external stakeholders and doing everything on their own because engaging stakeholders takes a lot of time.

In addition, few start-ups mention other challenges such as emotions and wrong expectations, country-related problems regarding regulations, finding users/customers, developing a suitable business model and problems with technology and product development.

AB, Ecotastic: “Main challenges is emotions right. Yeah your main challenges are gonna be the emotional human factor like sometimes you have bad days sometimes you don’t get accepted to things.”
PP, crowdEnergy: “(…) never invest in regulated markets so the German energy market is the most regulated market in the world so you’ll never find money from outside of Europe to invest in this kind of business it’s (…) very tough ja.”
DA, Ecorea: “That is to create the business model out of various sources. Because we bring together solution we have.”
4.2.8. How the start-ups are coping with the challenges

In this section we will explain what the start-ups did to cope with the two most common challenges that we described above: to not have sufficient financial resources and problems related to bringing the product to the market.\textsuperscript{17}

How the financial resources challenge is conquered

We will now explain how the start-ups SootTech, Company X, Blacksquared, crowdEner.gy, NTS and Ecotastic were conquering the challenge not to have financial resources to advance the product and/or service and company.

SootTech and Company X

SootTech and Company X are both B2B companies that have created a product that is new to the world for energy efficiency. Both products require a high level of engineering, which means that a lot of financial resources are required for the development and testing of prototypes.

SootTech blames the small size of the market for the difficulty to receive funds and because the mechanical process requires a high amount of resources. Due to the lack of financial resources, SootTech has to work very lean. For instance, they have involved customers in developing and testing the prototype because the customers have the facilities and skilled workforce needed.

ED, SootTech: “The customers were involved in actually doing the prototype. It was very lean (...)the customers have very good mechanical facilities and workforce on their side and also that they have engineers on the side and also when we have installed the equipment and the electric we used their internal engineers and service personnel for doing installations so it was. (...) We used customer resources to the maximum expand (…)”.

Furthermore, the start-up has received money from the government and investors. The involvement of investors helped the company to be co-financed by the government but it was also an obstacle for the company because they wanted to charge high management fees. An incubator helped SootTech to choose the right investors. Furthermore, the company is currently in the process of partnering with big companies in the same industry, which could provide financial resources and expertise needed.

Company X also required a high amount of financial resources for the installation of their prototypes. Applying for money from the government was slowing down the process of building and testing prototypes. The application process was long and the company could not do any work on the development when no financial resources were available. Different financial resources givers were involved in addition to the government as a consequence: capitalists, an investment bank and a business angel. The business angel is not only helping the start-up with financial resources but also with making contacts to customers because he is an experienced salesman.

Blacksquared and crowdEner.gy

The start-ups Blacksquared and crowdEner.gy are both B2C companies in the renewable energy business (solar energy). They both had troubles to receive financial resources from investors. crowdEner.gy blames the negative media about renewable energy in Germany, which he thinks is influenced by the lobbyists.

\textsuperscript{17} Due to the extensive amount of quotes, the quotes cannot be presented in the appendix.
Alexandra Dembczyk & Jaromír Zaoral

PP, crowdEner.gy: “In Germany, it is very clear we have very anti-renewable energy policy in media. All kind of media they are against renewable energy, even the most open minded newspapers, or televisions or radio (…). So if you read a normal German newspapers, you see all the costs and how we are destructing employees and big utilities and our economy is not comparable with companies outside of Germany and again and again. The lobby of utilities, they spend a lot of money in Germany and this is what they reached. They did a good job.”

In addition, he stresses that investors are too risk-adverse when it comes to financing start-ups in renewable energy. The company was founded in 2012 and Dr. Peer Piske explained that crowdfunding platforms were just starting to emerge in Europe. crowdEner.gy engaged with the media, institutions and conferences to become known in the industry and to increase its chance of receiving all types of help, e.g. knowledge, technical assistance and financial resources. Nevertheless, the latter did not help because the founder thinks that the industry is the problem (PP: “no one wants to touch this”) even though he received very good feedback from institutions and universities where they presented their idea (PP emphasized the word “very”). This is why the start-up had to finance the first stages of its development with its own financial resources. Also in the case of Blacksquared, the start-up had to be financed by itself for a period of time when the investor was not able to give the start-up financial resources anymore. Since not a lot of technological know-how was needed, Blacksquared hired a freelancer to help with technical aspects on a short-term basis. crowdEner.gy has a team member with experience in the IT industry.

**NTS**

Similiarly as in the case of crowdEner.gy, NTS pointed out that it is difficult to receive money from the government for new ideas in the area of renewable energy because politics is not in favor of renewable energy in Germany. NTS points out that the government is debating about the cost-effectiveness of renewable energy but that they are not taking the environmental degradation of non-renewable energy into account. This is why in the first step, the founder of NTS used his own financial resources and then asked for financial resources from the company 3M and the European Union.

UA, NTS: “But yeah, as you know, in Germany we have a lot of troubles just now with renewable energies and politics (…). They are talking about cost-effectiveness of renewable energies which is in the end nonsense. (…) They are not calculating in a proper way. Fossil fuels are not calculated for what they are destroying in the environment. But this is not counted for finance people.”

**Engaging stakeholders for the successful commercialization**

Greenpocket, Exibea, Rehact, Timbertower, NTS, Bioendev and Company X mentioned to have experienced challenges with bringing the product to the market and getting it accepted by the market. We will highlight how the start-ups engaged stakeholders to overcome this challenge.

**Exibea and Greenpocket**

Exibea and Greenpocket are both offering software solutions for the smart home market to consumers. To increase the success of the innovation to be accepted on the market, Exibea did not only make the products as user-friendly as possible but they also engaged with a big energy company to learn about their customers’ needs with reference to energy consumption. For instance, the energy company helped the founders to distribute a survey to their customers. This happened in the idea generation stage while the founders were writing their Master thesis which would be the basis for their business idea. Furthermore, the start-up engaged with promoters on a continuous basis, e.g. they asked journalists to write about their latest activities. The latter helped the start-up to increase sales.
In the case of Greenpocket, finding sufficient and reliable users, which test the product for free and give feedback has been a challenge in the process of bringing the product to the market. To compensate for the low amount of reliable users, the start-up engaged its own team members that are working on the product management to test the product and to give feedback.

TP, Greenpocket: “(…) the user feedback is very important for a young company. But sometimes it is difficult to find a reliable user group. In this case, it is very helpful to have a team that is able to think things from the user’s perspective (…)”

Nevertheless, this was just a short-term solution at the beginning of product development. In the development process, the start-up had access to more users because the start-up was able to interact and ask their customers’ customers for feedback depending on the project with the customers. Greenpocket also stresses that it is very important to engage the stakeholder group promoters, e.g. the bloggers or experts in the market (smart home market) from the very beginning to enter the market and to become accepted by consumers.

TP, Greenpocket: “Yes, for example the media. The media is very important for a start-up company. You should start right from the beginning to talk to the media about your business and about the solutions you offer (…)”

Timbertower and NTS
The wooden wind tower by Timbertower and the test track for the kite technology by NTS both need to be built in public areas for which permissions of the government are required. It took Timbertower and NTS about five years to receive the permissions for building the first prototype. This slowed them down bringing the product to the market. For instance, it took NTS a very long time to receive the permissions because they had to talk to 14 different governmental institutions. Uwe Ahrens had to prove that the kite would not cause harm to other flying objects. To our knowledge, NTS did not engage stakeholders to accelerate the process of receiving permissions for building the first prototype. Based on its troubles, however, he founded an association for airborne wind energy.

To receive the permissions, Timbertower engaged with politicians. For instance, the start-up talked to the major of Hannover and ministers in lower Saxony (German state) to receive the permission for building their prototype in the region of Hannover. Without the help of the politicians, the start-up stresses that the prototype site could have probably not been built. In addition, high-ranking politicians, e.g. the federal environment minister were invited to the opening ceremony of the first prototype and this helped the start-up to receive attention and recognition in the industry. During the time when the company was waiting for the permissions, Timbertower engaged with the media because articles in well-known German magazines that highlighted the potential of the idea helped to reduce the nervousness of investors. This secured financial resources that are important for the future business development and bringing the product to the market.

Bioendev
Anders Nordin sees a challenge in bringing his product to the market because he says that it takes a long time to turn a “university idea” into a commercial product and he calls that “the Valley of Death”. In order to bridge the gap between ideation and commercialization, he claims that it is important to engage different stakeholders from science and business. For instance, Piteå Energy Technology Center and Processum bring scientists and people from the industry together to exchange their knowledge. He describes that to be very valuable for bridging the valley of death because people from the business side of the industry can give
him knowledge about how to do business. The wider group of stakeholders involved is best described by Anders Nordin in the following quote (Uminova is an incubator in Umeå).

AN, Bioendev: “We have the university, the university scientists, we have the institute, we have Uminova we have Processum Biorefinery initiative which helps a lot we have the networks between the universities and the institutes. We have the government, the local authorities, very strong support from Umeå Energi who is owned by Umeå Kommun. We have the state support the energy agency.”

4.2.9. **When and why a company is not involving stakeholders or a wider number of stakeholders**

There are various reasons for why stakeholders or a wider group of stakeholders were not involved in the different stages of the development process.18 Two Swedish (Comfort Window System and SootTech) and two German start-ups (yetu and Blacksquared) did not involve other stakeholders in a specific stage because they had the industry experience, know-how and resources needed. For instance, in the development stage of the company Comfort Window System, Hans Öhman did not involve stakeholders outside his network because he knew most about it and so he argues that others could not have helped him. In the commercialization stage of the innovation, SootTech did not involve others because sufficient resources were available.

ED, SootTech: “Eh no, not really the initial selling was executed by our resources and that was by me and the CEO at that time.”

yetu did not regard it as necessary to involve external stakeholders in the idea development and early product development stage because the founder and his team had extensive industry experience and know-how in the industry:

CS, yetu: “(…) we had the idea, we were in control of the domain. (…) We had the idea, we had 20 years of Telekom career in the back of us and came with that idea to found the company.”

Furthermore, Ecoera, Blacksquared and Ecotastic did not involve some stakeholders during the business development due to reasons related to saving time. They did not consider it to be worth to engage others because they rather wanted to spend the limited amount of time available to further develop their products and to reduce time to market. This is also why Ecotastic was financing by itself and Ecoera was rejecting help from outside. Ecotastic did not depend on a high amount of financial resources because it had the skills to develop the software for the app in-house and no money was needed to be spent on patents because Ecotastic states that the software they have is not new and so they would probably not be able to patent anything.

AB, Ecotastic: “I think when you found a company there also comes the time between prioritizing. We were spending all this time applying for stuff or just to design the product. After some time we realized it’s more important to design the product and bring it out to market than hoping that someone is giving us money and we wanted to do it quick and fast and we had a few savings so we just started doing it full time. (…)”

DA, Ecoera: “(…) Sometimes, I can have people wanting to help us with business development but then It is hard to explain what we are doing so and that takes time. Therefore, it is not completely worth that. Threshold is so high.”

Nevertheless, it can also be the other way around: start-ups, e.g. in the case of Rehact and crowdEner.gy wanted to involve others, e.g. to get financial resources, knowledge or any other kind of help but the industry was not attractive enough. We already explained this

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18 Please see tables 48-55 in Appendix 4.
problem when trying to receive financial resources in the case of crowdEner.gy in the section 4.2.8.

Sometimes, the stakeholders that could have been helpful were not available when needed or just emerging. In the case of NTS, for instance, there was a conflict of interests and so the start-up even created its own association (Verband in German).

UA, NTS: “Yes, we are member of the BWE (Bundesverband Wind Energy) but of course they are not, at the end they are funded by conventional wind turbine producers so you can imagine that it is not the first business to help new technology which is cheaper and more effective and so on. So we founded our own Bundesverband VHWE.”

Furthermore, stakeholders also rejected to work together with the start-ups, e.g. in the case of Blacksquared and NTS because the products and services are very new and too many risks are involved.

DS, Blacksquared: “(…) The moment you try something new or you do things different you get a lot of that’s not gonna work and you get a lot of no’s and so I think they were basically it was (…) kind of like just working on or believing in what you think is right and just doing it.”

In two cases, Timbertower and NTS, reasons for not involving stakeholders were related to the fact that the business and product are not sufficiently developed yet. NTS had troubles to find big companies that want to cooperate with them and Timbertower did not involve others in the idea development stage because there was still uncertainty concerning the business creation.

HG, Timbertower: “(…) I think before founding the company business tower we worked on this project for 2 or 3 years but besides and very tiny time and I think nobody was thinking at this time to involve anybody because it was a side project.”

In one case, in the case of crowdEner.gy, they did not cooperate with an institution because there are doubts concerning its credibility and about benefits from working together.

PP, crowdEner.gy: “It is one of these institution which the governments or big players establish to do something but not really to do anything. (laugh). They are greenwashing institution. They are nice guys, they spend a lot of money, they are paying good salaries but they are doing nothing. They can’t help you. Nothing. They are involved in a lot of projects but no projects by now is done or worked (…).”

crowdEner.gy also points out that they and some other start-ups think that it is not good to involve too many stakeholders (not even for the money). The exact reason is not known, however.

4.2.10. **When and why a company is involving many stakeholders and a variety of stakeholders**

The start-ups Greenpocket, Exibea, Ecoera and Bioendev stress that it is important to involve many stakeholders. The reasons differ. Ecoera engages many stakeholders because the business model is very complex. Involving many stakeholders, e.g. users for feedback, the university for the technical development and marketing, etc. is important for Greenpocket to have better connections to the market.

TP, Greenpocket: “It is very important to have many stakeholders and partners, because otherwise you might get lost (laugh). You have to be connected to your market and to all the people that are important to you.”

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19 Please see table 56 in Appendix 4.
Bioendev has been involving many stakeholders because their innovation is taking advantage of a shift in the forest industry to expand to biorefineries. Anders Nordin stresses that to realize this shift, a lot of stakeholders and a variety of stakeholders from all over the world are needed. In the section 4.2.7 we highlighted which stakeholders belong to the “mix of stakeholders” that Anders Nordin refers to in his quote.

AN, Bioendev: “If we will succeed we will succeed mainly because the mix of stakeholders are so excellent. (...) We are going to expand/convert the traditional forest and pulp and paper industry to something else (biorefinery) and to make the shift, you need stakeholders from everywhere. It is also the environment, the carbon problem. It is not done. Not even EU can unite, not even Sweden can unite (...). To do that shift, we need to have a lot of stakeholders.”

Furthermore, Rehact involved many stakeholders and a variety of stakeholders to have more resources.

SB, Rehact: “It is a connective thing that all the stakeholders together have helped building the company and the company has now much better resources. (...). It is like spider’s web. It is like building a wall. The first bricks are so important but they are not bigger than the bricks on top.”

In the case of Exibea many stakeholders are seen as important for the success of the company and Ecoera involves many stakeholders because the business model is very complex.

JO, Exibea: “Since it is a complex business model. We need many involved. It is key.”

**4.3. Summary**

We created two tables in which we summarize the results to give a better overview of the cases. In addition, they were designed to facilitate a comparison of the results across cases and countries. They will be used as the starting point for our analysis to find additional patterns. The first table presents the results from the German cases and the second shows the results from the Swedish cases. The tables illustrate the different patterns per case. For instance, Timbertower received the key word “personal experience” which includes “personal experience and background in the industry” with regard to the topic “influences on the business creation and the company”. The two tables can be seen in Appendix 6.
5. Analysis

In this chapter we will go more in depth on how stakeholders are engaged by connecting the different parts of the results chapter with the topics that we want to study in the Model. First we will talk about the influences on the founder and their motivations. This covers the areas shown in the first part in Figure 4. The second part of Figure 4 will be covered by the following: We will explain the process of stakeholder engagement including which stakeholders are engaged and for which reasons during the product development. Afterwards, we will describe stakeholder engagement for bringing the product to the market and getting it accepted by the market. Both will address how the type of innovation influences stakeholder engagement in these phases. We will continue with going more in depth on other influences, e.g. secrecy and different types of relationships to stakeholders. In the results chapter we showed that these influences are relevant to increase an in-depth understanding of how stakeholders are engaged. Last we will discuss proactivity in stakeholder engagement. The disadvantages and advantages of stakeholder engagement as well as the challenges are integrated throughout different parts of the analysis chapter. This also matches the Model because they are placed in the middle and they affect different areas of stakeholder engagement.

5.1. Influences on the founder and stakeholder engagement before the establishment of the start-ups

In the first part of the analysis, we focus on what influences the founders and what motivates the founders to create their businesses. Moreover, we describe which stakeholders are involved in this stage.

Influences on the founder and idea initiation

The analysis of the influences on the founder and the idea initiation are integrated because the influences have a direct impact on the idea initiation. We identified four areas of influences: people that have a close connection to the founder, the founder’s personal background and experience, the external environment and changes in the market. In the literature review, we described these factors as non-motivational factors (career experience) and external factors (external environment and changes in the market) (Shane et al., 2003).

The most common influences were education, personal background, people in the industry and families. A pattern when looking at these influences and how the ideas were subsequently initiated is discernable. Education, previous experience and personal contacts from the industry lead to seeing a problem as an opportunity. For instance, Exibea was founded based on the business potential seen in the process of writing the thesis. The founders could apply their superior knowledge, which they gained during their studies and utilize it in filling a market gap by creating a new product or service. Furthermore, the place where the founders live, such as the city of Berlin has a positive influence on the creation of start-ups and innovations. We recommend further research on how Berlin is attracting sustainable entrepreneurial start-ups and which role its citizens play.

With reference to the literature review, we can see that the founders are influenced by three aspects: market failures (Cohen & Winn, 2007; Dean & McCullen, 2007), governmental actions (Meek et al., 2010) and societal and environmental challenges (Escudero & Googins, 2012; Szekely & Strebel, 2013, p. 476-477). All represented opportunities for the founders.
The founders indicated that the negative changes in the environment influenced them. Therefore, they decided to improve the environmental situation in the world with their products or services. This is in line with the claim of scholars (Escudero & Googins, 2012; Szekely & Strebel, 2013, p. 476-477) who say that opportunities can be seen in overcoming societal and environmental challenges. The influence external environment is often combined with the influences personal background or education. For instance, Anders Nordin has a strong interest in sustainability and environmental issues and therefore he wanted to find solutions to reduce greenhouse emissions. Consequently, he started to develop the idea to create a new innovative and ecological type of fuel.

The results showed that market failures are a source of opportunities, which were found due to imperfectly distributed information, inefficiencies and externalities (See Cohen & Winn, 2007; Dean & McCullen, 2007). First, the personal background and education contribute to the founders’ superior knowledge about resources, market and opportunities, which results in an imperfect distribution of information in society. Second, the founders also saw inefficiencies in their previous jobs and they believed they could do their own products or services better. For instance, the owner of Comfort Window System claimed that he would rather create a completely new window than to work on a “normal” window for another company. In other cases, the founders were influenced by changes in the environment that were caused by externalities, such as high CO₂ emissions in the case of Bioendev and Ecotastic. Other interviewees (Greenpocket and Exibea) claimed that they were influenced by changes in the market, specifically by governmental actions (Meek et al., 2010).

With regard to differences among companies, we identified a difference between smart home companies, companies producing products and services in energy efficiency and companies engaged in renewable energy. Smart home companies were mainly influenced by changes in the industry, such as new regulations. Companies providing services and products in energy efficiency were influenced by their education. For instance, the founder of Rehact was studying thermodynamics and he wanted to create more efficient products. With reference to companies engaged in renewable energy, personal experience and people in the industry mostly influenced the founders. For instance, Anders Nordin from Bioendev claims that conferences, workshops and seminars in energy and forest biomass technology influenced him a lot.

We cannot call the people and other influences (education, previous job, the environment), which triggered the business idea initiation, stakeholders. This is because the companies were neither established nor was the idea development started. However, we regard these influences as very important because they started the whole business development process. Some of them became stakeholders later. For instance, in the case of crowdEner.gy, the founder was influenced by his friends and families. They knew he was working in the solar energy industry and wanted to participate in some projects. However, they lacked resources. Therefore, he found a solution in creating a platform.

Idea development
After the business idea is initiated, the founders start to develop it. The founders engage their team. The team helps to look at the idea from more angles and to improve the development. Some companies (Comfort Window System, yetu, NTS, crowdEner.gy and Blacksquared) engage the team members and no other stakeholders in the idea development stage. The reasons seem to be their previous industry experience and their experience in creating a company. They are self-confident and consequently, they do not rely on help or feedback.
from other stakeholders. We can see parallels to Kline and Rosenberg (1986, p. 291) because
the start-ups make use of their own knowledge first before turning to stakeholders in its
external environment. For instance, in the case of crowdEner.gy, the founder has already
created a lot of start-ups in the industry. He knows how to finance projects and how to
structure them. Moreover, he is against involving too many stakeholders. Blacksquared,
however, did neither have experience with starting up a business nor did they have previous
experience in the industry. We suppose that they focused on the idea development with their
team only because they were scared of leaking out information.

In other cases, the founders engage not only the team but also feedback givers. This is
obvious especially when the founders have studied at a university. The founders received the
first feedback from a university mentor or thesis supervisors. For instance, the founder of
Snowpower was working on the snowcooling idea as a PhD student. During this time, he
received feedback from his professor and the professor also helped him to establish the
company.

Regarding the engagement of feedback givers, yetu is a very interesting case. The start-up
involves more feedback givers than others. They cooperate not only with customers but also
with partners, consultants and even potential competitors to validate the idea. The reason
could be that the founder is very experienced from his previous job and consequently regards
feedback givers as very important.

As mentioned in the results chapter, there are obvious differences among countries in
engaging stakeholders during this stage. Swedish start-ups are engaging incubators more. The
reason could be that the quality of the local incubators is very high. They also provide
assistance, e.g. they provide mentors and space where the start-up can work on the idea. This
is very important especially at the very beginning of the business development because it
encourages the founders to develop their idea and to found a company. For instance, this was
seen in the case SootTech.

Why the business is started and the motivation of the founders
Next, we examine what motivates the founders to start their businesses. The results
concerning why the business is started, the motivation of the founder to start the business and
the drive for sustainability and/or profit are very interconnected.

With reference to why the businesses were started, the answers were: seeing a business
potential and changing the work in order to have a positive impact on the environment. The
motivational factor internal locus of control (Shane et al., 2003) can be seen to some extent
because the founders believe that their actions can decrease environmental degradation even if
their impact on the environment as a whole cannot be seen directly. We identified differences
between smart home start-ups and start-ups in renewable energy. While the former started
business because they saw a business potential, the second wanted to change their work and
have a more positive influence on the environment. For instance, NTS’s founder was working
in another industry for 14 years and he wanted to change his job and do something good for
sustainability. The latter are the motivational factors need for achievement and to some extent
also the desire for independence according to the definitions by Shane et al. (2003).

The main motivation of the founders is sustainability (except for some few cases that can be
seen in the results chapter). Their goals are to create a solution to a problem that concerns
sustainability, to make a positive change in the world for sustainability, to provide others with
the opportunity to make the world more sustainable and to change people’s behavior related to sustainability (see goal setting in Shane et al., 2003). In addition to the motivation regarding sustainability, some founders indicated other motivations. For instance, one of the motivations is to do something good for society but this means to contribute to sustainability. In a few cases, the founders claimed that they would like to be more independent (see Shane et al., 2003), to have fun or to create something new. However, sustainability is still important to them. For example, Erik Dahlén who wants to have fun when doing business claims that sustainability is in his blood and so it is influencing his product creation.

Apart from a few exceptions, the founders directly claim that they are more sustainability-than profit-driven. For instance, the founding team of Timbertower worked on their idea for one year without having any income. They spent their free time on the project because they wanted to create a product that contributes to sustainability. Their drive and passion were motivating them (see Shane et al., 2003). In two cases, the founders state that profit is more important for them. However, they still aim to make a change towards sustainability. Codeatelier’s founders want to make the German houses more energy efficient and Blacksquared’s goal is to motivate people to change their behavior towards sustainability in the long term.

In a few cases, the founders argue that sustainability and profit are equally important. These founders consider profit to be essential in order to develop their business further and to contribute to sustainability with their products and/or services. Also those start-ups that are more sustainability-driven have pointed out the latter. For instance, Ecotastic claims that the company must be able to make profit in order to continue changing. Solarkiosk mentions that many non-profit projects failed because profit was not a big part of their motivation. Solarkiosk therefore believes that profit is important to make the company sustainable in the long term. Consequently, sustainability concerns are a more important driver for the sustainable entrepreneurial start-ups than profit but profit is still essential.

In the literature review, we pointed out that the distinction between sustainable firms is done according to their goals (sustainability-driven and opportunity-driven) (Parrish, 2010). However, our findings show that the goal of the start-ups is related primarily to sustainability and that they take advantage of opportunities, which occur in environmental challenges, changes in the market, etc. This is why we decided to adjust Figure 2. Instead of offering two kinds of firms (sustainability-driven and opportunity-driven firms), we connect them. Based on our analysis of which stakeholders are engaged in the idea generation stage, we adjusted the second part of the figure as well. The reason is that all firms engage stakeholders in this stage even though it is sometimes just the team. There are two ways. The first way is engaging the team only, while the second way also engages feedback givers. Figure 5 shows the original Figure 2 (left) and the adjusted figure (right) below.

![Figure 5: How the motivation is connected to engaging stakeholders](image)

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20 Based on the results section it is interesting to note that in the case of Blacksquared, SootTech and Codeatelier, the vision and the drive do not match.
In order to summarize how the business idea is initiated and subsequently turned into a business creation, we have developed Figure 6. At the beginning, the founder is influenced by his experience, education, the external environment and changes in the industry. These influences act as a trigger in the founders’ minds. It results in seeing a problem, which represents an opportunity at the same time. Afterwards, the idea is advanced and initiated in the team. While the idea is being developed, some companies tend to rely on themselves and some decide to engage feedback givers to evaluate the idea. If the influences come from people, they can become the first stakeholders in the idea development stage. For instance, we found out that education triggers the founders’ motivation and university mentors become their first feedback givers. In case the feedback is positive, the idea is further developed and the company established. Some companies do not engage feedback givers in the idea development and so they initiate the business without them.

Figure 6: Business initiation and idea development

5.2. **Stakeholder engagement during product development**

Results show that more stakeholders as well as different kinds of stakeholders are engaged in the product development stage compared to the idea generation stage. In the following paragraphs, we are going to focus on the five types of stakeholders we identified (team, feedback givers, financial resources givers, technology developers and promoters) and explain why and how they are engaged.

**Team**

In the results chapter, we pointed out that some companies regard the team members as the most important stakeholders and that they mainly rely on them. For example, the owner of Greenpocket claims that a very good team of employees is the key success factor to build a start-up company. The start-ups benefit from a mixture of people with different backgrounds. In the case of NTS, the company has a strong team with a mixture of all sciences, which enables the start-up to create a very innovative product.
**Feedback givers**

Feedback givers are getting even more important in the product development stage compared to the idea development stage. There are obvious reasons for involving them. Thanks to the feedback givers, the start-ups receive help, know-how and learning. Knowledge and organizational learning are seen as important advantages of stakeholder engagement (see Rothwell, 1994, p. 18-19; Leavy, 2014, p. 13). To illustrate the change of the feedback givers’ role in the two different stages, we developed Figure 7. The arrows show that there is more value added in the development stage because for some start-ups engaging feedback givers is inevitable in this stage. Solarkiosk would have many difficulties without the feedback from stakeholders in the development stage because their product is very innovative and completely new in Africa. Therefore, they are dependent on the feedback from users to improve the product. This can lead to a higher market acceptance of new products and/or services (see DeFillippi & Roser, p. 30, 2014; Rodriguez et al., 2002, p. 143) because the products can be adjusted to the market needs based on their feedback. In another case, the stakeholders help Codeatelier with accounting and administration throughout the development process. Therefore, they can focus on the software development even though this could be at the cost of revealing too much information about what they are doing to the stakeholders. The latter can help the start-up to develop higher innovation ability (Rothwell, 1994, p. 18-19; Leavy, 2014, p. 13).

![Figure 7: Change of the structure of feedback givers](image)

A comparison between the engagement of feedback givers in the idea development and in the product development stage shows that the start-ups do not only engage more stakeholders but also a bigger variety of stakeholders. Families and friends, university mentors and business competitions are getting less important because their feedback is not sufficient anymore. On the other hand, feedback from potential customers and users is seen as essential. The changes are illustrated in the Figure 7. This trend can be best explained by the example of Ecotastic. They compare engaging feedback givers to bubbles. At the beginning, they involve those who are closest to them – families and friends – in order to validate the idea (the first bubble). The engagement with the second bubble takes place during the product development stage when the company tries to reach a larger group of people in order to validate the idea from more perspectives. They found these people by asking friends of friends, contacting people on facebook etc. After the product was launched, the company engaged a larger group of people. In this stage, a broad market research was conducted in order to receive more feedback.

Customers and users are also used to test the prototypes. This is common in the case of smart home companies in particular, since all of them engage the end users. For instance, Codeatelier installed more than 200 beta systems, which provided important feedback to improve the product. Another finding is that incubators appeared to be important for both
stages in Sweden. Further research on the role of incubators could be helpful to understand why they are very important for the start-ups in Sweden.

There are also some disadvantages of engaging feedback givers. We found out that there is a connection between stakeholder engagement of being too time-consuming for the start-ups and receiving too much feedback from the stakeholders. These patterns were seen in the case of Timbertower and Ecotastic. In the case of Timbertower, many stakeholders gave the start-up a lot of useless feedback because they did not have sufficient knowledge of the new solution the start-up was working on. Their ideas were not helping the start-up because of the novelty of their product. In the case of Ecotastic, which involved many feedback givers, the challenge was to choose which feedback to implement. Another problem is that stakeholders tend to want to have too much influence on the business. Rehact indicates that stakeholders gave too much feedback and wanted to influence the company in its decision-making. It is difficult to make a decision about which feedback should be utilized because no one knows what the best way is before it is tried out. This is in line with the challenges of co-creation introduced by Prahalad and Ramaswamy (2004). Engaging stakeholders could be an obstacle in the innovation process because the dialogue with stakeholders can slow down the development time and so it can reduce speed to market. It is therefore important to filter the right feedback which can be a challenge. In case a wrong decision is made, the dialogue with stakeholders can cost development time and time to market can be increased.

**Financial resources givers**

The results show that to have sufficient financial resources for the development of the product and/or service has been one of the biggest challenges for many start-ups. The lack of financial resources is a frequent barrier to innovation (Larsen & Lewis, 2007, 142; Blanchard et al., 2012, p. 680; Mohnen et al., 2008, p. 203) for young and small firms in particular (Mohnen et al., 2008, p. 202; Larsen & Lewis, 2007, 142). Our cases show that especially new to the world products, which require a lot of engineering or technology, have high risks and costs. Financial resources givers are important because they can provide critical resources, which are key for the firm’s survival and success, especially financial capital (Sloan, 2009, p. 36). We will now highlight how and why the start-ups have engaged stakeholders to overcome the challenge of lacking financial resources and which other measures they have taken that relate to financial resources givers. We have chosen companies with different characteristics as examples to show as many perspectives as possible.

SootTech and Company X have both created a product that is new to the world for energy efficiency. They require a high level of engineering, which means that a lot of financial resources are required for the development and testing of prototypes. SootTech has taken advantage of the customers’ resources and skills and so it has saved costs for personnel and facilities. Having too high costs and insufficient resources is a frequent barrier to innovation (see Mohnen et al., 2008; Von Stamm, 2004). The involvement of investors was an obstacle for the company because some investors were trying to charge high management fees. SootTech involved an incubator to not lose control over the situation. A lack of control can be a challenge in stakeholder engagement (Prahalad & Ramaswamy, 2004, p. 6).

Company X tackled the challenge of not having funds on a continuous basis from the government (due to a long application process) by involving many financial resources givers, such as venture capitalists, an investment bank and a business angel. This was also observed in the case of Timbertower because own resources were combined with those from governments, banks and private investors. Company X chose a business angel based on the
fact that it can help the start-up with two challenges: a lack of financial resources and the successful commercialization. Consequently, the more the stakeholder is capable of supporting the start-up in different ways the more it provides value to the start-up, e.g. resources can be saved.

crowdEner.gy’s platform was very new to the industry of renewable energy and investors were too risk-adverse to invest in the start-up. The investor of Blacksquared went bankrupt. Both start-ups were able to finance the start-up by themselves for a short period of time. We argue that a difference can be seen between the cases of SootTech and Company X and the cases Blacksquared and crowdEner.gy. Blacksquared and crowdEner.gy are not as dependent on financial resources as in the other two cases. Their innovation is neither as radical nor as technology-intensive. No high-level engineers and many costly prototype developments and installations were needed.

As in the case of crowdEner.gy, the risk-adverseness of investors was an obstacle in receiving funds for NTS because of the novelty of their innovation. The commercial success is uncertain. Furthermore, both start-ups perceive the support from the German government as scarce in the area of renewable energy. As in the case of SootTech and Company X, a lot of resources are required for the development and testing the product. Consequently, NTS did not have any other choice than to engage with the company 3M and the European Union as financial resources givers because his own money was not sufficient anymore to advance the business. This also shows that because it is difficult to receive financial resources in the early stages, the founder has financed the start-up with his own money in the first stages of development (see Politis, 2008, p. 127).

Our results show that the government is the main source of financial capital in Sweden in comparison to Germany where there is a bigger spread among the financial resources givers. We therefore suggest further research on the role of governments in providing financial resources for sustainable entrepreneurial start-ups. In addition, there seems to be a good cooperation between incubators, start-ups and the governments in Sweden. Incubators work as a mediator and help the companies to obtain funding. For instance, SootTech mentioned that a business incubator helped them to receive the governmental funding to finance their pilot project.

Now we explain why Ecotastic did not engage financial resources givers to increase the overall understanding of the topic. Ecotastic did not engage with financial resources givers because it takes too much time and the priority is to bring the product to the market as fast as possible. Furthermore, the idea to change people’s behavior is primary, the software is secondary. The degree of novelty concerning the technology and the complexity of designing the product is not very high because the founders could develop it by themselves. Consequently, Ecotastic does not need to engage financial resources givers unlike NTS, Company X and SootTech. The cases Ecotastic and NTS show that in those cases where the start-ups do not require a lot of technical development or engineering or when the start-up is in its early stages, the founders’ own financial resources can be used for some period of time. To advance the business and to take the development of the product or service to the next level, however, financial resource givers are important for the business success.

**Technical developers**

Technical developers are engaged to advance the technical aspects of the product and so they help to speed up product development. They are important because they can provide critical
resources including knowledge, which are key for the survival of start-ups and success as suggested in the literature (see Sloan, 2009, p. 36; Tether, 2002, p. 951). Consequently, firms involve stakeholders to overcome the obstacle of having insufficient information about technology, markets, design, etc. (see OECD, 2005, p. 113). Especially, those start-ups whose products and/or services have a high degree of novelty (new-to-the-world) need to engage a lot of stakeholders because their invention is complex. Their innovation is radical in nature and the need for resources can be a reason for the argument made by Szekely and Strebel (2013), Escudero and Googins (2012) and DeFillippi and Roser (2014): The more radical the innovation is, the more stakeholders are likely to be necessary. We can see this in case of Company X, Bioendev and NTS. Company X was in contact with building developers, designers, entrepreneurs and manufacturers because they regarded them as important to see the problem from their points of view. The latter provided the start-ups with great ideas to improve the development. Their knowledge provided a very valuable asset (see Rodriguez et al., 2002, p. 143; Rothwell, 1994, p. 18-19) and at the same time they increased learning about the design and technical aspect of their product through the interaction with the stakeholders (see Leavy, 2014, p. 13).

NTS engaged universities in the product development by taking advantage of the research expertise of universities (see Tether, 2002, p. 953). The Fraunhofer Institute developed one of the steering units and the university developed a software to calculate the effectiveness of the systems. Greenpocket engaged a freelancer because he was an expert and helped them to develop the software. The only problem mentioned by Greenpocket was that it is not possible to engage freelancers for a longer time because they are very expensive. Due to the high cost of engaging some technology developers, companies try to find cost-efficient ways in engaging stakeholders to develop the technical aspects of the product or avoid the engagement with technical developers. For instance, Comfort Window System has a lot of engineering experience and so they decided to develop the product in their team only. This saved costs because they did not have to pay externals. The latter explains why the firm uses its own resources and knowledge for the development process first before consulting experts in the field or doing further research (Kline & Rosenberg, 1986, p. 291).

**Promoters**

The engagement of promoters helps start-ups to increase awareness through “positive word-of-mouth recommendation” (DeFillippi & Roser, 2014, p. 30). The engagement of promoters is important in the development stage to make the product and/or service and business more known in public and in the industry. The latter helps the start-up to, e.g. receive funding to secure the financial resources needed in the development. For instance, participating in a business competition helped Codeatelier to get in contact with energy providers who helped them to promote the product and consequently become more attractive for customers, business partners and strategic partners who could invest in the project. Our results show that promoters are mostly engaged in smart home companies, which are in a more competitive environment. We assume that these firms engage with promoters to gain competitive advantage.

When it comes to products, which are new-to-the-world, the companies engage with politicians. In our cases, politicians are engaged in cases of Timbertower, Ecoera and Bioendev. For instance, Ecoera proposes a new legal system, which could lead to the reduction of greenhouse gases and to an increased awareness of their product. Timbertower had troubles to receive permissions because their innovation is new-to-the-world and governmental institutions are very risk adverse. Timbertower engaged with high-ranking
politicians to promote the construction of the first prototype and to increase awareness among potential customers in the world. During the time when Timbertower was waiting for permissions, they engaged with the media because it helped them to reduce the nervousness of investors and so to secure financial resources. Consequently, the media helps to keep investors on board during a time when the start-up is struggling to advance in the product development.

As seen in the case of Timbertower, NTS has been experiencing problems in receiving permissions for building advanced prototypes. As there is an absence of stakeholders that could help with the release process, NTS founded an association. This suggests that the more novel a product or service is, the less there are associations and organizations that the start-up could engage.

The cases differ concerning when promoters are engaged. In some cases, the start-ups involve them from the beginning of the product development. In other cases, they rather wait and start engaging stakeholders just before the launch. For instance, Greenpocket considers building strong relationships with the media to increase awareness among future users from the very beginning. In the case of Company X, they rather wait with launching the website and promotion until their product can be ordered.

Now since we have explained the business initiation and stakeholder engagement in the idea- and product development, we would like to illustrate the process of stakeholder engagement to increase understanding. To show which types of stakeholders are engaged during the business development, we extended Figure 5 to Figure 8. After the company is established and the idea is generated, different groups of stakeholders are integrated. Their engagement differs among the companies. Some tend to engage most or all of them, some only a few of them. It depends on many factors, e.g. the skills, know-how, background, education, experience, the availability of resources and the novelty of the product.

**Figure 8: Stakeholder engagement in the idea generation and product development**

### 5.3. Stakeholder engagement for the launch

Some interviewees claim that they are going to open up even more to stakeholders after they enter the market. One of the reasons could be that they want to increase publicity of their company and the product in the last stage of development to increase sales as seen in the case of Company X. We recommend further research on a possible change of stakeholder
engagement and the number of stakeholders involved after the launch. Many of our start-ups have not officially launched yet, which hinders us to delve deeper into the topic but we consider it to be relevant to get to know more about stakeholder engagement.

In the results chapter we showed that many start-ups have had problems with bringing the product to the market and getting it accepted by the market. Scholars have pointed out that the successful commercialization is a common challenge (Teece, 1986, p. 287; Larsen & Lewis, 2007, 143). Our results show that the start-ups engage promoters to cope with this challenge. How this is done will be analyzed based on the examples of firms with different characteristics to show different perspectives:

Exibea and Greenpocket are both offering software solutions for the smart home market to consumers. Both engaged with potential customers to know their expectations (Hoonsopon & Rueenrom, 2012, p. 251) and to increase acceptance of their products and services on the market. In the case of Exibea, the users were passively involved through market research, while in the case of Greenpocket, the users were actively engaged to create a product and service that would be accepted by the market. The user groups gave valuable feedback to Greenpocket on a continuous basis so that Greenpocket was able to create a product that consumers would want (see DeFillippi & Roser, p. 30, 2014; Leavy, 2014, p. 13). The company was more focused on the customer experience instead of only “offering technological solutions” by constantly communicating with the customers about their needs and interests (see DeFillippi & Roser, p. 30, 2014). Consequently, being customer-driven (see Larsen & Lewis, 2007, p. 143) helped the company to successfully launch its products and services.

The media is an important stakeholder to promote the successful commercialization. Exibea and Greenpocket both engage with the media to increase attention and acceptance from consumers and the users. The quote by Torben Pfau in the results chapter (see section 4.2.8) lets us assume that the more a new product is connected to the Internet and end users are the target group, the more the media has to be involved to increase acceptance. In other words, involving the media is simply seen as a necessity for this kind of new and digital product. Exibea also involved the media on a continuous basis but we do not have a direct quote that points out when the media started to be involved.

The engagement of many stakeholders and a variety of stakeholders is valuable to reduce time to market especially in the case of start-ups where the innovation is new-to-the-world. Bioendev engages a variety of stakeholders because he believes that this is important for the success of his company. The importance of a variety of stakeholders was also pointed out by Hatch and Schultz (2010) and Guillart (2014, p. 8) who argue that the more stakeholders are involved the more value is created. The case of Bioendev provides us with a better understanding of the reasons. Stakeholders engaged by Bioendev are a mix because they belong to the knowledge, business and government side. The variety of stakeholders underlines that Bioendev is part of a system and that it integrates external stakeholders in the process of innovation (see Kline & Rosenberg, 1986; Rothwell, 1994; Varis & Littunen, 2010, p. 133; Von Stamm, 2008, Tether, 2002). In the case of Bioendev, value is created because Bioendev requires many skills and resources from a variety of stakeholders, e.g. contacts to the industry and business knowledge to speed up time to market. Bioendev has been involving many stakeholders because their innovation is taking advantage of a shift in the industry. As this shift is disruptive as many stakeholders as possible from all over the world need to support the acceptance of and an increased demand in Bioendev’s product.
The engagement of stakeholders does not automatically lead to an increased speed to market. The case of Snowpower indicates that the engagement of stakeholders can only be helpful for the speed and successful commercialization when the start-up is able to set priorities and analyze whether the engagement of stakeholders can be advantageous for the start-up. As stressed in the results chapter, the handling of different application forms from organizations that support start-ups and explanations about their idea was time-consuming. It was a big obstacle for Snowpower because the founder spent half of his time discussing with these organizations. One could also argue that this slowed down the development process because he did not prioritize which organizations to concentrate on. In fact, he contacted 40 organizations.

At the beginning of this section we pointed out that many start-ups have faced challenges on their way to successful commercialization. Company X and crowdEner.gy, however, show that bringing the product to the market does not have to be one of the biggest challenges. In the case of Company X, a B2B company that involves a lot of engineering to create a new-to-the-world innovation, both the engagement of customers (as in the case of Greenpocket and Exibea) and the engagement of politicians (as in the case of NTS and Timbertower) have helped the company to speed up time to market. The government is engaged as a supporter because its authority and reputation helps the start-ups to receive valuable business contacts to potential customers and so to bring the product to the market. Consequently, the right combination of stakeholders is also important.

Not engaging stakeholders can also speed up time to market when the start-up is not very much dependent on the stakeholders’ skills and resources for the technical development or engineering. This can be the case for innovations that are less radical and that require less technology and engineering skills. For instance, crowdEner.gy only engaged an external advisor for a short period of time and avoided the engagement of too many stakeholders because they claim that they increase time to market. In the literature review, we have pointed out that the engagement of stakeholders can be time-consuming (see Prahalad & Ramaswamy, 2004, p. 6). Based on the case of crowdEner.gy, it can be seen as a reason for why start-ups might not engage with stakeholders. Nevertheless, this has to be seen in the light of the founders’ existing experience and skills. They can take advantage of their experience in the industry and in creating a business. Furthermore, the degree of novelty is not determined by the technical aspects but rather by the social aspects, i.e. providing a platform where citizens can invest money in renewable energy. We argue that this is why innovative technical functionalities have less weight. We can see parallels to the argument made by Szekely and Strebel (2013), Escudero and Googins (2012) and DeFillippi and Roser (2014): the less novel the innovation, the fewer stakeholders and the less intensively they need to be engaged. In our case, this refers to innovations that are less technology-intensive or that require less engineering.

In order to illustrate stakeholder engagement through all phases, we designed Figure 9 to demonstrate which and when different kinds of stakeholders are engaged. The reason why the figure is shaped as a funnel is that the number of stakeholders is increasing during the start-up’s development. Moreover, we add a time axis in the shape of funnel because we found out that while skills, knowledge and reputation are lacking at the very beginning, stakeholders help to acquire them throughout the development. First, the team is engaged to develop the idea. Later, feedback givers are involved in order to validate the initial idea. Feedback givers are engaged after the idea development. The stakeholders belonging to the group can change
during the process. After the idea is finalized, technical developers help to develop the product. They contribute with their skills and know-how. At the same time, financial resources givers are engaged in order to acquire financial resources. The last group of stakeholders, which is engaged, are promoters. The time when they are engaged varies. Some start-ups prefer to engage them from the beginning of the development process while others start to engage them after the product is finalized and ready to launch. The promoters help to increase the successful commercialization of the start-ups’ products and services.

In the following sections, we go in depth on how secrecy is affecting stakeholder engagement and on the relationship to stakeholders. We consider them to be relevant to understand more about how stakeholders are engaged. They are best understood as a whole. Therefore, we have not integrated them in the different stages.

5.4. How secrecy is affecting stakeholder engagement in different development phases

In the results chapter we indicated that some start-ups do not see secrecy and the fear of being imitated by others as an obstacle in stakeholder engagement. In the case of some other start-ups, however, the fear of leaking information and being imitated has an influence on when and how stakeholders are engaged. We will now analyze which characteristics these firms have and go more in depth concerning the stage of development.

Stage 1: Idea development and early product development

In the idea development and early product development stage, the start-ups are more careful about secrecy than in the later stages of product development. This observation applies to start-ups where the innovation is not technologically complex and in those cases where technology and engineering is complex and at the core of the innovation. There are slight differences concerning how secrecy is assured and trust established. We will now give more detailed explanations.

In the case of Timbertower, NTS and Bioendev, the innovations are very technologically complex and require a high degree of engineering. The degree of novelty is very high and the innovations can be described as new-to-the world, e.g. Timbertower is the first company to
design wooden towers, NTS is using kite technology to capture high-altitude winds and Bioendev developed a new process for generating energy through biofuel. In these cases, the start-ups protect their inventions with patents first before engaging a wider group of stakeholders, e.g. cooperation partners, universities, etc. These start-ups are afraid that others could imitate their technology if they involved stakeholders in the technical development process before protecting their inventions. There could be a lack of appropriability (Teece, 1986, p. 287).

In the case of Blacksquared and Ecotastic, the technology- and software development is rather secondary to the social aspects of the idea: changing people’s behavior with the creation of a community. The start-ups are careful and try to keep information to themselves. In contrast to companies like Timbertower, NTS and Bioendev, they do not need patents to open up to possible business partners and investors but feel sufficiently protected by signing NDAs.

In some cases, secrecy influences if and how the start-ups engage stakeholders in the first stages of idea and product development. For instance, in the case of Blacksquared, the company did not start a conversation with anyone, e.g. investors who did not sign NDAs because the start-up was too afraid that someone might steal the idea. In the case of Greenpocket, the company made sure that investors promise not to talk about the idea to other business people. Documents were top secret and they were kept on a USB when shown to an audience. Consequently, these cases show that trust between the start-up and its stakeholders must be established first before the company decides to engage with stakeholders in the early stages of idea and product development.

The trade-off
There are tradeoffs that affect stakeholder engagement because the company has to make a compromise between keeping information to itself out of the fear of leaking information and receiving the greatest benefit from engaging with its stakeholders, e.g. resources and skills that the start-ups do not have themselves. The trade-off in stakeholder engagement is illustrated in Figure 10 below.

![Figure 10: The trade-off in stakeholder engagement](image)

In the literature review, we pointed out one of the tradeoffs that we have seen in our cases: having sufficient financial resources is a challenge for young firms in particular (Mohnen et al., 2008, p. 202; Larsen & Lewis, 2007, 142) but potential problems with appropriability can hinder firms to give information about their innovations to investors (Mohnen et al., 2008, p. 202). The latter could be an obstacle to get financial resources. This tradeoff was seen in the case of Greenpocket. The start-up stated that openness about their work and competitive advantage is necessary to receive credibility from, e.g. potential investors and business partners to receive the resources that are important for the further development of the product, service and business.

Similarly in the case of Exibea (which is like Greenpocket creating software for smart homes) the company is careful about which information it shares but it regards the exchange of ideas and speed as important. Exibea’s smart home solution is not as new-to-the world as the innovations by Timbertower, NTS and Bioendev, for instance. The same goes for yetu, which
is also in the smart home market and that regards time to market as more important than having patents. We argue that this could be a reason why a strong protection is less crucial than bringing the product to the market quickly.

A tradeoff can also be seen in the case of Timbertower, NTS and Bioendev that do not engage with stakeholders before having patents. As indicated by the start-ups, the filing of patents takes a long time and they are rather closed to stakeholders during the application process. We argue that during this time they cannot benefit from potential resources, such as knowledge and skills that they do not have themselves but that they could use from others to speed up the development process.

**Stage 2: Late development, right before the launch**

As indicated in the results chapter, the start-ups are more concerned about secrecy in the early stages of development. Those start-ups that are very advanced in the product development are less concerned about secrecy. This can be seen in those cases where patents are not as crucially important to protect the innovation; The founders have gained a high level of self-confidence based on their skills and knowledge which are more difficult to copy by competitors than codified knowledge in the form of documents, for instance (see Teece 1986, p. 287). Furthermore, they think that their product or service has enough competitive advantage so that more and more stakeholders can be involved. For instance, Codeatelier stresses that their skills and knowledge give them a strong position in the engagement with customers because the customer is dependent on the know-how of the start-ups. Consequently, the start-up is not concerned about secrecy during the engagement and can closely work together with the customers. In the case of yetu, one can see that the more the start-up is advanced in the development process and the more it is confident about its skills, knowledge and competitive advantage of its system, the more stakeholders it engages to develop and test the product further. Both cases are more open towards their stakeholders in the development process and are jointly working on the product together because secrecy is not a big concern.

In conclusion, all start-ups from which we have data are more concerned about secrecy when choosing and engaging stakeholders in the first stages of the development process (idea development and early product development). Those start-ups whose innovations are new-to-the world, very technologically complex and that involve a high level of engineering, are filing patents first before engaging with stakeholders. The others put emphasis on keeping information secret and they regard the establishment of trust in stakeholder engagement as very important. In some cases, a certain competitive advantage must be reached and the founders need to feel self-confident about their skills and knowledge so that stakeholders are engaged more openly. No matter how novel an innovation is and how technologically intensive it is, the start-ups must make a compromise. The compromise must be made between opening up to take advantage of opinions, skills and resources on the one hand and keeping information to themselves to avoid imitation on the other hand.
5.5. Relationship to stakeholders and stakeholder engagement

We will first describe the positive and negative aspects of building a good relationship to stakeholders. Second, we will talk about the relationship between trust, closeness and relationship to stakeholders in stakeholder engagement. Last, we will explain how the relationship to stakeholders can influence stakeholder engagement.

Positive and negative aspects of building good relationships with stakeholders

In the results chapter we pointed out that many start-ups have a positive relationship to stakeholders. A good relationship to stakeholders is important for the start-ups because they contribute to the start-ups business development and the success of their innovation. This is why, e.g. Timbertower spends a lot of time and effort to build up a good relationship to their stakeholders and to be close to them by visiting and talking to them personally. The start-up sees the establishment of a good relationship to their stakeholders as a “big part” of their day-to-day work. This suggests that the start-up regards the establishment of a good relationship to stakeholders as one of their responsibilities. The responsibility of the firm to establish a good relationship is indicated by Freeman (2004, p. 364) and Ramaswamy (2009, p. 32). We do not have quotes from interviewees that could lead us to assume that stakeholders also have responsibility to establish a good relationship with the firms. Prahalad and Ramaswamy (2004, p. 6) pointed out that one of the disadvantages of stakeholder engagement is that it is time-consuming. It is time-consuming for the start-up but the advantages of stakeholder engagement (feedback, help, learning, know-how and publicity) for Timbertower seem to be more important and more worth than the loss of time because otherwise the start-up would not engage stakeholders. Similarly, our literature review revealed that firms have more advantages than disadvantages from stakeholder engagement. Further research could be done on how stakeholders could be engaged to profit more from its advantages, e.g. how to engage stakeholders most efficiently.

Trust and closeness in stakeholder engagement

In those cases where the product or service components are not fully developed yet and where there is no protection yet, trust is a very important topic in stakeholder engagement and in the relationship to stakeholders. The latter can be a reason for start-ups to only engage people in their close network and not to disclose the same information to all stakeholders. As pointed out in the results chapter, Comfort Window System only engaged with stakeholders in their network and yetu was very selective concerning the amount of information that is given to stakeholders because of trust issues. In the literature review we have pointed out that a disadvantage of stakeholder engagement can be a lack of control (Prahalad & Ramaswamy, 2004, p. 6). In the case of Comfort Window System and yetu, this lack of control could refer to the amount of information that is given to stakeholders. One could say that they are reducing the lack of control or avoid it by engaging stakeholders that they can trust. The latter could lead to another disadvantage, which was not found during the literature review, however. In fact, those stakeholders that the start-ups can trust might not be the ones that could offer the best support.

The case of Bioendev shows that the closeness to stakeholders can be very important for the success of stakeholder engagement; Bioendev stated that the closer it is to the stakeholders, the more stakeholder engagement can be productive. When asked about secrecy, the start-up indicated that today secrecy is not a big issue for the company anymore because patents are filed, the partners are very familiar with each other and there is no fear of being copied anymore. In conclusion, one can assume that in the case of Bioendev, the engagement of stakeholders is productive and close because there is also trust between Bioendev and their
partners. Nevertheless, getting close to the stakeholders takes time as seen in the case of Timbertower because many meetings were required by Bioendev to establish a good relationship to the stakeholders too. Consequently, building up and keeping a good relationship to stakeholders are both time-consuming.

It is important to note that the level of closeness to stakeholders can differ. As pointed out in the results chapter, Codetalier chooses how close a relationship to a specific stakeholder is depending on how important the stakeholder is for the business. Mitchell et al. (1997, p. 854) have stressed that the salience of stakeholders is based on the firm manager’s perception. While this is also shown in the case of Codeatelier, a new aspect can be added: The start-up decides on the salience of potential new stakeholders, such as customers, with its already existing stakeholders together. Consequently, the salience of stakeholders is not decided upon by the firm manager only but the firm also takes the opinions of its stakeholders into consideration. In the case of Codetalier, the reason is risk mitigation (please see 2nd type of relationship below).

1st type: functional relationship
The relationship to stakeholders can only be purely functional and short because the start-ups are only engaging the stakeholders as service providers for a specific purpose (see DeFillippi & Roser, 2014, p. 31). This type of relationship mainly occurs for a short period of time, e.g. to receive knowledge, reassurance, connections or resources that the start-up is lacking to proceed with its product or service development. As pointed out in the results chapter, for instance, Solarkiosk is engaging some stakeholders to develop the technical aspects of their product further on more short-term, “when needed” basis, and others (the operators of the kiosk) to provide feedback on the business development aspects on a long-term basis.

2nd type: integrating stakeholders in the strategic decision-making
Another type of relationship identified in the results chapter was the engagement of stakeholders in the strategic decision-making of the business. Company X is engaging the business angel in the strategic decision-making process because they lack experience in marketing and sales, while in the case of crowdEner.gy and Codeatelier, important stakeholders are engaged in the strategic decision-making to mitigate a risk for the future success of the business. In the literature review we introduced Sloan’s two models of stakeholder engagement (2009, p. 37). In our cases some aspects of both models can be seen. Stakeholders are seen as an opportunity and collaborating partners and as a tool to mitigate risks by legitimizing the start-ups’ activities. They are integrated into the business to make the innovation more successful and to mitigate risks at the same time.

3rd type of relationship: joint development
The engagement of stakeholders is described as good and long when the stakeholders involved enjoy working on the product or service and are developing it together, e.g. in the case of Bioendev, NTS and Codeatelier. NTS and Bioendev expressed the latter with the emotion enthusiasm for the work and the development of innovation. One of the advantages of the latter was the joint learning and the exchange of knowledge due to a close interaction in the product development (see Rothwell, 1994, p. 27; OECD, 2005, p. 78; Leavy, 2014, p. 13). The literature by Szekely and Strebel (2013), Escudero and Googins (2012) and DeFillippi and Roser (2014) suggest that the more radical the innovation the more intensive stakeholder engagement. Furthermore, DeFillippi and Roser (2014) argue that if the purpose is to create new products and services co-creation with, e.g. partners is needed and the engagement should be deep, multiple and trust-building. One can argue that the start-ups with the third
type of relationship have a more intense and multiple engagement than the start-ups with the first type. Their engagement is longer and more intense because they are trying to find novel technical solutions. Furthermore, emotions, such as enthusiasm and trust are important.

The case of Codeatelier suggests, however, that the level of equality could also be one aspect in the joint development of novel products. Jointly developing a product made Codeatelier equal to its stakeholder. Codeatelier specifically stressed the level of equality when working together with the big company because the big company needed the skills of Codetalier and Codeatelier needed the resources. Consequently, dependency could play a role in the level of equality but this could be further researched in another study that is not so much focused on how stakeholders are engaged but on different power levels in the relationship to stakeholders. In fact, there is no consensus on this topic in academic literature (see Prahalad & Ramaswamy, 2004, p. 6; Greenwood, 2007, p. 18). Our case is supported by Prahalad and Ramaswamy (2004, p. 6) who describe companies and stakeholders as “equal problem solvers”.

In conclusion, the company engages stakeholders in different kinds of relationships based on different needs. These needs are mainly based on the resources and skills that the start-ups do not have or cannot obtain themselves. In the case of Company X, crowdEner.gy and Codeatelier, the engagement of stakeholders does not only provide skills and resources but also acts as security towards the success of strategic business decisions. It is evident in our cases that the start-ups decide which kind of engagement and which type of relationship they want to have with the stakeholders. This is in line with what we found in the literature review (see Freeman, 2004, p. 364; Ramaswamy, 2009, p. 32; DeFillippi & Roser, 2014, p. 31). The engagement of stakeholders is influenced and directed by emotions, such as trust, the feeling of being responsible for the success of the business and the well-being of its stakeholders, the feeling of being close to each other and to share enthusiasm for the innovation.

5.6. Proactivity and stakeholder engagement

Our results showed that the level of proactivity changes in several cases. This has not been addressed by academic literature to our knowledge. In stakeholder theory, as well as in the co-creation literature, it was found that business is proactive and takes the first step in approaching, developing a good relationship with and involving stakeholders (Freeman, 2004, p. 364; Ramaswamy, 2009, p. 32). Our study shows that the level of proactivity in stakeholder engagement is not a clear-cut case because despite having found four cases where the companies stress a high level of proactivity from their side, some cases indicated that they were also contacted by the stakeholders and two say that the level of proactivity is equal. The reasons differ concerning a high level of proactivity from the company side but three cases indicated that they chose the stakeholders for receiving the skills and resources that they were missing. DeFillippi & Roser (2014, p. 31) support our argument; the company decides who and how to involve based on a specific purpose.

We found out that there are several aspects that can affect the level of proactivity in stakeholder engagement and that the firm’s choice as pointed out by Freeman (2004, p. 364), Ramaswamy (2009, p. 32) and DeFillippi and Roser (2014, p. 31), is only one of the factors. The other aspects are the development time, the relationship with stakeholders and the engagement of the stakeholder group promoters. They will now be explained more in detail.
The influence of promoters on proactivity

To analyze which influence promoters can have on proactivity, we combined the quotes for promoters in “which stakeholders are engaged and in which phases of the model” with the findings in “level of proactivity in stakeholder engagement”.

In one case, in the case of Rehact, the start-up argued that it has to be proactive in the relationship to its stakeholders because the stakeholders are very passive even though the company can distinguish itself with success at competitions and the media attracts stakeholders to the business, e.g. investors or buyers. In general, however, one can see that the stakeholder group of promoters is encouraging stakeholders to become proactive and to engage with the companies. The media and competitions are helping the most in the promoters group because the politicians are rather increasing the general awareness of the companies. Unfortunately, we do not have quotes that stress directly that involving politicians attracts stakeholders. Based on the quotes we have, however, we can argue that winning competitions and involving the media increases the level of proactivity from the stakeholder side. In the case of Timbertower, for instance, articles in the newspaper attracted stakeholders and Codeatelier was contacted by customers after having won a prize at a business plan competition.

The attention created around the company and its innovation from the media and competitions is therefore stimulating proactivity from the stakeholder side. We have illustrated this in Figure 11.

![Figure 11: The role of promoters in stakeholder proactivity](image)

It follows that the more advanced the company is in the development process, “the more it can show and prove” and the more often it is in the media, the higher are the chances of being contacted by stakeholders. We have also pointed this out by highlighting a change in proactivity in the results section. As seen in the case of yetu, however, the company must be willing to become known in public to attract interest from the stakeholders. The media and competitions are only a catalyst for proactivity from stakeholders in stakeholder engagement. In addition, the start-ups have to be very active to continuously take advantage of this catalyst. This was seen in the case of Exibea because they worked closely together with public relations to increase awareness of their innovation and start-up. Figure 12 illustrates the increasing proactivity from stakeholders taking the development time into account. It also highlights the role of the start-up’s decisions with reference to whether it wants the stakeholders to be proactive and how to engage the media to increase the level of proactivity from stakeholders eventually.
In the results chapter we pointed out that Snowpower is mainly contacted by stakeholders and that it is the only company that offers snow cooling in Sweden. This could suggest that the more novel or disruptive an innovation is, the more the company is contacted by the stakeholders. We only know from Timbertower (the company which has built the world’s first wooden towers for wind energy plants (disruptive innovation)) that the more the company progressed in its development the more it was contacted by stakeholders. Nevertheless, we noticed that the novelty of innovation only plays a minor role because also in the case of Timbertower the company had to get known in the industry with the help of politicians, competitions and the media first before being contacted by more and more stakeholders to reach the level 50/50 (equal level of proactivity). Organizations writing about the company were also helping Snowpower to get in contact with stakeholders.

The influence of the type of relationship on stakeholder engagement
Comparing the type of relationship to the stakeholders and the level of proactivity, one can see several patterns. In those cases, where the start-ups involve the stakeholders in the strategic decision-making of the business, there is a two-way dependency and stakeholders are seen as partners, the level of proactivity from the stakeholder side is high (in the case of crowdEnergy and Codeatelier). In the case of Company X, which also involves its stakeholders in the strategic decision-making, the level of proactivity is at least equal. Nevertheless, in the case of Rehact and yetu, where the relationship is rather professional and functional, meaning that the companies are the ones which mainly benefit from the engagement with stakeholders and are involving them for a specific purpose only, the company is more proactive. In these cases, the stakeholders are rather seen as service providers than as partners. No pattern could be identified for when the relationship is very close to the stakeholders and both parties are enthusiastic about developing the innovation because NTS and Bioendev show different levels of proactivity; in the case of NTS the company is proactive, while in the case of Bioendev the level of proactivity is equal. Nevertheless, Bioendev stresses to have very good contacts to the industry and to frequently exchange his ideas with peers at conferences. Consequently, there could be many opportunities for being contacted. Furthermore, his innovation is more advanced in the development process because his innovation is already successfully established in a pilot plant while NTS is currently still in the testing phase. One could assume that the more promising the success of bringing the innovation to the market, the more it is contacted by stakeholders but Rehact and SootTech have already launched and they and not their stakeholders show a high level of proactivity. Further research is needed on whether the closeness to stakeholders and the emotions involved in stakeholder engagement has an influence on the level of proactivity in stakeholder engagement.
6. Conclusion

In this chapter we answer our research question, point out the limitations of our study and give recommendations for further research. We will explain our theoretical, practical and societal contributions at the end.

6.1. Answer to the research question

Based on the analysis of the results, we were able to answer the question marks in the Model. In addition, the analysis provided us with new insights related to stakeholder engagement. Both helped to revise and develop the Model that connects our concepts and illustrates the process of stakeholder engagement (see Figure 13 below).

![Figure 13: The revised Model](image)

We use the revised Model as a visual tool to summarize the foregoing chapters and to ease understanding of the answer to the research question. Due to the high complexity of each theme in the Model, we have not chosen to visually incorporate the figures of the analysis chapter 1 to 1. We will now answer our research question based on the Model:

*How are stakeholders engaged in the creation of an innovative product and/or service for environmental sustainability in sustainable entrepreneurial start-ups from the perspective of the firm?*

In chapter two we pointed out that it is still unclear who/what influences the founder’s idea generation for the innovative product/service and motivation to create a sustainable entrepreneurial start-up. We found out that the external environment, i.e. changes in the industry and the environment itself, i.e. the environmental degradation, as well as the personal background of the founders (family, friends, education, personal experiences) influences the founder and his or her motivation. The environment functions as a trigger for the founder to see an opportunity in the creation for a sustainable entrepreneurial business and an innovative product or service for sustainability. This is why the revised Model includes an arrow
 (“trigger” symbol) that is leading from the external environment to the founder and his or her motivation. If the influences come from people, they can become the first stakeholders in the idea development stage. For instance, we found out that education at universities triggers the founder’s motivation and university mentors become the first feedback givers.

The external environment influences the firm throughout all stages of innovation. Moreover, the firm also has an influence on the external environment because its innovation can reduce the environmental degradation and it can make people become more conscious of their energy consumption. Furthermore, also the firm’s interaction with stakeholders, e.g. Bioendev’s engagement with technology centers, shows that the firm influences the external environment. The interaction between the firm, its stakeholders and the environment can be seen as part of a system (see Kline & Rosenberg, 1986; Rothwell, 1994; Varis & Littunen, 2010, p. 133; Von Stamm, 2008; Tether, 2002).

Almost all of our start-ups are sustainability-driven and those that are rather profit-driven also regard sustainability as very important and as part of their motivation. Profit is essential for all of them because it allows them to further develop the product and/or service and to make the firm sustainable. Furthermore, all are engaging stakeholders. This is why we have erased way 2 in the Model (no stakeholder engagement).

In the original model we did not know which stakeholders are involved. We have grouped the stakeholders based on how they are engaged: to receive feedback for the development, validation of the idea and testing (feedback givers), to get financial resources to finance the product and/or service development (financial resources givers), to get knowledge and skills for developing the technical aspects of the product and/or service (technical development) and to increase speed to market and acceptance of the product on the market (promoters). The team also plays an important role in the development because in our study we have seen that the idea is first developed with the start-up’s own resources and internal ideas before external stakeholders are involved. We described when the start-ups are mainly engaging these stakeholder groups in Figure 9.

It is important to note that we have erased the division of the time line in sections in the Model. This is because stakeholder engagement happens throughout all stages of product/service development and also continues after the product or service is brought to the market. We have placed a “rewind” sign in the center of the Model to show that stakeholder engagement is a continuous process throughout all stages of development. This shows the interactive process of innovation (see Kline & Rosenberg, 1986, p. 275; Tödtling & Trippl, 2005; OECD, 2005).

Furthermore, the level of proactivity from the stakeholder side was not clear. We found out that the stakeholders are also proactive in engaging stakeholders and that the stakeholder group promoters is engaged by the companies to increase the level of proactivity from the stakeholders. In the revised Model, the proactivity arrow from the firm is longer than the proactivity arrow from the stakeholders; The start-ups are more active in contacting stakeholders at the beginning. The latter also depends on the willingness of the company to engage promoters during the development. One interesting new finding is that the relationship can have an influence on the level of proactivity; Those cases that engage stakeholders as partners and in the strategic decision-making of the business show a higher level of proactivity from the stakeholder side.
Our analysis shows that the influences on stakeholder engagement are not connected to the motivation to create a sustainable entrepreneurial business or product and/or service for sustainability. They are rather tied to the characteristics and needs of the firm and the product or service itself. The type of innovation and the needs of the start-ups influence stakeholder engagement. The reasons are that these require a lot of resources, e.g. financial resources or help to increase acceptance on the market. Stakeholders can provide these resources. Those start-ups that require many resources because their innovation is very technologically intensive or involves a lot of engineering tend to engage many stakeholders and a variety of stakeholders. The same was seen in some cases where the innovation is new-to-the world. In those cases where the social aspects of the innovation, i.e. to change people’s behavior, play a more important role than the technical aspects of the product or service, the firm is less dependent on skills and resources from outside and fewer stakeholders are engaged.

Furthermore, our analysis showed that promoters and secrecy influence stakeholder engagement. In fact, appropriability can be a reason for start-ups to prolong or limit their engagement with stakeholders especially in those cases where patents can be filed. The start-up must make a compromise between receiving resources and revealing information. Trust and confidence about the founders’ skills and the innovation’s competitive advantage can positively affect the relationship with stakeholders and so also the engagement of stakeholders. Furthermore, the type of relationship can influence how stakeholders are engaged, e.g. joint development is more intense than a functional relationship. The start-ups can also be engaged to contribute to the strategic decision-making. An interesting finding is that the salience of potential stakeholders can be decided upon by the firm and its existing stakeholders together (see case Codetalier). Consequently, we have replaced the question mark on the type of innovation above “engagement” with the word “influences” to express the plurality of factors that can affect stakeholder engagement.

From the literature review we concluded that there is a potential for sustainable entrepreneurial start-ups to take advantage of involving stakeholders for innovation to overcome their own, as well as environmental and societal challenges. Based on our analysis we can say that there is not only a potential for it but that the start-ups are actually doing it. They have been engaging stakeholders to overcome their own challenges, such as a lack of resources and marketing skills. The latter is needed to successfully bring the product or service to the market and to contribute to overcoming environmental and societal challenges. Furthermore, our literature review, the results and analysis show that engaging stakeholders has advantages and disadvantages. Based on our analysis we found out that the founder could also not decide to engage stakeholders because of the disadvantages of stakeholder engagement. Reasons are related to bringing the product and/or service to the market as fast as possible (see the case of Ecotastic) because stakeholder engagement can be time-consuming.

6.1. Contributions

With respect to sustainable entrepreneurship, our study provides an insight into how noneconomic motivators are influencing the founders with regard to sustainable entrepreneurship. Furthermore, the cases yetu, Ecotastic, Blacksquared and Greenpocket show how social and environmental motivations can be united in sustainable entrepreneurship. Research concerning both was called for by Thompson et al. (2011, p. 224, 213).

Our study gives new insights into and shows the importance of stakeholder engagement in sustainable entrepreneurship for the creation of innovative solutions for environmental
sustainability. Further research on the latter was called for by Spitzeck and Chapman (2012, p. 508), Escudero and Googins (2012), Szekely and Strebel (2013) and Ayuso et al. (2011). Moreover, we contribute to an improved understanding of the relationship between firms and their stakeholders as only little has been researched about it (Greenwood, 2007). For instance, we show that there are different types of relationships in stakeholder engagement and how they can influence stakeholder engagement and proactivity in stakeholder engagement.

In addition, we contribute to stakeholder theory by discussing the nascent concepts and ways of thinking about stakeholder engagement. The latter also includes stakeholder engagement for innovation for sustainability. As our study takes a wider group of stakeholders into account, it also contributes to an increased attention on the importance of secondary stakeholders for sustainability in academic literature as called for by Ayuso et al. (2011, p. 1403). Furthermore, we discovered that more aspects than just the choice of the firm have an influence on the level of proactivity in stakeholder engagement, such as the development time, the relationship with stakeholders and the engagement of promoters. In addition, our results show that not only the type of innovation is influencing stakeholder engagement as argued for by several scholars (Szekely & Strebel, 2013; Escudero & Googins, 2012; DeFillippi & Roser, 2014) but also other factors, such as promoters, secrecy and stakeholders, influence the engagement, too. The connection between the concepts of sustainable entrepreneurship, innovation and stakeholder engagement is a theoretical contribution itself. Our study also makes a contribution to empirical studies about sustainable entrepreneurship and stakeholder engagement.

With regard to our societal contributions, our study attracts attention to sustainable entrepreneurial start-ups because it provides an insight into their creation and development of innovations for increasing sustainability. Furthermore, it shows that an active integration of stakeholders from different parts of society, e.g. media, politics, business, etc. are necessary for the success of the start-ups. Our thesis makes aware of the challenges in innovation and stakeholder engagement and to which extent society plays a role in that. For instance, we have pointed out that some German start-ups have had difficulties to receive financial resources and they blame the negative media and politics for that. Moreover, our study shows that support from the media and the government is crucial for the success of sustainable entrepreneurial start-ups. We suggest increased funding from the government and support in receiving permissions from authorities faster to speed up the development of very novel innovations for sustainability in particular.

With reference to our practical contributions, several guidelines can be given to start-ups with reference to stakeholder engagement. We suggest start-ups to engage feedback givers in the idea development stage because it can help the start-ups to validate the idea and to develop the idea further. In addition, feedback givers can give start-ups the self-confidence needed to start the business. Moreover, they can increase their motivation. With reference to the product development stage, we recommend start-ups to pay attention to different feedback received and to make a good decision on which feedback givers to listen to.

To increase the level of proactivity from stakeholders, speed to market and the commercial success of innovation, we recommend start-ups to engage promoters throughout all stages. The latter is especially important for start-ups whose innovation is new-to-the market and where the environment is more competitive. The engagement of politicians can be helpful for new-to-the world innovations that need public space for the product development and testing in particular. Furthermore, stakeholder engagement can help to conquer a challenge and at the
same time provide a challenge for the start-up itself. We therefore recommend start-ups to carefully weigh up potential disadvantages with potential advantages before and during the engagement with stakeholders. Last but not least, we suggest start-ups to spend time on establishing a good relationship to stakeholders. A close relationships and mutual positive emotions can increase the success of stakeholder engagement. We hope that future research can give further recommendations about stakeholder engagement to start-ups.

### 6.2. Limitations and recommendations for further research

Our study is limited to start-ups which are located in Germany and Sweden and we only study one industry (energy industry) and not all sectors of the energy industry (namely only renewable energy and energy efficiency). We neither cover all areas in renewable energy nor in energy efficiency. Further research could be carried out in more industries and countries whether differences in public policy, culture, etc. could enrich the findings on stakeholder engagement for the creation of innovative solutions for sustainability.

Our study was focused on the perspective of the firm. It was focused on one founder only due to our resources and time constraints. Some start-ups have up to three founders, however, and their opinion, as well as the opinion of their team members could give a further insight into the perspective from the firm. Further research could study stakeholder engagement from the perspective of all founders, team members and stakeholders to receive an in-depth understanding from multiple points of view. Both, research on start-ups from different countries and industries and on stakeholder engagement from more perspectives could help to develop our conceptual model further. It could also lead to the creation of different models if many differences can be observed.

Based on the exploratory nature of our research, we did not focus on specific stakeholders because we needed to find out which stakeholders are the start-ups engaging before finding out how they are engaged. Further research could study the engagement of each stakeholder group, e.g. financial resources givers, in depth to reveal any differences in how specific stakeholders from each group are engaged.

Furthermore, choosing semi-structured interviews as data collection technique can be seen as a limitation to some extent because our findings are based on the spoken words and the memories of the founders only. This is because of our time and resources constraints but also because we chose not to study only very few start-ups in-depth but as many start-ups as possible to research stakeholder engagement from different perspectives. The data collection technique could have been complemented with observations, for instance. We believe that observations of how stakeholders are engaged could enhance the findings of the study by providing more information about interpersonal aspects, how stakeholders and firms communicate and work with each other.

Moreover, our time constraint made it impossible for us to make observations and to interview different stakeholders and the founder(s) in different stages of product or service development. However, we believe that a longitudinal study could provide several benefits, e.g. details and feelings about the engagement with stakeholders are most likely to be more present in the founders’ memory when the founders are interviewed at different points in time. The researcher could also be a participant.

Another limitation is the scarcity of data on how stakeholders were engaged to launch the product or service and on a possible change of stakeholder engagement and the number of
stakeholders involved after the launch. One of the reasons could be because more than half of our start-ups have not officially brought their product to the market yet. We therefore suggest further research on stakeholder engagement in that particular stage.

In addition, our study is limited to our definition of sustainable entrepreneurship, innovation and stakeholder engagement because academic literature has not yet found a consensus on these concepts. It is likely that other researchers that study stakeholder engagement in start-ups could get different findings based on their different definitions. For instance, their definitions could lead them to choose other selection criteria for the participants of the research.

Furthermore, we do not include geographic aspects and the role of regional innovation systems on stakeholder engagement. They are out of the scope of our study but we acknowledge that research in these fields could reveal interesting insights into the engagement of stakeholders of start-ups. For instance, Berlin has an influence on the creation of start-ups and the development of new ideas. We recommend further research on how the city is attracting sustainable entrepreneurial start-ups and which role its citizens play.

As stated in the analysis, further research could be done on how start-ups are engaging stakeholders to profit more from the advantages of stakeholder engagement and whether the closeness to stakeholders and the emotions involved in stakeholder engagement has an influence on the level of proactivity in stakeholder engagement. In addition, we suggest further research on the level of power in stakeholder engagement because there exist different opinions in literature and our research did not focus on that topic. Further research on the role of incubators could be helpful to understand why they are very important for the start-ups in Sweden. Moreover, further research on the role of governments in providing financial resources for sustainable entrepreneurial start-ups could provide value to countries, which have an interest in supporting this kind of start-up to overcome their environmental challenges.

Based on our recommendations for further research, we are providing examples of research questions below.

1) How are stakeholders engaged in the creation of an innovative product and/or service for sustainability in sustainable entrepreneurial start-ups from the perspective of stakeholders?
2) How are stakeholders engaged in other countries, industries and sectors to create innovations? Can differences be seen and if yes, which ones?
3) What are the differences in (financially) supporting sustainable entrepreneurial start-ups from the government in Germany and Sweden? How can the differences be explained? How do they influence the success of the start-ups?
4) How is the stakeholder engagement in the launch (in comparison to the product and/or service development)?
5) Does the closeness to stakeholders and the emotions involved in stakeholder engagement influences the level of proactivity in stakeholder engagement? If yes, how?
6) What is the level of power between stakeholders and firms in stakeholder engagement? What affects it and how does it influence stakeholder engagement?
7) What role do the incubators play in creating innovations for sustainability in Sweden? Are they utilized more in Sweden than in other countries and why?
7. Reference List


## Appendices

### Appendix 1: Researcher and interviewer questions

<table>
<thead>
<tr>
<th>Researcher Questions</th>
<th>Interviewer Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What motivates and influences the founders to create an innovative product/service for sustainability? What motivates the founders to start a sustainable entrepreneurial business? Are they more internally or externally motivated?</td>
<td>How did you come up with the product/service idea? Why did you start the business?</td>
</tr>
<tr>
<td></td>
<td>Can you please describe who/what influenced and motivated you to create the product/service?</td>
</tr>
<tr>
<td><strong>Follow-up questions:</strong></td>
<td></td>
</tr>
<tr>
<td>Who/what influenced and motivated you to create a product/service for sustainability in particular?</td>
<td>Where did you see the opportunities for creating an innovative product/service for sustainability?</td>
</tr>
<tr>
<td><strong>Follow-up questions:</strong></td>
<td></td>
</tr>
<tr>
<td>Which role did sustainability and profit play in that? Are the latter equally important to you or are you, e.g. more sustainability-driven? What is the mission and vision of your company?</td>
<td></td>
</tr>
<tr>
<td>Are start-ups engaging stakeholders in the creation of a product/service and which stakeholders are they engaging?</td>
<td>Which stakeholders have been involved to create the product/service, e.g. government, non-governmental organizations, universities, technology centers, cluster initiatives, customers, consumers, incubators, suppliers, etc.?</td>
</tr>
<tr>
<td>What stakeholders have been involved to create the product/service, e.g. government, non-governmental organizations, universities, technology centers, cluster initiatives, customers, consumers, incubators, suppliers, etc.?</td>
<td><strong>Follow-up question:</strong> In case the start-ups do not engage stakeholders, we will ask them why the stakeholders declined and how the innovation process of the product/service is, as well as for which purpose they asked them to get involved.</td>
</tr>
<tr>
<td>Are the start-ups proactive in stakeholder engagement? Are the stakeholders proactive too?</td>
<td>How did you get in contact with the stakeholders?</td>
</tr>
<tr>
<td>Why do they engage them?</td>
<td><strong>Follow-up questions:</strong> Did you take the first step in contacting the stakeholders or did they approach you? Where you more proactive? How</td>
</tr>
</tbody>
</table>
### How do start-ups engage stakeholders to create an innovation? What is the co-creation in the innovation process like?

| did they respond? What was the reaction from the stakeholders? Were they willing to get involved? |
| Why have you involved the stakeholders? Please describe your motivation to involve them in the process. |
| **Follow-up questions:** |
| *Have you involved them, e.g. to a.) jointly create the innovation for sustainability with them and for them, e.g. to get more ideas, to get to know the stakeholders’ needs and wants b.) to overcome challenges in the innovation process to create the product/service, e.g. to get sufficient financial capital, knowledge, skills? c.) to prevent risks from the product/service, e.g. for customers and the environment? c.) for organizational learning purposes in general? d.) for any other reasons?* |

### What are the advantages and disadvantages of engaging stakeholders and do they have an influence on how stakeholders are engaged?

| How did you work together? How and in which steps of the product/service creation/innovation process did you let them participate? |
| **Follow-up question:** |
| *How would you describe your relationship?* |
| Which disadvantages and advantages have you had from involving them? Which challenges did you face? |
| **Follow-up questions:** |
| *Which effect did it have on the cost and time of the product development innovation process? Did it rather cost or save you time in the product development innovation process? Which influence did it have on the speed up the innovation diffusion, bringing the product to the market and getting accepted by the market? Did you feel as if you were losing too much control over the product/service creation process? Where there any problems with legal* |
| issues and who is taking the responsibility?  
Were there any obstacles, e.g. leaking information about your innovation, fear of losing the IP rights, lack of good management of stakeholder engagement, lack of a strong vision, etc. in the process of stakeholder engagement?  

**General follow-up questions:**  
Can you please describe what you mean?  
Can you please explain that a bit more?  
Can you please tell us why?  
Can you please tell us more?  
What were/are the reasons for this?  
Can you develop this?  
Can you please give us an/some example(s) for that? |
Appendix 2: Follow-up e-mail with interviewer questions

Dear Mr./Mrs. -------,

Thank you very much for participating in our interview. As already explained in our e-mail conversations and on the phone, the interviews are part of our 30 ECTS Master Thesis at Umeå School of Business and Economics. Your responses are important to shed more light on how start-ups involve stakeholders in Germany and Sweden to create innovative products and/or services for energy efficiency and renewable energy, even if you might only involve a few or no stakeholders. The stakeholders can be e.g. customers, government, non-governmental organizations, cluster associations, universities, science and technology centers, etc.

Your participation is voluntary and you may choose not to respond and to withdraw from the research at any time. In addition, please note that also after the interview you can decide whether you want us to make your case anonymous. We plan to use a tape recorder and we hope that you will agree to being recorded. The recorded interviews will be stored safely on our personal computers. We will only use the recorded interviews for writing our thesis. The interview transcripts might be shown to the thesis grading committee and supervisor but are not shown to anyone else. If you like, we can send you the transcribed interviews afterwards.

Attached you can find our general interview questions. Depending on your answers we might ask some additional questions to clarify certain topics.

Please feel free to contact us if you have any further questions or in case some of the interview questions might not be clear to you.

The contact on skype through which we would like to make the interview is (Name)\(^\text{21}\).

We are looking forward to speaking with you.

Kind regards,
Alexandra Dembczyk and Jaromír Zaoral

Alexandra Dembczyk
Master´s Program in Management
Address
Mobile phone number
alexandra.dembczyk@gmail.com

Jaromír Zaoral
Master´s Program in Business Development and Internationalization
Address
Mobile phone number
zaoraljj@gmail.com

\(^{21}\) We are not providing personal details in this version because it is published online.
Interview themes about how stakeholders are involved in start-ups

1. How did you come up with the product/service idea? Why did you start the business?

2. Can you please describe who/what influenced and motivated you to create the product/service?

3. Where did you see the opportunities for creating an innovative product/service for sustainability?

4. Which stakeholders have been involved to create the product/service, e.g. government, non-governmental organizations, universities, technology centers, cluster initiatives, customers, consumers, incubators, suppliers, etc.?

5. How did you get in contact with the stakeholders?

6. Why have you involved the stakeholders? Please describe your motivation to involve them in the process.

7. How did you work together? How and in which steps of the product/service creation/innovation process did you let them participate?

8. Which disadvantages and advantages have you had from involving them? Which challenges did you face?

9. Would you like to add anything more with reference to stakeholder involvement in your company?

Thank you very much for participating in our interview!
### Appendix 3: List of participants in the study and interview data

<table>
<thead>
<tr>
<th>Name of the start-up</th>
<th>Interviewee</th>
<th>Interview duration</th>
<th>Interview date</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>German Start-ups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TimberTower GmbH</td>
<td>Holger Giebel</td>
<td>49 min.</td>
<td>19.03.2014 10 p.m.</td>
<td>Telephone call (no skype account)</td>
</tr>
<tr>
<td>Solarkiosk GmbH</td>
<td>Sasha Kolopic</td>
<td>37 min.</td>
<td>19.03.2014 4 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>NTS New Technology Systems GmbH</td>
<td>Uwe Ahrens</td>
<td>41 min.</td>
<td>17.03.2014 10 a.m.</td>
<td>Telephone call (no skype account)</td>
</tr>
<tr>
<td>Green Pocket GmbH</td>
<td>Torben Pfau</td>
<td>45 min.</td>
<td>20.03.2014 3 p.m.</td>
<td>Telephone call (preferred by interviewee)</td>
</tr>
<tr>
<td>Ecotastic</td>
<td>Anna Yukiko Bickenbach</td>
<td>43 min.</td>
<td>26.03.2014 9:30 a.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>yetu AG</td>
<td>Christopher Schläffer</td>
<td>42 min.</td>
<td>17.03.2014 4 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>Blacksquared GmbH</td>
<td>Daniela Schiffer</td>
<td>53 min.</td>
<td>19.03.2014 6:30 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>Codeatelier GmbH</td>
<td>Jochen Schöllig</td>
<td>51 min.</td>
<td>18.03.2014 3 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>crowd.Ener.gy GmbH</td>
<td>Dr. Peer Piske</td>
<td>42 min.</td>
<td>18.03.2014 4 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td><strong>Swedish Start-ups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioendev AB</td>
<td>Anders Nordin</td>
<td>48 min.</td>
<td>31.03.2014 4 p.m.</td>
<td>Personal, meeting in Umeå</td>
</tr>
<tr>
<td>SootTech</td>
<td>Eric Dahlen</td>
<td>57 min.</td>
<td>25.03.2014 8 a.m.</td>
<td>Telephone call (no skype account)</td>
</tr>
<tr>
<td>Company X</td>
<td>Interviewee X</td>
<td>61 min.</td>
<td>28.03.2014 1 p.m.</td>
<td>Skype, he/she did not have a webcam</td>
</tr>
<tr>
<td>Snowpower AB</td>
<td>Kjell Skogsberg</td>
<td>64 hrs.</td>
<td>24.03.2014 8:30 a.m.</td>
<td>Skype, he did not have a webcam</td>
</tr>
<tr>
<td>Ecoera AB</td>
<td>David Andersson</td>
<td>40 min.</td>
<td>26.03.2014 12 noon</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>Rehact AB</td>
<td>Svante Bengtsson</td>
<td>36 min.</td>
<td>25.03.2014 11 a.m.</td>
<td>Skype (but without webcam because of a bad connection)</td>
</tr>
<tr>
<td>Exibea AB</td>
<td>Joakim Ottander</td>
<td>43 min.</td>
<td>31.03.2014 3 p.m.</td>
<td>Skype with webcam</td>
</tr>
<tr>
<td>Comfort Window System AB</td>
<td>Hans Öhman</td>
<td>35 min.</td>
<td>25.03.2014 1:30 p.m.</td>
<td>Skype with webcam</td>
</tr>
</tbody>
</table>
Appendix 4: Tables with quotes from the interviews

Influences on the business creation (Tables 1-6)

1\textsuperscript{st} area of influence: 

\textit{Table 1: Family and friends}

<table>
<thead>
<tr>
<th>Company X (S)</th>
<th>IX: (…) that was my initial starting point and from there (names) have been (...). So I could combine the real world and how installation is done</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTS (G)</td>
<td>UA: (…) my daughters are very active in climate change and everything else. And they said Papa you are an inventor so you have to find something that is invisible and that is not influencing the climate</td>
</tr>
<tr>
<td>crowdEner.gy (G)</td>
<td>PP: (…) we had always a lot of questions by friends and families how they could join or participate in these very profitable renewable projects</td>
</tr>
</tbody>
</table>

\textit{Table 2: People in the industry}

| Bioendev (S) | AN: In Pitea energy technology center and that is a research institute, a platform, a meeting point between the university and the industry so that’s a huge influence for all of us where we value the contributions from companies they know a lot that scientists doesn’t know and on the other hand the scientists know a lot that the industry doesn’t know so I mean that was a strong influence that that was right there, this would be right here also. All the different conferences, workshops, seminars whatever in energy technology and forest biomass and forest technology and forest industry business development and so on everything has of course influenced. |
| Ecoera (S)    | DA: Yes of course it is also that when I´ve seen others do the same thing you know becoming entrepreneurs in cleantech within environmental technologies |
| SootTech (S)  | ED: I was working at Chalmers Innovation with a company and that community is very inspiring which makes possible to start company. (…) If I have been in a normal situation, I would not start a company. But I was in this community and it was very natural and very entrepreneurial attitude in that incubator so it was very natural to start the company and to try it (…).You are inspired by people around and inspired by environment. |
| Blacksquared GmbH (G) | DS: You have a lot of discussions with partners (…) We were quite close to the topic of renewable energies, had a lot of contacts from clients. We knew a lot about as we had several companies. We talked about several problems coming in from different people (…) That’s more or less it. The most important thing is the conversation you have. The people you talk with…. |

2\textsuperscript{nd} area of influence: educational and professional background

\textit{Table 3: Education:}

| Ecotastic (G) | AB: Especially if you’ve studied environmental management you sometimes feel like there is nothing to do to make the difference because it is such a large scale and you sometimes can have an influence even if it is a little pin drop… |
| Company X (S) | IX: So I could combine the real world and how installation is done with the things that I had learned actually at university in automation and (…) because I had just read engineering at the university, so I could see how to build this so then (…) we started to build prototypes, a lot of shitty prototypes but then (…) it became better. |
Exibea (S)

JO: Actually, (…) since I study mechanic engineering and a lot of mechanic engineering students at Chalmers write their thesis at Volvo and I didn’t feel like writing a small thing in a big company. I felt like it was more fun to get the whole picture. That’s why we three people didn’t feel like making the thesis in the large company. Therefore, we were like: We create our own project.

Bioendev (S)

AN: we’re taught from when we’re young ok science we are doing that and it’s for real you shouldn’t mix it you shouldn’t even consider that you’re close to reality. It’s a trigger to show everyone also that is can be used also in like that....

Rehact (S)

SB: He´s studied thermodynamics and he thinks that it’s possible to create it in a more efficient way and a more cost-efficient way than traditional solutions.

Table 4: Personal experience and background in the industry:

<table>
<thead>
<tr>
<th>Solarkiosk (G)</th>
<th>SK: As I said it is because he was already operating a company in Ethiopia and he realized that certain things are missing as far as getting certain product (…) because for example solar energy products in many communities in sub-Saharan Africa have a bad reputation because only the cheapest products reach the market and… at very high margin so people in this rural area would pay much higher margins than the people in the cities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timbertower (G)</td>
<td>HG: during this work designing towers the idea came up that the wind energy business has to face some specific problems with towers.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: (…) I am stemming from an industrial background. I think a lot of people today are fed up with inefficiency of big entities. And that is not that I dislike big entities. There are very solid companies out there. But I truly believe starting something new is best possible in a small entity where you have one focus on one thing and not two thousand projects. It is full of risk because it is spinary. You can either succeed or fail. You can’t rely on other seventy projects. It is this one. It is wonderful exposure to do.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>A: And your background probably played a role in that because you are an engineer for the aero planes right? UA: Yes I am an aeronautics engineer. UA: I was thinking about the strong air and often happen winds in the area between 200 to 400 meters and another point was that I was fan of CargoLifter and I am not sure whether you heard about it but CargoLifter was a very big Zeppelin to move heavy stuff and I thought that maybe it is also a good idea to think about this area and what we can do else with the strong wind there and to think about reasons behind.</td>
</tr>
</tbody>
</table>

3rd area of influence: Governmental regulation, change in the industry and market

Table 5: Governmental regulation, change in the industry and market

| Greenpocket GmbH (G)            | TP: Yes, of course, because at this time, especially in Germany, a new legal and political framework came up, and that was the start of the so called smart meters which are digital meters for measuring the energy consumption. Back in 2009 there was a decision that these smart meters will become mandatory for new and fully refurbished buildings. That decision was some kind of a trigger for a whole new market. TP: (…) We saw that almost every area of live and every kind of industry was and still is getting more and more digitalised. We thought that such a big industry like the energy industry will be altered soon by digital technologies |

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and that has actually happened over the last four years. The result is a very interesting transformation of the whole market and we have been seeing this coming right from the beginning and that’s why we started Greenpocket.

Exibea (S)

JO: We were two friends writing our Master’s thesis at Chalmers and we heard that all the electricity meters were changed to the smart meters and when we heard it we were thinking how to making more easy for people to understand their energy consumption.

4th area of influence: The environment in general (including the city of Berlin)

Table 6: The environment in general

<table>
<thead>
<tr>
<th>Source</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: The world is going to s*. That’s one.</td>
</tr>
<tr>
<td>Bioendev (S)</td>
<td>AN: That’s also influenced by long time in (…) growing up I think a lot of most of us or all of us has a strong interest in nature, sustainability, environment, environmental issues. The reason is the greenhouse gases and the oil gap.</td>
</tr>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: You look at what kind of companies, things are going on, about issues like climate change, thinking like can we do something. I don’t think I can find like one specific point that occurred. (…) It is rather a mixture. You are open to all kind of things happening around you. You have a lot of discussions with partners (…)</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: Macroeconomic environment influences me a lot. Think about in which state mankind is and how we do it in developed and developing countries… They have right to grow and to invest in energy and also consume energy like we did decades ago (…) This can be solved by means of technology which clearly is a solution to the problems of the world…</td>
</tr>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: “we have access to a lot of creative spirit (…). (…) access to all these amazing people. It is just a natural evolution that these ideas develop there. That is my romantic explanation.”</td>
</tr>
<tr>
<td>Blacksquared (G)</td>
<td>DS: “(…) I think that this is one of the most positive things about this ecosystem that’s there is that actually people are very very willing to help and to share their knowledge and they take time to actually talk to you. (…) people that get attracted to Berlin are people like my basically see things differently that have a certain open-mindedness (…).”</td>
</tr>
</tbody>
</table>

How the idea was initiated (Tables 7-11)

Table 7: Seeing a problem and opportunity

<table>
<thead>
<tr>
<th>Source</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: Actually, I didn’t come up with the founding idea. Fabian and Ralf, they were in US and they noticed that all their roommates were typical Americans driving to the university in their own cars (…) And in Germany, you just do a carpool. It is a kind of natural reaction to save money and drive together. So they thought: How can we motivate people to form carpools? And that idea transferred how could we make it broader to become environmentally friendly.</td>
</tr>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: (…) the idea was there to say ok solar and renewable energy accessible for people who don’t have their own rules, know how or a piece of land so they can just have it in the pocket and use it in the kitchen when outside it is sunny and they can use their energy. And very quickly, we came to the question how to motivate the people to keep on using these devices and start</td>
</tr>
</tbody>
</table>
changing their energy behavior and that’s how we step step by step came to it that we need a social community around this energy production and to saving…

<table>
<thead>
<tr>
<th>Solarkiosk (G)</th>
<th>SK: (...) he realized that many things were not reaching the internal market as far as solar energy product so he tried to come up with a way of bridging that gap and through that came the idea for solar kiosk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timbertower (G)</td>
<td>HG: during this work designing towers the idea came up that the wind energy business has to face some specific problems with towers. Mainly the powers have to be transported, the towers have to be price stable if you look to the steal price is goes up and down and it’s a great problem for wind energy producers and at this time also they wanted to have higher towers because the the yield of the plant (...) were growing very fast and the diameter of the rotor was growing and these came to the point that the towers also have to be bigger and this time there was a limit in steal towers approximately by 100 m tall and we were searching for solutions for this problem (...) that the Branche had to face and eh I think in 2005 and 2006 the idea came up to use other materials to design towers to make towers more comfortable to transport, make them cheaper, make them higher and make them more ecologic and yeah we came to the point where we were saying ok let’s try it with wood and so we tried to design wooden towers and yeah this was the beginning of the idea.</td>
</tr>
<tr>
<td>Codeatelier (G)</td>
<td>JS: We knew that there is so much on the market which is not as good as it should be so we decided to do our own project and doing it much more better than the others but we are not focused on making the planet more energy efficient so we try to figure out what the customer wants in smart home for example.</td>
</tr>
<tr>
<td>Rehact (S)</td>
<td>SB: Actually it´s my partner who came up with the idea. He´s been working with it for almost ten years and he’s been working with it for maybe 5 years before we met and it’s from his experience in heating and cooling solutions in buildings and he was missing this product on the market and he couldn’t find any similar products that´s why he invented this product.</td>
</tr>
<tr>
<td>Comfort Window System (S)</td>
<td>HO: About 15 years ago, I met a German innovator I could say. He asked me if I could produce his windows in Scandinavia and I had a look on the technique, the window that looked like any other window (...). And I said to myself if I’m going to produce or sell a window with this capacity, it has to look like a normal window so I started to work on this on my own and it took me many years until I found this basic and very simple solution but you know it’s the simple thing that is very hard. Today it’s a very good idea.</td>
</tr>
<tr>
<td>Exibea (S)</td>
<td>JO: From the beginning, we were two friends writing our Master’s thesis at Chalmers and we heard that all the electricity meters were changed to the smart meters and when we heard it we were thinking how to making more easy for people to understand their energy consumption. So our Master’s thesis was the starting point. It was more like recommendations or examples how to make it better in the reality.</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>SK: I was doing my Master thesis at Lulea university and then the county in Väster Norrland, Sundsvall, the energy controller, he was discussing with his colleagues how to cool down the hospital in the future. They had high ambitious environmental goals and another reason was that the cooling media they had in their chillers, it was going to be prohibited some years later. So they had to find a new alternative and he talked to some people in</td>
</tr>
</tbody>
</table>
Sundsvall who studied in Lulea and they a new a professor that was working with energy storage. So they invited him for a meeting and he suggested: why don’t you store snow and isolate it with woodchips? They said: OK, sounds like a good idea.

Bioendev (S)  AN: We thought that it would be smart, it’s as simple as this.

<table>
<thead>
<tr>
<th>Table 8: Family and friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>crowdEner.gy (G)</td>
</tr>
<tr>
<td>PP: (…) we had always a lot of questions by friends and families how they could join or participate in these very profitable renewable projects so the motivation was we created a platform where everybody can participate and not only the big players and this is what we did and a lot of friends and families now are investors in these kinds of project (…) and this was the main motivation.</td>
</tr>
<tr>
<td>NTS (G)</td>
</tr>
<tr>
<td>UA: Yeah that is a nice story because my daughters are very active in climate change and everything else. And they said Papa you are an inventor so you have to find something that is invisible and that is not influencing the climate and should use only a little bit of resources and so on (laugh). So this was one of the ideas to think about what we can do to save the climate and to reduce costs in renewable energy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 9: Industry experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>SootTech (S)</td>
</tr>
<tr>
<td>ED: I started my career in the industry in 93, in optimization industry so after I ended in another business industry, the idea come up. So it is based on industry experience in the field, not research…</td>
</tr>
<tr>
<td>yetu (G)</td>
</tr>
<tr>
<td>(Quote was removed based on the interviewee’s request)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 10: Potential in the industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenpocket (G)</td>
</tr>
<tr>
<td>TP: I was part of the business development team. We were four people altogether, and we worked for several months to find a compelling business idea. We had a look at different markets and then step by step we realised that it would be great to start a company which connects the energy market with the internet market. Because four years ago both industries were just about to join up and that was what made this new market interesting for us. We thought that there is much potential to start a successful business.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 11: Other people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoera (S)</td>
</tr>
<tr>
<td>DA: (…) We started out through working with biomass to use it for pallets and to burn them afterwards but we actually found that through another researcher that has been working out in the Amazon Jungle that we could actually create a carbon to put it into the soil so this carbon comes from them that we can use these pallets to create this carbon and that is how we came up with the idea. (…)</td>
</tr>
<tr>
<td>Comfort Window System (S)</td>
</tr>
<tr>
<td>HO: About 15 years ago, I met a German innovator I could say. He asked me if I could produce his windows in Scandinavia and I had a look on the technique, the window that looked like any other window (…). And I said to myself if I’m going to produce or sell a window with this capacity, it has to look like a normal window so I started to work on this on my own and it took me many years until I found this basic and very simple solution but you know it’s the simple thing that is very hard. Today it’s a very good idea.</td>
</tr>
</tbody>
</table>
**Why the business is started** (Tables 12-13)

*Table 12: Business opportunity, business potential*

<table>
<thead>
<tr>
<th>Company</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: The business itself because we have to live on something, right? Yes, there is the sustainability side but creating business out of it means that we can pay living expenses from it. And I think it is important to have a business and I am very much for having a for-profit company even when it comes to environment to social issues to be independent on some institutions. It just make life hard and if you can make business out of it, I am totally for.</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>KS: The main reason why I studied what I studied is environmental concern and since this technology is very green, I want it to see realized on more places. Of course also to have a challenging and inspiring work and to earn money of course.</td>
</tr>
<tr>
<td>Greenpocket GmbH (G)</td>
<td>TP: (...) we realised that it would be great to start a company which connects the energy market with the internet market. Because four years ago both industries were just about to join up and that was what made this new market interesting for us. We thought that there is much potential to start a successful business.</td>
</tr>
<tr>
<td>Timbertower (G)</td>
<td>HG: (...) what we saw was when we want to have a chance on the market so we have to do only one thing, only do towers and this was all that we were saying so we said ok let’s forget the engineering office, let’s focus on wooden towers and this was the point where we were saying ok we are going to found Timbertower GmbH.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: But I truly believe starting something new is best possible in a small entity where you have one focus on one thing and not two thousand projects.</td>
</tr>
<tr>
<td>SootTech (S)</td>
<td>ED: (...) It could be a very easy for a start-up. It doesn’t need a lot of resources and it could be sold to a large company easily. It is a very compact technology. I thought we should go to the market and make exit of it. (...)</td>
</tr>
<tr>
<td>Exibea (S)</td>
<td>JO: Because we saw a market opportunity and mostly because I thought it will be a fun thing…</td>
</tr>
</tbody>
</table>

*Table 13: To change work for having a more positive influence on the environment*

<table>
<thead>
<tr>
<th>Company</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: When we started in 2010, we were advertising agency. We did corporate communication and advertising.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: (...) 14 years maybe its time to change something and so I moved into the advisory board and founded NTS..and eh ja I thought also it’s a good idea to do something for sustainability.</td>
</tr>
<tr>
<td>Rehact (S)</td>
<td>SB: For me it was interesting. It was a new line of work so to speak. I used to work with computers before and I wanted to change my area where I worked so I liked the idea of producing a more environmentally friendly product and also hopefully making a big company out of it.</td>
</tr>
<tr>
<td>Ecoera (S)</td>
<td>DA: (...) It is because I want to make a change, I want to be able to make money out of something that I think is fun and worth working for so we could have done this through an organization, non-profit organization of course but we feel it has more credibility when we’re doing it through the company.</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>KS: The main reason why I studied what I studied is environmental concern and since this technology is very green, I want it to see realized on more places. Of course also to have a challenging and inspiring work and to earn money of course.</td>
</tr>
</tbody>
</table>
Motivation for the product and/or service creation for sustainability (Tables 14-20)

Sustainable motivation
Table 14: Create solution for problem that concerns sustainability

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehact (S)</td>
<td>SB: Yes he has an overall drive to create the 0 Energy house so (...) he’s an engineer and his overall motivation is to develop new things and to create solutions for problems.</td>
</tr>
<tr>
<td>Ecoera (S)</td>
<td>DA: Yes one is that I have grown up on a farm myself and I have seen that today’s agriculture is very unsustainable. I’ve also seen that all over the world we have soils that are becoming more and more like deserts and need help to restore them. This technology can help that so that’s partly because of that why I work with this right now. DA: Yes, partly it’s because it feels good to do something for others.</td>
</tr>
<tr>
<td>Timbertower (G)</td>
<td>HG: The motivation was mainly as I said to come up with a product that is cheaper, better to transport, higher and more ecologic than other competitive products on the market at this time. A: Was your goal to create more sustainability product? HG: It was it was our goal because we were saying that wind energy plants are very ecologic, very ecologic very very. One point on this machine is where we said a blind point, a blinder Fleck eh and this is the tower, the tower is made out of steel or concrete and this is not very ecologic and we were saying ok to make a wind energy plant green from the foot to the top it is necessary to look also to the tower and it was our goal to make these towers more sustainable and this was the reason why we started to use wood.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: Yeah that is a nice story because my daughters are very active in climate change and everything else. And they said Papa you are an inventor so you have to find something that is invisible and that is not influencing the climate and should use only a little bit of resources and so on (laugh). So this was one of the ideas to think about what we can do to save the climate and to reduce costs in renewable energy.</td>
</tr>
<tr>
<td>Codeatelie (G)</td>
<td>JS: the motivation was okay we want to build something where you have something in your house where you can build a modern yeah like living in the future that was our aim...so like in Science Fiction so this was our aim and then it was very focused on what is interesting for the customer (...) we found out that it’s not energy efficient and energy in Germany it’s not such a big part and people are not willing to pay money to make the planet a better world or whatsoever. They are more focused on their own wallet so and they want to have comfort and security in their homes. It’s much more interesting for the customer (...) we have a lot of passion about smart home, especially in Homeee because we are working in the field for a long time and in our point of view we knew that there is so much on the market which is not as good as it should be so we decided to do our own project and doing it much more better than the others.</td>
</tr>
</tbody>
</table>
**Table 15: To make a positive change related to sustainability**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoera (S)</td>
<td>DA: number two it is of course something that what can I say, you can see that you can change something you know. You can see that you have an impact somehow and that is another motivation.</td>
</tr>
<tr>
<td>Company X (S)</td>
<td>The content could reveal too much of the company’s product and/or service.</td>
</tr>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: There are additional avenues as well like powering, Telecom towers, satellite, internet (...) So that’s the whole appeal of the solarkiosk. They can run serve as a business in the community but it is so much more. It can develop the community and it is development based on clean energy. The effect that it is expandable is that it enables us to do anything.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: I am personally motivated to change the world a bit and that is my motivation. It is not money or fame or something.</td>
</tr>
</tbody>
</table>

**Table 16: Provide the society with an access to renewable energy**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: It is meant to provide quality products, like solar energy products as well as energy services to communities that never had access to solar products or energy services even though those are good communities that those products were designed for originally. So we wanted to create access to the product but also access to the services to the locals</td>
</tr>
<tr>
<td>crowdEner.gy (G)</td>
<td>PP: And what we had always a lot of questions by friends and families how they could join or participate in these very profitable renewable projects so the motivation was we created a platform where everybody can participate and not only the big players and this is what we did and a lot of friends and families now are investors in these kinds of project (...) and this was the main motivation. (...) We found the possibility to let people participate in this and we are a little bit fighting against all the media campaign because there is still this small part in the German public which is still interesting in this kind of projects so we give them the way to invest their money.</td>
</tr>
</tbody>
</table>

**Table 17: To change people’s behavior related to environmental sustainability**

<table>
<thead>
<tr>
<th>Organization</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: We’re trying to do it with actual environmentally friendly behavior and change behavior</td>
</tr>
<tr>
<td>Greenpocket (G)</td>
<td>TP: We wanted to engage the consumer to care more about energy efficiency. That was the main motivation for us to use web technologies to make saving energy much easier for everybody.</td>
</tr>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: Well, it was the question we asked ourselves how to motivate people to change their behavior to make it in the long term. We said: Ok, this is cool, let’s try it out (...) and that was basically the why we started with the community, what’s the credit etc. that really makes something sustainable out of it.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: Is that one of the aims, one of the motivations you had to change how people behave also towards energy usage? CS: Absolutely. You need to differentiate social innovation and social change. Social innovation really is a participatory instrument for people (...) and it contributes to generating innovation. In our case, it is really giving an informational basis that change behavior and people can by simply understanding what energy consumption is all about and get a couple of personal contextual recommendations, change the behavior instantly because they have now the information. In former times, electricity has been unknown territory to mankind because you get one invoice per year from your electricity provider…. By starting understand</td>
</tr>
</tbody>
</table>
that, you can (…) really change things.

**Table 18: To do something good for society and to be recognized**

<table>
<thead>
<tr>
<th>Exibea (S)</th>
<th>JO: I think it is inspiring to be in a field where you feel that what you’re doing is something for the future and in some way provide to society and you can really stand for what you’re doing. Most people you talk to think that it is a good thing and that’s one of the most important things.</th>
</tr>
</thead>
<tbody>
<tr>
<td>yetu (G)</td>
<td>CS: Yes, it is also personal motivation of course and that is to really be really accountable for a small project</td>
</tr>
</tbody>
</table>

**Personal motivation not related to sustainability**

**Table 19: To have fun and independence**

<table>
<thead>
<tr>
<th>SootTech (S)</th>
<th>ED: That is one of the main driver to have fun and enjoy it. You can’t make business for money or sustainability. That is impossible.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoera (S)</td>
<td>DA: and the third motivation is that it’s fun most of the time and (…) another motivation is also freedom that you are you are your own boss and (…) that you can work with that within the company.</td>
</tr>
</tbody>
</table>

**Table 20: To do something, to create something**

| Bioendev (S) | AN: We need to produce something we need to build something we are creative we want to build something we want to show that it works in reality. |

**Sustainability-driven/ profit-driven** (Tables 21-24)

**Table 21: More sustainability-driven than profit-driven**

<table>
<thead>
<tr>
<th>Ecotastic (G)</th>
<th>AB: Sustainability is the main motivator to keep working because you are not doing it for yourself but for everyone else and you are doing it because you see there is a need for it. The profit part was- I don’t think it was a motivation. Maybe in the long run. A: In the long run, you want to be economically self-sustaining? AB: Yes, that’s the only way- you have to be able to make your own profit in order to continue changing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenpocket (G)</td>
<td>TP: In the long run you need to have an outstanding idea and a vision. And having a vision means to believe that you are able to produce a product which can improve the world, because without such a vision it would be very difficult to keep up your motivation and to establish a sustainable business model. All in all, you have to believe in your idea and vision - and right from the start you have to work hard on making this idea profitable.</td>
</tr>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: Profit was not a big part of motivation, but, just my personal opinion, profit needs to play a part in it in order to make it sustainable chain because so many non-profit projects failed</td>
</tr>
<tr>
<td>Timbertower (G)</td>
<td>HG: we worked on this project for one year without any loan without any wage so we were financed by ourselves so I think at the beginning we were very driven by the idea to have a product that is very sustainable and we were all relying on the great future of this product. I think the focus on money came later.</td>
</tr>
</tbody>
</table>
| yetu (G) | CS: (…) smart homes can now be hugely affected with the energy management system just by changing behavior of people so that is all manifestation of social responsibility we feel (…) Profit is nothing really
primary in the world. It is a kind of measure. You have to have profit. Otherwise you can’t grow and develop (…) We need to have profit but it is like you are checking your pulse. It needs to be there otherwise you cannot live. But it is not what life is all about.

NTS (G)
J: So you think that the reason why you started the company was primarily to contribute to sustainability? UA: Yes.
A: (…) so the main motivator is sustainability, the main reason why you created the product is sustainability and not profit. UA: Yes, the profit as I learned in my life without profitability at the end nothing will work in the business so I also thought about the profitability because you are not able to get money for ideas without any effort also for the finance part.

crowdEner.gy (G)
PP: Yeah, as we started this kind of business, it was clear that this is not a very profitable business and the sustainability is the main driver.

Snowpower (S)
KS: Sustainability is much more important but it is impossible to run a company without compatibility. They have to be connected.

Ecoera (S)
DA: It’s definitely first of all sustainability then we can have profits not the other way around.

Bioendev (S)
AN: (…) most of us or all of us has a strong interest in nature, sustainability, environment, environmental issues (…) J: And what role did profit play in the company? AN: Nothing. Very little very little, it’s some kind of bonus or carrot.

Comfort Window System (S)
The interviewee was talking about importance of sustainability. He claimed that he ran the company for 7 years without any profit. He also said that profit will be crucial to be self-sustaining.

Rehact (S)
SB: More sustainability-driven I would say.

<table>
<thead>
<tr>
<th>Table 22: Both profit- and sustainability-driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company X (S) IX: It’s actually both. As I said before if it hadn’t been for the opportunity that we have with this company to really make change it would have maybe ended two years ago because there have been periods without any money in the company and you basically sit there looking at do I have to make something else or can I continue this and if it only were for the money it would have been easier to do something else during long periods of times but with this opportunity to really make change</td>
</tr>
<tr>
<td>Exibea (S) JO: Both of them. I mean a profitable company is important. If you are not profitable, you can’t exist (…) Yeah, company needs to be profitable. Then, it is matter how profitable (…) It is important that the company is sustainable.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 23: More profit driven than sustainability driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codeatelier (G) A: Maybe profit is more important to your company than sustainability? JS: Yes we want to try to make a healthy business out of it so it’s not like in two years we can have an exit but it’s more like to do a software company where we have homeee as the first and only product maybe the only one but it’s very successful or you have different products or the same.</td>
</tr>
<tr>
<td>Blacksquared (G) DS: Dudes, I have a company and the only way I see that you can actually drive change is to make money and profit. Because that prove things that do changes (…) But we have fun in the company because we think if you really want to do something, change something, then you have to do something</td>
</tr>
</tbody>
</table>
from within (...) We are definitely profit-driven because we are a normal company.

**Table 24: Challenge to create something**

| SootTech (S) | ED: The main driver is the challenge to create something. That is something what drives you- to do something successful, something that matters. You have changed and accomplished something. You started something to end it. That is the main driver and in the economic perspective, you can do some profit for exit. It will be nice. For the investors, it is a key issue. It is also a measurement if you have success, if you accomplished something... But profit is quite modest if you are in a cleantech field. But I think if you start a company, it is not the idea of getting rich. It is that you have a challenge and you want to accomplish something. The challenge is the real driver. |

**More sustainability-driven than profit-driven companies and their mission and vision** (Tables 25-27)

**Table 25: More sustainability-driven than profit-driven companies and their mission and vision**

<table>
<thead>
<tr>
<th>Mission</th>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: Mission is to motivate individuals to become environmental friendly.</td>
</tr>
<tr>
<td>Greenpocket (G)</td>
<td>TP: (…) to develop software which makes it much easier for as many people as possible to use energy more comfortably and efficiently.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: At yetu, our mission is to enable people to discover a new world at home (…) yetu is committed to foster a sustainable future for our planet by aiming at step-changes in energy efficiency.</td>
</tr>
</tbody>
</table>
| NTS (G) | UA: Oh, the mission is (laugh) production of energy, which is competitive with fossil }
fuels and it should not influence the visibility in the landscape, it should be safe for birds and bets and at the end it should use only …the other part is the low use of resources.

Rehact (S)  
SB: To bring the products in the market and make the company grow revenue wise and make the company profitable. We also look into developing new products and bringing them to the market. The idea is anything that has to do with heating and cooling technology within a building. That’s what we wanna be innovative and bring new product.

SB: To create the opportunity to build houses where all the energy for heating, cooling and ventilation within the building itself. You can have a beautiful house without any need to buy external…

Table 26: Both profit- and sustainability- driven

<table>
<thead>
<tr>
<th>Vision</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exibea (S)</td>
<td>JO: (…) I don’t really know the exact definition of the vision and mission. Since our vision is to enable people to live their everyday in more sustainable way, we do it by visualizing energy consumption at home and making that easy. Anyone should not be a technician to be able to understand your energy in building. That’s what we are doing. The aim is to increase awareness of the energy consumption and therefore to reduce energy.</td>
</tr>
</tbody>
</table>

Table 27: More profit driven than sustainability driven

<table>
<thead>
<tr>
<th>Mission</th>
<th>Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codeatelier (G)</td>
<td>A: We read that your vision is “to provide intelligent software solutions that contribute to the realization of customers’ creative ideas”.(…)</td>
</tr>
<tr>
<td>Blacksquared (G)</td>
<td>DS: With changers, the vision will be drive a lot of decision making… The vision to really improve, to find the way how to positively motivate people to change their behavior. Now, in May we are gonna have a relaunch and expand basically. The ways we can motivate people for their behaviors, we are gonna have an app which is gonna track behavior if you drive a bike instead of a car. You can earn credits (…) We can use all these systems for different things.</td>
</tr>
<tr>
<td>SootTech (S)</td>
<td>ED: The mission is to sell the company to a large company. I want to make an exit. We have proved the technology. It has a good sustainability aspect and I want to have this technology ED: Most sustainability products, they have very hard to reach the market. That is why they can’t make it really good in the world because it is not used in the market. That’s why I want to go into a big company and sell it (…) That is my vision…</td>
</tr>
</tbody>
</table>
spread around the world fast. I think you can’t do it with this small company.

**Level of Proactivity in stakeholder engagement** (Tables 28-31)

*Table 28: High level of productivity from the company side*

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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<tbody>
<tr>
<td>yetu (G)</td>
<td>CS: In our case it was us all the time because we were very secretive about what we were doing so nobody could approach us so nobody could know. So it was us. We did research, we thought about whom to approach and it was basically always us approaching people. (...)</td>
</tr>
<tr>
<td>NTS Energy and Transportation Systems GmbH (G)</td>
<td>J: How did you get in contact with the stakeholders? UA: It was my network. (...) A: Did you take the first step in contacting them? Or did they also approach you? UA: No, I did it. A: And when you started contacting the Fraunhofer Institute and Technical University and Beuth University you already knew people in these institutes or did you establish a new contact? UA: Some I knew before. Especially, the technical university in Berlin because it was my previous education and one of the professor was my friend. Fraunhofer Institute in Stuttgart was my research because we have been looking for institutes which are working in the field of rope technology and they developed these rope robots which are used in stadiums for football for example, you know for the moving cameras to reach place on a football game. So they have experience with rope so we took them… It is always different. Sometimes friends sometimes by their knowledge.</td>
</tr>
<tr>
<td>SootTech (S)</td>
<td>ED: (...) we took the first contacts with the customer (...)</td>
</tr>
<tr>
<td>Rehact (S)</td>
<td>SB: Most of them, I initiated the contact with. J: That’s all. Do you have something to add? SB: No, not really. It is hard work. Most of the stakeholders are relatively passive so you have to be the initiative taker in many cases. J: So you have to take the first step? SB: Yes, and the second, third and the fourth.</td>
</tr>
</tbody>
</table>

*Table 29: High level of productivity from the stakeholders side*

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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</thead>
<tbody>
<tr>
<td>Codeatelier (G)</td>
<td>JS: Normally, the company comes to us and say: Ok, we want to get in touch with you, know more about you…</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>KS: No I think mostly we have been contacted and did you know that if one organization writes about this then another organization that works with this question and they contact us and see.</td>
</tr>
</tbody>
</table>

*Table 30: Equal level of proactivity*

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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<tbody>
<tr>
<td>Company X (S)</td>
<td>IX: Let’s see (...) Sometimes, it has been like that someone heard about it and they wanted to see the demo, for example business angels. But also it was because my (name of family member) was in (...) industry and he had contacts with manufacturers so when they heard about it they wanted to know more. It was both ways but mostly I have to contact people and maybe because we don’t have our website.</td>
</tr>
<tr>
<td>Bioendev (S)</td>
<td>AN: Both A: How did they get to know about you? AN: As I have scientific background, I am often present at conferences. And...</td>
</tr>
</tbody>
</table>
at a lot of the conferences we meet. And we have a very strong energy network in the north of Sweden so we need a lot of scientists.

Table 31: Change in level of proactivity, increasing contact by stakeholders

| Ecotastic (G) | AB: for the ideation part we contacted everyone then for product management sure you had a few people that have maybe heard of us that contacted us but that’s quite minimal. During market entry, I would say that 80% is us contacting people especially also the partner companies, the users, PR and maybe 20% are people that word of mouth or have heard of us and find it interesting and also came to us. |
| Blacksquared (G) | J: Can I ask you how you got in touch with the American company? It sounds like an important stakeholder. DS: Research again. (...) it was more personal relationship or with DHL for example it was one of the our users actually he was a very early adopter he one of the people who were using the device very early and he got and he came to us and said like ok I am gonna see to it that DHL is gonna be a partner (...) basically just companies that knew us were like oh this sounds very interesting it would be cool to be part of this and I think one or two I called and said you? (42:39) would fit very well on the market place would you like to be part of this and of course (...) |
| Timbertower GmbH (G) | HG: (laugh) I think both. At the beginning it was more that we contacted people and companies from the wooden side and also from the wind energy side and it changes during the time during the company development more companies came to us and where asking can we do anything for you, can we also be a deliver you so em at the moment I think it is 50/50 that we’re going out speaking to them also and that people are also coming to us and also talk to us. |
| crowdEner.gy (G) | PP: Crowdfunding at this stage at 2012, 2011 it started in Germany, started in Europe with a couple of platforms so nobody really knew about crowdfunding (pause) (...)So we presented our project to a lot of institutions and we have a very good feedback I have to say we are present in all kind of media and all kind of conferences (…) We receive a lot of invitations from universities (from) all over the world |
| Ecoera (S) | DA: Yeah, in the beginning it was like that. But now, we have built the brand and reputation from where we can get information to us and we get contacted from external stakeholders. In the beginning, it was certainly that you have to be out there, selling. |

Relationship to stakeholders (Table 32)

Table 32: Relationship to stakeholders

| Ecotastic (G) | AB: It’s more are you able to align your visions with whomever you are trying to work with right because obviously if Greenpeace is trying to work with Shell, I doubt that they’re gonna be aligned on their vision (…) I don’t think it’s gonna be as easy as if Greenpeace tries to work with Unicef or not Unicef eh there is a British company that does a lot of environmental things but ya. |
| Greenpocket GmbH (G) | TP: You need user groups and you have to interact with them and ask them for their feedback, of course. (…) we established very strong partnerships with energy and software suppliers. (…) I think it is very helpful to have also |
strong relationships with the media. This is important for you as a company and we did that right from the beginning. It helped us a lot to enter the market and to be accepted by our customers.

**Solarkiosk (G)**

SK: (…) We have different relationships with local operators, product manufacturers, technical partners (…) Well, what we deal with technical partners has nothing to do with product manufacturers… They have no input or not direct connection to it. So there is different kinds of stakeholders, different groups. On the local level, they are not interested in what we deal with technical development, they just want to operate the business. So there is different groups of stakeholders.

**NTS (G)**

UA: It was very good because all of these are enthusiasts in the idea. They are keen to develop it. But in the end money counts (…) A: And did you also let them participate in the product development to prevent risks, like risks for consumers? UA: We did it all together with our partners. We have made FMIA- failure, management and influence analysis and we did it together with all cooperation partners.

**Timbertower (G)**

HG: (…) the big stake in our success is the relationship work to all the stakeholders. We’re in very good contact nowadays also with the Wirtschaftsförderung here in Hannover. We’re in good contact with politicians we’re in good contact with the stakeholders. They have sites or they plan to build wind energy plants. And we’re always talking to them, we’re visiting them and this is big part of our work to have good contact to all the stakeholders.

**crowdEner.gy (G)**

PP: what we are considering is the possibility to make an own crowd founding for our own platform maybe not for the whole platform but maybe for some tools or for some technology upsides (cough) and yeah this could work and of course if we do this we first have to convince our users but then also we we need to do it with them ja and not alone and ja, we’re open to it but in the day-to-day business what kind of projects, what kind of returns and how to what kind of project to bring on the platform it’s actually mine, our, it’s our decision and it should we this.

**Codeatelier (G)**

JS: Yeah, so one company is still our manufacturer. He helped us with tools and so on because we are just a software company. We don’t have know how and how we do the production, how much it costs and so on. We are in very good contact. They are building all the tools for us, find suppliers and so on. (…) At the same time they use us as a software developer. 

JS: If you are talking to right persons, (…) you get very personal communication between each other and they know that you are a start-up. It is not like: We are the big one and you are the small one and do what we say. It is more like: You are small company but you are innovative. We are old company, we are big (…) and if they are really good chiefs they know what their company (…) can do and what not. If they want to do an innovative product which is very separated from their normal field, then, they need some external experts with skills and very young team and so on. They know that. That’s how you work together. You are at the same level of discussing. (…) It is the same level… They want to hear your opinion because they know they need to hear your opinion to do something really good in their own company. This is a very good thing. You don’t have to be scared to talk to people who have millions on bank accounts. 

JS: They have to know that they all are responsible. If we take wrong way
and we lose money, or are dying as a company, then they are also responsible. They also spent a lot of money so they have to know what way we are going. But for us, it is good. If we are very sure something is working, we are doing it. If we are not sure, we take them and do the decision together. Then, we are sure that a lot of people decide to go this way and if it is wrong, we all are responsible for that
JS: The only thing which we are very close with our stakeholders is when we have a new big development contract or want to work with other big company. Then we talk to them and they help us in doing good prices and so on. So we are in discussions with them if we should use this new development opportunity to earn money to do something else or we are more focused on this. (...) Maybe they have to spend this money to us… For us, it is important for us that we are not the persons who decide everything and responsible for everything. Our stakeholders are also responsible if we are doing some decisions and if we say we don’t know if to go this way or this way (…) we take them to our table and say: Which way we should go
JS: it is very good to have personal communication with some of the highest people of some companies. They are also normal human and you can work with them, you can let them feel your passion. They are very helpful to find solutions for you. It is not just to ask for money it is more like work together and doing something great. It is often the feeling that we get from the companies.

yetu (G)
CS: (...) Then, in the second process which is the development stage, we are still in the development stage because we have not launched yet. You are very engaged with potential customers. That always remains there.
A: So it’s more closed innovation with the trusted community? CS: Na it’s (…) I think in terms of the typology it’s still a bit of a mixture but it’s more of a closed innovation, not in that meaning of only the company itself but in our case we involve external stakeholders but we bound them to an ecosystem which was a closed innovation in that system so a series of open elements but within that boundary. A: And you choose who gets which information and who helps you with which development. CS: Exactly.
CS: At the end it was not such an open process in the early stage because we were under non-disclosure which means it was really our project team which was communicating openly within the project team but not communicating to the outside world, you know that was the nature of our development project and you have to make a choice so that was…When we talk about the scientific institutions, our customers, or trial users, all of them were part of the project so far and we openly communicating in the community but not beyond that. (…) It’s not that we put out a pizza application and let the world use it. That’s not our system.

Rehact (S)
SB: (...) We have a professional relationship with them (…) It is professional relationship. We are not very close.

Comfort Window System (S)
Notes: engages with network because he can trust them

Company X (S)
IX: When it comes to the manufacturers, building entrepreneurs, developers, it is not the money we are going after. It is to be able to implement our products in the right environment. If it is a building that will be talked about or the building which really tries to have less amount of energy consumption.
It is to be able to get into in right projects. That’s what we try to make with those. And when it comes to investors, then we have chosen investors, we have actually chose the investors who can bring something to the table. For example, the business angel, he had great experience in marketing and sales. He was a perfect fit for the company. That’s why we wanted his money.

Exibea (S)  
JO: I would say good in general I don’t think there is anything negative at all.

Bioendev (S)  
AN: Very good. Very good… A: What makes it very good?  
AN: It is interesting also it takes to get close to be really productive. It takes 10-15 meetings, maybe some travelling when you can be really open and honest and be very productive, very close. If the chemistry is also right, then it is excellent. It happened with all our partners. The chemistry is founded because every one loves developing new process. Everyone likes environmental issues, the economics and benefits. There is a lot of things that are in common what everyone likes so it becomes very positive projects. It is very hard to have negative feeling.

Secrecy (Tables 33-35)

Table 33: Secrecy is not regarded as crucially important

<table>
<thead>
<tr>
<th>Company</th>
<th>Response</th>
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<tbody>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: If it is successful, it is just a matter of time before someone does. That’s a fact of life and that’s what you can’t get away. But so far, we are still a very small company and our reach at this level is still quite small so we are not confirmed by the idea (…) At this stage we are not worrying about copying yet. It might happen that we will but now, we are still so small.</td>
</tr>
<tr>
<td>Codeatelier (G)</td>
<td>J. Weren’t you scared they can steal your idea? JS: No, I think for the companies it is very interesting. They know that they don’t have the opportunity to build the software on their own (…) They don’t have skills to do software (…) They have to hire people to do the software for them and they can hire directly us and give us a development contract.</td>
</tr>
<tr>
<td>Ecotastic (G)</td>
<td>AB: I don’t know if you would necessarily call it a secret but because we’re still in the development phase you don’t we don’t always tell people maybe what it is you can do and can’t do you know yeah but I don’t know if we’re kinda scared of it. I think we’re a pretty transparent company (…) we don’t have any big like black horses hidden anywhere. No not really I think we’re ok.</td>
</tr>
<tr>
<td>Ecoera (S)</td>
<td>DA: We have been quite open. Just at the beginning, secret database with the recipes for pallets and I would say that our current knowledge, we have a lot of know-how that is ours and that is what makes us strong now.</td>
</tr>
<tr>
<td>Exibea (S)</td>
<td>J: Aren’t you scared that someone will steal your idea? JO: Yeah, of course that’s always a risk but that’s something you have to get used to and of course in the beginning you need to be a bit you have to be know what you tell other people and what you don’t tell them but I think in general that it’s better to speak as much as possible and to share your ideas because if it’s only an idea it’s not the idea that is more important it’s the execution of the idea and how you make it I don’t see it as a risk it’s just common business sense of course you shouldn’t tell your competitor exactly what you’re doing of course you have to be quick and make sure to work in the right direction at times.</td>
</tr>
<tr>
<td>Company</td>
<td>Quote</td>
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<td>------------------</td>
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<tr>
<td>Blacksquared (G)</td>
<td>DS: That was, at the beginning, it was very very close circle and at these times, looking back you have to laugh about us, that somebody will steal our idea. We didn’t talk to anybody without signing NDAs. Literally, I have two folders like this (showing a big size) with signed NDAs. Now, looking at it I say oh my G*. Ok, at this point, we were really scared that some big corporations will take the idea and just walk away (…) Still, we don’t have a real competitor in terms of hardware and this certification system (…)</td>
</tr>
<tr>
<td>Timbertower (G)</td>
<td>A: Were you afraid of leaking information like secrecy? HG: no no no because we applicated the first patent in 2006 and the founding of the company was in 2008.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: We are now coming to a phase where we completely open up ja, because we feel the system is mature enough and has competitive advantage enough that we can fully open it up and put the product in beta zone and stuff like that. A: But you have patents or how do you protect your (…) CS: Yes we have applied for patents, as you know this is taking a series of years in order to be granted the patents so (…) for instance for the home energy application we have applied for the patents two years ago for the European patent and the US patent in that context so we have that but let’s face it you know this is not a world where you can only protect a patent, you have to be fast and being fast and time to market is important. (…) the best recipe to be protected it’s not filing patents. This is a lawyer’s game and we’re not lawyers.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: We are very open for everything because we have patents of 80% of the world market so we are very open with information and what they can do… A: Did you make the patents first? And then you cooperated with stakeholders? UA: Yes, first patents and then cooperating.</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>KS: There are ways to do it much better in Sundsvall but those are our secrets before we build a new plant.</td>
</tr>
<tr>
<td>Bioendev (S)</td>
<td>AN: In this time, there between, we were careful. We kept everything in secret and we were quite confident that everything works out. We could release what we are doing without any fear. As soon as the patent is filed, there’s no fear (…) Right now, the partners are so familiar with each other so it is not any issue. We will not steal anything from the other partner.</td>
</tr>
<tr>
<td>Ecoera (S)</td>
<td>DA: We have been quite open. Just at the beginning, secret database with the recipes for pallets and I would say that our current knowledge, we have a lot of know-how that is ours and that is what makes us strong now.</td>
</tr>
<tr>
<td>Exibea (S)</td>
<td>J: Aren’t you scared that someone will steal your idea? JO: Yeah, of course that’s always a risk but that’s something you have to get used to and of course in the beginning you need to be a bit you have to be know what you tell other people (…) have to be quick and make sure to work in the right direction at times.</td>
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Table 35: Secrecy is seen as very important

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<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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<tbody>
<tr>
<td>Greenpocket (G)</td>
<td>TP: You have to rely on that the people you talk to won’t share your ideas with other business people. All the documents you send to them have to be treated as strictly confidential. But in the end you always have to trust in the people you share your ideas with. Otherwise you can’t talk to potential partners or investors about your business and you can’t show them that</td>
</tr>
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</table>
you’re working on it seriously and that you have for example an usp and that you are ahead of your competitors - of course, it’s always a bit risky.

**Advantages and disadvantages of engaging stakeholders** (Tables 36-40)

**Table 36: More advantages than disadvantages**

| Exibea (S) | JO: (…) My experience is that it’s good to get as many stakeholders as possible more or less to because maybe it’s probably quite that when you’re an inventor or entrepreneur you wanna keep things to yourself and you want to have control but actually its much better if you have more people talking about what you’re doing and more people that have an interest in your company and that your company shall be successful so em ja as many stakeholders as possible and there are more people working in the right direction. |
| Greenpocket (G) | TP: In general you can say that there are much more advantages than disadvantages… to be honest, I think it is wrong to focus on the disadvantages, because ultimately it is very important to talk to your stakeholders. |
| crowdEner.gy (G) | PP: We now have a clear picture of what people really need, what we need to improve, what we need to change what kind of information policy what kind of transparency all these issues which are really important in the day-to-day business and there we are receiving a lot of feedback and we have a much clearer picture of this... The disadvantage mhh (pause) the only disadvantage that we see is of course that it would be more interesting for us to have also a technical partner but this means not renewable energy technical this means an IT partner on board because eh in a start-up business yeah in a start-up business you lose a lot of speed if you’re depending on an external IT provider. This is the only problem. |

**Table 37: Advantages in getting feedback, help, know how and learning, from the stakeholders and assurance with what you are doing**

| Snowpower (S) | KS: One advantage was that we learned a lot form potential customers… I get contacted by companies and potential customers in for instance Canada and US twice a year, different parts of Europe, and of course also Finland, Sweden, Norway. |
| SootTech (S) | ED: The customer I think that is a very natural way for me you need to have the customers involved in the beginning. You have to have them involved. You need to have them involved that is one because these are all problems you need to have customers who are interested in what you’re doing. |
| Rehact (S) | SB: The advantage is if you get some believers, then you get ambassadors who helps you to bring it to the market. |
| Ecoera (S) | DA: It is very important. Since it is a complex business model. We need many involved. It is key. |
| Exibea (S) | JO: (…) My experience is that it’s good to get as many stakeholders as possible more or less to because maybe it’s probably quite that when you’re an inventor or entrepreneur you wanna keep things to yourself and you want to have control but actually its much better if you have more people talking about what you’re doing and more people that have an interest in your company and that your company shall be successful so em ja as many |
stakeholders as possible and there are more people working in the right direction.

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<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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<tbody>
<tr>
<td>Ecotastic (G)</td>
<td>AB: Ok, let’s start with advantages obviously feedback, information, understanding your own product better, understanding what you have to do.</td>
</tr>
<tr>
<td>Solarkiosk (G)</td>
<td>SK: The advantage form that side is that we depend on them in order to be able to translate these ideas we have to transfer into reality. They are really willing to work with because they know what’s out in the world. They know exactly what is going on in the world.</td>
</tr>
<tr>
<td>Timbertower (G)</td>
<td>HG: I think in our case it was very a big advantage to go out and to present our idea to people that are not from the business in our case from the wind business that was very good because to get feedback but other people think about this idea and I think this was a big advantage.</td>
</tr>
<tr>
<td>crowdEner.gy (G)</td>
<td>PP: (...) The launch project no influence because we started and we decided when to launch and how to launch but they have a big influence, for example on innovation on the platform. We now have a clear picture of what people really need, what we need to improve, what we need to change what kind of information policy what kind of transparency all these issues which are really important in the day-to-day business and there we are receiving a lot of feedback and we have a much clearer picture of this.</td>
</tr>
<tr>
<td>Codeatelier (G)</td>
<td>JS: They are for us like a big brother for us who is doing all the stuff that we don’t like to work with like bills and whatever- normal mechanism what you have to do as the company. We can concentrate on what we are good at and this is software developing, creating creative process and not spending time on bills or whatever.</td>
</tr>
<tr>
<td>Greenpocket (G)</td>
<td>TP: It is very important to have many stakeholders and partners (...). In general you can say that there are much more advantages than disadvantages.</td>
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**Table 38: Other advantages**

<table>
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<tr>
<th>Company</th>
<th>Quote</th>
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<tr>
<td>SootTech (S) finance</td>
<td>ED: Without Chalmer’s Innovation nothing has happened there never started a pre stadium of the market and so on pre commercial studies initializing on and we haven’t been able to financing. If at the beginning the initial financing we have not been able to continue financing. Too tricky to of these small organizations to do financing to do installations and everything in parallel (...)</td>
</tr>
<tr>
<td>Bioendev (S) finance, driving force</td>
<td>AN: Financing, complementing partnerships and also the driving force. It is tough to do it alone but if you are more companies who are strong in team, it is much stronger.</td>
</tr>
<tr>
<td>Timbertower (G) publicity</td>
<td>HG: Another advantage of stakeholders was that sometimes stakeholders they’re not from the wind business they were like a wave that we were surfing on because we had so many press articles we had some television interviews, we had radio interviews and we had so many help from the press and also from the wood industry.</td>
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**Table 39: Disadvantage: Getting too much feedback**

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<thead>
<tr>
<th>Company</th>
<th>Quote</th>
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<tbody>
<tr>
<td>Rehact (S)</td>
<td>SB: The disadvantage is that everyone has an idea how to run your business. You can get too much feedback and people might think that you should do it differently and no one knows until you try it.</td>
</tr>
<tr>
<td>Bioendev (S)</td>
<td>AN: As I said if you choose too large partner, then you lose time and product can be too expensive. You lose flexibility, creativity, entrepreneurship.</td>
</tr>
<tr>
<td>Ecotastic (G)</td>
<td>AB: Disadvantages perhaps you have to be able to hear out the right things</td>
</tr>
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</table>
as well cause you’re gonna get a lot of opinions, and comments and then you have to really figure out how you’re gonna (…) filter them out correctly.

| Greenpocket (G) | TP: The point is that the more investors you have the more people you have to convince of your idea and strategy. With the team it is quite similar, if you have very good and ambitious people in your team, then you have to work on keeping them all together and you have to convince them that the company moves in the right direction. |
| Timbertower (G) | HG: No I think stakeholders, in my opinion, I think stakeholders never help you or not never but not do it so much to help you to develop your product any better or to perform better I think you are, as I speak for me, I am the expert in my of building up wood energy plant towers and a lot of stakeholders try to talk to us and gave us the ideas but the problem is they came not from the wind business. As you talk to anybody who comes from the wood business he gives you tips (laugh) it is mostly it is useless and (laugh) and so the product development is not influenced by any stakeholder in our case. |
| Codeatelier (G) | JS: The disadvantage is that… they know every bill from you. They know why you spend money. Sometimes, they ask why do you need this and this and this could be very influencing how you work. We are very lucky because they are not doing it much. The disadvantage is that you are not your own CEO of your own company. You can’t do what you want. But for us it was important to have somebody… |

| Snowpower (S) | KS: Disadvantage that it takes a lot of time. |
| Company X (S) | IX: The single most bad part of all stakeholders when comes from the start-up company is that everything takes so much time and time costs money. And especially the financial you have to triple the time that they say it takes at the beginning. I mean… (finding the word cash flow)… |
| Ecotastic (G) | AB: That’s it takes time. I wouldn’t say that it’s difficult and I don’t think it’s difficult to get them on your side I just say that it takes some time because the bigger the company, the more bureaucracy there is. |
| Solarkiosk (G) | SK: The disadvantage is for example trying to instill these ideas about regular process like how we would like them to do things in terms of reporting, communicating with us. These are things completely new for them. In the end, we have to deliver reports. So have developed business, operator, communication training in order to educate them on what’s necessary to make this successful operations. I would not necessarily say it is a disadvantage it is just a necessity. And again, we are doing it in a try and error way because nobody has done it before. (needs to educate- time-consuming) |

**Table 40: Disadvantage: Time-consuming**

**The positive and negative effects of stakeholder engagement on the cost and time of the product/service development** (Tables 41-42)

**Table 41: Engaging with stakeholders is time-consuming**

| Ecotastic (G) | AB: Its a really cool feeling, however it takes them (here: big companies) a really long time to get s* done cause there are all these legal aspects and so for us we lost a lot of time because you know you’re preparing for all these |
meetings…. you have to know what’s important to you like how much time might one stakeholder cost or not and in the end, nothing is ever guaranteed until you have it in writing so get things in writing…. And even when you’re with the person on the top they gotta check with finances and they’re got to check what are the other projects what they’re doing and you know there are all these different hurdles and they also have to look at legal aspects and until they finish all of that even one little thing could get up and you know great idea but we guess we can’t do it, so it’s just really time-consuming.

Timbertower (G) HG: Yeah nearly it is this argument is right it took us a very very long time to convince a lot of people (…) the stakeholders tried to help us to speed up because like I said the politicians were saying ok come up hurry up but it didn’t work so there I can say nowadays that the stakeholders at this time were not helping us to speed up the development.

crowdEner.gy (G) PP: No normally you are spending a lot of money and a lot of time, if you’re raising money or if you are working together with external stakeholders like you call it normally you use a lot of time. As we did everything by our own we were much more faster to do this and much more open to discuss with externals (…)

NTS (G) UA: No, but it takes a lot of time to collect money for developing new ideas. This is also what I am telling my daughters always: If you want to find out the value of money, try to get it…

UA: And business at the end is wasting of time because there is no opportunity to say: Hey, I need 5 millions to save environment and you get it. You have to find people who are financing and it takes time.

Snowpower (S) KS: There is a problem. There are a number of different organizations involved in helping start-ups and especially cleantech and there are so many of them and they have all their special application forms. It’s really a jungle and it takes so much time to keep track on all of these.

Table 42: Engaging with stakeholders is speeding up innovation

Greenpocket (G) A: Which effect did the stakeholders have on the cost and time of the product development process? TP: A big effect. It’s much easier if you have a very strong network of stakeholders, because you can ask them for support in financial terms, in terms of knowledge, and in terms of connections or partnerships. (…) as I said before, if you have a strong network of stakeholders, then everything gets much easier for your company.

A: The stakeholders also helped you to speed up the innovation? TP: Yes of course, especially our investors. They support you in thinking innovate and if necessary they help you with constructive criticism. In the end, this has a very positive effect.

Solarkiosk (G) SK: yeah, we had to move fast. Technology is changing so quickly and we really want to be pioneers in establishing these projects in rural areas and that’s our main drive and technically we have a good support, from the stakeholders…

yetu (G) CS: We did not really open up that much that it really slowed us down. It didn’t slow the process.

A: Did it rather accelerate the process? CS: Absolutely, without these stakeholders in the process we would have been slower, yes.

Company X (S) IX: I don’t know if they speeded it up. They probably have. Yes, they have. Because without them… The thing which slows it down is the lack of money
Challenges (Tables 43-47)

Table 43: Challenges in financing

<table>
<thead>
<tr>
<th>Company</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenpocket (G)</td>
<td>TP: (…) sometimes you have to ask your investors to spend more money and you have to explain them why and convince them. That might be a very serious challenge, of course, because sometimes more venture capital is the only way to grow your business successfully.</td>
</tr>
<tr>
<td>Blacksquared (G)</td>
<td>DS: A lot of big companies had to go to the clearance… That also happened to our investor. They had a bad time. They got to troubles, we got to troubles so we had to declare insolvency in 2011… At the beginning 2012, we bought back the company assets as new company from the insolvency administrator. And then worked on two years basically, sort of financing the company ourselves… Beginning of 2013, we had this crowdfunding round in Germany and in the end of 2013, we had a big investment round.</td>
</tr>
<tr>
<td>crowdEner.gy (G)</td>
<td>PP: German energy market is the most regulated market in the world so you’ll never find money from outside of Europe to invest in this kind of business it’s (…) very tough ja</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>CS: It’s really funding that is the biggest problem because (…), if you are come up with disruptive innovation which is not so close to market but maybe two or three years ahead of it, investors are very risk adverse.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>J: So was it difficult to find the funds? UA: Very difficult.</td>
</tr>
<tr>
<td>Snowpower (S)</td>
<td>Economical calculations in Sundsvall were based on 50% subsidies of the investment cost but if you included the total investment cost, it is an absolutely not economically beneficial.</td>
</tr>
<tr>
<td>SootTech (S)</td>
<td>ED: It was regarding financing. (…) financing…you must work extremely lean</td>
</tr>
<tr>
<td>Rehact (S)</td>
<td>SB: The biggest issue is financing, then getting to the market and product development.</td>
</tr>
<tr>
<td>Comfort Window System (S)</td>
<td>Note: Biggest challenge money, to get financed.</td>
</tr>
<tr>
<td>Company X (S)</td>
<td>IX: (…) the hardest side has been the financial side because when you have a start-up really from the beginning you don’t even have a functional prototype…</td>
</tr>
<tr>
<td>Exibea (S)</td>
<td>JO: Before you reach break even before you are a profitable company, the financing is always a big problem.</td>
</tr>
</tbody>
</table>

Table 44: Challenges in bringing the product to market and getting it accepted by the market

<table>
<thead>
<tr>
<th>Company</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehact (S)</td>
<td>SB: The biggest issue is financing, then getting to the market and product development.</td>
</tr>
<tr>
<td>Company X (S)</td>
<td>IX: The biggest chal (…) if you look at the technology of course there has been the challenge to work it out and when we have met the market I mean (…)</td>
</tr>
<tr>
<td>Bioendev (S)</td>
<td>The gap between idea and commercialization is huge. We describe it often as the Valley of death. It is a long way from the university idea to commercial product.</td>
</tr>
<tr>
<td>Greenpocket</td>
<td>TP: (…) the user feedback is very important for a young company. But</td>
</tr>
</tbody>
</table>

and cashflow.
sometimes it is difficult to find a reliable user group.

Exibea (S)

JO: I would say that reaching out with a product and to succeed with the communication and marketing and attract the customers and attract not only the technically interested people but also the mainstream market that is very difficult.

Timbertower (G)

A: And what about the government did you involve any stakeholders in the government or non-governmental organizations? HG: Yes, we tried to especially here in the region of Hannover to get a project site. This was the reason why we were talking to the mayor of Hannover. We talked to some ministers here in lower Saxony. And I think it was also important to these first prototype sites.

A: So at the end you got the permission so it was helpful to cooperate with them?

HG: Yes I think so because it took us nearly 4.5 years to build up the first wooden tower and I think without these (words? Work?) 33:12 and without the politicians I think it wouldn’t have worked.

NTS (G)

UA: I found out the development process that a product takes only one to two years but the release process takes about five years, so at first we started to get the release to build a test track and as I said this took five years because we had to talk to 14 different governmental institutions eh it was unbelievable.

Table 45: Challenges in controlling motions, in the case of Blacksquared GmbH: also expectations

Ecotastic (G)

AB: Main challenges is emotions right. Yeah your main challenges are gonna be the emotional human factor like sometimes you have bad days sometimes you don’t get accepted to things.

Blacksquared (G)

DS: I have given a lot of talks about failing and standing up again you know and basically the feedback I got was that a lot of the mistakes we did in the first year it’s just very very common within basically it’s like (...) we hit like every most common mistake (that you could have possibly done). (...) We were total maniacs we thought that we would grow and everything and explode and we need to like have the most biggest most secure server environment there and be like full knox.

Table 46: Country-related problems – regulations

crowdEner.gy (G)

PP: (...) never invest in regulated markets so the German energy market is the most regulated market in the world so you’ll never find money from outside of Europe to invest in this kind of business it’s (...) very tough ja.

Table 47. Challenges with business model

Écoera (S)

DA: That is to create the business model out of various sources. Because we bring together solution we have.

Why stakeholders or wider group of stakeholders were not involved (Tables 48-55)
Table 48: Industry experience, know-how, resources

<table>
<thead>
<tr>
<th>Comfort Window System (S)</th>
<th>Note: He did not involve stakeholders outside his network because he had the industry experience and know-how of the window, it is very unique and he had the most expertise because he invented it.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SootTech (S)</td>
<td>A: We just asked you about stakeholder involvement after the launch but did any stakeholders help you to launch and sell it on the market? ED: Eh no, not really the initial selling was executed by our resources and that was by me and the CEO at that time.</td>
</tr>
<tr>
<td>yetu (G)</td>
<td>A: And can you please tell us the reasons again for why at this early stage you didn’t involve any external stakeholders? CS: It was not necessary, (...)We had the idea, we had 20 years of Telekom career in the back of us and came with that idea to found the company.</td>
</tr>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: We are actually continuously keeping working on the product or on the concept so that these that external stakeholders as you are calling them are not necessary (...) I think that these very very condensed thinking has involved a (…) that quite special product that special view on the world I had like in 2011 (...)</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: “(...) there is no opportunity to say: Hey, I need 5 millions to save environment and you get it. You have to find people who are financing and it takes time. Maybe, such new ideas should be funded by government and not by private people. But yeah, as you know, in Germany we have a lot of troubles just now with renewable energies and politics (...)”</td>
</tr>
</tbody>
</table>

Table 49: Reasons related to saving time

<table>
<thead>
<tr>
<th>Ecoera (S)</th>
<th>A: Involving others would be more complex to solve this challenge? DA: It is a good point. Sometimes, I can have people wanting to help us with business development but then It is hard to explain what we are doing so and that takes time. Therefore, it is not completely worth that. Threshold is so high.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: “We have talked to a lot of people (...) I think that people have a hard time like really following the whole story so (...) it’s rather that it takes us a lot of time to actually explain people what we do more or less and then we have people who get it immediately (...) but we never really had it that we had some huge contribution from externals (...)”</td>
</tr>
<tr>
<td>Ecotastic (G)</td>
<td>AB: We did Ecotastic from our own savings (...) AB: Because it doesn’t make sense to really ask for money when you can’t showcase anything. (...) I think when you found a company there also comes the time between prioritizing. We were spending all this time applying for stuff or just to design the product. After some time we realized it’s more important to design the product and bring it out to market than hoping that someone is giving us money and we wanted to do it quick and fast and we had a few savings so we just started doing it full time (...)</td>
</tr>
</tbody>
</table>

Table 50: Problems related to the industry

| Rehact (S) - money        | A: Why have you not chosen to ask private investors, business angles, venture capitalists? SB: Yes, we did, we asked. The problem was we asked them between 2008-9 and 2008 was the beginning of the European financial or American crisis so these years were difficult times to try to raise for that kind of investors. It was difficult for private investors as well. Then, the |
feedback we got in Sweden was that they prefer to invest in ICT companies doing software - Spotify and Skype, stuff like that or also Sweden was going through quite a big change, privatization of government functions so that’s also spot where venture capitalists put the money in construction sections (…)

crowdEner.gy (G)

PP: Understand. Yeah, it is very easy. Nothing. No stakeholder. We did everything by our own. You know in Germany, start-ups and especially start-ups in renewable energy is nearly impossible to get any money from anybody or get any help from anybody. It is very easy. Haha A: Didn’t you ask any potential consumers about the development of the platform, any input, feedback? PP: Yeah, of course, we worked (…) I am a lawyer and my partner is an IT guy so we worked with external advisors how to make it and software was developed by external developer, not by myself. But as it was a very unique approach and there is no example, except maybe some US platforms. You know we needed do it by ourselves (…) I have to admit that we tried and spent a lot of time to get help, financial, logistic help but Germany again is not a country where start-ups especially for cleantech are (…) The problem is that in Germany there are venture capital (…) all the programs which we have are focused on technology but we are not technology, we are a service provider and we are not entering in all kinds of programs. We are completely off assistance, help, discussions, whatever. J: So you were trying to find stakeholders, the partners, funding and everything but help but nobody wanted to help. PP: nobody wanted to help. (…) we have a big institution in Berlin, where the company is based which is a public bank which is involved in a lot of start-up support programs and they when we launched the platform they need to close two solar industry factories in Berlin, the got bankrupt, so when we said we have here a platform which is linked with renewable energy projects they more or less they thrown off their building (laugh). This is the reality you know (…) nobody really wants to touch this.

Table 51: No availability of stakeholders

| Blacksquared GmbH (G) | A: At this stage when you hit every mistake that you could have possibly made have you also talked to other start-ups in that stage already? DS: No actually that would have been something that would have been good (…) getting back to these external stakeholders I think that would have been (…) the biggest plus or the most positive thing about Berlin and the start-up community is that there is a community so there is people you can actually meet, you meet quite often you can actually they are very willing to share their experience (…) I think that would have been very very helpful in the beginnings like in 2011 at this point of time we didn’t have the relationships into the start-up community and the community wasn’t there in this way either. So basically the Berliner start-up community was just kinda growing or kinda emerging at this time. (…)
| NTS (G)            | UA: Yes, we are member of the BWE (Bundesverband Wind Energy) but of course they are not, at the end they are funded by conventional wind turbine producers so you can imagine that it is not the first business to help new technology which is cheaper and more effective and so on. So we founded our own Bundesverband VHWE. You can google it too. And one of my co-founders is now the president of the Bundesverband. |
**Table 52: Being rejected by stakeholders because something is very new and may involve risks**

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacksquared GmbH (G)</td>
<td>DS: I know that a lot of people (…) said that this marketplace is never gonna work (…) the moment you try something new or you do things different you get a lot of that´s not gonna work and you get a lot of nos and so I think they were basically it was (…) kind of like just working on or believing in what you think is right and just doing it.</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: We also talked to (…) oh I don’t know if I know the translation of Stadtwerke, ehm, the same situation and I can understand it because the CEO of the Stadtwerke is not a risk manager he is eh responsible for supplying safe energies, so they are not venture capital, so that´se the reason we haven’t had any opportunities to do it together with Stadtwerke.</td>
</tr>
</tbody>
</table>

**Table 53: The business and product are not sufficiently developed yet**

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timbertower GmbH (G)</td>
<td>HG: (…) I think before founding the company business tower we worked on this project for 2 or 3 years but besides and very tiny time and I think nobody was thinking at this time to involve anybody because it was a side project. (…)</td>
</tr>
<tr>
<td>NTS (G)</td>
<td>UA: We tried to (…) no we did it, we talked to the CEOs of the big five German energy suppliers like RWE, ENBW, and so on but if I (...) but all of these companies haven’t been interested they say “come back if you have one serial plant”</td>
</tr>
</tbody>
</table>

**Table 54: Problem related to the capability of the stakeholder**

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>crowdEner.gy (G)</td>
<td>PP: (…)We have a good relationship with XXX. We are their neighbors on Oliver campus but you know a little bit what is XXX: It is one of these institution which the governments or big players establish to do something but not really to do anything. Haha. They are greenwashing institution. They are nice guys, they spend a lot of money, they are paying good salaries but they are doing nothing. They can’t help you. Nothing. They are involved in a lot of projects but no projects by now is done or worked…</td>
</tr>
</tbody>
</table>

**Table 55: Not involving too many stakeholders**

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>crowdEner.gy (G)</td>
<td>(…) I did a lot of start-ups before and the worst thing you could do is to have too much stakeholders on board and personally I would never invest my money in a company with a lot of stakeholders involved and the feedback which I am receiving from other start-ups (slight laugh) or other friends of mine who at the end of the day for reason of money accepted the the entrance of investors or other stakeholders, they they they say exactly the same you know em. It’s a very problematic situation. But probably it’s a German problem.</td>
</tr>
</tbody>
</table>

**When and why a company is involving many stakeholders and a variety of stakeholders** (Table 56)

<table>
<thead>
<tr>
<th>Company</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenpocket (G)</td>
<td>A: It is very important to have many stakeholders and partners, because otherwise you might get lost (laugh). You have to be connected to your market and to all the people that are important to you.</td>
</tr>
</tbody>
</table>
Exibea (S) | JO: (…) My experience is that it’s good to get as many stakeholders as possible more or less to because maybe it’s probably quite that when you’re an inventor or entrepreneur you wanna keep things to yourself and you want to have control but actually it’s much better if you have more people talking about what you’re doing and more people that have an interest in your company and that your company shall be successful so em ja a as many stakeholders as possible and there are more people working in the right direction.

Ecoera (S) | DA: It is very important. Since it is a complex business model. We need many involved. It is key.

Bioendev (S) | AN: If we will succeed we will succeed mainly because the mix of stakeholders are so excellent. We have the university, the university scientists, we have the institute, we have unimova we have processum biorefinery initiative which helps a lot we have the networks between the universities and the institutes. We have the government, the local authorities, very strong support from Umea Energi who is owned by umea kommun. We have the state support the energy agency. Of course on top. J: Important is you said: The more stakeholders, the more important it is and the better probability to survive the valley of death, right? AN: (…) It is a new industrialization. We are going to expand/convert the traditional forest and pulp and paper industry to something else (biorefinery) and to make the shift, you need stakeholders from everywhere. It is also the environment, the carbon problem. It is not done. Not even EU can unite, not even Sweden can unite (…). To do that shift, we need to have a lot of stakeholders.

Rehact (S) | SB: It is a connective thing that all the stakeholders together have helped building the company and the company has now much better resources… Many things we are doing now would not be able to do if we haven’t involved the stakeholders. It would be still Jerzey and me trying to get somewhere. A: Could you give us some examples of the things you meant? SB: It is like spider’s web. It is like building a wall. The first bricks are so important but they are not bigger than the bricks on top. So getting the recognition from WWF was extremely important for us and that helps spin off a lot of other things - getting to the incubator- that helped the finance- that helped to the public offering which helps too. It is a series of events. It is difficult to say what would happen if one of them would not happen but the start of WWF was the most important for us. It was like the starting point of public recognition.
## Appendix 5: Stakeholder engagement in different phases

<table>
<thead>
<tr>
<th>Idea development</th>
<th>Product Development</th>
<th>Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business</strong></td>
<td><strong>Product</strong></td>
<td><strong>Testing</strong></td>
</tr>
<tr>
<td>Family and friends</td>
<td>Ecostatic, crowdfund.ge</td>
<td>Ecostatic</td>
</tr>
<tr>
<td>University</td>
<td>Ecostatic, Greenpocket</td>
<td>Greenpocket, yetu</td>
</tr>
<tr>
<td>Incubators</td>
<td>Ecostatic</td>
<td>Ecostatic</td>
</tr>
<tr>
<td>Business competition</td>
<td>Timbertower</td>
<td>Codemaster</td>
</tr>
<tr>
<td>Users</td>
<td>Ecostatic, Solarislook</td>
<td>yetu, Ecostatic, Solarislook, Greenpocket, Codemaster, yeti</td>
</tr>
<tr>
<td>Customers</td>
<td>Greenpocket</td>
<td>Greenpocket, yeti</td>
</tr>
<tr>
<td>Partners</td>
<td>Solarislook, Blacksquare</td>
<td>Codemaster</td>
</tr>
<tr>
<td>Consultants, potential competitors</td>
<td>yetu</td>
<td></td>
</tr>
<tr>
<td>Business angel</td>
<td>Codemaster</td>
<td></td>
</tr>
<tr>
<td><strong>Financial resources given</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventors</td>
<td>Greenpocket, Solarislook, Timbertower, NTS, Blacksquare</td>
<td>Solarislook</td>
</tr>
<tr>
<td>Partners/Custaders</td>
<td>Codemaster, Ecostatic</td>
<td>Ecostatic</td>
</tr>
<tr>
<td>Bank</td>
<td>Timbertower</td>
<td></td>
</tr>
<tr>
<td>Shareholders</td>
<td>Solarislook, NTS, crowdfund.ge</td>
<td></td>
</tr>
<tr>
<td>Customer</td>
<td>Codemaster</td>
<td>Codemaster</td>
</tr>
<tr>
<td>Governments, Administrative centres</td>
<td>yetu, NTS, Solarislook</td>
<td></td>
</tr>
<tr>
<td><strong>Technical developers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>Greenpocket, Timbertower, NTS, yeti</td>
<td></td>
</tr>
<tr>
<td>Freelancers</td>
<td>Greenpocket, Blacksquare, crowdfund.ge</td>
<td></td>
</tr>
<tr>
<td>Suppliers, customers, other partners</td>
<td>Ecostatic, Codemaster</td>
<td>Greenpocket, Timbertower, Codemaster, Solarislook, NTS</td>
</tr>
<tr>
<td>Institutions, Tech centres</td>
<td>NTS, yeti</td>
<td></td>
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<tr>
<td><strong>Promoters</strong></td>
<td></td>
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</tr>
<tr>
<td>Media</td>
<td>Greenpocket, yetu, Timbertower</td>
<td>Timbertower</td>
</tr>
<tr>
<td>Rewards, competitions</td>
<td>Greenpocket, Codemaster, yetu, Ecostatic</td>
<td>Greenpocket</td>
</tr>
<tr>
<td>Politicians</td>
<td>Timbertower</td>
<td>Timbertower</td>
</tr>
<tr>
<td>Partners</td>
<td>Blacksquare</td>
<td></td>
</tr>
<tr>
<td><strong>Team</strong></td>
<td></td>
<td></td>
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<td></td>
<td>Ecostatic, Blacksquare, Greenpocket, Timbertower, yetu</td>
<td>Blacksquare, NTS</td>
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### Stakeholders engaged in Germany

<table>
<thead>
<tr>
<th>Idea development</th>
<th>Product Development</th>
<th>Launch</th>
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<tbody>
<tr>
<td><strong>Business</strong></td>
<td><strong>Product</strong></td>
<td><strong>Testing</strong></td>
</tr>
<tr>
<td>Family and friends</td>
<td>Snowpower, CX, Ecosia</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>Snowpower, Ecosia</td>
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<tr>
<td>Business competition</td>
<td>Snowpower, CX</td>
<td></td>
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<tr>
<td>Incubators</td>
<td>Scotttech, CX, Biosonde</td>
<td>Snowpower, Scotttech, Robo, Ecosia, CX, Ecosia, Biosonde</td>
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<tr>
<td>Users</td>
<td>CX</td>
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<td>Customers</td>
<td>Robo, Ecosia</td>
<td>Scotttech, Robo, Ecosia, CX, Ecosia</td>
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<tr>
<td>Business angel</td>
<td>Snowpower, Scotttech, CX</td>
<td>Snowpower</td>
</tr>
<tr>
<td><strong>Financial resources providers</strong></td>
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<tr>
<td>Customers</td>
<td>Scotttech</td>
<td></td>
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<tr>
<td>Business angel</td>
<td>Snowpower, Scotttech, CX</td>
<td>Snowpower</td>
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<tr>
<td>Bank, Venture capital</td>
<td>CX</td>
<td>CX</td>
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<tr>
<td>Shareholders</td>
<td>Robo, Ecosia</td>
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<tr>
<td>Venture capital</td>
<td>CX</td>
<td></td>
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<tr>
<td>Governments, Administrative centres</td>
<td>Snowpower</td>
<td>Robo, Ecosia, Comfort W.S., CX, Ecosia, Biosonde</td>
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<tr>
<td><strong>Technical developers</strong></td>
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<td>University</td>
<td>Ecosia</td>
<td>Scotttech, Robo</td>
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<td>Research institutes</td>
<td>Ecosia</td>
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<td>Suppliers, customers, other partners</td>
<td>CX, Ecosia</td>
<td>CX</td>
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<tr>
<td>Clusters</td>
<td>Robo</td>
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<td><strong>Promoters</strong></td>
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<td>Media</td>
<td>Ecosia, Robo</td>
<td>Ecosia</td>
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<td>Rewards, competitions</td>
<td>Robo, Ecosia</td>
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<td>Politicians</td>
<td>Ecosia, Biosonde</td>
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<td><strong>Team</strong></td>
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<tr>
<td></td>
<td>Scotttech, Robo, Comfort W.S., BIOSONDE</td>
<td>Comfort W.S., BIOSONDE, Biosonde</td>
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<td>Appendix 6: Results summary of the German start-ups</td>
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<td>---------------------------------------------------</td>
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<tr>
<td>Personal experience</td>
<td>Personal experience</td>
<td>Family and friends</td>
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<tr>
<td><strong>Idea initiation</strong></td>
<td>Seeing a problem and opportunity</td>
<td>Seeing a problem and opportunity</td>
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<tr>
<td><strong>Why business started</strong></td>
<td>Business opportunity</td>
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<tr>
<td><strong>Motivation</strong></td>
<td>Sustainable motivation</td>
<td>Sustainable motivation</td>
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<tr>
<td><strong>Level of Proactivity</strong></td>
<td>Increasing contact from stakeholders</td>
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<tr>
<td><strong>Relationship to stakeholders</strong></td>
<td>Good</td>
<td>Good; functional</td>
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<tr>
<td><strong>Role of secrecy</strong></td>
<td>Change in time</td>
<td>Secrecy not crucial</td>
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<tr>
<td><strong>Advantages</strong></td>
<td>Feedback; help; learning; know how; publicity</td>
<td>Feedback; help; learning; know how</td>
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<tr>
<td><strong>Disadvantages</strong></td>
<td>Too much feedback</td>
<td>Time consuming</td>
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<tr>
<td><strong>Positive/ negative effects - cost and time</strong></td>
<td>Time consuming</td>
<td>Speeding up innovation</td>
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<tr>
<td><strong>Challenges</strong></td>
<td>Bringing the product to the market</td>
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<tr>
<td><strong>When and why no stakeholders</strong></td>
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<td>-</td>
</tr>
<tr>
<td><strong>When and why many/variety</strong></td>
<td>-</td>
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<tr>
<td>Results summary of the Swedish start-ups</td>
<td>Bioendev AB</td>
<td>SooTech</td>
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<tr>
<td>------------------------------------------</td>
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<tr>
<td>Influences business creation</td>
<td>People in the industry; education; the environment</td>
<td>People in the industry</td>
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<tr>
<td>Idea initiation</td>
<td>Seeing a problem and opportunity</td>
<td>Industry experience</td>
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<tr>
<td>Why business started</td>
<td>-</td>
<td>Business opportunity</td>
</tr>
<tr>
<td>Motivation</td>
<td>Personal motivation</td>
<td>Personal motivation</td>
</tr>
<tr>
<td>Sustainability/profit driven</td>
<td>More sustainability</td>
<td>Challenge to do something</td>
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<tr>
<td>Level of Proactivity</td>
<td>Equal</td>
<td>Company proactive</td>
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<tr>
<td>Relationship to stakeholders</td>
<td>Good; close; chemistry; stakeholders enthusiasts</td>
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<tr>
<td>Role of secrecy</td>
<td>Change in time</td>
<td>-</td>
</tr>
<tr>
<td>Advantages</td>
<td>Finance; driving force</td>
<td>Feedback, help, learning, know how, finance</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Too much feedback</td>
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<tr>
<td>Positive/ negative effects - cost and time</td>
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<tr>
<td>Challenges</td>
<td>Bringing product to the market</td>
<td>Financing</td>
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<tr>
<td>When and why no stakeholders</td>
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<td>Industry experience; know-how; resources</td>
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<tr>
<td>When and why many/variety</td>
<td>Variety, to make a shift</td>
<td>Business model, complexity</td>
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