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Internationalisation paths for a cleantech start-up prospecting to take a
circular idea into the international market

An explorative case study of a Swedish cleantech company

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Abstract

Throughout history, there have been several theories conducted regarding the internationalisation process, perhaps the majority concerning the traditional company. However, this degree project focuses on the applicability of internationalisation theories in regards to cleantech start-ups with circular ideas, hence a fundamental shift from the traditional linear business model. By conducting qualitative interviews with a cleantech company and a potential client company, this degree project evaluates the internationalisation paths and bundles suitable for a cleantech start-up aiming to enter the international market arena. The results show the prominent path to be that of expanding together with an international company. Along with the prominent internationalisation path, a unique combination of the Uppsala model and the network theory is presented combining less risks and mutual benefits for the two parties involved. Further, two other internationalisation bundles are proposed in case an international company cannot be accessed; the bundles consist of one with a short-term perspective and the other with a long-term perspective. To conclude, one can regard that even though the selected internationalisation theories are traditional by nature, they provide a solid base which indeed can be used to recognise patterns in a more recently created company if the theories can be modified somehow to fit the circular ideas of the company.

Keywords: Circular economy, circular business model, cleantech, internationalisation, start-up, small-sized company, the Uppsala model, the network theory, the resource-based view

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1 Introduction

This chapter contains an introduction to the research field of the degree project. This is followed by both a theoretical problematisation, outlining the observed research gaps, and a practical problematisation, stressing the necessity to internationalise clean technology, aiming to achieve more circularity at the global level. Finally, the end of the current chapter discusses the purpose of the research and presents the research question, which serves as the foundation for the analysis, aiming to meet the purpose.

1.1 Background

As for today, both global warming and environmental concerns are stressed more or less all around the world. Global warming is a term describing the recent rise in temperature, which increases far beyond what many ecosystems can adhere to (Birken, Muscheler, von Post, Johansson & Rummukainen, 2019). This can be described by a broad range of factors, for instance, poor waste management, and processes leading to harmful emissions in the atmosphere, which contribute to the rising temperature around the globe (European Environment Agency, 2014).

If solely looking at Europe, according to a paper published by the European Environment Agency (2014), the continent produces much waste, including everything from food waste, to technological waste, construction and demolition waste, industrial waste, and mining waste. The agency further states that all these wasted materials are directly related to the modern-day production and consumption patterns. There are not solely private individuals contributing to the unsustainable consumption patterns and the waste generation, Persson (2020) states that if looking at the global freshwater, approximately twenty percent of it is consumed by the industries, while there currently is a global water shortage. Further, water.org (n.d.) stresses that, among private individuals worldwide, one in nine lack access to clean water. By 2040, Persson (2020) states that the worldwide demand for industrial water is estimated to be double the current demand. Hence, he further argues that the companies need to become more self-sustaining, which includes not to consume water in an unsustainable manner and thereby increase the water shortage among humans.

If waste could be regarded as a resource, the acquisitions of new resources could be scaled down and thereby some of the negative impacts that otherwise could occur down the production and consumption chains could be reduced (European Environment Agency, 2014). Regarding waste as a resource that could be reused, is a prerequisite for implementing a circular approach (European Environment Agency, 2014; Ellen MacArthur Foundation, 2018). A circular approach would mean that companies transition from solely focusing on the product life cycle from production to the selling point, and instead consider all aspects of the product life cycle, which is from the acquisition of raw material to the end-of-life management (Ellen MacArthur Foundation, 2018). The circular economy, resulting from circular approaches, is argued by Bocken, Geissdoerfer, Hultink and Savaget (2017) to be based on a regenerative design with a significant decrease in waste, emissions and resource use. This is explained by the authors to result from, for instance, more efficient use of resources and through the usage of energy loops which maximises the energy usage as efficiently as possible.

Helios Innovations is a company that strives to reduce the global water shortage by desalinating saltwater using waste heat from the heavy industry, as described in an interview with the chief executive officer. The chief executive officer further states that in general, the heavy industry is not utilising all the resources that the factories are producing. Namely, many resources are leftover in the form of waste heat, which contains a large amount of energy. Thus, as described in the interview, Helios Innovations can help companies operating in the heavy industry to become more self-sustaining and circular in their production chain and business model, as the company uses this residual waste heat produced to heat up, and desalinate saltwater. In that sense, the waste heat created by companies in heavy industry is explained by the chief executive officer to be considered a key resource for Helios Innovations. Moreover, as given in the interview, if using Helios Innovations technology, the companies do not need to waste their excessed heat, but would rather use it to receive clean water necessary for their operations, without over-consuming the freshwater that private individuals demand.

Furthermore, water.org (n.d.) states that the water scarcity is of high worldwide relevance, and as Jonatan Persson (2020), the chief executive officer at Helios Innovations, states, more

than two billion people lack access to clean water. Water.org (n.d.) argues that the access to clean water has the prospect of opening up new potentials at the global level. The organisation further states that these include increasing global health and enabling people to have time for work and school, which mainly refers to women as they, in some regions, have the responsibility to find water daily. As the need for clean water continues to grow globally by both people and industries, the need for water handling using technological innovations is becoming more and more important (Government of Sweden, n.d.). In order to secure the water supply, significant investments are needed on a global scale to meet the challenges caused by climate change (Business Sweden, n.d.). In conclusion, since there is a global demand for fresh, safe, and clean water, it becomes essential for companies with desalination methods, like Helios Innovations, to internationalise in order to increase the water supply on the global level.

1.2 Problematisation

1.2.1 Theoretical problematisation

Throughout history, many theories have been conducted to discuss the internationalisation process of companies. One example is the Uppsala model, explaining the incremental internationalisation process, where one step constitutes the next as the international market entails a high degree of uncertainty (Johanson & Vahlne, 1977). To reduce the level of uncertainty, the authors suggest that a company should expand to a country where the psychic distance is low, that is to a country where the differences to the home market are as few and small as possible. Further, the network theory stresses the importance of establishing business networks with foreign partners in the internationalisation process of a company, stating that the coordination between companies can be very beneficial for both sides in their expansion to the foreign markets (Johanson & Mattsson, 1988). One could also regard the resource-based view in an internationalisation context, where the internationalisation decisions depend on the bundle of resources and capabilities held by the company (Barney, 1991; Peteraf, 1993).

According to Montagova (2018), the most prominent and well-known internationalisation theories solely regard the traditional company, and hence not the novel types of companies.

One type of company that offers a significantly different product than the traditional company is the clean technology, henceforth cleantech, company. Bjornali and Ellingsen (2014) describe it to be the kind of company delivering a product that provides value while still using either a limited amount, or no nonrenewable resources, and generates less waste than traditional companies. Further, cleantech companies are described to use resources in a more effective manner (Swedish Cleantech, 2019), which Webster (2015) states is the act of being circular, to constantly keep all resources at their highest value and productivity.

Bjornali and Ellingsen (2014) describe that cleantech companies, with their environmentally-friendly solutions, have a high international potential. However, the authors argue that there is a lack of concrete research regarding the internationalisation process of cleantech start-ups. They also suggest that future research should investigate the appropriateness of different internationalisation theories in regards to the internationalisation process of cleantech companies, as there have been few attempts to address this. In relation to this, Andersson (2005) states that the suitability of the internationalisation theories depends on the specific contexts of the industry in which the company is embedded. Further, according to Montagova (2018), there is a lack of research regarding the internationalisation process of small-sized companies in general. Since there both is a general lack of research regarding cleantech companies per se, and theoretical applicability in their internationalisation process (Bjornali & Ellingsen, 2014), it is interesting to further investigate the nature of the rather unexplored cleantech company in regards to internationalisation theories.

1.2.2 Practical problematisation

As the global environmental footprint of the business is growing all around the world, changing the old business models becomes essential (United Nations, n.d. a). In modern times, the world is in a threatening condition as the average temperature is continuously rising (NASA, n.d.; Birken et al. 2019). This entails a demand for cleantech companies to emerge, as they, according to Cleantech Scandinavia (n.d.) are aiming to solve some of the climate change-related problems the world is currently facing. Furthermore, as Bocken et al. (2017) argue, by enhancing circularity and circular energy loops, the emissions and wasteful use of resources are heavily decreased.

As stated in the interview with Helios Innovations, industries are consuming a large amount of water, a resource that is also demanded by individuals around the world who can receive better access to the clean water if the industries could become more circular and self-sustaining in their water management. In regards to the global water shortage, there is a need for new technologies to solve the issue (Government of Sweden, n.d.), as a large number of people are suffering from not having access to clean water (Government of Sweden, n.d.; water.org, n.d.). Furthermore, the United Nations (n.d. b) argues with their sustainable development goal number six that the world should ensure clean water for everyone. The organisation also stresses that the current COVID-19 outbreak has further underlined the critical importance of solving the issue of the global water shortage, as individuals need clean water in order to be hygienic and prevent the spreading of different viruses. Thus, there is an excessive need to expand recently invented technologies that can solve the issue to the global market (Government of Sweden, n.d.). In that regard, the recognised practical problem is how to conduct an appropriate internationalisation path, for a circular, cleantech start-up aiming to solve a global problem.

Regarding the internationalisation path, there are, as mentioned in the theoretical problematisation, many different opinions on the best method to utilise. It has previously been argued that cooperation, in terms of networks between governments and companies, potentially can solve pressing environmental issues (Geffen, Marcus & Sexton 2002). Further, Westman (2020) argues that in order to achieve the goals of Agenda 2030, connection and cooperation between countries are necessary where, for instance, Sweden can contribute with its experience in some regards. Thus, cooperation on different levels has shown the potential to be profitable in environmental work. Having this in mind, this degree project will evaluate if networks and cooperation likewise is profitable at the company level in solving the global environmental issues of water scarcity. That is, internationalising technology that can potentially act as a solution to the global issue of water scarcity. Alternatively, if the technology should be internationalised incrementally or through the resources the company possesses.

1.3 Research purpose

The purpose of this degree project is to contribute to the existing research on internationalisation paths for small-sized, cleantech companies with circular ideas.

1.4 Research question

What would be an internationalisation path or bundle for a cleantech company with a circular idea, considering the specific characteristics held by cleantech companies and the associated market factors?

1.5 Delimitations

Due to the limitation in both time aspects and scope of the degree project course in International Business, the degree project could only focus on a few internationalisation theories rather than a range of different ones. If this degree project would evaluate more theories, given the course requirements, it could violate both the depth and the quality of the analysis. Furthermore, the degree project will only focus on one cleantech company, whereas one could argue that in case it looked into other cleantech companies as well, a more accurate answer to the research question could have been reached since more companies are evaluated, and also within different fields of cleantech. However, due to the current COVID-19 virus, it is hard to reach more companies as this situation naturally causes much uncertainty, leading to more work directed towards the core business of companies in the workplace atmosphere, and less work directed towards interviews with students. However, one could also argue that it is profitable to limit this degree project to only regard one company in the sense of more in-depth interviews, contributing to a significant understanding of the researched company.

Further, the degree project will be limited to regard the part of cleantech that regards resource optimisation and energy efficiency. The theories regarded will include the Uppsala model, the network theory and the resource-based view. This is due to the scope of this degree project, which limits the word count. However, this leaves more research possibilities in the future, which will be further touched upon in the analysis and discussion chapter.

1.6 Disposition

This degree project starts with the introductory, chapter one, stating the background and the importance of the degree project. Further, chapter two highlights the theoretical concepts and models used to conduct the interviews and the analysis. Chapter three discusses the method used to write the degree project. In chapter four, the results given from the interviews with the researched company and its potential client company are presented. Chapter five analyse and discuss the interview materials together with the theories presented in chapter two and suggest opportunities for future research. Finally, chapter six concludes the project, expressing the main findings drawn from this research project.

2 Literature and theoretical review

The current chapter begins by discussing, through a literature review, different concepts, and theories necessary to conduct this degree project. The literature concerns the circular economy, the circular business model, cleantech companies, and research on the internationalisation process of cleantech small- and medium-sized companies, henceforth SMEs. The theories presented are the Uppsala model, the network theory, and the resource-based view in an internationalisation context, which all will be analysed in order to answer the defined research question. However, the internationalisation of cleantech SMEs will, throughout the paper, be used as a guide for the company in preparation for its internationalisation process, rather than be critically evaluated in the same manner as the above-mentioned theories.

2.1 Circularity

2.1.1 The circular economy

The concept of the circular economy has increased in popularity since the 1970s (Ellen MacArthur Foundation, 2013). One of the early pioneers of the circular economy was Commoner who, with his book “The Closing Circle” published in 1971 (cited in Scott, 1973), argues about the law of ecology. The article further described that Commoner argued that all natural systems are looped and that everything transitions into something else as the resources in nature never go away. In regards to this, Commoner proposes that all affairs within the economy should be organised in accordance with nature, as cited in Scott. Later research has further invested in the concept of a circular economy, with, for instance, one astonishing framework called the cradle-to-cradle model by McDonough and Braungart (2002). According to them, a resource design should be implemented so that resources or products can nourish something new after having a useful life.

Ellen MacArthur Foundation (p. 7, 2013) describes the circular economy as “restorative or regenerative by intention and design”, and Webster (2015) adds that a circular economy aims to keep all resources, at all times, at their highest value and productivity. Ellen MacArthur Foundation (2013) further argues that, within a circular economy, the end-of-life phase for a product or resource should be followed by restoration, which facilitates reuse, and can

eliminate waste through designing a circular way of using materials, resources and systems. Moreover, Yuan, Bi and Moriguichi (2006) state that the resources within a circular economy always entails a closed-loop system within multiple phases. There is further a time aspect when regarding the circular economy as Bocken, de Pauw, Bakker and van der Grinten (2016) describe the circular economy to be closing the loops of resources as well as slowing down the material use.

2.1.2 The circular business model

Osterwalder and Pigneur (2010) argue that the business model is the fundamental rationale describing the way a company creates, delivers and captures value. The circular business model, on the other hand, is described by OECD (2018) to be a fundamental shift in production and consumption patterns. Further, the organisation states that a circular business model holds the potential to drive the transition to the circular economy.

Hofmann, Jokinen and Marwede (2017) argue that the circular business model is the method used by companies to create and deliver value to its various stakeholders while at the same time reducing ecological and social costs. The latter concept is further discussed by OECD (2018), claiming that the transition to circular business models can reduce the environmental footprint caused by the unsustainable production and consumption patterns in the economy. Zero Waste Scotland (n.d.) further adds that at the same time, the life length of products and materials need to be restored in order to utilise their maximum value. OECD (2018) states that the purpose of the circular business model is to decrease the generation of industrial and consumer waste by using pre-existing materials and products as inputs rather than acquiring new natural resources. Further, both OECD (2018) and Hofmann, Jokinen and Marwede (2017) argue that in order to implement a circular business model, a fundamental change in the way of thinking is required to drive the transition towards using resources in an efficient manner and reduce the negative environmental impact resulting from economic activities.

Hofmann, Jokinen and Marwede (2017) present a framework of business model strategies for companies with the objective to slow and close resource loops. Another eminent framework developed for companies in the transition from linear business models to circular business

models is proposed by Ellen MacArthur Foundation (2015), namely the reSOLVE framework. Ellen MacArthur Foundation explains that the reSOLVE framework describes six areas that companies can manage in order to enhance circular strategies. The areas presented by the foundation include ‘regenerate, share, optimise, loop, virtualise and exchange’ (p.21). Iyer-Raniga (2019) further investigates the practical applicability of the reSOLVE framework, concluding that none of the six areas could properly be demonstrated by the five studied practical examples in her research. The author further states that none of the cases could demonstrate the exchange area. She further states that this can be partly explained by the disruptive business models needed for excessive engagement in innovation. Regarding other areas, the different cases analysed in her research showed that they indeed could demonstrate other reSOLVE areas. However, the author further adds that in order to fulfil the demonstration of some areas, either reskilling or upskilling is required for employees and processes in order to use new materials, or reuse materials.

2.2 Clean technology

According to Caprotti (2011), cleantech is a newly emerged business field initiated in the beginning of 2000s, and as a newly emerged term, it lacks a concrete definition. However, he defined it as “... spanning a wide range of environmental technologies and processes, including renewable energy, nanotechnologies, energy efficiency and storage, materials, and other technologies and industrial processes” (p. 370). The objectives of cleantech products and services are to reduce or eliminate the environmental impact and to create environmental benefits by protecting the ecosystem (Cleantech Scandinavia, n.d.). Namely, the cleantech companies intend to respond to environmental problems by technological, business solutions (Caprotti, 2011).

According to Asemokha, Keränen, Rissanen, Saarenko, Salojärvi, Torkkeli and Uzhegova (2018), as written in their internationalisation handbook for cleantech SMEs, cleantech cannot be specified as a certain branch within an industry, but rather applied as a category covering eight different industries. The authors argue examples of these industries to include air and environment, clean energy, energy efficiency, energy storage, transportation, and water. The handbook further claims that, unlike regular SMEs, cleantech SMEs depend on

finding new ways to develop both environmentally and economically offerings and exhibit the benefits of their offerings, which, for instance, can be customer value or that the offerings are less expensive from a long-term perspective. Within the last decade, the cleantech phenomenon is growing at a fast pace, resulting in the emergence of new cleantech companies in many different countries (Caprotti, 2011). Furthermore, many companies nowadays are adopting cleantech in order to comply with government regulations and to improve their image in public (Del Río González, 2005).

2.3 Internationalisation of cleantech small- and medium-sized companies

Asemokha et al. (2018) present an internationalisation handbook for SMEs. The handbook studies cleantech companies, where the respondents are companies particularly within the energy and resource efficiency industry which constitute 38 percent of the respondents, followed by 15 percent of companies from the clean web and internet of things industry, and the as well as 15 percent from the renewable sources of energy and smart grid industry. According to the authors, the cleantech companies mostly face the challenge of acquiring sufficient fundings when operating in the international market, and the capital is the main source enabling the desired growth prospects in the international market. Another challenge the handbook discusses that cleantech companies face within the international market is the presence of more dynamic competition, and the fact that the international market demands appropriate marketing. Regarding the success factors faced by cleantech companies operating in the international market that are discussed in the handbook, the cleantech companies that succeed in the foreign market face a demand in the international market that are higher than expected. Moreover, if the competitive abilities of a company are higher than those of its competitors, that would also lead to a significant success.

When generally looking at SMEs, Asemokha et al. (2018) present four major obstacles for internationalisation. The first challenge discussed in the handbook is that the general market risk is a present challenge, which includes the distance between the home and the target market in terms of culture, quality of competition, language differences, finding appropriate distributors, and further differences in how the trade is performed. According to the authors, the general market risk is especially present in the internationalisation of cleantech companies

if regulations imply that the company is required to find a distributor at a fast pace. Secondly, the handbook states that the political risks are also present in the internationalisation of SMEs, which include administrative challenges, bureaucracy and politics in a foreign market, regulation in the foreign market that increase the obstacle to export to that market, large rates for tariffs and taxes. In regards to cleantech companies, the handbook argues that the political risks are foremost present if there is a change in regulation in a foreign, targeted market, and further in general uncertainty within the political environment as well as if the market for cleantech companies is underdeveloped in a certain market.

According to Asemokha et al. (2018), SMEs also face commercial risks, which are related to currency risks, risks regarding contracts and resolutions, the risk for corrupt markets, uncertainty concerning funding, and delays in both the delivery and distribution channels. As previously stated, the risk of not receiving sufficient funding is a present risk affecting the growth of cleantech companies in their internationalisation process, and that is the major commercial risk in their internationalisation process as proposed in the handbook. Finally, in the authors stresses the presence of internal challenges, referring to the high internationalisation costs, the need for adapting the product and the service portfolio to the foreign, target market, when investments by executives in managing the international growth is not sufficient, lack in regards to language skills, and difficulties in identifying customers, partners and mere business opportunities in the targeted market. In regards to cleantech companies, the handbook discusses that the main internal obstacles refers to the business models being too strict, which may be a disadvantage in the internationalisation process and the companies could hence require innovative business models and be dynamic in managing change in order to succeed in the internationalisation process.

Asemokha et al. (2018) further discuss different ways to meet these challenges. These are described to involve the ability to make fast decisions in the entrance process, reacting quickly to regulatory reforms in the prospected market, and obtaining experience before entering a targeted market, which is especially important if large cultural differences are present. The handbook discusses that a potential way to obtain experience could be to acquire new personnel with knowledge about the specific market or have executives that are experienced in international business. However, the authors also discuss that the cleantech

company must be able to enter a targeted market, even when there is a lack of sufficient information.

Other key ways to manage the challenges are presented by Asemokha et al. (2018), including to justify the fundamental business model of a company and present these propositions externally in an attractive manner, and to be dynamic in business model innovation as the entrance process may require the value proposition to adapt to fit the new market. In order to manage uncertainty in different markets, the handbook proposes that cleantech companies should continuously analyse the foreign market on potential partners or distributors and in advance, establish a network with them. Further, Asemokha et al. (2018) established a self-assessment tool in regards to the 'readiness' of internationalisation, that cleantech companies can use before they decide whether to internationalise or not.

2.4 Internationalisation theories

2.4.1 The Uppsala model

The original version of the Uppsala model, developed by Johanson and Vahlne (1977) describes the internationalisation process that companies undertake when expanding activities to the international market. The authors state that the internationalisation process results from incremental decisions, where one decision constitutes the next. Further, they discuss how uncertainty is central in the internationalisation model, as performing activities abroad equals a high degree of uncertainty for companies. Thus, in regards to the high degree of uncertainty, the companies should engage in gradual internationalisation (Johanson & Vahlne, 1977).

Further, Johanson and Vahlne (1977) explain the reasons behind why companies choose to expand to certain countries as the phenomena of psychic distance is presented. According to them, the psychic distance can be described as a summation of the differences between a company's home country and a certain foreign country. Johanson and Vahlne (1977) further argue that a company will choose to internationalise to a market which the company has information about and where the degree of psychic distance is low, that is a country sharing as many similarities and as a few differences as possible, in regards to the home country of the company. Regarding information, the authors claim that the more knowledge a company

has about a certain market, the more committed the company is to that particular market, and the same holds the other way around.

Different studies have been performed in order to evaluate the accuracy of the Uppsala model in different regards. Kubičková (2013) believes that the Uppsala model is not accurate as a general theory for all companies, as the Uppsala model does not consider the phenomenon of born globals, that is companies that internationalise soon or immediately after their founding. In regards to this, the authors state that in the study of SMEs, a significant representation of the companies in the case study do not perform incremental internationalisation, but rather started a rapid internationalisation after the foundation. Hence, the shortcomings of the Uppsala model are present at times. Moreover, Zohari (2008) raises the critical point that the Uppsala model does not regard the external environments of a company. This is further supported by UKEssays (2018), discussing the failure of the Uppsala model to consider the market-specific environments as well as the specific characteristics in the targeted country, which include economies of scale, regulations by governments and the relative intensity of research and development.

2.4.2 The network theory and its role in the internationalisation process of the company

The studies concerning network theory were brought up during the second half of the 1980s by Johanson and Mattsson (1986) and by Johanson and Vahlne (1990), as a framework to explain and support the internationalisation process of companies. In 2009, Johanson and Vahlne suggested a reformulation of the original Uppsala model from 1977 and incorporated business network theory and entrepreneurship theory into the model to comply with the ever-changing business world. According to Johanson and Vahlne (1990), as companies interact with each other, they develop relationships connected by networks.

Business networks are defined by Johanson and Vahlne (2009) as interrelated relationships where one exchange is related to another. A network of business relationships consists of different stakeholders such as customers, competitors and suppliers (Johanson & Vahlne, 1990). Johanson and Mattson (1988) discuss that all companies in a market are linked to one or more networks creating network relationships with different stakeholders. Moreover, the authors state that the internationalisation process can be achieved through these network

relationships with different foreign partners. By developing their relationships, the members of a network could gain and acquire mutual benefits (Johanson & Vahlne, 2003).

According to Håkansson and Lind (2004), companies in different sizes can achieve coordination, including close cooperation and global alliances by combining different forms of activities on different levels. They continue by stating that the establishment of a business relationship requires matching resources and activities by the involved companies. In order to maintain strong and long-lasting business relationships, the authors argue that sometimes companies need to adapt their organisations to each other, as did Ericsson and Telia, which resulted in a partnership agreement with maintained worldwide cooperation. The sustained business relationship between these two companies is explained by the authors to possess great importance for both of them. This is demonstrated by having special individuals and units in their organisations dedicated primarily to manage the relationship of the two companies, as explained in the article.

The idea of network importance is further supported by Johanson and Mattson (1988) arguing that, due to companies' insufficient resources, they are interdependent. The authors further argue that by maintaining an appropriate position within the network and developing strong relationships with each other, companies could access the resources of other companies, thus benefiting from each other. Bell (1995) adds that network relationships have a substantial impact on the decision regarding the selection of which market to enter, and the choice of entry mode for small-sized companies.

Networking can be seen as a linking process that allows companies to internationalise in faster rates (Mitgwe, 2006). Further, the network has the ability to lay the basis and encourage the company to initiate its internationalisation path (Mejri & Umemoto, 2010). According to Mitgwe (2006), a rapid internationalisation path can be achieved by the modern high technology companies through its experience and resources of network partners. Mejri and Umemoto (2010) identify network knowledge as one of the factors that are influential on the internationalisation process of a company and discuss the importance of network knowledge in the early phases of internationalisation of SMEs. They further indicate that the

presence of both social and business networks facilitate the internationalisation process of the company.

In a study conducted by Holmlund and Kock (1998), the presence of networks in both home and foreign countries were evaluated to be one of the most influential factors on internationalisation of a company in its early stage. Moreover, Blomstermo, Eriksson, Lundstrand and Deo Sharma (2004) state that as companies internationalise to different markets and gain experience, the knowledge acquired from their expanded network becomes essential for facilitating the further expansion into new markets. This view is also supported by Johanson and Mattsson (1988), arguing that the number of relationships within a network of the company grows as it internationalises, thus contributing to its future expansion into other foreign markets. According to Asemokha et al. (2018), the act of developing networking abilities is one of the most astonishing organisational culture development and competencies for cleantech companies.

2.5 The resource-based view and the internationalisation process of the company

The resource-based view is a theoretical framework in the strategic management field that defines the conditions generating a sustained competitive advantage for a company over time, as described by Barney (1991). Wernerfelt (1984) states the importance of the tangible resources such as physical assets, and intangible resources, that is knowledge, experience, managerial skills, of the company in the acquisition of sustained competitive advantage. According to Peteraf (1993), a bundle of distinctive resources and capabilities that a company has, can lead to a competitive advantage over its competitors. Barney (1991, p. 102) refers to the sustained competitive advantage as “... when a company is implementing a value-creating strategy not simultaneously implemented by any current or potential competitors and when these other companies are unable to replicate the benefits of this strategy”. Namely, the author argues that the sustainability of competitive advantage depends on the possibility of its imitability.

Barney (1991) distinguishes four attributes of resources that are valuable, rare, inimitable and non-substitutable, showing how heterogeneous and immobile the resources of a company are.

The author further states that it shows how these contribute to estimating the degree of competitiveness of a company and generating sustained competitive advantage. According to the author, these resources can be used internally in order to build dynamic capabilities within the company. This is further discussed by Johanson and Vahlne (2017) stating that this process makes the duplication difficult for the competitors within the same industry. Barney (1991) further explains that in an industry where all the companies implement the same strategies and possess the same resources, companies cannot acquire a sustained competitive advantage. The author classifies the complex physical technology as typically imitable and argues that this kind of advantage is not a source of sustained competitive advantage since the technology can be bought by the competitors and can easily be duplicated.

The internationalisation decisions regarding the resource-based view depend on the distinctive bundle of resources and capabilities of the company (Barney, 1991; Peteraf, 1993). Kamakura, Ramón-Jerónimo and Vecino Gravel (2012) further add that decisions regarding the selection of suitable entry mode to a foreign market depend on the available resources and capabilities that the company controls in this regard. That is, the company has to have the critical capability in order to acquire a competitive advantage by applying the resources available for expanding into new markets, as Wang and Ahmed further explain (2007).

According to Wernerfelt (1984), the decision regarding the mode of entry into foreign markets depends on the nature of available resources. Leonidou and Katsikeas (1996) observe that as the company internationalises, its resource commitment, such as financial capital, workforce, production volume, grows gradually as well. According to Peng (2001), during the initial phases of internationalisation, start-ups are not able to commit as many tangible resources as their larger competitors. He further argues that the start-ups can commit their rare intangible resources such as technological know-how, managerial skills, organisational capabilities and professional networks in order to be able to internationalise successfully. The professional networks, interpersonal ties and contacts developed between the start-up representatives and managers at other companies in the early stages of the internationalisation process, lead to collaboration and formation of strategic alliances that are difficult to imitate, thus providing a unique advantage to the start-up (Peng & Luo, 2000; Peng, 2001).

3 Research methodology

The third chapter discusses the structure of the paper, and the steps taken and performed in order to answer the formulated research question. The chapter discusses the research approach, the research design, the data collection method, the data analysis with its accompanied sections; reliability and validity. Further, the limitations of the method are discussed, as well as ethical considerations.

3.1 Research approach

Creswell (2014) argues that the research approach is the research procedures, including the stage from more comprehensive assumptions to detailed methods of collecting data, analyse the findings and the interpretation stage. Three approaches are presented in the book by Creswell, that is the quantitative, qualitative and mixed method. The author further argues that the quantitative research examines relations between variables, and the collected data should preferably be analysed through performing statistical procedures, to test existing theories in a deductive manner.

The qualitative method, on the other hand, is described by Creswell (2014) as a method studying either one individual or a group of individuals in order to understand the nature of some sort of problem in either human or social terms. Creswell further states that the qualitative approach generally follows the procedure of formulating questions and collecting the information in the setting of the participant, and the author of the report interprets the information gathered. The finalised, qualitative report is argued in the book to follow a flexible structure. Creswell further discusses that the qualitative study generally supports an inductive manner of looking at current research, where the individual perception among the interviewed individual or individuals allows for an interpretation of the existing theory and situational complexity. Bryman and Bell (2011) further describe the qualitative method as an inductive method regarding the relationship between research and theory, in which the research generates theory. The authors argue that generally, the quantitative method tends to focus on numbers, while the qualitative method tends to focus on words, and Creswell (2014) adds that the mixed method tends to focus on collecting both quantitative and qualitative data to integrate the results. The author further claims that the fundamental idea of the mixed

research method is that neither of the qualitative nor quantitative methods alone provides a better understanding. Rather, this could be attained by mixing the two different methods.

Given the nature of the different research approaches, the qualitative research approach was selected, as the formulated research question required a collection of explorative data in the context of the researched company. The data could further be analysed and interpreted with the theories used. If the interviewed companies, instead of answering different open-ended questions, would have received a survey to answer, the result chapter could potentially have missed an amount of information that could not be stated or expressed in a strict survey with multiple choices. Moreover, the forgone information from a survey like that could potentially be valuable when analysing the accuracy of the selected theories. Hence, for this degree project to acquire the two participants full view on internationalisation or circularity, interviews were held. Since the questions were formulated as open-ended, different perspectives from the interviews were analysed to evaluate the accuracy of traditional internationalisation methods on a recently created cleantech company and the benefits of circular business models. Thus, the interviews provided an understanding of how a new cleantech company potentially could internationalise.

According to Saunders, Lewis and Thornhill (2012), the main research approaches are deductive and inductive. They state that the deductive approach is relevant if the authors chose to use and examine an existing theory where the research question is modified to the specific theory. By this, they indicate that the data is gathered in order to test the available theory. The authors further explain that the inductive approach, on the other hand, is implemented by analysing empirical data and reaching conclusions in order to develop the theories. They continue by saying that this approach is most appropriate when the research area is new, and there is not enough research conducted before relating to the specific topic. The third approach, which is regarded as a combination of deductive and inductive, is the abductive approach, as argued in the book. Moreover, the authors state that in abduction, a so-called “surprising fact” is being observed for which existing theories are utilised in order to explain the existence of this phenomenon. They further argue that this approach is usually used when the area of study is well researched to adjust an existing theory or when it is researched in a new context to generate a new theory.

Due to the explorative nature of this degree project, which will be further discussed in the next section of this chapter, an inductive approach was evaluated to be the most appropriate. This was decided because the research topic of cleantech companies was rather unexplored in terms of internationalisation theories. Further, as given in the theoretical problematisation, the internationalisation theories that were examined regards the traditional company. Hence, it was considered interesting to test their appropriateness to more recent companies with circular business models, instead of linear ones. In that way, the degree project was conducted inductively, to contribute with information to a rather new research area, and possibly develop the theories. The empirical data was also analysed in that way, to test the suitability of the traditional internationalisation theories selected, and suggest topics of importance for cleantech companies, that the theories do not cover. Further, it was given from the very construction of the research purpose and question to be an inductive report, as the purpose was to contribute to existing research on internationalisation paths for cleantech companies with circular ideas. The research question also outlined that the cleantech company has specific characteristics, for instance, circularity and thus the extent to which the traditional theories cover these was investigated in the degree project.

3.2 Research design

Yin (2014, p. 28), describes the design of a research as “... the logical sequence that connects the empirical data to a study’s initial research questions and, ultimately, to its conclusions”. Namely, one could view the research design as the ‘blueprint’ of the research study (Yin, 2014), which helps to understand how one can answer the defined research question (Saunders, Lewis & Thornhill, 2012). Together with providing a framework for the collection and the analysis of subsequent data (Bryman & Bell, 2011), the research design helps to choose the relevant research strategy such as case study associated with qualitative research (Saunders, Lewis & Thornhill, 2012).

A case study is a detailed exploration of a specific case (Bryman & Bell, 2011). According to Yin (2012), the prominent aim of implementing a case study is to acquire a thorough understanding of a real-world case. The case study is of high relevance if the question of the

research intends to illustrate a complex social phenomenon in a specific context by answering ‘how’ and ‘why’ questions (Yin, 2014). Skärvad and Lundahl (2016) observe that case studies can also be used to explore a previously studied phenomena from a new viewpoint, thus getting a new perspective in a different context.

The purpose of this degree project is to explore and identify internationalisation paths for a Swedish cleantech start-up to take its circular idea into the international market. Therefore, an exploratory single case design is decided to be the most relevant research strategy for this degree project in order to answer the defined research question which largely involves exploring a topic that is rather uninvestigated in the literature. Conducting a single case study gives the opportunity to research a unique phenomenon that is not sufficiently studied before (Saunders, Lewis & Thornhill, 2012). According to Yin (2014), an exploratory study investigates an undisclosed event which needs to be further discovered and explained. The author further states that usually, if there is a lack of knowledge or past research regarding a new phenomenon, it can often result in exploratory research. By implementing an exploratory study, the internationalisation prospects were explored and described to achieve an understanding of the most suitable internationalisation path or bundle for the Swedish cleantech start-up, Helios Innovations.

3.3 Data collection method

To conduct this research, both primary and secondary data were collected in order to answer the defined research question. First, secondary data was collected through reviewing literature regarding the related topics of this degree project. The data collection process was continued by implementing interviews with the company representatives. This enabled the understanding, identification and analysis of the internationalisation path applicable to the researched company.

3.3.1 Primary data

The primary data was collected by interviews with the chief executive officer of Helios Innovations, Jonatan Persson. Since the management of the company is directly involved in the decision-making process regarding different issues faced by the company, and further

regarding the internationalisation prospects, it is believed that a representative from the management of the researched company could provide the most relevant information. Due to the presence of the COVID-19 virus at the time the interviews were held, the interviews were conducted in the form of video calls through Skype. The primary data collected was the main foundation for the result chapter and the analysis and discussion chapter.

In order to collect primary data, semi-structured interviews were performed. Alvehus (2013) describes semi-structured interviews as a series of rather broad questions around a certain topic or theme. The authors continue by expressing the nature of the semi-structured interview, which provides the interviewed persons the ability to affect the content with their own opinions, and the interviewer to ask supplementary questions. Alvehus (2013) further discusses other structures of interviews, being the structured and the unstructured, where the structured usually consist of questions with pre-written multiple-choice answers similar to a survey, and the unstructured interview is often can be compared with an open conversation. When conducting this degree project, it was fairly easy to choose the semi-structured interview structure, as the aim was to hear the interviewed companies opinions or thoughts regarding different topics. If conducting structured interviews, valuable information could potentially have been lost. If conducting unstructured interviews, it was believed that the interview material would have been too abstract, and resulting in that some of the information could have been off-topic. Hence, the semi-structured interviews, as attached in the appendices, were implemented.

The interviews were held in English instead of Swedish in order to eliminate the possible errors which could have occurred during translation of the collected material. Furthermore, the interviews were held asking open-ended questions in a manner that could bring about interesting conclusions from the companies. The interviews were recorded, and after each interview was performed, the results were transcribed and structured in different paragraphs. According to Alvehus (2013), there are different ways of transcribing. He argues that one example is the type of transcription that occurs in conversational analysis, where everything from the material provided from the interviewee to small pauses and tunings are transcribed in a careful manner. Another example discussed by the author is the type of transcription that makes the given material tidier in a sense, that is transcribing it more into textual format. This

degree project used the second alternative to be able to structure and categorise the material in a good manner in the result chapter and to give more clearance to the analysis.

3.3.2 Secondary data

The secondary data was used mainly to conduct the first four chapters of the degree project and was critical to regard in order to formulate the purpose of the study. The secondary data used to develop the first chapters was mainly retrieved through different databases such as ‘LUB-search from EHL library’ and Google Scholar, by searching for formulated keywords, for instance, ‘internationalisation’, ‘cleantech start-up’ and ‘circular business model’. As a result, the suitable material was found describing relevant theories within the scope of the study. Further, when writing the analysis chapter, some secondary data was used, especially when discussing Helios Innovations’ ‘readiness’ for internationalisation with the table conducted by Asemokha et al. in 2018.

Alvehus (2013) describes the CARS model as an abbreviation for “create a research space” to involve three stages. The book presents the first stage to be the act of establishing an indication of the relevance of the proposed research, while the second stage describes a research gap in current research or conflicting ideas. The third stage outlines that when knowing what is missing in the literature, it could be easier to formulate and understand what has to be done (Alvehus, 2013). This degree project used secondary data to follow the order of the CARS model, where the introduction and partly the problematisation stressed the importance of researching this topic, because the world was suffering from water shortage, and a solution was required on the global level. Then, in the theoretical and practical problematisations, both the existing research gap on the internationalisation process of cleantech companies as well as the issues that need to be solved were addressed. Finally, the general focus of the study, what needed to be done, was partly outlined in the problematisation, however, to a larger extent in the purpose section of the first chapter.

3.4 Data analysis

In the following stage, the collected data was interpreted and analysed in accordance with the respective theories described in the literature and theoretical review chapter of the degree

project. According to Saunders, Lewis and Thornhill (2012), in qualitative research, one of the general methods for analysing data is considered to be the thematic analysis model. The authors explain that this model is used to draw the themes or the patterns of the gathered data to a coherent order. The authors further argue, in order to ease the generalising process of the massive data collected during the interview within a qualitative research frame, it is prominent for the interviewer to categorise and code the information properly.

This degree project was analysed through the thematic model. At first, the results from the interview were structured after their topic in the result chapter. Then they were commented upon in the analysis chapter, following approximately the same structure, which was considered as the most logical alternative. Moreover, the result chapter was chosen to be included so that the readers both could sense what was said in the interviews and receive the possibility to draw their own findings when reading through the result chapter. It can also be argued that this can help the reader to understand the analysis better and also regard other potential analysis paths.

3.5 Quality of research

The reliability and the validity of a study determines the quality of the research (Saunders, Lewis & Thornhill, 2012). These two are considered to be the most important criteria to assess the social research (Bryman, 2008). Hence, the reliability and validity are further taken into consideration in order to demonstrate the possible impact that they can cause on the quality of research.

3.5.1 Reliability

Saunders, Lewis and Thornhill (2012) refer to reliability as one of the most prominent characteristics of the quality of research. The authors further explain it as whether the analytical approach and data gathering result inconsistent findings in case another researcher attempts to replicate them on other occasions. Since this degree project studies the internationalisation process of a single Swedish cleantech start-up, it is believed that an attempt to implement a similar study in the future, with only one company, would lead to similar findings.

According to Yin (2014), reliability aims to prevent possible biases and mistakes interfering with the findings of a research study. As stated by Bryman (2008), one of the concerns of reliability is to check if the findings of the research are repeatable and to what degree they can be replicated. In spite of the fact that reliability is mostly a matter of quantitative research aiming to check if the measurements are stable enough and reliable (Bryman, 2008), it can also be relevant for qualitative research. Namely, by considering the qualitative aspects of the reliability, it is believed to be achieved during an interview when the utilisation of the same method can result in similar findings (Kvale & Brinkmann, 2014).

Considering that if the later researcher would follow a similar procedure with a qualitative approach, and using the same internationalisation theories combined with comparable data and interview questions, the research would most certainly be comparable to this degree project. That is if the later researcher would study the internationalisation process of a single company within the field of cleantech with the same theories, in an exploratory case study design taking a qualitative approach, and asking comparable open-ended questions. However, as cleantech is a broad term including a range of different fields, the researched company should be within the same field as Helios Innovations, namely energy efficiency, in case not choosing that company. When this degree project was written, and the interviews conducted, an objective standpoint was enhanced in order to not let any personal objectives or judgements interfere in the process of conducting the degree project. Thus, the material used was to the largest extent possible based on the interviewees responses. Further, since this methodology chapter was written to show all the steps taken explicitly, and considering that all the interview questions can be regarded in the appendices, the act of replicating this degree project should be fairly gentle.

3.5.2 Validity

Validity is one of the essential criteria in the research study (Bryman, 2008). According to Saunders, Lewis and Thornhill (2012), validity in research practices refers to the verification process of the gathered data and its credibility. The primary forms of validity are construct, internal and external types (Yin, 2014). According to Bryman (2008), construct validity, which is also known as measurement validity, applies mostly to quantitative research. This

view is supported by Saunders, Lewis and Thornhill (2012), and they further explain it as the degree to which the research measurements are feasible when estimating what it is intended to be appraised.

The internal validity relates to the causality between different variables (Bryman, 2008). Namely, the change in one variable affects the other one as well (Saunders, Lewis & Thornhill, 2012). External validity, on the other hand, considers the extent to which the gathered research findings are generalised beyond a particular context (Saunders, Lewis & Thornhill, 2012; Bryman, 2008). It also indicates if the results of the research are of interest to other organisations (Bryman & Bell, 2011). Namely, external validity examines if other cases also can utilise the data collected for a particular case by interviews (Saunders, Lewis & Thornhill, 2012).

According to Yin (2014), the results of a case study can be generalised in terms of theories. Since this degree project was designed as a single case study investigating one single company, it was difficult to generalise the results to a larger population. However, generalisation can be achieved through comparison between findings and relevant internationalisation theories. Thus, the findings can have applicability beyond the investigated company, and the conclusion can be theoretically generalisable. Moreover, to estimate the accuracy of the substantiality of the conclusion, some aspects are taken into account, for instance, the findings of the study are generalised and address the purpose of the degree project. Since the studied company is categorised as a cleantech company by the chief executive officer himself and is within the scope of the cleantech definition, the validity of the analytical generalisation of the findings was further increased.

3.6 Limitations

Because of the global pandemic concerning the novel coronavirus disease, COVID-19, face-to-face interviews were not carried out in order to prevent the spread of the virus. As a result, the two interviews with Jonatan Persson, the chief executive officer at Helios Innovations, were conducted online through Skype video calls. The interview with Hilmar Vidarsson, the representative from a potential client company, was conducted through a

traditional mobile call. The change of interview structure was performed in order to be in line with the regulations of the public authorities regarding social distancing and unnecessary gatherings. The traditional physical meetings could have resulted in gaining even more trustworthy and truthful information. According to Bryman (2008), the quality of data gathered by a call compared to the one collected during face-to-face meetings can vary extensively and therefore be inferior. Furthermore, he argues that interviewees could be less engaged with the whole process of the interview, and the interviewer could have difficulties in understanding the real thoughts of the respondent.

Another limitation related to virus-situation is that it was difficult to interview and gather data from other cleantech companies to have a more diverse viewpoint. It was hard to find companies available for interviews as most companies did not have spare time to spend on interviews but rather were busy handling the virus situation. Thus, this degree project had to limit the number of interviewed companies to one case study company and one potential client company.

The interviews conducted for this degree project were recorded and later on transcribed. One possible limitation of recording the interviews is that the interviewee feels limited in his or her openness to share information, as described by Alvehus (2013). Hence, the author argues that a potential strategy to avoid this is to take notes during the interview instead of recording it. However, he further states that some information could have been forgone if not recording the interviews, as writing notes naturally requires more time. Further, it is difficult as an interviewer to listen to the interviewee if taking notes. As previously mentioned, this degree project used semi-structured interviews which Alvehus (2013) describes as a structure allowing the interviewers to ask follow-up questions. Thus, it was considered to be more appealing to record the interviews as the interviewers then had the possibility of being more engaged in listening to the interviewee, rather than focused on taking notes. Thus, to conduct this degree project, the interviews were recorded. However, this was in full consent with the interviewees, which will be referred back under ethical considerations. Moreover, as previously described, Alvehus (2013) also mentions that, at times, the interviewees can also feel more secure if they know that every word they say will be analysed and reflected upon in its bigger context, and that important information has a higher chance of not being excluded.

Since the researched company is a start-up, its staff consists of four people, including the chief executive officer. The chief executive officer is further both the inventor of the technology and the founder of the company. The interview questions were answered by him, as he was the most well-informed company representative in regards to the technology. The limitations can be that there is a possibility that the information gained from a single source during the interviews with Helios Innovations could be biased.

3.7 Ethical considerations

According to Saunders, Lewis and Thornhill (2012), the ethical considerations play an important role during each step within the research project and therefore should be accurately appraised. They argue that it is prominent to be taken into account, especially when dealing with human participants in order to avoid unethical practice. Therefore, the authors of the book suggest that the business researchers have to be extra sensitive when it comes to ethical concerns.

As Saunders, Lewis and Thornhill (2012) explain, the respondents have the absolute right to be aware of the purpose of the study and that they are going to be part of the research project so that the interviewee can give consent to the interviewer. In order for this degree project to be in line with what Saunders, Lewis and Thornhill (2012) suggest, during the data collection process, the interviewees were asked whether or not they wish to remain anonymous and if the interviewees accepted the interviews to be recorded. Additionally, the respondents were informed about the purpose of the study.

The results gathered from the interviews were not modified but written in accordance with the views of the respondents at the time the interview was held. As previously explained, the result chapter was implemented for the reader to be able to look into the material provided from the interviews. By implementing chapter five, the interviewees can also regard the information from the interviews so that they can ensure the material is accurate. Further, a high level of objectivity in the analysis and discussion chapter is maintained in order to minimise the ethical concerns.

4 Empirical findings

The following chapter strictly discusses the results from the interviews with Jonatan Persson, the chief executive officer at Helios Innovations and the interview with Hilmar Vidarsson at Höganäs AB. All the information gathered in this chapter originates from the interviews, unless otherwise stated using in-text sourcing. Different areas will be touched upon, including circularity, risks and competition in the international market arena as well as internationalisation in regards to the selected theories.

4.1 Results from the interviews with Helios Innovations

4.1.1 The technology behind Helios Innovations

Helios Innovations is a small-sized, cleantech start-up located at Ideon Science park in Lund. A small-sized company can be characterised as having long-term goals and aiming to achieve a stable growth in an existing market, while start-ups, on the other hand, aim to earn revenues at a fast pace in a disrupted market (Pope, 2020). With these definitions, Helios Innovations can be characterised as both a small-sized company as well as a start-up. Thus, both terms are used throughout the paper to describe the cleantech company in the case study. Helios Innovations believes that the conventional way of purifying water is too expensive and has a substantial energy consumption which makes it economically and environmentally unsustainable. Further, the conventional method also possesses a threat to marine life, since the rejected water released back into the sea has a high salt percentage, making it sink to the bottom of the sea and causing oxygen deprivation. Hence, Helios Innovations has developed a circular desalination method that cleans saltwater through the usage of waste heat from companies operating in the heavy industry.

The technology is based on residual waste heat from the heavy industry, which is used to heat saltwater. This water flows over cellulose blocks which expose a large amount of water surface. Behind, there is a fan providing an airflow through the blocks, and when the air gets in contact with the heated water surface, an amount of water evaporates. This results in humid air flowing out of the blocks, which in turn is condensed on cold saltwater pipes that collect purified water. When the water is condensed on the pipes, the water is heated in a first step before it is heated in the factory. All stages concerning evaporation and condensation are

performed within a closed air tunnel, where most of the heated energy and the movement momentum of the air can be preserved.

The process results in deionised water suitable for a range of industrial processes, and it spares the companies of the heavy industry from purchasing regular tap water. In addition, the technology acts as a cooling plant and provides the factory with a new area to allocate its residual heat during the summer months. This results in a factory being able to reduce its water and cooling costs while protecting the business from price increases or even from production reductions if water supplies are reduced. It further provides a social benefit to the immediate areas, as the factories will heavily reduce their consumption of local water resources.

4.1.2 Helios Innovations and circularity

One of Helios Innovations core values is that every human being on this planet deserves access to clean water. Therefore, Helios Innovations strives to remove one of the biggest water consumers, namely the heavy industry, from the water grid, which spares water and enables water consumption by private individuals. As for today, the industries account for 20 percent of all the freshwater consumption in the world, and the company states that it is estimated that the demand for industrial water will double by 2040 globally. Instead, if the industries could transition towards having self-sustained, more circular factories, in regards to water usage, there could be more water available for private individuals to utilise. This innovation hence aims to cover the water shortage created by the heavy usage of water by industries. However, the solution will not cover the shortage that is related to an insufficient infrastructure. The infrastructure can also create water shortages in some areas, as the water cannot be adequately distributed, although the region has water per se.

Helios Innovations further strives to increase the energy efficiency in desalination methods as more than 330 million people acquire drinking water from desalination plants, and the conventional desalination methods consume a large amount of energy. This means that the conventional desalination method contributes to much carbon dioxide emissions. Helios Innovations proposes that instead, if the conventional desalination plants could be replaced by the technology developed by Helios Innovations, carbon dioxide emissions could be

decreased in the future. The company further tries to recover the waste heat that is currently disregarded in the heavy industry, as estimations have concluded that around 50 percent of the global energy becomes residual waste heat that is disregarded. Instead of disregarding the waste heat, it could be seen as a resource having a large potential.

Helios Innovations desalination units further provide cooling properties through the cold saltwater pipes. Many industries and factories are located in warmer climates, or simply have warm summers when cooling systems are required. One common solution used by the modern-day factories is electric fans which are heavily energy-intensive and hence emit carbon dioxide. If they instead used Helios Innovations technology, the industries can reduce energy and the usage of cooling systems and thus save energy.

Helios Innovations state that the company is circular in two ways. First, the company works with circularity through their technology. Second, the company can help other companies that are their customers to enhance a more circular business model. In regards to the industries, Helios Innovations utilise waste heat from the operations in the industries. The company is trying to use the energy that industries are producing to make them self-sustaining. In that way, the industries can circulate all their water within the factories. For the moment, Helios Innovations is focused on desalination of saltwater, but there is also a potential to clean the waste water from the industries. In that way, the industries can become more circular in their water usage, as they can reuse all the water in the factories by utilising the technology offered by Helios Innovations. Hence, in regards to the customers, Helios Innovations provides a technology that can make industries more circular and introduce a circular business model or way of doing business to client companies.

Within Helios Innovations, the technology itself has some energy recovery stages. The energy required to run the unit is waste heat from industries which is used to create steam. Within the steam, there is plenty of energy stored which the company tries to recover during the condensation stage. In that way, the company can recover 50 percent of all the energy within the condensation stage and hence preheat the saltwater with the steam. The energy efficiency can be enhanced to an even further degree. The company is currently working with two or

more stage condensers where the company, at the same time, can have a hot water surface and a cold water surface. In that way, it is improving the energy recovery even further.

The company is further working to recirculate the waste water produced in the unit. Within the technology, water with a temperature of 95 degrees Celsius is poured over evaporation pads which creates steam. However, the waste water from these evaporation pads holds the temperature of around 60 to 70 degrees Celsius, which indicates that there is much energy left in that waste water. In order to extract the excess energy, the unit runs the water a few times which ultimately reduces the energy consumption.

Helios Innovations uses leasing agreements, meaning that the company remains the owner of the desalination units and leases it to client companies. Further, every quarter, Helios Innovations focuses on increasing the life expectancy of the units, and the company has continual service and maintenance checks to increase the lifetimes of the units. In this way, the company can control the state that the units are in and sustain a circular way of performing its business. In regards to the life cycle of the product, if one unit would break down, the end-of-life management would be to reuse the parts that are able to reuse and recycle the parts accordingly that needs to take the form of something new.

The chief executive officer at Helios Innovations describes circularity to be a key factor for the company to remain in business. The economic incentive to circularity is described as if the company does not recover all the energy in the system. It would be too expensive to clean the water with the technology developed by Helios Innovations. Further, if the company could not use waste heat by the heavy industry, the company had to buy the energy, which would make it very hard for a young company like Helios Innovations to succeed in the market. Having a circular innovation also possesses a unique selling point, and this is prominent for Helios innovations when selling its ideas to different companies from the heavy industry. Helios Innovations thus states that its technology can help industries become more circular and more self-sustaining in regards to their water consumption, which can enable the client companies to secure their production from future drought or increased water tariffs. Hence, circularity is both a unique selling point for Helios Innovations as well as a key factor within the technology itself.

4.1.3 Recognition of international market risks, potentials and prerequisites

Asemokha et al. (2018) present a self-assessment tool with the idea of assessing the ‘readiness’ for cleantech companies to internationalise. Further, according to the handbook, if the cleantech companies fulfil these requisites, they can potentially face a successful international growth at a fast pace. Otherwise, the companies can work on the different topics listed.

	Systematically	Periodically	Very rarely
We assess the attractiveness of our value proposition in relation to the opportunities available on the international markets.			
We make sure that environmental and social responsibility can be seen in our business models and in our value propositions to customers.			
We assess potential and current international partners and their significance for our business.			
When we detect an opportunity to expand to a foreign market area, we know which organisation to contact in order to build a larger consortium.			
We are willing to adapt our operating methods (such as independent distributors, subsidiaries or production plants) based on the needs of each foreign market area.			
Score calculation factors	x 3=	x 2=	x 1=
Readiness for international growth:			
14 - 15 Points	Very good readiness for fast international growth		
12 - 13 Points	Fairly good readiness for fast international growth		
10 - 11 Points	Readiness for stable, but not necessarily fast international growth		
8 - 9 Points	Readiness only for slow, gradual international growth		
5 - 7 Points	Poor readiness for seeking growth from the international market		

Table one (Asemokha et al. p. 38, 2018):

In regards to Helios Innovations, the company states that as for proposition one, the company positions itself somewhere between systematically and periodically. As for proposition two, the company positions itself as systematically. The company further states that regarding proposition three, it would be somewhere in between periodically and very rarely, and that if ‘rarely’ was an alternative, the company would select that. The positioning to proposition four, according to Helios Innovations, would be rare. In regards to proposition five, the company positions itself as periodically. Helios Innovations results from this table will be further discussed in section 5.1.2 of the analysis.

As previously mentioned in section 2.3, according to the internationalisation handbook by Asemokha et al. (2018), there are four general risks that need to be managed and understood before and during the internationalisation process, namely general, political, commercial, and internal obstacles. Regarding the general market risks described, Helios Innovations proposes that the company currently has one team member with international working experience and thus with valuable knowledge of working in and with a number of global markets. The company further argues that if it expands, for instance, to Spain, it would be required to find appropriate team members with knowledge in the Spanish culture. The company explains that if it introduces itself to a new country, it has to have a service station or office located within that market as it cannot internationalise at a too small scale. If Helios Innovations would internationalise to Spain, the company further requires a certain amount of customers in a pipeline before it is possible to enter that market.

Helios Innovations continues by stating that it probably will not face that much difficulties when internationalising to markets that are similar to Sweden, for instance, the Nordic countries and countries such as Australia and the US. However, if it is a completely different market, the chief executive officer states that the company would be required to put in great efforts in order to receive more experience, hire new personnel and prepare to cope with new business styles. Although, this process is not started at this moment, as the company at first aims to establish itself in the Swedish market. The company is and will continuously be analysing the market it operates in and aims to operate in.

To continue on the general risks concerning cultural differences, the company argues that the knowledge and awareness about circularity and environmentally-friendly technologies possibly differ between countries, as some countries have more knowledge and commitments allocated to these fields. However, some factories need to become more circular as their countries demand them to be. For instance, if a country or a region does not have sufficient water resources, then the country has to become self-circular in its water utilisation at a national level. Hence, as stated by Helios Innovations, many water-related products are more technologically advanced, for instance, in Africa compared to Sweden. Consequently, regions that suffer from water scarcity have already gained experience related to circularity.

According to Helios Innovations, an average Saudi Arabian inhabitant uses twice as much water as an average European inhabitant does, although Saudi Arabia suffers from low water resources. The company further states that in Europe, on the other hand, the people use ten times more water than African people do. Hence, because of the cultural differences between nations, different countries evaluate the value of water in different ways, and some countries use more water than others do, despite the fact that it is a scarce resource. Therefore, the company explains that its selling point of the technology being environmentally-friendly does not have to be as attractive in different countries, as some nations value the economic benefits of the technology more. Thus, Helios Innovations might need to change its business proposal and value proposition when entering different markets in order to make it an appropriate fit.

When discussing the political risks, Helios Innovations states that the company will face an increased political risk when expanding into a new market, for instance, to cope with administrative differences that will imply an increased cost. The company indicates that it would almost be obliged to hire a person from a particular country who can handle the administrative work in that region. The company further acknowledges a greater risk in entering the water industry on the global level, because according to Helios Innovations, in almost every country, the water is provided by the state. This indicates that the water supply is often subsidised, and it can be hard to compete with the low pricing if not receiving government funding which can also be a challenging and difficult task. For instance, in Saudi Arabia, the water is highly inexpensive, although the country suffers from substantial water problems which is explained by their subsidised water resources. Thus, if Helios Innovations cannot form agreements with the local authorities, it would be nearly impossible to succeed in the water industry in countries like Saudi Arabia.

In relation to the currently discussed risk, the company indicates that it is working at a small-scale level with individual factories. In that regard, the company is not positive at this time if it would receive support as they are working at the factory level and not at the municipal level. Moreover, it can be hard for the company to receive support in the international market, since many countries possibly prefer to subsidise their own companies. However, Helios Innovations also recognises that some of the changes in regulations can potentially be beneficial for them. This could, for instance, be the case if a new regulation is

strict on transitioning towards environmentally-friendly desalination methods. Then the country would transition from using reversed osmosis, which is harmful to marine life, to cleantech methods, such as the technology invented by Helios Innovations. The company further discusses that in some countries, it cannot use some of its advantages as a selling point, such as being more friendly to marine life than other methods, as it might offend the receiving end who has invested a lot in the conventional technology.

Concerning the commercial risks, the company states that it requires a production factory of its own before entering the foreign market. Because, if Helios Innovations introduces itself to a new market, the company would prefer to do this at a faster pace rather than not having the possibility to produce and deliver more units. Hence, it needs to develop its capacities to enable quick entrance into new markets. The company further discussed that a commercial risk for them could be legal issues regarding the leasing contracts that the company offers in regard to their units, as different markets could potentially react differently to these contracts. The chief executive officer further argues that when the company internationalises, it will either hire the competencies of writing international contracts or recruit consultants with experience in international contract writing, as the company currently does not possess those competencies. Regarding issues concerning corruption, Helios Innovations believes that the company is in a rather secure place as its market entry will not require large investments, which potentially could save the company from corruption and problems with secured financing, because that will be solved in Sweden and the company only ship the units to the international market. Hence, as described by Helios Innovations, the company would not enter markets with million-dollar investments, but rather only would have installation costs, perhaps not facing large problems if the market of entry had a high level of corruption.

Concerning the internal obstacles, the company indeed recognises that these obstacles can challenge the internationalisation process. Due to the problem that can occur in regards to language barriers and different cultures, the company proposes that an alternative would be to have all the head managers in the different international offices having a Scandinavian background, at least for the first ten years of international operations, in order to have cultural and language similarities at the management level. This should then be accompanied by hiring local competences to support the international offices. These Scandinavian managers

could meet every year with the purpose of creating and maintaining the same company values and culture, a company culture that is not solely based on the specific, individual market that every manager is operating in. The company motivates this proposal by stating that it will be hard to communicate if there are only native employees in the international location where the company is operating. Thus, it will be more complicated to create a true company culture, Helios Innovations' culture.

A critical point raised in the handbook is the direct internal obstacles that frequently occur in the internationalisation processes of cleantech companies, namely that the business model is too strict. Helios Innovations comment on that by stating that some regions, as previously touched upon, have subsidised pricing, and in those regions, the company might be required to change their business model to adapt it to the new targeted customer. The new target would, in that sense, be governmental municipalities rather than the customers that usually purchase the technology of Helios Innovations.

The handbook by Asemokha et al. (2018) discusses a large threat to the successful internationalisation process of cleantech companies, which is to acquire sufficient financial fundings before and during the internationalisation process. Helios Innovations states that its income is mostly based on revenue generated from the units. The chief executive officer indicates that if the company has a steady backbone and if it has enough units deployed in Sweden, then the company can finance its internationalisation in another part of the world. As for now, when the company still is in its early phase, funding the internationalisation process would be a difficult task, as the company then would have to raise investments. However, over time, when about 100 units are deployed, the company estimates that it can finance not only its current operations, but also future investments prospected by the company. Further, the Helios Innovations believes that cleantech companies have an easier time to receive support from public actors, and thus obtain funding, investments, or loans from state-level or EU level organisations that might be positive to this certain kind of innovation.

4.1.4 The prospects from Helios Innovations to internationalise

Helios Innovations believes that Sweden is not their ideal market or for any type of desalination method for that matter. The reason behind this statement is that there are only a

few areas on the East coast; on Gotland, on Öland and some instances in Kalmar, that have intensive water shortage. This is because the Nordic countries enjoy clean water in rivers and groundwater due to the long winters with snow and ice. Hence, it will be hard both to sell to factories and find sufficient factories suited for the technology within the Nordic region. If looking further to the South, on the other hand, some countries do not need the excessed waste heat. These countries hold waste heat the entire year around, which thereby would double profits of Helios Innovations, as the company could constantly run its units, and the water is more valuable in those areas.

However, Helios Innovations thinks that entering the Swedish market was the right direction to go as a first step. The company motivates this as large companies in Sweden, in general, are more accepting towards small-sized companies and start-ups, and further that it is a safe market and starting point. Helios Innovations believes that if it jumps into the international market at a too fast pace, the company will meet a large base of competitors that would either try to overtake the technology invented by Helios Innovations or the competition would try to sabotage the company. Concluding this, Helios Innovations assumes that building up a solid foundation in the Nordic and receiving support from larger international companies would further be a good and helpful base for internationalisation. Further, the company underlines that being profitable in the Swedish desalination market is a big achievement considering its relatively small market, and having that in mind would make them better prepared for the internationalisation process.

4.1.5 Competition, production cost and patent outline

Three different types of competitors are identified by the chief executive officer at Helios Innovations. The first group of competitors are those companies which have other technologies for desalination using waste heat, such as multistage flash. However, because of the high installation and production costs, they are not accounted for as large competitors for Helios Innovations. Rather, the competition can be seen as how much water could be produced per kilo at one hour of waste heat. The second group which can be seen as competitors are companies that clean water through reverse osmosis which is the most frequently used desalination method. Within the last two decades, these companies have increased their efficiency to a great extent by implementing economies of scale. This means

that the production costs are greatly reduced. However, this requires billion-dollar investments. Thus, the competition becomes very intense with established desalination plants, such as gigantic Israeli plants. However, Helios Innovations prospects that the company can have an advantage within small-scaled production and factories. Within the last decade, many companies have started to produce electricity with low-temperature waste heat, which are the third and main recognised competitors. Those competitors are the companies that try to reduce the waste heat, like electricity generation from lower temperature waste heat. The competition can thus be on a level of who can access the waste heat first.

The production cost of one unit together with the development costs are estimated to be approximately 600,000 SEK. However, there are ongoing efforts to reduce the production cost to 400,000 SEK, which will include the installation service and water piping. It is estimated that the production cost can be reduced when the company is scaling up to produce more units, and further as the development costs decrease with time. The chief executive officer believes that Helios Innovations is cost-efficient in small-scale installations.

Regarding patents, the concept by Helios Innovations is very hard to patent since the technology the company uses is based on evaporative desalination, which originate in Ancient Greece and has been known since the ancient times. The first attempt towards attaining a patent for the technology was rejected because the method was explained with a too broad description. However, as for now, there is a plan to file a narrower patent application after the pilot facility is constructed, installed and tested, where the main focus will be on the key parts of the technology that is uniquely held by Helios Innovations. The potential, future patent will add new value to the company when operating in a market with dynamic competition.

4.1.6 Ideal market characteristics and prospected internationalisation strategy

In the near future, the European market is prospected to be the most appealing internationalisation alternative for Helios Innovations. This is explained by the relatively short distance from the home market that is the Swedish market. The company would moreover internationalise to the European market, because it is similar to the home country, as the company would like to avoid, for instance, cultural differences in the beginning of the

internationalisation process. Further, the existing and potential partners of Helios Innovations have other factories in Europe, which could be beneficial and enable internationalising to the European market to an even further extent.

Helios Innovations states in short that the ideal market is situated at a coastal location, has companies operating in the heavy industry with excess heat and that it is located in an area or region suffering from water shortage. Hence, in regards to Europe, the company states that it potentially could introduce the technology in areas around the Mediterranean, such as Spain and Greece. However, enough market research regarding the heavy industry located close to the coast has not been performed at this moment in time due to the main focus on the Swedish market. If suitable and appropriate factories that meet the criteria are found, then a Mediterranean country would be the most appealing location for Helios Innovations to internationalise first. After entering a market relatively close to the home market, the vision is to further internationalise to Australia and India, which both suffer from water shortage and have larger factories in the heavy industry.

Continuing on the topic of ideal market characteristics, a market that is investing or has previously invested in conventional desalination methods is also highly interesting for Helios Innovations. If a country, for instance, has invested in reversed osmosis and is aware of the high costs of its investments, then that country would most probably be interested in Helios Innovations technology which is more energy-efficient and less expensive. Regarding the types of industries of interest, Helios Innovations argues that the heavy base industries such as paper mills, smelteries and power plants are interesting because of their availability of excess heat.

Since the technology has to be installed where it is demanded, the most similar countries are not suitable. Even though the German market has many similarities with the Swedish market, it is not attractive since most of the factories are located inland. None of the other Nordic countries would be suitable, as they have the same climate with a low degree of water scarcity, and hence in regards to climate, have similar market characteristics as the Swedish market.

Regarding an appropriate internationalisation strategy, Helios Innovations are currently interested in finding an international company with factories both in the Swedish and in the international market. If the technology could be introduced to that company in Sweden, and that company is satisfied with the technology, then it could be installed at other appropriate locations where that company has factories. Another strategy would be to have factories in Sweden and collaborations with other industries in Europe and internationally, then Helios Innovations would like to work through those channels and invite them to Sweden to see how the technology works at the Swedish factory and try to attract international companies in that way.

Concerning the entry mode, Helios Innovations' strategy will be to provide all the desalination units. The company currently produces container size units in Sweden, and these units can be transported and installed conveniently at different places around the world. The company would hence prefer to only produce its units in Sweden and ship them to factories overseas, at least for the first five to seven years. However, the company also states that in time, if it, for instance, would become a big player in the Asian market, it will be too expensive to transport the units as well as having the communication between Sweden and the Asian market. Hence, in that case, it would be more beneficial to open a factory in Asia as well.

4.1.7 Consideration of presented theories

As for the Uppsala model of internationalisation, the company claims that the theory partly describes a good internationalisation method, that could be an appealing framework to regard in its internationalisation process. The chief executive officer believes that working with similar cultures and working in regions that have similar characteristics as Sweden would be profitable. Further, as Helios Innovations does not have any software, it cannot expand to the international market at a very fast pace. Instead, it requires a careful stage by stage method. In regards to the technology, the company states that it would like to enter markets that are as similar to the Swedish market as possible, and where there is also a demand for the technology. Further, concerning knowledge, the company could potentially gain a large amount of knowledge if it starts in a market that is similar to Sweden, as although different countries and markets have similarities, differences still exist. This means that regardless of

the country the company chose to internationalise to, the company will acquire new, valuable experiences of working in a new way in a new market. Further, as the company has tried three to four different markets, there are much higher chances of successful affairs in the fifth and sixth market.

In regards to the network theory, the company states that participating in networks could be a profitable resource. Helios Innovations is currently a part of Climate-KIC and its Nordic accelerator. The company believes that it can receive helpful guidance from such networks in the initial phase of its internationalisation process. From that network, it can reach other, even larger networks, hence extend its customer base. In regards to start-up companies, it can be profitable according to Helios Innovations, as larger companies are more likely to take in new projects and innovation if a contact that the company trusts has validated the project or start-up company. Moreover, through the networks, Helios Innovations states that the company can access new customers, and if it has both experience from working with a certain network and can receive help from that network, the company believes that the network can have a positive effect on the internationalisation process. However, if Helios Innovations does not have a network in place in a market they would like to expand to, that will not affect their choice to enter that market, and the company will manage to enter the new market without the use of networks.

Helios Innovations further stresses that some networks also have disadvantages. This mainly refers to the threshold of becoming a part of a network, which is explained to at times be high, as the network can have strict regulations and be bureaucratic about which company to accept. Helios Innovations argues that the company has had good interactions with networks. However, at times, the company met difficulties in being accepted to a few networks that are too specific and sometimes customers can only trust the companies that are a part of that specific network.

Regarding the resource-based view, the company stresses its current relative lack of sufficient resources, that are units, to expand to new markets using the resources as the main internationalisation strategy. It is further stated that it will be difficult for Helios Innovations to expand at a fast pace, considering the time requirements in the construction of the

technologies, although the entrance to some markets would be highly profitable. The act of internationalising through the resources is, however, explained to be a potentially profitable strategy of internationalisation in the future.

4.2 Results from the interview with Höganäs AB

4.2.1 Insights from the potential client company Höganäs AB

Founded in 1797, Höganäs Metal Powder Solutions, namely Höganäs AB, is a leading Swedish iron and metal powders producer with a yearly capacity of 500,000 tons and based in southern Sweden (Höganäs, n.d.). Moreover, as stated on the webpage, the company is well known worldwide and has its production facilities in 18 countries. With nearly 2500 employees, the company serves customers from heavy industry all around the world (Höganäs, n.d.). The company values sustainability and environmental wellness as a top priority and works actively towards achieving a more circular business model, thus evaluating itself as “already circular” in some aspects. However, it has a long way to go before it can consider itself fully circular, as there are many areas that should be improved.

According to Hilmar Vidarsson, who is working as a senior specialist at the research and development department at Höganäs AB, structuring a more circular business model plays an important role for the company as it is constantly trying to bring circularity into its business model. Furthermore, the company regards the circular economy as the path for a sustainable future. Circular activities are being applied in not only the energy utilisation process within the operations, but also in the production of materials, for instance, the metal powder. However, at this moment, circularity is less valid for the material production compared to the energy usage where some success can be expected. As mentioned by the senior specialist during the interview, achieving these goals are seen as a long-term rather than a short-term commitment. In order to attain these targets, the company continually improves its production systems. Lately, Höganäs AB is planning to implement a transformation and go from carbon-based production of metal powders to more sustainable hydrogen-based production. As mentioned by the senior specialist, the company is currently at its initial stage in this large transformation process. Many efforts are required in the coming years in order to successfully implement the challenging transformation process in the production systems to obtain a more

sustainable and environmentally-friendly business model. However, according to the company, despite the strong ambitions of Höganäs AB, the transformation can not be done immediately, and it is expected to take a longer time.

Höganäs AB has developed an efficient strategy where the company can utilise some of its waste heat. However, some waste heat generated from the production is not used at all. Thus, the company is at this time not utilising all of the waste heat generated from its operations. The reason behind this is twofold. At first, some of the waste heat has too low of a temperature to receive any meaningful turnover or to transform it into something useful. This is explained by the senior specialist saying that it is always easier to use the waste heat the higher temperature it has. If the temperature is below 70 to 80 degrees Celsius, it becomes much more difficult to get a profitable result from the utilisation than if its temperature exceeds 70 to 80 degrees Celsius. Namely, the lower the temperature, the more difficult it becomes to get energy out of this, thus resulting in a very costly process. Second, if the waste heat comes in the form of warm water, the process becomes easier.

The company is well aware of the studied cleantech start-up, Helios Innovations, and thinks that the technology offered could be suitable for Höganäs AB in the future. Further, it can help Höganäs AB towards achieving a more circular business model. The senior specialist described the technology as “... a valuable method to reuse the industrial waste heat”. Besides this, Vidarsson also values the water purifying and industrial cooling abilities of the technology to a great extent as these have a high relevance for Höganäs AB in its daily operations. In order to begin using the technology offered by Helios Innovations, detailed calculations and evaluation of the technology are required to see if it is worth investing in the technology from the economic perspective and if it will result in overall cost savings and thus increase the profitability. If the investment is economically feasible and the gains from the investment are justified, then Höganäs AB can demonstrate its commitment to actualise the investment. Besides the cost saving goals in energy utilisation, Höganäs AB has also set strategic targets regarding sustainability and circularity performance. According to the senior specialist, the utilisation of the technology offered by Helios Innovations can facilitate the achievement of those sustainability-related targets. Currently, Höganäs AB has a production cost and energy-saving programs in all the factories to be more sustainable and more circular.

There is also a strategic opportunity when it comes to pure water. It is believed that the water will not be widely available in the future. Hence, Höganäs AB prospects that if it uses this technology, it does not have to be dependent on buying water from the water grid, but rather can be self-sustained in their water consumption. Further, if Höganäs AB could be self-sustained, it would also create a benefit to its sustainability target of securing that pure water will be available for the society. This is even more important in the areas the company is operating in that are suffering from water scarcity.

4.2.2 The international operations of Höganäs AB and the relevance of Helios Innovations technology

Running operations in 18 markets (Höganäs AB, n.d.), Höganäs AB can be accounted as a good business partner for Helios Innovations towards actualising its internationalisation plans. The senior specialist, who is well aware of Helios Innovations and the functions of the technology behind the start-up, states that the United States and Brazil could be appropriate primary markets for the technology. However, it is better to start using the technology in Sweden first to test and accurately calculate the possible outcomes of it for Höganäs AB, and after its approval send it to the foreign units of Höganäs AB for further utilisation, especially to the operation with high-temperature processes that require industrial cooling, regions located in coastal areas and finally places where water purification is needed.

The senior specialist further pointed out some industries that could benefit a lot from the technology offered by Helios Innovations. One of the most important industries that needs pure water in its operating systems is the steel industry in the first place, where clean water is required to cool the steel. Other industries that can potentially benefit from the technology of Helios Innovations are the chemical industry and the solar power industry. The heat-generating process by the solar concentrators requires a great amount of pure water, thus making it a relevant industry for the technology offered by Helios Innovations.

5 Analysis and discussion

This chapter starts by examining the circularity of the researched company, Helios Innovations, and the topic of circularity will also be periodically examined throughout the chapter. Secondly, the analysis evaluates market risks, potentials and prerequisites in regards to the empirics presented in chapter four. Further, the empirical data presented in chapter four is analysed in regards to the internationalisation theories discussed in chapter two, as well as the resource-based view in regards to internationalisation. The chapter discusses the accuracy of the different traditional theories in regards to Helios Innovations and its surrounding, as well as the internationalisation prospects of the company, in order to find a relevant internationalisation bundle or path.

5.1 Analysis

5.1.1 Circularity in regards to the cleantech company Helios Innovations

Since the industries globally consume 20 percent of all the freshwater available in the world, and the world currently faces a water shortage, there is a need for circularity in the water management. By desalinating saltwater, Helios Innovations can help companies operating in the heavy industry in coastal areas to become self-sufficient in their water consumption, as the units provide the client company water which is no longer needed to be bought from the water grid. Further, one specific attribute of Helios Innovations that help other companies to become more circular, is that the waste heat of industries is utilised to clean water that can supply the operations of the client factories. The potential client company, Höganäs AB, further recognises this, by stating in the interview that the method by Helios Innovations is “... a valuable method to reuse the industrial waste heat”. This is related to Commoner’s view that resources naturally should result in something new, as cited by Scott (1973), and that all resources should be reused after having a functional life (McDonough & Braungart, 2002; Ellen MacArthur Foundation, 2013). For instance, in regards to Helios Innovations practical example, this means that the wasted heat resulting from the operations of the heavy industry, should naturally be transitioned into something new, in this case, clean water.

Another area of circularity that Helios Innovations provides is the cooling properties of the cold saltwater pipes, which can be utilised by the client company and result in both decrease in energy consumption as well as in energy-related cost savings. Thus, a client company can become circular in some aspects of its production, and the technology can be helpful in regards to the transitioning towards a circular business model, as discussed by both Höganäs AB and Helios Innovations. Because, the act of decreasing wasteful consumption by using pre-existing resources is described by OECD (2018) to be the purpose of the circular business model. The decrease in energy usage by Höganäs AB from using Helios Innovations cooling properties can be regarded as an act in transitioning towards the circular business model. Further, developing a circular business model is indeed a building block in order to reach the circular economy (OECD, 2018).

In the results chapter, section 4.1.2, Helios Innovations explains its internal circularity, which includes that the energy used for the units consist of waste heat, which otherwise could have been wasted out into the air or the water. Further, other activities are also mentioned, such as running the water a few times through the units to utilise the heat, maintaining the units every quarter and thus increase their life expectancy as well as enhancing energy efficiency by two or more stage condensers. The circular properties of the company are its fundamental idea and a unique selling point. However, as discussed in the previous chapter, this selling point can be valued differently by different cultures. Hence, at times, the value propositions need to be changed in a sense, which will be further deliberated on in the next section.

5.1.2 Managing market risks, potentials and prerequisites in preparation for internationalisation

In the previous chapter of the degree project, the prospects for Helios Innovations to internationalise is discussed saying that Sweden is not the ideal market for the company to operate in, which is mostly explained by the water situation in Sweden with long winters, generating snowmelt and river flows of freshwater in the spring season. Further, as both stated in the practical problematisation as well as by the representative of the researched company, the technology behind Helios Innovations has worldwide relevance as over two billion people lack access to clean water. Hence, Helios Innovations should internationalise so that more countries can enjoy the benefits entailed by this technology. However, one could

argue that in almost all strategic decisions, there are risks involved, sometimes to a lesser degree, and sometimes to a larger degree. Risks thus also apply to Helios Innovations internationalisation process, and therefore, the first part of the analysis will discuss the prerequisites necessary for a successful internationalisation path.

The risks concerning the internationalisation of cleantech SMEs is a well-discussed topic in the handbook for cleantech SMEs by Asemokha et al. (2018). The handbook is thus suitable to regard when evaluating an appropriate internationalisation path for Helios Innovations, as the researched company operates in the energy and resource efficiency field. This is because it is saving energy from otherwise being wasted by using residual heat to desalinate saltwater. In the handbook, energy and resource efficiency cleantech SMEs constitute 38 percent of the respondents. To manage the risks involved in internationalisation, both before and during the process, is crucial in order for Helios Innovations to internationalise successfully.

Before evaluating the risks Helios Innovations could face when internationalising and discuss ways to approach them, this paragraph will discuss a way for Helios Innovations to assess how ready the company is to operate in the international market. The chief executive officer stated, in section 4.1.3, that the company aims to have a fast introduction in a new market, where it can sufficiently supply the market. Hence, as also described in the result chapter, the company needs to develop its production capabilities. This fast internationalisation process that Helios Innovations aims to have can further be supported if the company develops the ideas necessary in order to internationalise successfully at a fast pace. These ideas are described by Asemokha et al. (2018) in table 1, where Helios Innovations currently scores 10,5 points, meaning that the company would currently be able to face a rather stable internationalisation process. However, that does not, by definition, indicate that the process is, in any way, fast-paced. Since the company favours fast-paced international growth, Helios Innovations could develop its desired international growth by forming its value propositions in accordance with what the foreign market of entry demand. The company could further develop its work on prospecting the potential in different markets, as well as evaluate the potential of different partners and client companies. The assessment tool would further suggest to build up the networks between the company and the market of entry in order to know who to contact when aiming to operate in that market. Finally, Helios Innovations

could adapt its operating methods to fit those of the new market of entrance. These suggestions will be further discussed in the current section of the analysis chapter.

As discussed in the literature review on the internationalisation handbook by Asemokha et al. (2018), acquiring sufficient fundings is necessary to meet the growth targets in the international market. Hence, Helios Innovations have to prepare sufficient fundings before and during their internationalisation process in order to expand successfully. As section 4.1.3 of the result chapter presents, Helios Innovations will finance the company by its generated revenues when a sufficient amount of units are deployed, and thus also the internationalisation process. Further, the company believes that receiving fundings from public actors can be relatively easy for cleantech companies with environmentally beneficial innovation, that is in the form of fundings, investments or loans from state-level or EU-level organisations.

The internationalisation handbook by Asemokha et al. (2018) further discusses the presence of general market risks, political risks, commercial risks and internal challenges. Helios Innovations acknowledged these risks and at times, also potential ways to cope with the obstacles involved in the internationalisation process. In regards to the general market risks, Helios Innovations outlines that the company will be required to work intensively to receive more experience, hire new personnel and prepare to cope with new business styles when internationalising to markets where the culture differs significantly from the Swedish one. Continuing on the topic of cultural differences in general market risks, Asemokha et al. (2018) propose that the company that is entering the international market should possess the ability to justify its business model. This makes it more dynamic in a sense to fit the international market, and further adapt the value proposition, if the foreign market requires a certain way of doing business.

Today, Helios Innovations strives to be circular in their resource use, as described by the chief executive officer. However, as outlined in the section 4.1.3 of the result chapter, Helios Innovations believes that the awareness of the need of circularity possibly differs between countries, and also that the commitment to these matters can differ. Regarding the business model as dynamic, which should be transformed to fit the targeted market, could be a

potential challenge for Helios Innovations, as the fundamental idea of the company is exactly that of being circular. However, the company also agrees upon the idea that in some regards, a reformulation of the value proposition is required in order to attract potential customers in the targeted market, to manage these cultural changes. In that scenario, the environmental benefits from the technology would be entailed, although this probably was not what the client was buying the product for. Other practices such as appropriate marketing, cultural adaptations, and a suitable way of doing business in a new market should also be developed by the company in order to fit the new targeted market. Besides from the idea that the value proposition should be dynamic in order to fit the targeted market, Helios Innovations further acknowledges that the business model, at times, need to be changed to target governmental municipalities, rather than the heavy industry, as described in the result chapter.

Concerning political risks, the company regards a political risk in competing with subsidised pricing in regions where the government steadily supports the water industry financially. Hence, as stated previously, at times the business model has to be changed to target governmental municipalities instead of heavy industry. This can be explained as if not acquiring their support, it will be highly difficult for Helios Innovations to succeed in a market with that kind of structure.

When discussing commercial risks, Helios Innovations states that the company should develop a production factory of its own, with sufficient capabilities to export units at a fast pace before entering a new market. Further, legal issues could potentially occur regarding the leasing contracts that the company uses for their units, as different markets can react differently to them. Regarding corruption, the company positions itself in a rather secure spot since it will use the leasing agreements and ship the units. The only direct cost involved in the market of entry will be the installation costs. Both the political and commercial risks could be managed through hiring either a team member or a consultant from the targeted market with experience from working with administrative tasks and contract writings in that country.

Concerning challenges within the company, Helios Innovations indeed outlines that there can be language barriers and cultural differences that can threaten its various local offices. In order to manage these challenges, the company describes that it would be profitable to have

all the top managers in the different international offices from similar backgrounds, that is to say preferably Scandinavian for the first ten years. In this regard, the company believes that it can create consistency in the corporate culture.

In regards to the presented risks and obstacles, Asemokha et al. (2018) further propose other ways of managing the risks and obstacles. This includes making quick decisions in the entrance process, acting quickly to regulatory changes and acquiring experience before entering a new market. This is of high relevance if Helios Innovations expand into a country with large cultural differences. The handbook discusses that the cleantech companies should continuously analyse the foreign market on potential partners or distributors and in advance establish a network with them, in order to avoid uncertainty and receive more information about the market (Asemokha et al. 2018). This expression is in some regards intertwined with both the internationalisation view of the network theory and the Uppsala model. This is because it both discusses that a company should establish networks when internationalising, and that increased knowledge about a foreign market decreases the uncertainty of operating in that market. In regards to this, Helios Innovations is already researching the Swedish market and will perform different market analyses before entering a foreign market. However, the company states that the preferred way, in the beginning, will be to internationalise incrementally in order to receive knowledge about the foreign market, which will be referred back to in section 5.1.4 concerning the Uppsala model or that the company will internationalise through already established companies, which will be referred back to in section 5.1.8 concerning the internationalisation path through networks.

5.1.3 Managing increased competition

Expanding into new markets entails interacting with an even larger market base than solely the home market of the company, and Helios Innovations must, therefore, protect its technologies before entering a new market, and a larger competitor base. The internationalisation handbook by Asemokha et al. (2018) further discusses that cleantech companies face a greater presence of more dynamic competition when operating internationally. Helios Innovations believes that entering the Swedish market is the right direction for the first phase of their operation as the potential customers in Sweden tend to be more accepting towards small-sized companies and start-ups, and that the Swedish market is

a safe start. Helios Innovations believes that Sweden is a safe country to start in because the company would face a large base of competitors if internationalising too early. The competitors could either overtake the technology invented by Helios Innovations or sabotage the company. Thus, Helios Innovations believes that building up a sufficient foundation in Sweden and receiving support from large international companies would be a profitable base for internationalisation.

The internationalisation handbook by Asemokha et al. (2018) discusses the way cleantech companies succeed in the international market. These key success factors are described in the handbook to be present when a company is facing a demand in the international market that is higher than expected, and when a company has competitive abilities higher than those of its competitors. Barney (1991) further adds that success is achieved through gaining a sustained competitive advantage which is possible when a company has a value-generating strategy that is not currently implemented by a present or potential competitor, and are not possible to duplicate by competitors. Thus, in this way, Helios Innovations do possess a chance of receiving a competitive advantage in the international market as the company has lower production cost than most of its competitors and consumes less energy within their operations. Further, as the desalination method is uncommon, the company has an even greater chance of acquiring a competitive advantage, as Barney (1991) states that the competitive advantage cannot be reached if all companies in an industry implement the same strategies and possess the same resources. Then, the energy-savings and cost reductions can be seen as the unique value held by Helios Innovations with its uncommon technology. In order to push competitors out of Helios Innovations' market, the company should protect its technology, which will be further deliberated on in the next paragraph.

Another prerequisite for Helios Innovations, before meeting the greater competition base when internationalising, is to acquire a patent associated with the technology so that potential or current competitors, or other companies for that matter with good financial possibilities, are deprived of the opportunity to duplicate the technology. It is further on Helios Innovations agenda to create a more narrow patent application so that the technology can be properly protected before entering the international market. However, before possibly launching the patent associated with the technology, the positive part for Helios Innovations as for today, is

that the initial cost of one unit is estimated to 600,000 SEK, which is a large investment pushing many potential competitors from duplicating the invention as they must first receive fundings for the technology. Further, when Helios Innovations has developed knowledge about the production of the technologies, the company can decrease production costs to 400,000 SEK as well as acquiring economies of scale in the near future leading to a lower production cost for the unit.

5.1.4 The Uppsala model

As described in the literature review, the original Uppsala model by Johanson and Vahlne in 1977 explains that a company should internationalise through gradual expansion, as internationalisation results from incremental decisions, where one decision constitutes the next. According to the Uppsala model, performing activities in a foreign market equals a high degree of uncertainty, and the uncertainty including the market risk which is also discussed in section 2.3 by Asemokha et al. (2018). The difference between the two theories, however, is that Asemokha et al. (2018) propose that the company should perform certain activities before and during the internationalisation phase, whereas the Uppsala model by Johanson and Vahlne (1977) describes that the company should perform incremental expansion. Further, the Uppsala model discusses that companies should expand to a country where the psychic distance is low in regard to the home market in order to manage uncertainty.

In regards to Helios Innovations' internationalisation process, the chief executive officer recognises the Uppsala model as applicable in the sense that the company would indeed like to expand to a similar country. This would facilitate the international business in terms of cultural differences, and general political and business-related systems. In that regard, the researched company agrees with the idea of expanding to a country where the psychic distance is low, meaning a country with as many similarities as possible. However, as stated by Helios Innovations, Sweden is not the ideal market for its technology; hence, neither are the closest countries in terms of geographical area. The explanation to this is that the similar climate-related factors are inappropriate for the technology held by Helios Innovations, as the neighbouring countries and the entire Nordic region experience long winters with a large amount of natural water. Hence, the company prefers to internationalise to countries with their specific market requirements. However, the company agrees with the Uppsala model in

the sense that it would be the easiest to internationalise to the neighbouring countries if not regarding the technology, due to the similar business environments.

As previously stated, Helios Innovations regards markets that are suffering from water shortage, and that is located in a coastal area as the most appropriate market for their technology. However, the chief executive officer states that when looking at markets possessing these requirements, the company will initially start expanding to the country that has the lowest psychic distance in comparison to Sweden. In that regard, the Uppsala model cannot be completely dismissed according to the objectives of the company. As seen in the literature review, the Uppsala model has been criticised for exactly the fact that it does not regard the market-specific environments (UKEssays, 2018; Zohari, 2008). In that regard, the specific product attributes are not concerned, and neither are the markets where these products can be highly demanded, which is a critical point raised by the chief executive officer at Helios Innovations. Hence, in the initial internationalisation process, Helios Innovations should both look into markets that have a demand for the technologies offered by the company, as well as look into which of these countries have the lowest degree of psychic distance.

The Uppsala model highly values knowledge about different markets, and explains that the more information about a market of entrance, the more committed the company is to that particular market, and the same holds the other way around (Johanson & Vahlne, 1977). In regards to this, the chief executive officer does not particularly state that the more knowledge it possesses about a certain market, the more committed the company is. However, Helios Innovations states that the more knowledge the company attains within the internationalisation process from succeeding in foreign markets, the more likely the company is to succeed in further internationalisation to other targeted markets.

Hence, to conclude the idea of the Uppsala model, Helios Innovations states that if following the Uppsala model strictly, it will not be suitable for the company as an internationalisation strategy. However, if the company can combine the concept of psychic distance and market attributes suitable for its technologies and resources, then that would be a suitable internationalisation path. The chief executive officer provides an example of this as even

though India and China possess a demand for clean water and have many coastal factories, those countries would be lower on Helios Innovations ranking than, for instance, Spain. This is because Spain is located closer to Sweden and has the market requirements, as well as a more 'European' or similar way of doing business, hence, becoming an attractive country to expand to in the early internationalisation phase.

5.1.5 The network theory

The availability of the networks in foreign countries, in general, plays an enormous role in the decision-making process regarding the internationalisation of the company (Mitgwe, 2006). Mejri and Umemoto (2010) further add to this that a network can encourage a company to initiate its internationalisation path. Helios Innovations comments upon this by explaining that it can be important to be a part of different networks in order to achieve success in the international scene. Further, taking part in a business relationship facilitates the internationalisation of the company, especially when the network is available in the country where the company wishes to internationalise (Holmlund & Kock, 1998). As the chief executive officer of Helios Innovations observes, the presence of business networks in a particular region is an advantage in entering that market. However, he argues that the decision regarding internationalisation for Helios Innovations will not depend on the availability of the network in the country, but on the suitability of the technology location-wise.

Another occasion which would be evaluated during the decision-making process is whether one of the customers has established business relationships in a particular area and is working there. After these requirements are met, establishing a relationship or joining a network active in the region will be considered by the company as the second step in order to further facilitate the entry to the targeted market. Namely, when internationalising, Helios Innovations understands the importance of having a network in the market introduction stage in the targeted country. Nevertheless, in contradiction to Bell (1995) arguing that network relationships have a substantial impact on the decision regarding which market to enter, the chief executive officer of Helios Innovations states that the networks could be disregarded in the sense that the company will manage to internationalise despite them.

5.1.6 The resource-based view in the internationalisation context

As discussed in the literature review, several scholars highlight the important role of unique resources and capabilities in the internationalisation process of the start-ups (Barney, 1991; Wernerfelt, 1984; Peteraf, 1993). Because of its nature, the early phases of internationalisation can be challenging for the small-sized companies due to the lack of sufficient resources compared to its larger counterparts (Kamakura, Ramón-Jerónimo & Vecino Gravel, 2012). Due to the scarcity of available resources in the current, initial phase, Helios Innovations observes that positioning the resources as the main internationalisation driver is not perceived to be realistic for now. Further, to internationalise with resource-based objectives will not be possible at this moment in time since the production of the technology requires time and further development. However, as the company scales up, and the resources do not require as much time allocated to production and development, the company can start to internationalise through its resources. Hence, one can take into account both a short- as well as a long-term internationalisation perspective in regards to the importance of resource-based internationalisation. This section is followed by both a short- and a long-term internationalisation bundle that the company can use in its internationalisation process.

The internationalisation process will further entail the company valuable knowledge which can be regarded as a profitable resource. Besides the valuable knowledge acquired through internationalisation, the company will also obtain another resource, experience, while cultivating its presence and strengthening its position in the first set of markets. The gathering of knowledge and experience in the foreign markets will be valuable in regards to further internationalisation for the company. Having knowledge-related resources is further perceived as profitable in terms of the Uppsala model.

5.1.7 Short- and long-term internationalisation bundles

In the initial internationalisation process of the researched company, the Uppsala model is necessary to be regarded, as described in the interview with Jonatan Persson. This entails that the researched company needs to internationalise to a similar country; however, as previously mentioned, where the specific resources held by the company are demanded. Hence, in the short-term internationalisation process, for their initial phase, Helios Innovations needs to partly regard the Uppsala model, together with the internationalisation through resources. The

company also expressed that participating in a network potentially could be beneficial. However, having a network in place is explained not to be crucial.

In order to find a suitable internationalisation path in regards to the short-term perspective, Helios Innovations specific market requirements should be analysed, together with how the company perceive different possible entry strategies. From the interview, it can be analysed as in the initial internationalisation process, the Uppsala model is of high relevance, and can account for about 50 percent of the internationalisation bundle suitable for Helios Innovations. Further, the resources are highly important as Helios Innovations need to internationalise to a market where its technology is demanded, hence about 30 percent should be allocated to the resource-based view of internationalisation. Finally, the network theory could potentially account for 20 percent of the internationalisation bundle. Regarding entry mode, the chief executive officer at Helios Innovations describes that initially, it is most profitable for the company to export to different markets and remain to produce the technology in Sweden. This potentially underlines that the Uppsala model should account for the largest percentage share within the bundle, as the theory favours exporting as an internationalisation mode.

The chief executive officer at Helios Innovations discusses that in a matter of time, when the company has excelled its presence in the international market, it can start regarding the internationalisation using their resources, instead of moving incrementally to as similar countries as possible. Hence, a shift in the internationalisation path of the company can be seen in the future. Further, Helios Innovations states that, while exporting is appropriate for the initial internationalisation period, this may be inappropriate in the long run. Then, building up factories producing Helios Innovations' desalination units where it is required on the international market can perhaps be required.

The shifted internationalisation path could be prospected to value the resource-based view to a greater extent than, for instance, the Uppsala model. This is because, as the company states, the act of internationalising to different markets generates much information and market knowledge, and a general knowledge regarding how to conduct international business in different countries. Helios Innovations further states that every new market, even though it

may be similar to the home country of the company, is in a way different, and generates knowledge. Thus, the act of working with more and more countries that are increasingly different from Sweden, that is the home country of Helios Innovations, entails an increased understanding of the internationalisation process. Moreover, with both increased information and increased confidence in the internationalisation process, and as the company states that it will receive more desalination units as they scale up, expanding through the resources will possibly be an internationalisation path in the future.

When the company has these resources, they can move and produce where the resources are needed, and perhaps mostly internationalise incrementally if they expand to countries that are very remote in regards to the home market. With that stated, there is still a possibility that the Uppsala model will be regarded in the future, as a range of different markets probably still need to be approached incrementally. In that way, the Uppsala model could potentially account for 20 percent of the bundle, while the resource-based internationalisation method could account for 50 percent of the bundle.

In regards to the network theory, the networks could be even more appropriate in the international market as this can enable contacts to other countries, and also help the company to grow stronger in a sense. If the company has good networks within the same field in different countries, these networks can, for instance, help the company to ensure a coherent quality level in its different markets. This could especially be beneficial if the company starts to produce units in a foreign country. Hence, networks could also be more beneficial when the company starts to operate more internationally. Thus, in the internationalisation bundle, networks can account for 30 percent. Regarding the future entry mode, exporting can potentially still be profitable. However, the company can start to produce units in more regions and hence receive more shipping points. The company also stressed that it perhaps is required to open up new production facilities in different markets in future terms in order to reach out to more markets.

5.1.8 Internationalisation path through networks

During an interview with Helios Innovations, the company raised its idea about an alternative internationalisation path of expanding through an international company that already owns factories or facilities in different markets at the global level. This internationalisation path brought up by Helios Innovations can indeed be regarded as a way of internationalising through networks, although it was not discussed in that sense during the interview. The reason for this being a potential network internationalisation strategy, is that both companies could potentially benefit from each other, which will be further deliberated on in the next paragraphs. Thus, this internationalisation path will be referred to as the internationalisation path through networks. Holmlund and Kock (1998) underline this exact internationalisation path as they discuss that participating in a business relationship facilitates the internationalisation of a company, especially if its network partner is already established in the country the company wishes to internationalise to.

Helios Innovations argues that it is difficult and time-consuming to reintroduce the technology for new companies continuously. Instead, Helios Innovations could start by introducing its technology to an international client company, and at first install the desalination units at that company's Swedish factory. If the Swedish factory is satisfied with the outcome of the desalination method, the client company can have other operations around the world that possibly would stand in alignment to implement the technology. However, this strategy also has limitations, for instance, that a large portion of the companies owning factories in Sweden are not multinational corporations, and in that case, there are only a few players Helios Innovations can work with to organise this type of internationalisation. Although Helios Innovations considers this limitation, the company still believes that 30 to 40 percent of the energy can be focused on attracting those international companies in order to take the first steps towards the international market and expand gradually.

By engaging in a network, the participants can enjoy mutual benefits (Johanson & Vahlne, 2003), and by maintaining the position within a network, companies can access resources of one another (Johanson & Mattson, 1988). An astonishing example of a strong network relationship is that between Telia and Ericsson, where the two companies adapted their organisations after each other (Håkansson & Lind, 2004). The authors emphasise the

importance of this kind of business relationship and close cooperation between companies in different sizes, in regards to success in the international business arena and in the creation of global alliances. Regarding Helios Innovations, engaging in the internationalisation path through networks that the company proposed could potentially be a start of such a relationship, where two businesses interact and mutually benefit from each other. As previously mentioned in the results chapter, Helios Innovations has the potential to help other companies to transition to implementing a more circular business model. When interviewing the senior specialist, Hilmar Vidarsson, at the potential client company Höganäs AB, he recognises that if the company started to use Helios Innovations technology, it would indeed help Höganäs AB to become more circular in their business model.

Further, being present in almost every continent of the world and running operations in 18 markets (Höganäs AB, n.d.), Höganäs AB can be prospected as one of the better potential business partners for Helios Innovations towards actualising its internationalisation path through networks. As Peng (2001) describes, during the initial phase of internationalisation, start-ups cannot commit the same amount of tangible resources as their competitors; therefore, it can connect with a larger company. The interpersonal ties, contacts and networks created between the start-up and the larger company can result in the formation of strategic alliances that are hard to imitate (Peng & Luo, 2000; Peng, 2001). One could hence argue that such cooperation results in a bond which is difficult to compete with.

Vidarsson describes that if the company was to invest in the technology in Sweden and if it proved profitable in their operations, the company indeed has other areas on the international market where the technology could be even more profitable, namely in areas suffering from water scarcity. Hence, to conclude, one could see that both the potential client company and Helios Innovations could benefit to a greater extent from networking with each other. One could also argue that this networked relationship could include the resource-based view, as the companies are connecting with each other, for instance, to exchange resources in the form of enhanced circular capabilities, and acquire experience and knowledge. Because, as argued by Johanson and Mattson (1988), the companies' interdependence of one another, is explained by their insufficient resources. Further, both companies also see the value in taking the technology to international markets where the demand for the technology is even higher.

The internationalisation path through networks, could also be regarded as an incremental way of starting the international operations, as a part of the internationalisation process is on behalf of the client company, leading to a heavy risk-reduction for Helios Innovations. Hence, the alternative strategy could stand in alignment with the Uppsala model as well, since the theory is known for stressing the importance of internationalising incrementally. It further states that a company should start expanding close to the home market, and the act of acquiring knowledge about the international market before entrance is central. In that way, the units could at first be installed in the Swedish market, which is also the home market of Helios Innovations. Then, it could follow the established company to the international market which the latter already has experience in. Thus, both the uncertainty and risks involved could be heavily reduced, which are favourable according to the Uppsala model. This internationalisation path through networks would result in a unique combination of the network theory and the Uppsala model, and to some instances, the resource-based view.

As touched upon in the literature review, Ellen MacArthur Foundation (2015) has developed the reSOLVE framework that helps companies with ideas to transition from the linear business model to the circular one. If looking at the network between Helios Innovations and Höganäs AB, one could regard the 'share' area to be fulfilled, as the potential client company can share its waste heat, which can be reused to clean saltwater. Further, Helios Innovations can share its cooling facilities which generate energy savings for Höganäs AB. In regards to the 'optimise' area, Helios Innovations and Höganäs AB would indeed optimise the efficiency of their resources if networking with each other and, for instance, heavily decrease the wasted energy. The other areas, however, cannot be properly demonstrated in the internationalisation path through networks. This is similar to the study by Iyer-Raniga (2019), indicating that the different areas potentially can be difficult to perform appropriately.

5.1.9 General analysis

In general, there are two different alternatives in regards to Helios Innovations' internationalisation process. The most beneficial path in regards to the research question of this degree project is the internationalisation path through networks, as it can be argued to reduce the internationalisation-related risks for Helios Innovations as well as open up for tight cooperation and mutual benefits between the two parties. However, one of the interviews with the chief executive officer at Helios Innovations, made it apparent that it can be difficult to attract these types of companies. Thus, it is important to discuss another internationalisation path as well that can be considered in case the researched start-up cannot find a networking partner to connect and cooperate with throughout its internationalisation process. Namely, if Helios Innovations would internationalise on its own, in the beginning, it can follow the short-term bundle and further use the long-term internationalisation bundle in the future, as presented in section 5.1.7. However, the internationalisation path through networks is considered to be the prominent path proposed in this degree project.

5.2 Discussion and future research

This degree project aims to answer the question “What would be an internationalisation path or bundle for a cleantech company with a circular idea, considering the specific characteristics held by cleantech companies and the associated market factors?”. As presented in the chapter on empirical findings, the specific characteristics held by Helios Innovations are that the technology requires waste heat from heavy industry and saltwater pipes, meaning that the production facility has to be located at a coastal line, or close to the coast. Further, the technology is also most appropriate in a market, in this case, country or region, that suffers from limited water resources. Hence, the ideal market for the technology offered by Helios Innovations is an area located close to the ocean with water scarcity that has factories with excess heat, which otherwise would be wasted. When regarding this, one can indeed regard that the statement by Andersson (2005) holds true, which is saying that the suitability of the internationalisation theories depend on the industry context in which the company is embedded. For instance, this degree project evaluates the Uppsala model, saying that it is suitable for Helios Innovations to internationalise incrementally to similar markets. However,

the technology must be suitable for the market of entrance, and the closest markets to Sweden have limited demand for the technology, as described by Helios Innovations.

As both the chapter on empirical findings and the analysis section of this chapter discuss, when a company internationalises, it will face more risks and obstacles associated with the international market arena. Hence, it is given in the analysis section of this chapter, that the company is required to be prepared for the risks involved in the internationalisation process in order to manage the expansion well. The risks include general market risks, political risks, commercial risks and internal challenges, which are all discussed by Helios Innovations. The mere fact that the researched company already has some ideas of how it will manage the risks involved in internationalising is highly beneficial, as the company is required to handle these risks in order to internationalise successfully.

The most suitable internationalisation alternative proposed in this degree project is the internationalisation path through networks, as it provides opportunities for mutual benefits between the companies involved, as well as external welfare. This internationalisation path could also be regarded as a unique combination of the Uppsala model and the network theory. The explanation behind this statement rests on the incremental nature of the internationalisation path through networks, which opens up potentials for reduced risks since the risks are spread over two companies. Further, it could also be the case that the client companies already have a strategic approach to handle the risks involved in the international market within which it is operating.

In regards to the Uppsala model by Johanson and Vahlne (1977), entering the international market involves increased risks, and the risks can be avoided by internationalising incrementally to a country where the psychic distance is low. In this regard, one could argue that the internationalisation path through networks indeed is suitable in regards to the Uppsala model, as the risks, as previously mentioned, naturally is decreased from the connection between Helios Innovations and a potential client company. Moreover, when knowing that the technology suits the client company in Sweden, it also decreases the risks as their international factories most certainly would also stand in alignment for the technology. Concerning the connection to the network theory and the benefits provided, one could

understand that the internationalisation path through networks indeed is mutually profitable for the two parties, which is also mentioned during the interview with Helios Innovations and the potential client company Höganäs AB.

The benefits allocated to the potential client company are motivated by the opportunity of energy and cost savings from the cooling properties, and the possibility for the client company to improve its environmental work when transitioning to a more circular business model. As pointed out in the literature review, the act of transitioning to a circular business model can indeed be a step towards achieving the circular economy (OECD, 2018). The benefits involved for Helios Innovation are that the company could enter the global market incrementally when facing a lower risk, generate increased revenue, and that the company can further work towards achieving one of its core objectives, that is to provide clean water to everyone.

The above-mentioned topic can potentially involve the resource-based view, as the companies' network enables them to share resources, mainly in the form of knowledge and capabilities with each other. That is, Höganäs AB increases their capabilities of becoming more circular, whereas Helios Innovations receive contacts and knowledge about operating in the foreign market. Wernerfelt (1984) further supports this as he not only argues that there is a critical importance in physical assets, but also stresses the value of intangible resources, for instance, knowledge, experience and managerial skills in acquiring a competitive advantage. If Helios Innovations could receive all these resources, they could expand to the international market at an even faster rate. This is supported by Mitgwe (2006), arguing that networks allow companies to internationalise at a faster pace, together with its experiences and resources of network partners. Regarding external welfare, the internationalisation of the technology invented by Helios Innovations is profitable at the global level as water.org (n.d.) argues that accessing clean water opens up new potentials around the world, such as increasing global health and enabling people to have time for work and school.

As previously stated, the idea of the internationalisation through networks is argued to be the most appropriate expansion path in this degree project. In the result section, the chief executive officer at Helios Innovations, indeed recognises that this path would be highly

profitable if Helios Innovations could access an international company that it can expand together with. However, as stated by the chief executive officer, it can be difficult to find and attract such companies. Therefore, this degree project formulated internationalisation bundles, as presented in the next paragraph, that could be used if an internationalisation path like the alternative one could not be performed.

The bundles consist of two perspectives, the short- and the long-term perspective. The reason behind this is that the interviews with Helios Innovations resulted in the common understanding that the company prospected to internationalise incrementally in the beginning, possibly in accordance with the Uppsala model. However, the short-term perspective also indicated elements of the other internationalisation strategies as well, with a percentage bundle of 50 percent of the Uppsala model, 30 percent of the resource-based view and 20 percent of the network theory. The reason for this bundle is that there are certain market requirements from both the researched company's side and the market side. As previously described, the specific technology is most certainly not demanded in markets close to Sweden, although these markets are the closest to Sweden with possibly the lowest psychic distance. Hence, the company is required to internationalise to countries, regions or markets where the technology is demanded. In regards to the network theory, the company believes that participating in a network could be profitable. However, the company argues that it can manage its internationalisation process without taking part in any network. The expansion process into the foreign markets should preferably follow the short-term internationalisation bundle until sufficient resources are produced for the company to expand through its resources. Further, after following the short-term internationalisation bundle for a while, the company is believed to possess sufficient information about operating in the international market, and the internationalisation process as such, to move over to the long-term internationalisation bundle.

In regards to the long-term internationalisation bundle, the company states that in the future, when the company has acquired sufficient resources, the resource-based view in an international context will be more important. This is because the company will internationalise through the resource when it has them. Hence, the long term internationalisation bundle consists of a larger percentage share of the resource-based view.

However, the Uppsala model will still be present when the company internationalise to countries that are very different from Sweden, where the company is more or less required to internationalise incrementally. In regards to the bundle, the Uppsala model can thus account for 20 percent, while the network theory accounts for 30 percent. The reason behind the increase in the network theory is explained by the connections the company will receive in the international market area, which potentially can provide a helpful recommendation, guidance and further contacts to other markets.

When studying the different theories in the sense of circularity, the limitation of these theories calls for future research. Concerning the Uppsala model, it is apparent that it does not regard circular ideas or different products. For instance, a company with a circular product and idea, might have an easier time internationalising to a country where circularity is on the agenda, and the companies in that market acknowledge the importance and value of the product or idea. If the countries are familiar with, for instance, circularity, one could argue that the psychic distance is smaller in regards to those countries, even though those countries are not the closest in geographical terms for instance, so perhaps, there is more to the psychic distance to be researched. Similarly, in regards to network theory, this degree project has contributed to looking beyond the financial incentives of networks between companies and stressed the circular benefits that can occur within a network between two or more companies. Concerning the resource-based view, it can be argued that the current version of this theory does not pay much attention to the resources that can be reused, but rather seem to focus on the single-used resources in terms of material resources. Thus, future research could regard the value of companies reusing resources and reusable resource materials as such, that can benefit either other companies or in some way the society.

When looking beyond the traditional theories of companies, it is clear that this study contributes to the internationalisation processes of small-sized companies, which Montagova (2018) states is a rather undiscovered research area. However, future research could look into a broader small-sized company base, consisting of other fields as well, thus not only cleantech. Further, as discussed in the theoretical problematisation, Bjornali and Ellingsen (2014) argue that few attempts have been conducted to address the nature of the cleantech companies. The authors also stress the research gap regarding the internationalisation process

of the cleantech company in regards to internationalisation theories. This degree project indeed contributes to knowledge of cleantech companies as such, and the applicability of internationalisation theories on cleantech companies. However, due to the time and scope requirements of this degree project, only a few internationalisation theories could be covered that is evaluated and analysed. Thus, future research could both study the nature of the cleantech company as such and evaluate the applicability of other internationalisation theories in terms of cleantech companies.

Further, this research has focused on internationalisation theories, and thus not the entry mode decision applicable to a cleantech company. Future research can, in that sense, look at the possible entry modes, such as exporting, foreign direct investment, and licencing, and further consider their appropriateness. The choice of entry mode, as well as the applicability of different theories as discussed in the previous paragraph, can also be explored through looking at different cleantech companies, in order to receive a more general internationalisation path of the cleantech company, as the concept of cleantech also includes different fields.

According to the Government of Sweden (n.d.), new technologies that can solve the global water shortage are essential on the international market. Thus, one practical implication of this degree project contributes with an internationalisation path that can help a company which is aiming to solve a global problem to become international. The global problem that is examined is the issue of water scarcity. Thus, if the case study company would follow the proposed internationalisation path, one could argue that the water scarcity could be reduced.

Other practical implications of this degree project is that it contributes with an applied understanding of how a company can enhance a circular business model, which the United Nations (n.d. a) stresses to be important as the global environmental footprint is continuously rising. Namely, section 4.1.2 contains an in-depth explanation of how Helios Innovations is circular. Further, the network between Helios Innovations and Höganäs AB indeed exhibits a practical example of how Höganäs can enhance a more circular business model from cooperating with Helios Innovations.

In relation to the network relationships necessary to tackle environmental problems, Geffen, Marcus and Sexton (2002) propose that government and company cooperations potentially can solve pressing environmental issues. Moreover, Westman (2020) argues that countries need to cooperate in order to meet the targets put forward by the Agenda 2030 goals. Another practical contribution of this degree project is that it shows a connection on the company level, namely if two companies are networking with each other, can also be highly beneficial in solving environmental issues. This is because, as Helios Innovations expands its technologies into the international market, it helps its networking partners to enhance a circular business model, as well as is working towards solving the issue of the global water shortage. However, due to the limited scope of this degree project, it was hard to investigate this even further, as most of the space was used to analyse the different theories. Thus, future research could look into whether cooperation at the company level can solve pressing environmental concerns, as well as to what extent.

6 Conclusion

Throughout history, there have been several attempts to describe the internationalisation process of companies. Some of them value network relationships or incremental internationalisation through exports. However, the main similarity between the regarded theories is the research around traditional, linear companies, whereas this degree project studies a recently created company with its fundamental idea being circular. This qualitative degree project in international business examines the Uppsala model, the network theory, and the resource-based view in an internationalisation context through in-depth interviews with not only the researched company, Helios Innovations, but also the potential client company, Höganäs AB. The purpose of this study is to contribute to the existing research on internationalisation paths for small-sized, cleantech companies with circular ideas. Since the nature of circular cleantech companies is quite specific, this paper contributes both to the understanding of their characteristics and also the theoretical applicability of traditional theories in terms of modern time concepts and circular business models. The act of engaging in international operations naturally results in the exposure to increased risks and competition. Therefore, this degree project evaluates this and discusses possible ways of managing the risks involved and the increased competition, in order for the chosen internationalisation path to have a higher chance of being successful.

The research question aims both to find a profitable internationalisation path or bundle, as well as to outline the characteristics of the cleantech company and the associated market factors. It all results in the conclusion of an internationalisation path through networks, indicating that the cleantech company is aiming to solve the problem of scarce water resources at the global level, and that the internationalisation process should preferably be conducted together with an international company. Thus, Helios Innovations can internationalise through, or together with its network partner, because if the client company enjoys the technology supplied by Helios Innovations, it most certainly has other factories around the world that could stand in alignment for the technology. However, in case an international client company cannot be reached, which potentially can be the case as discussed by the chief executive officer at Helios Innovations, the company perhaps needs to internationalise on its own. In that case, this project proposes an alternative

internationalisation bundle consisting of a short- and long-term internationalisation bundle. Further, the specific characteristics and the market factors are investigated in the degree project stating that Helios Innovations needs residual heat and saltwater pipes. Hence, the client company needs to have a factory or factories having waste heat which are located close to the coast. It is also most profitable to enter a market suffering from water shortage, as the company can provide valuable benefits there.

This degree project demonstrates a unique setting and combination of the Uppsala model and the network theory, and to some extent, the resource-based view. This is because the internationalisation path through networks calls for both a close cooperation with another company, where the internationalisation related risks are either divided between the two companies in the network or heavily reduced since one company is already established in the international market. Perhaps the most critical, the network abilities of this internationalisation path are explained to entail mutual benefits between the potential client company and the researched company. Further, the networking abilities can indeed strengthen the work regarding circularity, as shown in this degree project where Höganäs AB argues that one of the most valuable elements from connecting with Helios Innovations is the potential transition towards a more circular business model. One could argue that these companies exchange valuable resources. Thus the relationship between the two parties can potentially be resource-based. Although these traditional theories can be argued to have their flaws, the theories still explain complex situations in international contexts that are both critical and valuable to take into account.

The practical contributions of this degree project is that it provides an understanding of the importance of networks at the company level in solving critical environmental issues and benefiting both parties. Further, the internationalisation path through networks provides an understanding of how a circular idea, aiming to solve a global issue, can be internationalised. Even so, to the markets that perhaps do not value circular ideas that high, if the client company already is established in that market. This path would benefit the process to solve a global issue, namely that of water shortage at the same time as it allows the client company to enhance more circular practises. As given in the project, the transition to a circular business model is indeed integrated in achieving the circular economy. Perhaps, one could potentially

draw the conclusion that the act of networking could be a key towards reaching the circular economy.

References

Alvehus, J. (2013). Write an essay with qualitative method: A handbook, Stockholm: Liber

Andersson, S. (2005). Internationalization in different industrial contexts, *Journal of Business Venturing*, vol. 19, no. 6, pp. 851-875, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 1 April 2020]

Asemokha, A., Keränen, J., Rissanen, T., Saarenko, S., Salojärvi, H., Torkkeli, L., & Uzhegova, M. (2018). Internationalisation handbook for Cleantech SMEs, Lappeenranta: Lappeenranta University of Technology

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage, *Journal of Management*, vol. 17, no. 1, pp. 99-120, Available online: [https://josephmahoney.web.illinois.edu/BA545_Fall%202019/Barney%20\(1991\).pdf](https://josephmahoney.web.illinois.edu/BA545_Fall%202019/Barney%20(1991).pdf) [Accessed 2 April 2020]

Bell, J. (1995). The internationalization of small computer software firms—A further challenge to “stage” theories, *European Journal of Marketing*, vol. 29, no. 8, pp. 60-75, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 2 April 2020]

Birken, P., Muscheler, R., von Post, M., Johansson, M., & Rummukainen, M. (2019). Crash course: Five scientists about climate change, Available online: <https://www.lu.se/article/snabbkurs-fem-forskare-om-klimatforandringar> [Accessed 31 March 2020]

Bjornali, E., & Ellingsen, A. (2014). Factors affecting the development of cleantech start-ups: A literature review, *Energy Procedia*, vol. 58, no. not given, pp. 43-50, Available online: https://www.researchgate.net/publication/275534011_Factors_Affecting_the_Development_of_Clean-tech_Start-ups_A_Literature_Review [Accessed 31 March 2020]

Blomstermo, A., Eriksson, K., Lindstrand, A., & Deo Sharma, D. (2004). The perceived usefulness of network experiential knowledge in the internationalizing firm, *Journal of International Management*, vol. 10, no. 3, pp. 355–373, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 4 April 2020]

Bocken, N., de Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy, *Journal of industrial and production engineering*, vol. 33, no. 5, pp. 308-320, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 10 April 2020]

Bocken, N., Geissdoerfer, M., Hultink, E., & Savaget, P. (2017) The Circular Economy – a new sustainability paradigm? *Journal of Cleaner Production*, vol. 143, no. not given, pp. 757-768, Available online: https://www.repository.cam.ac.uk/bitstream/handle/1810/261957/The%20Circular%20Economy%20-%20a%20new%20sustainability%20paradigm_accepted%20version.pdf?sequence=1&isAllowed=y [Accessed 2 April 2020]

Bryman, A. (2008). *Social research methods*, 3rd edn, Oxford: Oxford University Press

Bryman, A. & Bell, E. (2011). *Business research methods*, 3rd edn, Oxford: Oxford University Press

Business Sweden. (n.d.). *Cleantech in Sweden*, Available online: <https://swedishcleantech.com/wp-content/uploads/2018/02/cleantech-sector-overview.pdf> [Accessed 3 April 2020]

Caprotti, F. (2011). The cultural economy of cleantech: environmental discourse and the emergence of a new technology sector. *Transactions of the Institute of British Geographers*, vol. 37, no. 3, pp. 370-385, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 5 April 2020]

Cleantech Scandinavia. (n.d.). *What is Cleantech?* Available online: <https://cleantechscandinavia.com/about-us/> [Accessed 29 March 2020]

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, 4th edn, Los Angeles: Sage Publications

Del Río González, P. (2005). *Analysing the factors influencing clean technology adoption: a study of the Spanish pulp and paper industry*, vol. 14, no. 1, pp. 20-37, Available online: <https://onlinelibrary.wiley.com/doi/abs/10.1002/bse.426> [Accessed 2 April 2020]

Ellen MacArthur Foundation. (2013). *Towards the circular economy*, Available online: <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf> [Accessed 10 April 2020]

Ellen MacArthur Foundation. (2015). *Delivering the circular economy - a toolkit for policymakers*, Available online: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/EllenMacArthurFoundation_PolicymakerToolkit.pdf [Accessed 10 April 2020]

Ellen MacArthur Foundation. (2018). *Our mission is to accelerate the transition to a circular economy*, Available online: <https://www.ellenmacarthurfoundation.org/> [Accessed 10 April 2020]

European Environmental Agency. (2014). *Waste: A problem or a resource?*, Available online: <https://www.eea.europa.eu/signals/signals-2014/articles/waste-a-problem-or-a-resource> [Accessed 3 April 2020]

Geffen, D.A., Marcus, A., & Sexton, K. (2002). *Business-government cooperation in environmental decision-making*, vol. 9, no. 4, pp. 354-355, Available online: <https://www.sciencedirect.com/science/article/abs/pii/S1066793802001100> [Accessed 25 May 2020]

Government of Sweden. (n.d.). The future is built with environmental technology from Sweden, Available online: https://swedishcleantech.com/wp-content/uploads/2018/02/imt_environmental-technology_engelska.pdf [Accessed 30 March 2020]

Hofmann, F., Jokinen, T., & Marwede, M. (2017). Circular Business Model, Available online: <https://sustainabilityguide.eu/methods/circular-business-models/> [Accessed 10 April 2020]

Holmlund, M., & Kock, S. (1998). Relationships and the internationalization of Finnish small and medium-sized companies, *International Small Business Journal*, vol. 16, no. 4, pp. 46–63, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 5 April 2020]

Höganäs AB. (n.d.). Höganäs in three minutes, Available online: https://www.hoganas.com/en/about-hoganas/hoganas-in-three-minutes/?fbclid=IwAR2CwSzpYDkkFycNxxw1zhIqgRWLD8E3iQlz3fGqjKw5Kp_HhxnRpxGs6B0 [Accessed 10 May 2020]

Håkansson, H., & Lind, J. (2004). Accounting and network coordination, *Organisations and Society*, vol. 29, no. 1, pp. 51-72, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 15 May 2020]

Iyer-Raniga, U. (2019). Using the ReSOLVE framework for circularity in the building and construction industry in emerging markets, Available online: <https://iopscience.iop.org/article/10.1088/1755-1315/294/1/012002/pdf> [Accessed 20 April 2020]

Johanson, J., & Mattsson, L. (1986). International marketing and internationalization processes—a network approach, in P.W. Turnbull & S. Paliwada (eds), London: Routledge, pp. 234–265

Johanson, J., & Mattsson, L. (1988). Internationalization in industrial systems: A network approach, in Hood, N., & Vahlne, J-E., (eds), London: Croom Helm, pp. 194-213

Johanson, J., & Vahlne, J. (1977). The internationalization process of the firm - a model of knowledge development and increasing foreign market commitments, *Journal of International Business Studies*, vol. 8, no. 1, pp. 25-34, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 15 April 2020]

Johanson, J., & Vahlne, J. (1990). The mechanism of internationalisation, *International Marketing Review*, vol. 7, no. 4, pp.11–24 Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 12 April 2020]

Johanson, J., & Vahlne, J. (2003). Business relationship learning and commitment in the internationalization process, *Journal of International Entrepreneurship*, vol. 1, no. 1, pp. 83-101, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 23 April 2020]

Johanson, J., & Vahlne, J. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership, *Journal of International Business Studies*, vol. 40, no. 9, pp. 1411-1431, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 20 April 2020]

Johanson, J., & Vahlne, J. (2017). From internationalisation to evolution: The Uppsala model at 40 years, *Journal of International Business Studies*, vol. 48, no. 9, pp. 1087-1102, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 2 April 2020]

Kamakura, W.A., Ramón-Jerónimo, M.A., & Vecino Gravel, J.D. (2012). A dynamic perspective to the internationalization of small-medium enterprises, *Journal of the Academy of Marketing Science*, vol. 40, no. 2, pp. 236-251, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 25 March 2020]

Kubičková, L. (2013). Limits of the Uppsala model application in the internationalization process of Czech SMEs, *European International Journal of Science and Technology*, vol. 2, no. 9, pp. 245-254, Available online: https://www.eijst.org.uk/images/frontImages/gallery/Vol._2_No._9/25.pdf [Accessed 25 April 2020]

Kvale, S., & Brinkmann, S. (2014). *The qualitative research interview*, 3rd edn, Lund: Studentlitteratur

Leonidou, L.C., & Katsikeas, C.S. (1996). The export development process: an integrative review of empirical models, *Journal of International Business Studies*, vol. 27, no. 3, pp. 517–551, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 4 April 2020]

McDonough, W., & Braungart, M. (2002). *Cradle to cradle: Remaking the way we make things*, New York: North Point Press

Mejri, K., & Umemoto, K. (2010). Small- and medium-sized enterprise internationalization: Towards the knowledge-based model, *Journal of International Entrepreneurship*, vol. 8, no. 2, pp. 156-167, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 10 May 2020]

Mitgwe, B. (2006). Theoretical milestones in international business: The journey to international entrepreneurship theory, *Journal of International Entrepreneurship*, vol. 4, no. 1, pp. 5-25, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 24 April 2020]

Montagova, J. (2018). Recognizing the Role of Networks in Market Entry Mode Decisions of SMEs, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 2 April 2020]

NASA. (n.d.). The effects of climate change, Available online: <https://climate.nasa.gov/effects/> [Accessed 1 April 2020]

OECD. (2018). Business models for the circular economy, opportunities and challenges from a policy perspective, Available online:
<https://www.oecd.org/environment/waste/policy-highlights-business-models-for-the-circular-economy.pdf> [Accessed 2 April 2020]

Osterwalder, A., & Pigneur, Y. (2010). Business model generation, New Jersey: John Wiley & Sons Inc

Peng, M.W., & Luo, Y. (2000). Managerial ties and firm performance in a transition economy: The nature of a micro-macro link, *The Academy of Management Journal*, vol. 43, no. 3, pp. 486–501, Available through: EHL Library website:
<https://www.ehl.lu.se/biblioteket> [Accessed 27 April 2020]

Peng, M.W. (2001). The resource-based view and international business, *Journal of Management*, vol. 27, no. 6, pp. 803–829, Available online:
<https://www.sciencedirect.com/science/article/abs/pii/S0149206301001246> [Accessed 27 April 2020]

Persson, J. (2020). Helios Innovations pitch, Youtube, [video online], Available at:
<https://www.youtube.com/watch?v=OwZ5DUdyet8> [Accessed 30 March 2020]

Peteraf, M.A. (1993). The cornerstones of competitive advantage: Resource-based view, *Strategic Management Journal*, vol. 14, no. 3, pp. 179–191, Available through: EHL Library website: <https://www.ehl.lu.se/biblioteket> [Accessed 30 April 2020]

Pope, E.K. (2020). Startup vs small business: What's the real difference?, Available Online:
<https://www.fundera.com/blog/startup-vs-small-business> [Accessed 27 April 2020]

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methods for business students, 7th edn, Harlow: Pearson

Scott, R. (1973). The closing circle: A review of Barry Commoner's book, Available online:
<https://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1006&context=iustitia> [Accessed 16 April 2020]

Skärvad, P.H., & Lundahl, U. (2016). Investigation methods, 4th edn, Lund: Studentlitteratur

Swedish Cleantech. (2019). About cleantech, Available online:
<https://swedishcleantech.se/om-miljoteknik.html> [Accessed 22 May 2020]

UKEssays. (2016). The Uppsala model a poor guide. Available online:
<https://www.ukessays.com/essays/business/the-uppsala-model-a-poor-guide.php?vref=1> [Accessed 14 April 2020]

United Nations. (n.d. a). Impact: Transforming the business, changing the world, Available online:

<https://sustainabledevelopment.un.org/content/documents/2149Impact%20Transforming%20Business.pdf> [Accessed 3 April 2020]

United Nations. (n.d. b). Goal 6: Ensure access to water and sanitation for all, Available online: <https://www.un.org/sustainabledevelopment/water-and-sanitation/> [Accessed 27 May 2020]

Wang, C.L., & Ahmed, P.K. (2007). Dynamic capabilities: A review and research agenda, *International Journal of Management Reviews*, vol. 9, no. 1, pp. 31-51, Available online: <https://repository.royalholloway.ac.uk/file/591eb589-5df7-45b1-89e0-6ed34222d85d/1/Wang%20C%20IJMR%20final.pdf> [Accessed 19 May 2020]

Water.org. (n.d.). The water crisis, Available online: <https://water.org/our-impact/water-crisis/> [Accessed 29 March 2020]

Webster, K. (2015). *The circular economy: A wealth of flows*, Isle of Wight: Ellen MacArthur Foundation Publishing

Wernerfelt, B. (1984). A resource-based view of the firm, *Strategic Management Journal*, vol. 5, no. 2, pp. 171-180, Available online: <http://web.mit.edu/bwerner/www/papers/AResource-BasedViewoftheFirm.pdf> [Accessed 15 April 2020]

Westman, U. (2020). International cooperation, Available online: <http://www.swedishepa.se/Environmental-objectives-and-cooperation/Cooperation-internationally-and-in-the-EU/International-cooperation/> [Accessed 23 May 2020]

Yin, R.K. (2012). *Applications of case study research*, 3rd edn, Thousand Oaks: Sage Publications

Yin, R.K. (2014). *Case study research: Design and methods*, 5th edn, London: Sage Publications

Yuan, Z., Bi, J., & Moriguichi, Y. (2006). The circular economy: A new development strategy in China, *Journal of Industrial Ecology*, vol. 10, no. 1-2, pp. 4-8

Zero Waste Scotland. (n.d.). What are circular economy business models?, Available Online: <https://www.zerowastescotland.org.uk/content/what-are-circular-economy-business-models> [Accessed 25 March 2020]

Zohari, T. (2008). The Uppsala internationalization model and its limitations in the new era. Available online: http://www.digitpro.co.uk/paper/The%20Uppsala%20Internationalization%20Model_web.pdf?fbclid=IwAR0ABj7DDYePt_1QnYW0ovYqdEGQ74BxoXv56iubt9F1Dswm-l3oSqNEzY4 [Accessed 29 April 2020]

Appendices

Appendix A - Interview questions for Helios Innovations

1. In what ways does Helios contribute to a more sustainable world?
2. a) In what way do you work with circularity and how circular would you estimate your business model to be?
b) What is your perception on how you are working with circularity?
c) Would you consider yourself profitable in regards to circularity within your own company?
3. What is your vision, how would the ideal world look to you, in regards to water management?
4. Would you consider your innovation being profitable for other companies, for instance, in their process to improve their circularity?
5. Why would you like to expand your idea to the international market?
6. What country would you like to expand to first, and why that specific market?
7. Do you have any idea about how and by what strategy?
8. Which are the attributes that you would look at when going into another market?
9. What are the characteristics of the targeted customers?
10. How do you consider the following different internationalisation paths, i.e. these different theories, explaining how you chose where to go and how you internationalise?
 - a) Internationalise to a country with similar economic, social and political systems, and moving incrementally (carefully) through exporting?
 - Do you think that this lacks something that you would want to include?
 - b) Use your resources as the key reason for internationalisation?
 - For instance, some countries may demand this kind of innovation and then you move into that country?
 - Do you think that this lacks something that you would want to include?
 - c) Take part in a network in the international market and hence get knowledge and experience about different markets?
 - Do you value having networks in a specific market, does that decrease the barriers to internationalise to that country?
 - Will networks affect the decision regarding what market to internationalise to?
 - Do you think that this lacks something that you would want to include?
 - d) Do you prefer one of these internationalisation paths over the other? What sounds most appealing for your company for the technology etcetera?
 - e) If you were to use these theories, and could use all of them, however to different degrees, which one do you value the most?
 - f) Or would you choose to internationalise in a completely different way, following a completely different strategy?
 - g) Why, for what reasons?
11. Is it important for you to have networks within the targeted country that you would like to expand to?
12. Do you have already established networks in any country that you would like to internationalise to or networks internationally in general?
13. Will it affect your internationalisation decision and choice of country?
14. What do you see as an appropriate entry mode, for instance, exporting, licencing, joint venture etc.? What sounds most appealing for your company for the technology etcetera, do you prefer one entry mode over another?
15. What is the production cost for one unit?

16. What does the patent situation look like?
17. Could you see any potential competitors?

Appendix B - Interview questions for Helios Innovations

1. Asemokha et al. (2018) developed a self-assessment tool in regards to the ‘readiness’ of internationalisation, that cleantech companies can use before they decide whether to internationalise or not. Where does Helios Innovations position itself now?

	Systematically	Periodically	Very rarely
We assess the attractiveness of our value proposition in relation to the opportunities available on the international markets.			
We make sure that environmental and social responsibility can be seen in our business models and in our value propositions to customers.			
We assess potential and current international partners and their significance for our business.			
When we detect an opportunity to expand to a foreign market area, we know which organisation to contact in order to build a larger consortium.			
We are willing to adapt our operating methods (such as independent distributors, subsidiaries or production plants) based on the needs of each foreign market area.			
Score calculation factors	x 3=	x 2=	x 1=
Readiness for international growth:			
14 - 15 Points	Very good readiness for fast international growth		
12 - 13 Points	Fairly good readiness for fast international growth		
10 - 11 Points	Readiness for stable, but not necessarily fast international growth		
8 - 9 Points	Readiness only for slow, gradual international growth		
5 - 7 Points	Poor readiness for seeking growth from the international market		

(Asemokha et al. p. 38, 2018)

2. How do you think that you will prepare yourself in regards to general risks?
3. How do you think you could prepare yourself in regards to political risks?
4. How do you think that you can prepare yourself in regards to commercial risks?
5. How do you think that Helios Innovations can prepare for internal obstacles when internationalising to the international market?
6. How do you plan to acquire sufficient fundings to operate in a foreign market?
7. Do you have an idea how to manage an increased competition base, and do you think that this will be a challenge for Helios Innovations?
8. a) Do you think it can be hard to internationalise when pitching a circular idea into a new market?
b) Do you think that some companies or countries do not value a circular business model as much as others? Will you then use country-specific value propositions of the technology behind Helios Innovations?
9. Do you have an idea or prospects of a strategy that can manage a changing environment, as changes can be present to a large degree in the international market?

Appendix C - Interview questions for Höganäs Metal Powder Solutions

1. What is your current position at Höganäs Metal Powder Solutions?
2. How does Höganäs Metal Powder Solutions value circular business models?
3. How do you evaluate Höganäs Metal Powder Solutions in terms of circularity?
4. Does Höganäs Metal Powder Solutions' factories have residual waste heat? In that case, what do you do with it?
5. How well are you aware of Helios Innovations technology?
6. Now we will discuss different aspects of the technology that potentially could be valuable for Höganäs Metal Powder Solutions;
 - a) Do you think that the technology offered by Helios Innovation could help you towards achieving a more circular business model?
 - b) Do you think that the technology could result in energy savings, for instance, through the cooling facilities that the technology provides? Is this applicable to your company?
 - c) Do you think that this technology can result in cost savings and thus increase the profitability of Höganäs?
 - d) Do you think that the technology can be valuable in any other way for Höganäs?
7. Do you see an opportunity in utilising this technology in the future in terms of circularity?
8. Do you think that some other markets could benefit even more from this technology than, for instance, Sweden? Further, do you have any idea of a market, in which you are operating, where this technology could be beneficial?