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Internationalization through business models

-a case study of Swedish cleantech firms-

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Abstract

Though in the innovative and technological forefront of cleantech, Swedish firms must become better at commercializing clean technology and to capitalize on international opportunities. Furthermore, firms' business models are sources of competitiveness and serve as instruments to commercialize technology. To internationalize and compete in increasingly global and complex environments, a good business model is therefore crucial. Yet, business model- and internationalization research have largely been carried out as separated fields, with few studies investigating how business models are used when and affected by internationalization. To address this research gap, multiple case study research of eight Swedish cleantech firms within the energy efficiency sector were carried out. Interviews were conducted with managers at the participating firms to explore how they had utilized the business model during internationalization. The results show that certain business model design traits and business model adaptations facilitates internationalization of the firm. Specifically, our results indicate that the business model design traits of customer centricity, business and product development focus, and prominent use of partnerships and business network facilitates internationalization. The findings also show that business model adaptations are a prerequisite for internationalization, due to differences that exist among international markets. Finally, the results indicate that the firm strategy is an important influencer on the choice of business model design and adaptations for internationalization.

Keywords: Business models, internationalization, international business models, Swedish cleantech, strategy

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Abbreviations

B2B – Business-to-business

B2C – Business-to-consumer

BG – Born Global firms

CEO – Chief Executive Officer

COO – Chief operating officer

HVAC – Heat, ventilation and air conditioning

INV – International new ventures

IoT – Internet of things

KAM – Key account manager

LED – Light emitting diode

MNC – Multinational corporation

OEM – Original equipment manufacturer

R&D – Research and development

SME – Small and medium-sized enterprise

1. Introduction

This chapter begins with a background of the main concepts of this thesis; Internationalization, Business models and Cleantech. This is followed by a problem discussion, identifying the research gap and the relevance of the study. Thereafter, the purpose and research question that guides the thesis is presented.

1.1 Background

Globalization and international business are phenomena that has been around for centuries. However, integration of global markets has risen substantially since the post-World War II period (Chibba, 2014; Ghemawat, 2003). Nevertheless, global markets are not perfectly integrated, forcing firms to take location specificity into consideration in international business strategy (Ghemawat, 2003). International business research has taken both the perspective of larger corporations with regards to international production networks and sales activities (Dunning, 1988; Johanson & Vahlne, 1977), as well as the role of smaller firms participating in international business (Kuivalainen, Sundqvist, Saarenketo, & McNaughton, 2012). Better availability to markets through globalization and improvements in infrastructure and communication technologies have been triggers for small firms to internationalize early to improve their competitiveness (Castaño, Méndez, & Galindo, 2016; Cavusgil & Knight, 2015). Internationalization of the firm serves to achieve firm growth (Saarenketo et al., 2018), increase firm performance, competitiveness, as well as profitability (Cavusgil & Knight, 2015; Schwens et al., 2018). Furthermore, internationalization of firms and entrepreneurial activity are sources of competitive strength of a country, as it leads to employment and economic growth (Castaño, et al., 2016).

However, with continued globalization and internationalization of firms, managers must learn to navigate the complexities of international markets to be competitive (Mudambi & Zahra, 2007). While competencies, international mindset, knowledge, experience, as well as utilization of business networks are all important for international competitiveness (Cavusgil & Knight, 2015, Johansson & Vahlne, 2009), the business model concept goes further in explaining how firms can achieve competitiveness in international markets (Kraus, Brem, Schuessler, Schuessler, & Niemand, 2017). A firm's business model explains how it creates value, how this value is delivered to customers, and how the firm itself can profit and extract revenues from this process (Teece, 2010). In short, the business model is an instrument for firms to

commercialize innovations and technology (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Teece, 2010), and has been depicted as a useful tool for managers to take well-informed decisions on how to increase competitiveness of the firm (Trimi, & Berbegal-Mirabent, 2012). Moreover, whenever a firm chooses to internationalize operations, it is done by changing specific aspects of the business model (Rask, 2014). The decisions of changing the business model to internationalize operations is highly related to the strategic issues of internationalization, as managers must decide what activities to do, where to locate certain activities, and who should perform them (Onetti, Zucchella, Jones, & McDougall-Covin, 2012). A parallel development to globalization and international business in the international community is the growing concern of climate and environmental change, due to alarming reports of increasing CO₂ emissions, climate disasters, and record temperatures (IPCC, 2018; McGrath, 2018). Thus, accelerating the need for sustainable solutions, technologies and businesses (Gaddy, Sivaram, Jones, & Wayman, 2017). The cleantech sector represents sustainable technologies and businesses (Dikeman, 2018).

Sweden has one of the world's best performing cleantech sectors with substantial public R&D expenditure and a renowned entrepreneurial culture (Sworder, Youngman, Stubelius, Nekham, & Henningson, 2017). However, Sweden is surprisingly ineffective in converting said inputs to commercialized outputs (Sworder, et al., 2017), and capitalizing on international business opportunities (Kanda, Hjelm, and Mejía-Dugand, 2016; Sworder et al., 2017). For instance, Sweden has been outperformed in exports by their nearby neighbors Finland and Denmark despite having higher turnover in the sector (Kanda et al., 2016), and by Germany and China, even after weighting to GDP (Sworder, et al., 2017). This lack of exports is an intriguing aspect, as it speaks for a general lack of ability or ambition of managers and policymakers regarding growth, commercialization, and internationalization in the Swedish cleantech sector. Nevertheless, as the Swedish cleantech sector is ranked highly in comparison to many other countries (Ibid.), firms in this sector could be considered to have the prerequisites to be competitive in international markets.

Research on the business model in relation to firms developing sustainable solutions and innovations is especially interesting as these firms specifically need to focus on how to create competitive business models to compete with traditional firms (Boons, Montalvo, Quist, & Wagner, 2013; Johnson and Suskewicz, 2009). Sustainable businesses are not only delivering financial value to their customers, but also environmental and social value to their customers, as well as other stakeholders in the wider society (Saarenketo et al., 2018; Tolcamp, Huijben,

Mourik, Verbong, & Bouwknecht, 2018). However, these varying aspects of proposed and delivered value, can also be difficult to assess and successfully communicate to customers (Saarenketo et al., 2018). Although, learning how to communicate not only economic benefits, such as decreased materials spending or operating costs, but also branding opportunities and risk-reduction benefits to customers, could be a source of competitive advantage for cleantech firms (Saarenketo et al., 2018). By learning how to balance this multilayered value proposition (Boons, & Lüdeke-Freund, 2013), and incorporate customer feedback to adapt the business model accordingly (Tolkamp et al., 2018), cleantech firms can increase their competitiveness.

The fact that Swedish cleantech firms seems surprisingly inactive internationally and that business models serves a useful instrument for managers to understand how to commercialize innovations and internationalize operations - make for an intriguing research topic. Thus, within the context of Swedish cleantech, this thesis will delve into questions on how business models can be used when internationalizing.

1.1.1 Business model definition

The concept of business models has yet to be fully defined and researchers argue that the field still have issues with coherence, due to lack of agreement on how to define the business model (Zott, Amit & Massa, 2011). The research on business models became popular after information and communication technologies challenged established assumptions on how to do business (McGrath, 2010; Zott et al., 2011). Teece (2010, p.179) defines the business model as: “A business model articulates the logic, the data, and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value. In short, it’s about the benefit the enterprise will deliver to customers, how it will organize to do so, and how it will capture a portion of the value that it delivers.”

This definition will be followed in this thesis and the business model concept will be further elaborated in the theory chapter. As the business model literature is fraught with definitions and varying terms, we will use the term ‘business model design’ when referring to the state of any business model in line with Teece (2010), Zott & Amit (2007), and Landau, Karna and Sailor (2016). Further, when referring to altering of the business model, we will use the term ‘business model adaptation’, as used by Landau et al. (2016).

1.1.2 Cleantech definition

Cleantech is short for clean technology, a diverse term which incorporates many different industries under the same name. The term was made popular during the early 2000s and was

primarily introduced by the private US consultancy firm the Cleantech Group, to describe new technology focusing on both the aspects of profitability and sustainability. As a contrast, older terms greentech or environmental technology primarily reflected a focus on sustainability (Dikeman, 2018). This differentiation from older technology have also been highlighted by others who argue that cleantech combines sustainability values and economic interests, but also involves substantial use of information and communication technology (Saarenketo et al., 2018). The following definition of cleantech by Gaddy et al. (2017, p.386) will be used in this thesis: “those which are commercializing clean energy technologies or business models, including those developing, integrating, deploying, or financing new materials, hardware, or software focused on energy generation, storage, distribution, and efficiency.”

Saarenketo et al. (2018) point out that cleantech cannot be considered an individual industry, but rather a composition of firms with focus on sustainability and profitability that encompass multiple industries. In this thesis, as the unit of analysis; we will look specifically into Swedish firms within the energy efficiency sector, thus not covering the entire cleantech sector. The energy efficiency sector is comprised of firms within energy efficiency, energy storage, heating and cooling, lighting, smart grids, and ventilation according to Swedish Cleantech (2019).

1.2 Problem discussion

Though internationalization theory is well researched with a conceptual base, the research on business models as a theoretical concept is fraught with a vast array of definitions and its conceptual base remain lacking in depth (Zott et al., 2011). Previous research has predominantly been focused on taxonomy and typology, arguing for what a business model is not but failing to reach consensus to what it is. Consequently, researchers and academics have called for cumulative research (Zott et al., 2011; Clauss, 2017; Morris, Schindehutte, & Allen, 2005). Thus, conducting empirical research based on previous business model conceptualization (e.g. Clauss, 2017) could provide increased clarity and coherence in what constitutes a business model. This thesis builds on the conceptualization that business models are made up of three dimensions; value creation, value proposition, and value capture, each composed of a specific set of components (Clauss, 2017; Osterwalder & Pigneur, 2010).

Furthermore, business model as a theoretical concept, and internationalization research has largely been carried out as separate research streams, with little interaction between the two fields (Kraus et al., 2017), illustrating a research gap. However, few scholars have tried to bridge this gap. Nevertheless, some argue that many of the managerial decisions connected to

internationalization and business models are the same (Onetti et al., 2012; Rask, 2014). Others have tried to explain what characterizes business models designed or innovated for international operations, to create typologies of international business models (Child et al., 2017; Rask, 2014). Few have looked at the business model as an influencer in the internationalization process, although Kraus et al. (2017) found specific elements of business models to facilitate rapid internationalization of BGs. Furthermore, Landau et al. (2016) found evidence of business model adaptation in chronological phases when longitudinally studying a German MNC's entry to an emerging market. As the available literature focuses mostly on typologies of international business models, the relationship between internationalization and business models is still a rather unexplored union. This is problematic as the general decisions regarding the business model and internationalization are closely related (Onetti et al., 2012), with regards to products, services, sales channels, customer segments, business networks, etc., (Clauss, 2017; Johanson & Vahlne, 2009; Welch & Luostarinen, 1988).

Existing internationalization research has largely discussed internationalization strategy, and its practical implications on firm activities (Johanson & Vahlne, 2009; Knight & Cavusgil, 2004; Oviatt & McDougall, 1994). However, this has been done without discussing business models, which can be considered the realization of strategy and the logic of how the firm operates (Casadesus-Masanell & Ricart, 2010). There have been calls for using new theoretical lenses to explain internationalization of the firm (Cavusgil & Knight, 2015). Using business models as a theoretical lens on internationalization could explain how a firm design and adapt its various activities and components of the business model when internationalizing. Moreover, both internationalization research (e.g. Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003; Weerawardena, Mort, Liesch, & Knight, 2007) and business model research (Demil & Lecocq, 2010; Foss & Saebi, 2018 Teece, 2010; Teece, 2018), emphasizes the role of learning, experience, and knowledge, showcasing further similarities between the two fields. Thus, this thesis will not only provide theoretical understandings of the design and adaptation in the business model when internationalizing (Child et al., 2017; Rask, 2014). It will also provide practical implications and managerial tools for understanding how firms can design and adapt the business model for internationalization.

1.3 Purpose and objective

The aim of this study is to extend the research field of internationalization by utilizing the theoretical lens of business models, and thereby contribute to bridging the two fields of research. Accordingly, the purpose is to illustrate how business model design and adaptation facilitates internationalization of firms. This is done by conducting multiple case study research on firms in the potentially burgeoning business of Swedish cleantech. More precisely the business model perspective on internationalization will be applied to Swedish firms in the energy efficiency sector, where existing research is scarce to the degree of near absence. Thus, the thesis will provide added theoretical insight to the field of internationalization and much needed empirical research on cleantech. Hence, this thesis is delimited to looking at business models and internationalization in the context of the Swedish cleantech sector, using a multiple case study methodology.

In practicality, the purpose is to identify design and adaptation features of the business model that facilitates internationalization, by investigating real-life cases of Swedish cleantech firms and how they have utilized their business model when internationalizing. With this in mind, we aim to provide realistic suggestions on how cleantech managers can design and subsequently adapt a business model that enables growth through internationalization.

1.4 Research question

From the problem discussion and the purpose of the study, the following research question has been developed, which will guide the rest of the thesis:

- *How does business model design and adaptation facilitate internationalization of Swedish cleantech firms?*

2. Theoretical framework

This chapter describes what key concepts have been used in this thesis. The chapter first describes the conceptual foundations of what a business model is, how the business model is connected to strategy, what constitutes business model adaptation, and describes how internationalization and the business model concepts relate. Thereafter, internationalization of the firm is described and positioned within the network view of internationalization. The concepts of knowledge and learning is then connected to the business model as well as internationalization. Lastly, a conceptual framework to be used as an analytic tool is presented.

2.1 Business models

2.1.1 Business model conceptualization: dimensions and components

The lack of consistent conceptualization of what a business model is has led to many different explanations of what components constitute a business model design (Clauss, 2017). There is however agreement that some main dimensions are part of a business model, i.e. value creation, and value capture (Baden-Fuller & Haefliger, 2013; Clauss, 2017; Morris, et al., 2005; Teece, 2010). Some include an additional dimension which regards how value is also delivered to customers, namely; value delivery (Baden-Fuller & Haefliger, 2013; Teece, 2010), or value proposition (Clauss, 2017; Morris et al., 2005). According to Clauss (2017), the dimension of value proposition both refers to the firm's value offering, as well as how this offering is delivered to customers, effectively capturing the delivery element suggested by Teece (2010) and Baden-Fuller & Haefliger (2013). Therefore, the conceptualization used in this thesis, found to be the most concrete, is that of Clauss (2017). Thus, a business model design entail three dimensions *Value Creation*, *Value Proposition*, and *Value Capture*.

Moreover, Clauss (2017) makes a comprehensive review of the business model field and defines what different components research has identified to belong to the business model design. These sub-components are categorized under the three business model dimensions *Value Creation*, *Value Proposition*, and *Value Capture* (Clauss, 2017). Figure 1 below, illustrates the different dimensions and the sub-components of a business model, as developed by Clauss (2017).

Business Model

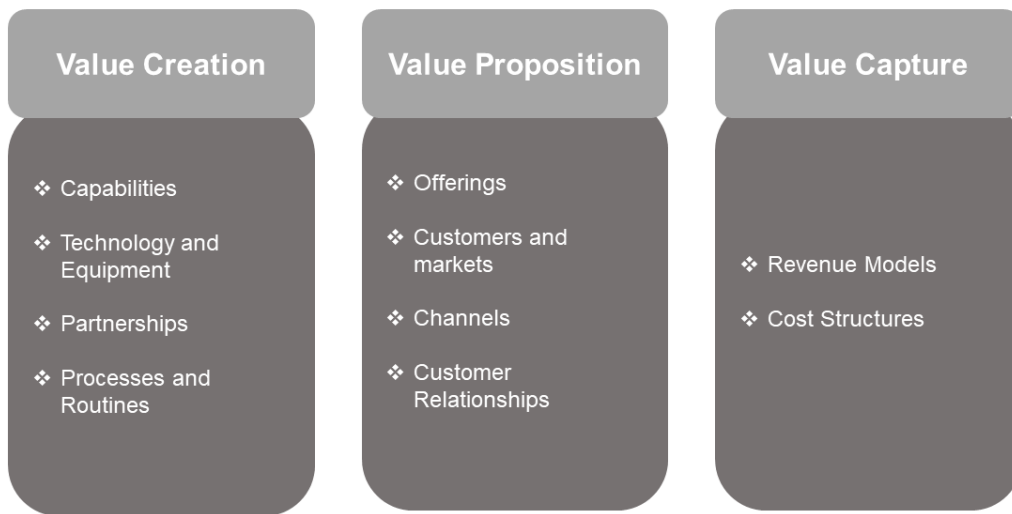


Figure 1: Business model conceptualization

Source: Figure created from dimensions and components presented by Clauss (2017).

The conceptualization of a business model suggested by Clauss (2017) is similar to the conceptualization suggested by Osterwalder & Pigneur (2010) in their 9 building blocks, or *canvas* of a business model. The 9 building blocks of Osterwalder & Pigneur (2010) business model canvas are: *Key Partners, Key Resources, Key Activities, Value Proposition, Customer Relationships, Channels, Customer Segments, Cost Structure, and Revenue Streams*. Where the blocks show the logic of how the firm intends to make money. Although similar, Clauss (2017) framework allows for useful integration of the various sub-components into three overarching dimensions that can be used for analyzing business models.

Value creation dimension

Capabilities are inherently important to value creation, as the capabilities refers to how efficiently a firm can govern its resources through various activities and routines (Teece, 2018). In this capability component, resources and competencies are also present, as competencies of management and the resources available enables the firm to align the organization towards creating value and delivering that value in the form of offerings (Demil & Lecocq, 2010). The value creation is also dependent on the processes & routines (Clauss, 2017) of a firm, which Zott and Amit (2010) refers to as activity system structure and governance. The activity system structure captures how a firm links its various activities used to create value, whereas governance refers to who should perform these and by what mode (Zott & Amit, 2010).

Technology & equipment also serve as a basic firm resource for value creation (Teece, 2018), as it allows firms to utilize it in their new products or services, or as a device to more effectively capturing value (Teece, 2010). Partnerships is an integral part of value creation, as the governance of certain activities or processes can be outsourced to third parties (Zott & Amit, 2010), as part of the external organization (Demil & Lecocq, 2010).

Value proposition dimension

The value proposition dimension is composed of the firm's offerings to customers, as well as its ability to deliver that offering to customers (Clauss, 2017). Thus, the offering component in this dimension refers simply to the product/service offering and the value provided to customers (Teece, 2010). The component of customers and markets is where the firm acknowledges who the customers and users are (Baden-Fuller & Haefliger, 2013), as well as choosing the markets to develop or serve (Teece, 2010). A product/service offering is also delivered through value chains, to both user and/or customer if they differ (Baden-Fuller & Haefliger, 2013), which constitutes different channels of delivery (Clauss, 2017). Lastly, customer relationships revolve around whether a firm pursues new customer relationships or maintains and develops existing ones, and how the firm interacts with customers (Clauss, 2017).

Value capture dimension

The value capture dimensions refer to how a firm captures or appropriates a part of the value that is created (Teece, 2010). The components in this dimension are the revenue model to deliver an offering, and the cost structure to create and deliver that offering (Teece, 2010, Zott & Amit, 2010). According to Demil and Lecocq (2010), a firm's value proposition leads to the potential structure and volume of the revenue model, while the governance and processes adopted by the internal and external organization leads to the structure and volume of the costs. Thus, the capture of value is essentially determined by the difference between the volume of revenue and costs, leading to the margin of the business (Demil & Lecocq, 2010).

2.1.2 Business model vs strategy

Whether the business model concept is needed or not is an ongoing debate between academics. The sceptics are characterized by the position that the business model is poaching questions and concerns from the strategy research stream (Massa, Tucci & Afuah, 2017). One notable opponent to the business model concept is Porter (2001) whom considers that the business model concept does not add anything new to the understanding of strategy, and theories on business models fail to extend the established positioning view or the resource-based view

(Massa et al., 2017). Proponents on the other side of the fence, acknowledges that there is an overlap between strategy and business models but argue that the business model has the potential to enlighten unexplored issues (McGrath, 2010; Teece, 2010). For instance, Casadesus-Masanell and Ricart (2010) view the business model from a strategic perspective and suggest that firms compete through business models. Thus, the concept is rather intertwined with strategy, particularly with the positioning school that considers competitive advantage to stem from having a difficult-to-imitate system of activities, not from having a single resource or competency (Porter, 1996). The business model concept also overlaps with the resource-based view, where competitive advantage comes from having valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). However, Chesbrough and Rosenbloom (2002) argue that resources by itself lack inherent value to customers and that the value of a technology remains latent until commercialized to some degree, and the business model is the instrument for commercializing innovations (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Teece, 2010).

Proponents of the business model concept argue that strategy theorists have made a series of assumptions that can be challenged: (i) firms, managers and customers have perfect information. (ii) firms, managers and customers have unlimited cognitive abilities. (iii) no externalities, i.e. that no benefits and cost for a third party can be imposed by the transactions between the firm and its customers. (iv) competitive advantage is single-source and supply-side only (Massa et al., 2017). However, Afuah (2014) uses Google as an example to explain their competitive advantage as multisource and both supply and demand sided. Google gets its competitive advantage from its intellectual property but also from the activities performed to deliver value to its value co-creating networks of searchers, advertisers and app-developers. Hence, Amit and Zott (2001) suggest that activities creating as well as delivering value transcends the boundaries of the firm and that the business model concept enable customers and complementors to be visible in the value creation.

Strategy and business model are different, and whether the latter is an extension of the former can be debated further. We agree with McGrath (2010) that managerial choice is more graspable and nuanced from a business model perspective as opposed to strategy. Managerial choice is further enlightened by Casadesus-Masanell and Ricart (2010) who argues that strategy is the firm's contingent plan as to which business models managers can choose from, whereas the business model is the reflection of realized strategy, the outcome of strategic choices and the visible strategy in action. They also state that the strategic choice of employing a certain

business model entail residual choice, something they call tactics. The chosen business model determines firms' available tactics, such as a retail giant like Walmart can make a tactics choice to lower pricing to levels not available for a small corner store with a different business model (Casadesus-Masanell & Ricart 2010). Furthermore, the business model is described as the blueprint for strategy implementation, through organizational structures, processes and systems (Osterwalder & Pigneur, 2010). The choice of strategy is a managerial choice; strategy is upper-level choice of selecting businesses: i.e. where to compete (corporate strategy) and how to position the selected businesses (business strategy). Whereas the business model is at the operational level, defining how to execute the strategy (Onetti et al., 2012). DaSilva and Trkman (2014, p.383) emphasize that “strategy reflects what a company aims to become, while business models describe what a company really is at a given time”.

Hence, strategy is linked but separate from the business models, as business models represent the current realized strategy of the firm (Casadesus-Masanell & Ricart, 2010; Chesbrough & Rosenblom, 2002; DaSilva & Trkman, 2014; Teece, 2010; Zott & Amit, 2001). Though devising a strategy is important, the long-term aspects of the strategic perspective might fail to capture what the firms actually do, as Casadesus-Masanell and Ricart (2010, p.200) puts it: “every organization has a business model. [it] makes some choices, which have consequences. [But] not every organization has a strategy - a plan of action for different contingencies that may arise.”

2.1.3 Business model adaptation

Business models are dynamic and involves an aspect of change, and there is an inherent learning curve to creating a highly competitive business model, where management often are required to adapt the business model according to the needs in the market (Teece, 2010). Knowledge of customer needs is critical to creating good business models, and firms need to be able to learn from their customers to successfully innovate their business models (Teece, 2010; 2018). To do so, firms can incorporate customer feedback loops, where the customer becomes active participants in a user-centered business model, enabling the firm to uncover customer needs and what value customers want (Tolkamp et al., 2018). However, changes to the business model are largely interdependent, whereby firms must be able to adapt business model components according to changes made in other components to uphold what Demil and Lecocq (2010) describe as dynamic consistency.

While business model adaptation or innovation can be triggered by external processes or factors (e.g. environmental changes leading to increased costs), it is also an outcome of managerial

decision-making when actively searching for new business models, responding to competitive threats and trying to capture future growth potential (Martins, Rindova, & Greenbaum, 2015; Demil & Lecocq, 2010), or reactively and continuously responding to changes in the environment (Dunford et al., 2010). It has been suggested that business model innovation is not only about learning, but also relates to managers ability to create new business models, and it is therefore important to be aware of other business models, for instance those at work in different industries or markets (Martins et al., 2015; Teece, 2018). Furthermore, an important feature of business model innovation is being able to sense new opportunities, design new business models to meet said opportunities, and having an ability to transform and restructure an existing organization to support the new business model, referred to as dynamic capabilities (Teece, 2018). Furthermore, Doz and Kosonen (2010) outline similar meta capabilities for what they call: strategic agility. Referring to a firm's ability to pro-actively anticipate and react quickly to unpredictable environmental changes, namely: strategic sensitivity, leadership unity and resource fluidity. Thereby, outlining prerequisites for business model adaptation. Hence, business model adaptation is the outcome of both searching and creating new models, as well as experiential learning and improvement through the existing business model (Berends, Smits, Reymen, & Podoyntsyna, 2016).

The business model is made up of choices regarding the key dimensions, and these choices continuously change and evolve, which manifests as business model innovation (Foss & Saebi, 2018). Business model innovation can therefore occur in many ways, either by changing the entire business model; by changing multiple different choices across the multiple dimensions; or even just one change in one dimension in the business model (Ibid.). However, the term innovation is coupled with connotations to something pioneering and disruptive and we consider the threshold for what is deemed as innovation as quite low. Therefore, we have chosen to equate business model innovation (Clauss 2017, Foss & Saebi, 2018; Teece 2018), business model evolution (Demil & Lecocq, 2010), business model renewal (Doz & Kosonen, 2010); to business model adaptation (Landau et al., 2016). Thus, modifications, reconfigurations, renewal, innovation, extensions and revisions are all considered business model adaptations regardless of their magnitude; whether changes are large-scale or small and incremental (Amit & Zott, 2012; Doz & Kosonen, 2010; Foss & Saebi, 2018; Landau et al., 2016).

2.1.4 International business model design and adaptation

Business model design decisions includes deciding what activities the firm should focus on (e.g. sales, manufacturing, R&D) to produce its value proposition, but also how to

geographically distribute the value chain, and especially what operational mode (and partners) each activity should be performed with (Onetti et al., 2012). International business models have different designs depending on the locations of the upstream and downstream activities (Rask, 2014). In the creation of typologies of international business models, Rask (2014) argues that firms with a domestic-based business model design locate most activities (sales, manufacturing, R&D) in-house in the home market but utilizes domestic partners to sell products in international markets. Firm's with export-based business model designs instead focus on downstream operations in international markets, with focus on international sales through own subsidiaries or direct sales or exports to customers or local partners, and are largely adaptive regarding customer relationships, channels, revenue model, or segments (Ibid.). Import-based business model designs involve a high degree of upstream internationalization where manufacturing is outsourced and offshored to allow the firm to focus on core activities. A semi-globalized business model involves both downstream and upstream activities internationally, which are performed both in-house by the firm and by partners as outsourced activities. Lastly, a firm can innovate and adapt the business model when internationalizing to be more upstream or downstream which requires adaptations in customer relationships, channels, revenue model, key partners, etc., (Ibid.).

Similarly, Child et al. (2017) found that SMEs adopt different international business models designs labeled traditional market-adaptive, technology-exploiter, and ambidextrous explorer. The traditional market-adaptive design was more likely to simply adapt current offerings, to highlight efficiency capabilities, utilize direct exports as a channel, and be assisted in internationalization by suppliers and partners. The technology-exploiter also adapted current offerings, but instead highlighted innovation as core capabilities, which they utilized to exploit existing technology as opposed to creating new. The channels used by the technology-exploiter were direct but with more use of the internet, and they also emphasized customers as assisting in internationalization. Lastly, the ambidextrous explorer both adapted existing and developed new offerings, emphasized innovation as a core capability, used both indirect and direct channels internationally, and partners and customer were assisting in internationalization. Furthermore, industry and home market economic development are powerful influencers on firm's choice of business model for international markets (Ibid.).

Further, the cause of BGs' superior international performance has been suggested to lie in their business models because they are suggested to have higher values in efficiency and novelty-centered business model design than more traditionally internationalizing firms (Kraus et al.,

2017). BGs use firm resources, business networks, focus on niche offerings, and transfer these to customers efficiently. However, they also focus on new innovative technology, use new innovative entry modes, and interact with customers in new and innovative ways. The BGs were also focusing on customized products sold directly to B2B customers, had high capabilities in sales, marketing, and R&D, formed strong partnerships with customers, and had a clear growth strategy through internationalization (Ibid.). Managers are also often aware of the distinct business model components that allow their firm to be competitive internationally, and international experience of managers can aid in development of international business models (Kraus et al. 2017; Child et al., 2017).

Moreover, experience and learning are important aspects of how firms innovate and adapt their business model to fit international markets (Cao, Navarre & Jin, 2018). Firms use different routes to business model innovation or adaptation in internationalization. The first route is when firms exploit home-based resources in new markets. The second form is when the firm exploits the resources of the host-market environment, through partnerships with local actors or learning from local actors. Third, firms can also be explorative and develop new resources such as products, services and processes for individual markets, where subsidiaries become owners of specific products and processes specific to that market (Ibid.). Related to this; rapid internationalization is underpinned by business model replication across different markets (Dunford, Palmer, & Benveniste, 2010). The process involved in business model replication is an initial development of basic business model design principles for all markets, followed by small local adaptations to marketing, products or processes across international subsidiaries. However, subsidiaries also experiment with new business models, and can be used for testing new business models in 'test-markets', with successful experiments eventually being co-opted and spread to other operational units of the firm (Ibid.).

Furthermore, Landau et al. (2016), found, in a longitudinal study of a German automotive MNC, that firms made changes to the business model in phases when internationalizing to a specific market. First the firm adjust value proposition and capture mechanism to local demand, before embarking on downstream and upstream value creation and delivery. Finally, the firm adjusts all components continuously, while retaining the main design themes. From an activity system standpoint, structure and governance were more adjusted than the actual content of performed activities (Ibid.).

2.2 Internationalization of the firm

Internationalization of the firm is often described as a behavioral process (Eriksson, Johanson, Majkgård, & Sharma, 2015). Internationalization involves deciding what mode of entry to use (exports, agents, licensing, etc.), what international market to target, and what goods or services should be sold in the chosen market (Welch & Luostarinen, 1988). The level of internationalization of a firm also differs depending on how many markets the firm is active in, and how well developed the firm is to support internationalization (i.e., organizational structure, finances, and human resources) (Ibid.). Traditionally internationalization of the firm has occurred incrementally, based on previous firm experiences and the accumulation of knowledge (Johanson & Vahlne, 1977). However, some firms also internationalize with a rapid speed to many different markets within a short timeframe after firm inception (Oviatt & McDougall, 1994; Oviatt & McDougall, 2005; Knight & Cavusgil, 2004). These firms, INVs and BGs (Oviatt & McDougall, 1994; Knight & Cavusgil, 2004), are often found in high technology sectors with high growth (Cavusgil & Knight, 2015), although these firms exist in other industries and internationalizes according to many different strategies (Madsen, & Servais, 1997).

Moreover, firms internationalize operations in accordance with a variety of strategies and patterns, where some internationalize incrementally while others internationalize more rapidly (Kuivalainen et al., 2012). A reason for this difference in the various internationalization paths and decisions by firms are the perceived barriers that firms' experiences when attempting to internationalize operations (Kahiya, 2013). Internal barriers such as lack of managerial commitment and knowledge, problems with market entry, difficulties with marketing mix adaptations, and resource-constraints are prominent barriers influencing internationalization. However, external barriers such as foreign-market regulations, standards, trade restrictions, market competition are also influencers on internationalization (Ibid.). Similarly, large cultural distances can act as a constraint or barrier to internationalization and affects the choice of entry mode (Barkema, Bell, & Pennings, 1996; Kogut & Singh, 1988). The distance a manager perceives towards a market (e.g. cultural and geographic) called psychic distance can further act as a barrier to internationalization (Johanson & Vahlne, 1977). Finally, firms in the cleantech sector experience even larger barriers to internationalization than traditional firms in the form of stringent and rapidly changing regulatory frameworks, which these firms need to be able to respond to (Saarenketo et al., 2018).

Furthermore, managers make either strategic proactive decisions regarding internationalization of the firm, or reactive decisions (Child & Hsieh, 2014), often becoming more rational in the

later stages of internationalization (Schweizer, 2012). Thus, firms learn to make more rational and well-grounded decisions regarding internationalization with increased business experience and knowledge (Nummela, Saarenketo, Jokela, & Loane, 2014; Schweizer, 2012). Other influencers on internationalization decisions such as a global mindset of managers, unique knowledge and capabilities within a firm, as well as enhanced use of business networks and relationships, often acts as drivers of rapid internationalization (Oviatt & McDougall, 1994; Oviatt & McDougal 2005; Knight & Cavusgil, 2004; Cavusgil & Knight, 2015). Illustrative of this is that BGs often have a flexible internationalization strategy concerning foreign market selection and entry mode (Sharma & Blomstermo, 2003)

2.2.1 The importance of networks

Internationalization of the firm is largely dependent on firms' access to networks and business relationships, as firms take steps towards international markets by utilizing these relationships (Cavusgil & Knight, 2015; Johanson & Vahlne, 2009). Networks are made up of customers, suppliers and local partners, institutional actors, competitors. Where those relationships can be of a strong or weak nature (Coviello and Munro, 1997; Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003). Developments in the business environment have made business networks increasingly important, and the key issue in internationalization has, since the 1970s, gone from overcoming the liability of foreignness to overcoming the liability of outsidership (Johanson & Vahlne, 2009). Business networks contributes to the decision of what markets to enter and what mode of entry to use, enabling many different internationalization paths (Ibid.). For instance, network ties can provide knowledge of potential customers and sales channels, which can influence firm's internationalization to specific markets and provide information on what the most appropriate entry mode available is at a given time (Sharma & Blomstermo, 2003). Firms also utilize both formal business contacts and more informal contacts such as family or friends when internationalizing (Coviello & Munro, 1995).

Furthermore, Smaller, high-technology firms, as opposed to large traditional manufacturers are also more likely to give up control of certain marketing-related activities to gain access to markets, although successively attempting to reclaim control of these marketing activities (Coviello & Munro, 1995). Moreover, Coviello and Munro (1997) argue that internationalization is influenced by, and experience is gained in networks, but networks can also inhibit international growth. Strong network partners can resist small firms' attempts to increase internationalization commitment, such as attempts to diversify the product portfolio, enter new markets, or utilize a different operational mode (Ibid.).

2.3 Knowledge and learning in business models and internationalization

Experience, learning, knowledge and a managerial mindset have all been found to influence internationalization of the firm (Cavusgil & Knight, 2015; Johanson & Vahlne, 1977; Nummela et al., 2014; Sharma & Blomstermo, 2003; Weerawardena et al., 2007). According to Johanson and Vahlne (1977), internationalization of the firm is dependent on experiential knowledge to make internationalization decisions, and that such knowledge is acquired through international operations. Consequently, the firm will make incremental decisions regarding which target market to enter, and what mode of entry a firm will use, increasing commitment to internationalization as experiential knowledge increases (Ibid.). Business experience and knowledge also has a central role in the internationalization decision process, as managers become more rational in their decisions as business experience increases (Nummela et al., 2014).

Furthermore, learning and accumulation of knowledge in internationalization occurs within business networks (Johanson & Vahlne, 2009), a process that have also been emphasized in BGs (Sharma & Blomstermo, 2003) illustrating the importance of business relationships. Moreover, Weerawardena et al. (2007) suggests that preconditions for accelerated internationalization is rooted in managers previous internationalization experience and knowledge, but also in firms' ability to learn and acquire knowledge. Firms need to be able to learn and acquire knowledge in order to develop marketing capabilities for international markets. Furthermore, having learning capabilities to acquire and disseminate technological and non-technological knowledge produced within the firm improves the development of knowledge intensive products suited for international markets (Ibid.).

Similar to how learning is pertinent to internationalization (Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003; Weerawardena et al., 2007), learning is at the heart of creating a competitive business model (Teece, 2010). Technological developments can produce new ways of meeting customer needs and these require business models to fulfil the customer need (Teece, 2010). However, competitive business models are not always readily developed at once but is rather a function of managers' ability to learn and adapt the business model (Teece, 2010). Therefore, it is important that managers are open to experimenting with different business models (McGrath, 2010; Dunford et al., 2010). This process is not necessarily analytical, but more discovery-driven and trial-and-error-based, which can enable firms to discover a potentially rewarding business model, not previously evident (McGrath, 2010; Sosna, Trevinyo-Rodríguez & Velamuri, 2010). However, managers should not only learn from

experimenting with the firm's own business model, managers can also learn from business model experimentations done by, and in other firms and industries (McGrath, 2010).

2.4 Conceptual model

The conceptual model has been created to examine how business models can facilitate internationalization for Swedish cleantech firms. The business model consists of three dimensions; value creation, value proposition and value capture, together covering ten subcomponents drawn from Clauss (2017). These dimensions and subcomponents are the actual representation of a firm's business model at a given time. The business model captures how a firm creates value through capabilities, technology & equipment, processes & routines, and the partnerships aiding in value creation. Moreover, it shows what markets and customers are chosen, what the proposed and delivered offering is, what channels are chosen, as well as how the firm interacts with customers. Finally, it highlights the cost structure of the firm, and how to extract revenues.

The conceptual framework further shows that firms use their business models to internationalize to business networks in a given market, illustrated by the *internationalization* arrow to *networks*. The business network plays a significant role in what markets are chosen, and how the firm chooses to operate in any given market. Depending on the business network, firms can internationalize at different speeds, to different numbers of markets, and with varying intensity in each market. A firm is also likely to extract experiences, learnings, and knowledge from these relationships, which is showcased by the *knowledge* arrow back to the *business model*. Furthermore, the business model is not static, circumventing arrows indicate that business model *adaptation* can occur pre- and post-internationalization as knowledge is gained and internalized from interactions with foreign business networks.

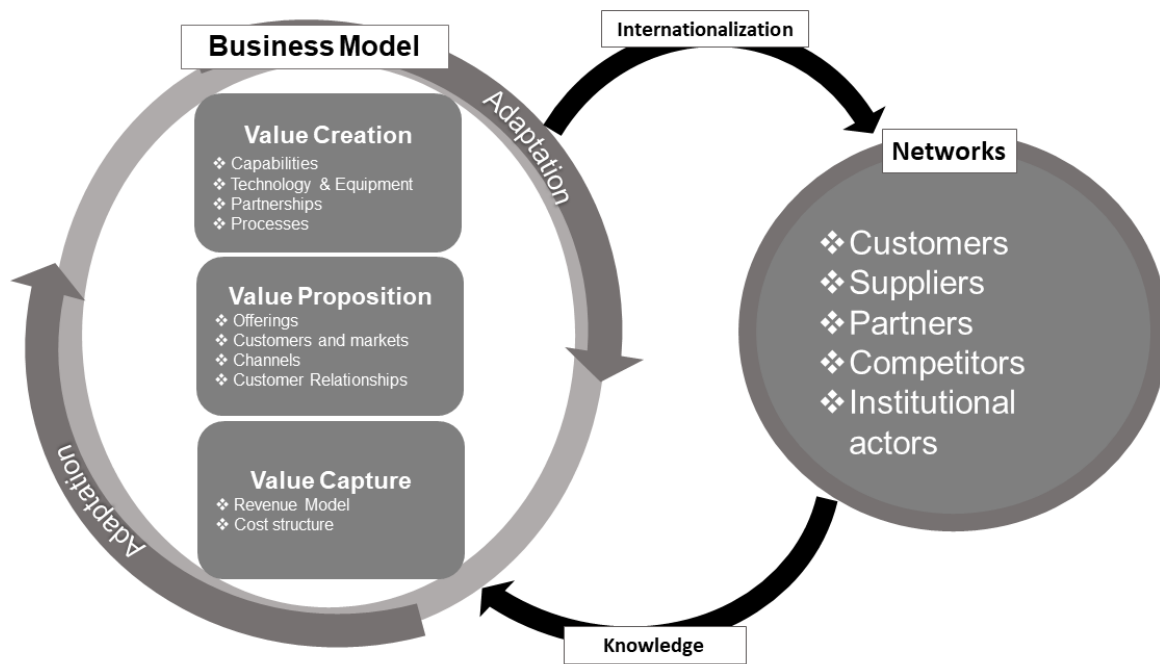


Figure 2: Conceptual model based on the theoretical framework

3. Methodology

The methodology chapter is divided into sections, each dedicated to describing aspects of the method used, and the arguments for the choices made. The chapter describes the abductive approach, the qualitative methods used, the data and how it was collected and analyzed. The chapter ends with a discussion on how quality has been ensured throughout the study and how ethical considerations have been taken into account.

3.1 Abductive approach

The aim of this thesis was to forward internationalization theory by applying the business model concept within the empirical context of Swedish cleantech firms. For this purpose, an abductive approach was considered most appropriate, as the focus was to develop existing theoretical frameworks, as opposed to creating new theories, in line with Dubois & Gadde (2002). The purpose has also been to conduct multiple case study research, and since case study research is often not linear and involves the researcher moving between theory and empirical observations (Dubois & Gadde, 2002), an abductive approach was further considered valid. The research process started with trying to identify potential theoretical research streams to apply to the empirical context of Swedish cleantech. An extensive literature review revealed the business model concept as an interesting way of forwarding internationalization theory.

Thus, a theoretical framework and conceptual model was developed to join the two largely separate research streams. The theoretical framework became the basis for data collection, from which the authors amended certain aspects of the theoretical framework, utilizing a non-linear process as suggested by (Dubois & Gadde, 2014). Mainly, the issues of whether strategy is an aspect of the business model or not have been revisited and added to the theoretical framework, due to many interviews revealing strategy as an important element. Similarly, the international business model literature has been extended, and a network view on internationalization has been adopted during and following data collection. The research process has therefore been an iteration between theory and empirical reality in order to devise a theoretical analytical framework. Thus, because of this iterative process and constant interplay between theory and empirical data (Bryman & Bell, 2015; Dubois & Gadde, 2014; Eriksson, & Kovalainen, 2016), the research approach in this thesis can be positioned as abductive research.

3.2 Qualitative methods

A qualitative research strategy has been chosen for this study because of the explanatory nature of the research question: *‘How does business model design and adaptation facilitate internationalization of Swedish cleantech firms?’*. The research questions require managers to interpret how their firm has utilized the business model in relation to internationalization and express and explain this in a meaningful manner. Qualitative strategy emphasizes understanding social reality and interpretation as opposed to quantification of data and statistical analysis (Eriksson, & Kovalainen, 2016), and enables the collection of data that is rich and complex (Saunders et al., 2009). Therefore, the above-mentioned research question is best answered with qualitative data as this allows for a detailed explanation of how firms have designed and adapted their business model when internationalizing.

Moreover, research questions common in qualitative research are for example ‘what’, ‘how’, ‘why’ questions that are focusing on explaining and describing a specific research issue (Eriksson & Kovalainen, 2016). As the purpose was to understand how the business model facilitates internationalization of Swedish cleantech firms; a qualitative approach was deemed to be most appropriate as this involve describing and explaining the relationship between the two concepts. This combination of descriptive and explanatory research is also supported by Saunders et al. (2009) as description is an important feature to subsequently explain the relationship between different variables.

3.3 Case study research method

Case study methodology has been chosen as the qualitative research methodology for this thesis. A case is often referred to as an organization, event, location, or individual (Bryman & Bell, 2011; Yin, 2014). The research problem concerns business models and internationalization, in the specific context of cleantech firms, and a case study design is therefore the most appropriate. The reason for this is that a case study method is called for when a phenomenon needs to be investigated in-depth, and the researcher is concerned with understanding the real-world context of the phenomenon (Saunders et al., 2009; Yin, 2014; Eriksson & Kovalainen, 2016). However, this research is positioned as extensive case study research as suggested by Eriksson and Kovalainen (2016), as the focus was more on developing an understanding and explanation of the business models role in internationalization than the real-life cases of each specific cleantech firm.

Furthermore, in order to make well-grounded analytical conclusions regarding the business model and internationalization of Swedish cleantech firms, the use of a multiple case study design was chosen to generate more robust findings, as suggested by Yin (2014). A multiple case study design positioned as extensive is appropriate when the focus is on a specific phenomenon explored in multiple cases with less detail, as opposed to the unique case (Eriksson & Kovalainen, 2016). As the focus in this thesis was on the phenomenon of business model design and adaptation in internationalization and not a particular case, emphasis was placed on collecting enough data to fully explain the phenomenon. Moreover, because these concepts and phenomenon takes place at an organizational level, the cleantech firms included in this study are considered as holistic cases (Yin, 2014), where the manager represent the firm in its entirety. The findings from the multiple case studies has also been analytically generalized to provide insights to forward theory as suggested by Yin (2014), which is also in line with the extensive nature of the case studies (Eriksson & Kovalainen, 2016).

3.3.1 Case selection & sampling

While multiple case study research is not concerned with statistical generalization (Yin, 2014), the cases should match the purpose of the study to enable answering the research question and be typical of the larger cleantech sector (Eriksson & Kovalainen, 2016; Saunders et al., 2009). Therefore, in line with the suggestions of Saunders et al. (2009) and Eisenhardt (1989), a non-probability purposive sampling approach was utilized, as the focus was on generating theoretical knowledge of the research problem, rather than the general population of cleantech firms. Thus, the research question and empirical context called for the selection of cases that have some specific characteristics, namely that they were international and matched the definition of cleantech. All of this supports the choice for purposive sampling, where the researcher uses personal judgement to choose information-rich cases matching the objective of the research (Saunders et al., 2009).

The sampling process began by compiling a list of companies that matched the selected cleantech definition for this study and had some international operations. This was done in order to make sure that the sample was representative of the Swedish cleantech sector (specifically in the focus subsector of energy efficiency) and that they would provide valuable information regarding internationalization. The list was compiled with the aid of the government agency *Swedish Agency for Economic and Regional Growth* and their project, the website www.swedishcleantech.com, where Swedish cleantech firms are listed. The website lists roughly 1100 firms in the Swedish cleantech sector, of which the majority are small and

medium companies (SME) with less than 250 employees and below 50 million euro in revenue. By utilizing the filter function of the website to only show companies in the energy efficiency sector, case companies matching the selected cleantech definition could be identified. Further, to make sure that the case companies could be accessed by at least one participant in-person, the search was limited to companies in the county of Västra Götaland. To request participation and access, the firms were contacted through email and phone.

The firms selected for this study, and the participants from the firms are highlighted in *table 1*, in section 3.4.3. *Interviews with Swedish cleantech firms*. All firms selected in this study were smaller firms with characteristics of an SME, i.e. less than 250 employees and 50 million euro in turnover, although some were also owned as subsidiaries of a larger parent group. Hence, we are aware that this might have implications for the firms, such as resource constraints (Kahiya, 2013), and network insidership (Johanson & Vahlne, 2009), although we do not believe that this limits our ability to answer the research question.

3.4 Data collection

3.4.1 Primary data and secondary data

In-depth interviews with managers of the case firms was done as primary data collection method, as this was considered the best way to answer the research question. This is supported by the fact that case study research is most often based on primary data in the form of in-depth interviews, but also other sources of data such as surveys, observations, diaries, archives, and protocols (Eriksson & Kovalainen, 2016; Eisenhardt, 1989). However, in order to increase the level of accuracy and richness of each case, secondary data in the form of company websites, online documents from company websites (e.g. press-releases and company presentations), and if available physical documents (e.g. brochures of value propositions) was utilized. This is in line with the suggestions of Eriksson and Kovalainen (2016) who argues that case study data should be comprehensive and based on multiple sources, and Eisenhardt (1989) suggests that such triangulation adds strength to findings.

3.4.2 Semi-structured interviews

In order to get the most out of how managers have utilized the business model during internationalization of the firm, semi-structured interviews were chosen as the primary data collection method. A semi-structured interview design is an appropriate method for an explanatory study, where there is a need for the researcher to cover specific themes or topics, and when wanting to understand participants' opinions, attitudes, and decisions made (Saunders

et al., 2009). Therefore, semi-structured interviews were done for this study, as there was a need to cover the specific topics of business models and internationalization, where managers point of view and knowledge of operations were instrumental in capturing these topics. In line with Saunders et al. (2009), the participants were asked open-ended and complex questions where they could talk freely. This allowed for explanations and descriptions of how firms had internationalized their operations, while still allowing the participants to bring up topics they considered important. Also, seeing as semi-structured interviews can capture how managers makes sense of their operating environment (Qu & Dumay, 2011), this design contributed to the understanding of how the managers had made sense of business model design and adaptation for internationalization. Semi-structured interviews are preferable when conducting multiple case study research where there is more than one interviewer, as to provide interview consistency and ensure cross-case comparability (Bryman & Bell, 2015), and add richness to the data (Eisenhardt, 1989). Seeing that both authors were present during all interviews, and the aim was to do a cross-case comparison of the various cases to further theoretical understanding of business models usage in internationalization, semi-structured interviews were suitable. Thus, this data collection method is considered to have yielded a rich set of qualitative data, which could subsequently be analyzed, as suggested by Saunders et al. (2009).

To make certain that each interview was carried out in a similar fashion, an interview guide (see appendix 1) was constructed with general questions and key themes to be asked; ensuring coverage of the key elements of business models and internationalization. However, follow-up questions not part of the interview guide were used to clarify the participant's answers and follow up on interesting aspects. Although the participants had each gotten an email describing the study, all interviews started with a brief description of the research topic to make the participants more aware of the subject and more comfortable answering the questions. Furthermore, the questions started with more open questions, to make the participants feel at ease in answering questions, and then moved on to more complex questions further into the interview. Having such a structure of a qualitative interview is recommended by Collis and Hussey (2014). Moreover, during the interview the authors presented the participants with a blank business model figure (appendix B) containing all 10 components of the business model. This was done to clarify the chosen conceptualization of a business model to the participants and allowed them to explain their business from this perspective. The participants were encouraged to fill in the business model figure, although most simply looked at the figure and responded to the questions tied to each component. Lastly, all interviews were recorded and

subsequently transcribed the interviews in line with the recommendations of Bryman and Bell (2015).

3.4.3 Interviews with Swedish cleantech firms

The interviews were conducted between the 5th and 29th of March 2019 (see table 1). The participants were all managers of the firms they represented and had substantial knowledge of the business model and insights into the international operations of the firm. The participants either had a CEO position or a senior sales position, which made them especially fit to answer how the firm generates value, delivers this value to customers, and captures a part of this value, which is the essence of a business model. All but two interviews were conducted face-to-face. However, the two phone-interviews were done with participants from firms where face-to-face interviews had already been done, to not compromise consistency in the interview-format. One interview was a group interview with the CEO and Export sales manager which was done due to time-constraints, however the structure of the interview was the same as in other interviews and utilized the same interview guide. The number of participants differed between one and two, which was due to varying access in each case and whether the data gathered was considered sufficient in answering the research question.

Table 1: Interviews with cleantech managers

Company	Participant	Title	Format	Date	Interview Length
ReVibe Energy AB	Erik Kling	Head of Business Development	Face-to-face	2019-03-05	53 minutes
Bevent Rasch AB	Per-Magnus Magnusson & Tobias Hendén	CEO Export Sales Manager	Face-to-face	2019-03-06	65 minutes
Lum-n-lux AB (Anonymous)	CEO (Anonymous)	CEO	Face-to-face	2019-03-08	52 minutes
Wideco Sweden AB	Robert Andersson	Head of Sales	Face-to-face	2019-03-11	78 minutes
AB Regin	Johan Hervéus	Export Sales Manager	Face-to-face	2019-03-15	73 minutes
AB Regin	Stefan Blom	Sales Director	Phone	2019-03-28	90 minutes
KTC AB	Rikard Strid	CEO	Phone	2019-03-25	34 minutes
KTC AB	Magnus Åkerskog	COO/KAM	Face-to-face	2019-03-25	65 minutes
Babcock & Wilcox Vølund AB	Per Lindgren	Head of sales	Face-to-face	2019-03-25	81 minutes
Ecopilot AB	Erik Wikström	Sales and Marketing Director	Face-to-face	2018-03-29	48 minutes

3.5 Data analysis

To manage the data, the primary data was first transcribed and rewritten to exclude fragmentary and incomplete statements. Thereafter, the data was thoroughly studied once transcribed to identify common themes and patterns in the data using the key concepts within the conceptual model (figure 2). To make the large amount of information comprehensible, a systematic approach was adopted to divide and categorize the data by filling in a business model figure (Appendix B) from the data of each case. The data was then summarized in the findings chapter for each case (chapter 4). As the purpose of the study was to investigate how cleantech firm's business models facilitates internationalization, a cross-case analysis of the data was made to identify commonalities and differences among the cases, as it allows for more robust findings as suggested Yin (2014). In order to conduct the cross-case analysis, the data from each case were first compiled into tables (2-9) in section 4.9 to showcase themes or patterns in each case. These tables were then the basis of the cross-case analysis in chapter 5, which was structured according to the conceptual model to see how the business model facilitates internationalization. This entire process is in line with the general analytical procedure according to Collis and Hussey (2014), as we started with data reduction, continued with restructuring the data and creating data displays, from which the analysis was made, and conclusions were drawn.

3.6 Quality of study

To ensure the quality of the research in this thesis, some common criteria in qualitative research to evaluate the trustworthiness of the results was used. While quantitative studies are often concerned with reliability, validity, and generalizability, qualitative research is not always best evaluated using these criteria (Eriksson & Kovalainen, 2016). As a result of this, four criteria of trustworthiness, namely; *credibility*, *transferability*, *dependability*, and *confirmability* as suggested by Lincoln and Guba (1985) was selected. Below is an account of how each criterion has been ensured and illustrates how quality throughout the study was achieved.

Credibility ensures that the research is measuring what it intends to, and to fulfil this criterion the recommendations of Shenton (2004) has been followed. First, the questions in the interview guide was based on the work of previous authors regarding business models. Secondly, multiple sources of data have been used in order to triangulate the findings such as interviews, company websites, and supporting documents. There have been multiple peer scrutiny meetings, where the research process has been discussed. Lastly, all participants were asked to review the written

findings to check if it accurately represented what the participants intended to say. Moreover, transferability refers to whether the research and findings can be transferred to other contexts (Collis & Hussey, 2014). Seeing that established internationalization concepts and theories was used and the work of other researchers was adopted to capture the business model concept, similar research is possible to produce in other contexts. Further, in line with Shenton (2004), descriptions of each firm and participants at each firm in this study has been given, how many researchers were involved in the data collection, and a detailed description of the data collection process has been given to illustrate the boundaries of the research context.

Dependability as a criterion refers to the researcher's responsibility to offer the reader a well-documented and clear picture of the logical research process (Collis & Hussey, 2014; Eriksson & Kovalainen, 2016). To ensure that future researchers could repeat the field work in this thesis, the entire research process has been described throughout this methodological chapter. Throughout this thesis, we have aimed to provide clear descriptions of what concepts was used, how the research was conducted and what the potential limitations have been, thus fulfilling the criteria of dependability according to Shenton (2004). Lastly, the criteria of conformability concerns whether the researcher is making logical interpretations of the findings based on the data (Eriksson & Kovalainen, 2016). The authors have therefore presented explicit accounts of the data from each case (see section 4), and then made a thorough analysis of the empirical findings using the conceptual framework (see section 5). The ambition has been to clearly state the actual findings in each case to enable a well-grounded analysis, and thereby also illustrate how the interpretations of the data have been made (see tables 2-9). Once again, multiple sources of data have been used to triangulate the data and findings. The clear description of the methodological choices allows for scrutiny of the research project, establishing an audit trail of the research results. Thus, conformability has been established according to Shenton (2004).

3.7 Ethical considerations

To ensure ethical practices and that no harm is done by the research (Qu & Dumay, 2011), several steps were taken throughout the research process. The participants were fully informed of the intended use of the data and the purpose of the study, both when asked for access and during the data collection stage, to make sure that the participants felt comfortable participating. This ensured access through informed consent (Saunders et al., 2009). Whether the participants wished to be anonymized in the text was explicitly asked both before the interview as well as after the interview, and the participants were also asked to consent to audio recording for

transcribing purposes. One firm decided to take up the offer of being anonymized, highlighted in table 1. These practices are all in line with the recommendations of Qu and Dumay (2011) to protect the right to privacy and confidentiality, that no harm is done, and that the research intent is fully disclosed to participants. Another key point of ethical practice in research is to let the participants read the findings and see how they will be presented in the final work (Saunders et al., 2009). Therefore, the respective findings were sent to the associated participants, requesting them to comment on potential errors or misunderstandings, so that this could be revised prior to analysis.

4. Empirical findings

In the following chapter, the empirical findings of each individual firm will be presented with a brief description of each firm, and their current international presence. The business model design is then presented, followed by the business model adaptations made by each firm when internationalizing. The chapter ends in a summary of the key findings for each firm to enable an overview of the case firms.

4.1 ReVibe Energy AB

Founded in 2014, ReVibe Energy AB has 5 employees and has been international since inception, with most revenue stemming from international customers. To date the firm has achieved sales in, among others, Japan, Korea, Singapore, Hongkong, USA, Germany, Italy, and France, thus considered to have multinational presence.

4.1.1 ReVibe Energy AB's business model

ReVibe's value offering of patented technology to convert vibrations to electricity is presented to customers as a way to achieve "true wirelessness". ReVibe frames the offering as a useful solution to the future demands put forth by IoT and Industry 4.0. The customer value in wireless monitoring lies in the convenience of fewer cable installations, fewer battery changes to sensors, cost reduction through energy savings, and higher accessibility to sensor data as more sensors can be attached to monitor and log data from vibrating machinery or equipment. Furthermore, customization to client's specifications is another value offered by ReVibe:

"In practice zero percent of the cases can these modules be applied instantaneously. There will always be adaptations, we don't have a one-size-fits-all product."

- Co-founder & Head of Business Development

ReVibe taps into a niche market segment within energy harvesting and data logging, independent of industry. The common denominator is heavy industry, where machinery vibrates, and processes requires monitoring. The main customers (mainly large MNCs) are found in railway, mining, aerospace and OEM customers. According to the participant, companies of that size are more prone to invest in early technology, although the size is also coupled with inertia, exhibited in the time from initial interest in product to implementation. Dealing with customization and long sales processes requires long-term customer relationships and close collaboration with customers. Hence, inhibited by its size, ReVibe has few projects

running simultaneously. Channels used to get products to customers are direct and mostly rely on driving inbound leads to the own web shop. However, evaluation kits are also sold through indirect sales with the distributor Digi-Key.

Looking at the value creation dimension, ReVibe's main capabilities are related to business development, with emphasis on sales and marketing of products. The company has the ability to identify customer needs and develop solutions which can be customized and integrated in customers' own products or services. ReVibe's products are highly innovative and based on a patent from the defense industry. Sophisticated technology is also used to facilitate customization of products. Main processes & routines used to create value is sales and product development. The sales process involves direct sales through cold calls, establishing and maintaining contacts with the market, as well as inbound marketing to generate leads. The product development process is based on non-recurring engineering, focusing on creating integrated and customized solutions for customers. ReVibe also partner with other organizations to assist in value creation processes such as contract manufacturing, marketing consultants for digital marketing, and distributors for sales.

The firm outsources manufacturing to enable flexibility and low fixed costs. Therefore, the main costs are associated with sales and product development. ReVibe's preferred revenue model is that of selling hardware in large volume. In reality, most revenue stem from non-recurring engineering and customization of hardware for customers. Furthermore, due to ReVibe being a start-up and not yet able to turn a profit, it is partly financed by venture capital.

4.1.2 ReVibe Energy AB's business model adaptation for international markets

ReVibe considers its business model applicable in all markets, although the fit varies depending on market. Therefore, the target market sometimes requires small adaptations to the current business model. Capabilities and technology & equipment are well suited for internationalization and have mostly been reinforced in terms of international sales and marketing knowledge. The processes used are essentially the same globally but differs to some degree. The sales process needs to take local culture in consideration, and the product development process needs to adapt product modules to local regulations. According to the participant, internationalization has also led ReVibe to increase the focus on inbound traffic through marketing. Moreover, to overcome the barrier of not reaching key opinion leaders and decision-makers, ReVibe has used its existing business networks, established new network contacts, and utilized Business Sweden. Similarly, a recent development has been establishing

a distribution partner in Digi-Key and increased focus on selling through distributors as a channel to export, although direct exports to customers through the ReVibe website is also used.

While channels have been adapted to fit international markets, both value offering, customers & market segments remained unchanged and seem to be viable in all markets. The most obvious adaptations to the business model to fit international markets regards customer relationships. While the focus is on creating close relationships with customers, the participant explained that the ease of maintaining such relationships differs, as customers in certain markets are more prone to pay for value and appreciate a close long-term relationship. Other markets and cultures are more concerned with low-price, transactional relationships. ReVibe also makes prioritization of customer relationships based on the largest market potential. For instance, ReVibe briefly had an office in Berlin, and hired an interpreter during a development project with a large customer. However, for travel-related cost-reasons in-person meetings are usually avoided unless necessary.

Lastly, regarding the cost structure and revenue model, little adaptation has been done to the business model regarding internationalization, as the current cost structure and revenue model seems applicable in all markets. Notable is that internationalization takes place despite ReVibe's red numbers as international presence is regarded as a necessity for eventual profit.

4.2 Bevent Rasch AB

Bevent Rasch AB started in 1998, through a merger between Rasch and Borås Ventilation's sales company Bevent. Today, the company and its sister company Rasch is the ventilation branch of Hydria Group, with the latter acting as production unit although they function as a single entity. Together, they employ somewhere between 90 to 95 people, located at the headquarter in Borås, the sales office in Stockholm, or the production facility in Motala. Bevent-Rasch has primarily internationalized through partners and customers, and currently have distributors in Norway, Denmark, Finland, United Kingdom and Ireland. However, most of the 200 million SEK revenue stem from Sweden, with roughly 5% coming from export sales.

4.2.1 Bevent Rasch's business model

Bevent Rasch's business model revolves around selling ventilation products with focus on fire protection to business-to-business customers (B2B), with products such as cowls, louvres, fire dampers, smoke detectors, monitoring units and more. The value offered is closely connected to fire safety, for every product category, even if the ventilation need differs. The market

segment Bevent Rasch caters to are public and private building and real estate projects in a variety of industries. However, while the value of functionality and fire safety is downstream with the end-user, Bevent Rasch sells further upstream to HVAC contractors, consultants, installers and OEM-customers. Thus, the value Bevent Rasch offer to customers are ease of installment, products that meet high quality standards, and predictable deliveries. Furthermore, support is key, whether pre-purchase with the digital sizing tool *Dimensio* or post-purchase by the back-office customer support. To deliver products to customers, the channels are direct sales; online and offline, as well as indirect sales through distributors, wholesalers and agents. The online sales are mainly standardized orders, whereas larger projects with more complex and specific tenders require a lot of face to face and close contact with the other project parties. Thus, the customer relationship varies, although focus is placed on close relationships.

Bevent Rasch's main capabilities are high technological knowledge, quality customer support, and an ability to innovate from customer needs. By utilizing sophisticated analysis and simulation tools the firm has an edge in product development, but also embeds sophisticated sizing tools and technology with focus on safety and quality in the offering to customers. Bevent Rasch owns all processes from production to sales. The firm has full control of its own production to ensure quality. There is an internal product development process for new solutions where everything from pre-studies, development, to final testing is done. Lastly, there is an internal sales process with focus on customer support, networking, attending fairs and seminars, customer needs evaluation, and conducting online marketing. However, Bevent Rasch utilize development partners for IT-projects or production projects within control and regulation, to assist in the product development phase. Similarly, in the sales process; distributors, agents, and wholesalers participate as intermediaries, and relationships with HVAC consultants are continuously cultivated to produce sales.

Bevent Rasch's cost structure is defined by performing most value creating processes internally. Production, product development, and sales is kept in-house, to reflect the core values and ensure safety in the products. The revenue model is based on sale of hardware with flexible pricing based on complexity, volume, cost of achieving certifications, extra product development, and additional services.

4.2.2 Bevent Rasch's business model adaptation for international markets

Regarding Bevent Rasch's adaptation of the business model to fit international markets, though some occur, relatively few adaptations are made to the various components of the business

model. Aspects of the value offering to Swedish customers, namely the online sizing tool *Dimensio*, is unavailable on the English version of the website. Moreover, the product development and sales processes have been slightly adapted to international markets as some products needs to be adapted to local standards and regulations, including achieving certain certifications. The sales process is adapted internationally to understand differences in customer needs across markets, which involves going to international fairs and utilizing business networks to gain traction in international markets. The international sales process also focus on establishing partnerships with distributors, agents, or wholesalers in targeted markets, as opposed to more direct focus on HVAC consultants in Sweden. The offering to international markets is adapted to fit with local standards and regulations. However, there exist some issues in reproducing the same value offering in other markets, because of differences in customer needs and quality requirements.

“We can't just come out and say - this is how we do it in Sweden and expect them to follow, that doesn't work. You have to make sure that you are adaptable and flexible in what you are and listen to what's being said.” - Export Sales Manager

“On the other hand, it is hard to change what we are, the products are developed with aspects of higher standard. We try to transfer our domestic success factors abroad.”

- CEO

The clearest adaptation are the channels used internationally, as distributors or agents are almost exclusively used in international sales. However, the focus on close relationships with customers has also allowed Bevent Rasch to follow customers to international markets, again illustrating the networking activities in the sales process. Lastly, both cost structure and revenue model stay largely fixed both domestically and internationally, although cost of achieving certifications in other markets are added to sale of product, and some of the sales department is dedicated to export.

4.3 Lum-n-lux AB

Lum-n-lux AB is a fictitious company name, as the participating lighting company decided to be anonymized. The firm's decade plus history stem from a university incubator environment, and several business models were attempted before settling in 2009 for the one in use; to be an OEM providing lighting modules and fixtures. Having been international since 2009, Lum-n-lux have not proactively targeted specific international markets, instead Lum-n-lux have a

strategy to work closely with international customers. Today the firm delivers products to Sweden, Norway, The Netherlands, Austria, China, and Estonia, among others, although the main sales contacts are with customers in Sweden, Norway, and China. Some customers also sell products containing Lum-n-lux solutions in many international markets. The firm has also established in-house manufacturing in China to be close to customers.

4.3.1 Lum-n-lux AB's Business model

Lum-n-lux's business model is based on having a value chain position as an original equipment manufacturer (OEM) without own branded products. Lum-n-lux offers customers unbranded LED modules and systems with values of lower energy consumption, better price performance, easier and cheaper installation, and an added value of quick and fast customization of products. Lum-n-lux caters to four distinct market segments: general lighting; outdoors lighting; technical lighting; vehicle lighting. General lighting is the main segment with approximately 70% of the revenue and that segment is divided in three subsegments: office lighting; retail lighting; industry lighting. The typical customers are MNCs in the lighting industry that purchases products for several geographical markets from a central procurement office.

“Our typical business is that we make a deal with the Swedish office; what products do they want? Then these products could either be shipped to their factory in China, their sales office in Spain, or their central warehouse in Sweden” - CEO

Thus, the channels used by Lum-n-lux are direct sales to B2B customers. The customer relationship is very close, and the sales department deals with few customers to manage the workload. The CEO summarized the customer relationship as:

“Very customer intimacy positioned, where we are very intimate with our customers with high levels of trust in the dialogue with very high integrity” - CEO

On the dimension of value creation, the inhouse capabilities of Lum-n-lux has its roots from previous business models, bringing extensive knowledge of thermal management later applied to lighting solutions. The capabilities are predominantly: experience and technological knowledge; software and hardware design; electrical engineering; mechanical integration; a deep sense of quality design. Though not necessarily innovative in value creation in terms of technology & equipment, as standard product development tools such as standard CAD and mounting tools are used. The firm distinguish itself though its high-quality production process and facilities. Furthermore, the highly customer-centric manufacturing process is the culmination of the sales- and product development processes. Typically, Lum-n-lux have an

informal contract order in the form of demand prognosis from customers from which procurement of supplies and manufacturing is based on. The sales process is not particularly marketing oriented and instead built around the firm's technological knowledge and experience. Thus, in terms of creating value - product development and manufacturing is highlighted as key processes. Partnerships are mostly those of supplier-manufacturer relationship. Solid relationships and good commercial terms with suppliers of lighting emitting diodes (LED) are paramount and can sometimes generate new business through a referral.

Lum-n-lux's cost structure is defined by the main costs from the two manufacturing units in Sweden and China, as well as product development. Only about 5% of the costs are attributed to sales and corporate governance. The revenue model is based on sale of products with a flexible pricing strategy where development and adaption costs are added to the product price.

4.3.2 Lum-n-lux AB's business model adaptation for international markets

Lum-n-lux's internationalization is largely dependent on customer relationships and the customer segments chosen (mainly MNCs), as most adaptations of the business model have been initiated to fulfil customer requests. The close customer relationships with MNCs have enabled Lum-n-lux to grow within customers and thus also deliver to many different markets.

“But our business model: to give the customer exactly what they desire; doesn't scale very well from an internationalization perspective. It's a business model that is kind of difficult to understand. If you get intimate with a customer that understands what you can do, then it's easy to scale within that customer and reach more of their sites.

That's how we've internationalized.” - CEO

The channels are still direct to B2B customers, which have entailed exporting goods to customer sites in various markets, or that the MNC has bought centrally and distributed to international markets. To fulfil customer requests, Lum-n-lux have created processes & routines in product development to adapt products to local standards, regulations, and achieve certifications. In cases where customers have required local market adaptations, Lum-n-lux have added the cost of adapting, product testing, and achieving certifications for markets onto the cost of the product, in line with the flexible pricing. The clearest adaptation of the business model is the establishment of a manufacturing unit in China, an initial change to the business model component: partnerships, as establishment required a joint venture with a Chinese partner. However, the partner was eventually bought out, but the Chinese production facility, associated processes & routines, and adaptation in cost structure remained. This was again due to following

customer requests, as a large customer wanted Lum-n-lux locally present in China. However, it was also to lower production costs to meet the increased volume that internationalization brought.

Internationalization itself has also led to some minor adaptations tied to the offering. For one, the volumes have increased which the manufacturing need to match. Second, the products have evolved to more finished lighting products. Third, Lum-n-lux have added knowledge of local adaptations in the form of achieving certifications, testing, and managing administrative hurdles. Lastly, the revenue model is not directly adapted, but in line the flexible pricing strategy the cost of achieving certifications, developing, and testing products for other markets is added onto product price. Furthermore, Lum-n-lux's focus on close customer relationships means that the firm is heavily dependent on decisions of customers, mentioned by the CEO to inhibit changes in the business model. However, Lum-n-lux have, through customers, internationalized to other markets without an active choice to purposely enter a predetermined market. The current business model is suitable for following customers to international markets, whereby the firm has been able to insert itself in new and different contexts. To do this, Lum-n-lux have developed new processes, capabilities and cost structure to respond to increasing demands by customers in different markets. Also, a lot of the business model adaptation done, to and because of internationalization, have put Lum-n-lux in a position where further adaptations can be made, on a more proactive level. The reason for not having decided on a more downstream business model already, is to not bite the hand that feeds the firm:

“What we are looking at now, which is a change, driven by the fact that we are present in China; should we process and work towards the local market there, to customers of our own? Maybe with our own branded products? That is a possibility because, over there, we would not compete in the same way with our customers. If we were to market our own product here at home, our customers would wonder what we were doing.”

- CEO

4.4 Wideco Sweden AB

Wideco Sweden AB was founded 1982 in Borås and has been active internationally since the early 2000s. The company has about 20 employees and roughly 35 million SEK in revenue in 2018. The initial internationalization efforts were mostly reactive, where Wideco followed customers on projects in international markets, and more than 90% of the revenue came from the Swedish and Nordic market. However, in 2016 proactive internationalization efforts were

initiated, and the firm began working actively on several international markets such as UK, USA, China, Germany, France, and Italy. As a result, more than 50% of the current revenue stems from international markets.

4.4.1 Wideco Sweden AB's business model

Wideco's value offering is based on providing sealing, monitoring, and alarm solutions for piping- and underground manhole systems. The customers are provided with the value of precision and control of piping and manhole systems. Thus, saving cost and increasing safety, allowing for off-site monitoring and quick detection of leaks. Offering integration between Wideco products and customer products also provides customers with added value to their own product lines. The main customer segments are pipe manufacturers (where Wideco act as an OEM) and energy companies. The customer relationships are characterized by personal interaction through face to face meetings, skype meetings, email communication, and Wideco prioritizes the level of engagement based on the potential gain any given customer relationship can deliver. The channels used are offline direct sales and indirect sales through partnerships with distributors, agents, and pipe manufacturers.

Regarding the value creation dimension, Wideco's core capabilities are long experience and knowledge of district heating and cooling and the monitoring technology of time domain reflectometry. Wideco therefore has the technical ability and product development skills to translate monitoring data to useful information. Recently, Wideco has added sales capabilities and an international mindset to go along with the technical expertise in combining software and hardware. The technology is not new or overly innovative but holds a high standard, as the Nordics have historically been at the forefront of district heating and cooling systems. Wideco's focus on sustainability is also mentioned to add a high level of quality to products as it requires the firm to get sustainability certifications and document the products properly. Moreover, Wideco is located within the business cluster of Borås, where several nearby partners partake in the value creation. However, though assisted by partners in product development and testing, Wideco mainly develops its own software and hardware. To some extent, Wideco also partners with customers (e.g. pipe manufacturers) that integrate Wideco's monitoring solution in their own products before selling to end-user. Wideco highlights control of the entire value chain as a measure to mitigate risks related to delivery time, quality, and to differentiate the firm from competitors.

Wideco's control of the value chain defines its cost structure, with in-house manufacturing, in-house product development, and in-house sales as the main costs. The revenue model is based on one-time sale of product and services, but also on service agreements and recurring revenue streams. The pricing strategy is flexible and depends on varying market prerequisites and sales volumes.

4.4.2 Wideco Sweden AB's business model adaptation for international markets

Wideco's internationalization efforts were largely initiated in 2016, and several distinct steps have been taken to increase revenue from international markets. The increase in international mindset has led to several adaptations to the business model. The obvious adaptations in Wideco's business model revolved around the value creation dimension, and how the sales process has evolved to become more internationally oriented. Wideco has also started partnering with any actor that could aid in internationalization:

“I also believe that you don't have to do everything yourself. We are a small company, asking for help is good thing. I've worked closely with the Swedish Energy Agency, Business Sweden, Business Region, Euro Heat and Power. Organizations that considers us an interesting company - can really open the playing field for us.” - Head of Sales

Sales and marketing differ, as Wideco uses digital marketing more in Sweden, whereas foreign partners manage the marketing abroad. The main sales process or routine added to the international business model is travel where customers are visited at least quarterly, as solely relying on email and telephone contact is seen as insufficient. Large foreign markets, particularly the US, also comes with different demands in terms of protection from liability and need for insurance which influences the sales process. Furthermore, the international mindset added to capabilities has led to a more proactive search for opportunities abroad. Previously, internationalization was reactive where Wideco followed customers to international markets, as opposed to the more proactive practice that started in 2016 when Wideco created an explicit vision and strategy for internationalization.

“Today we work very distinctly with individual markets, we make a plan for each market prior to every new year; prognoses, budget, which trade fairs are interesting, how many visits should each partner and customer be paid?” - Head of Sales

Consequently, the cost structure has been adapted to increase the focus on the sales department, as resources are spent on cultivating relationships in international markets. Furthermore, different markets require additional documentation, translations and certifications, especially

for China and the Middle East, meaning adaptations to processes & routines. However, as Wideco has historically kept certifications up to date (e.g. CE and ISO), these adaptations to processes have been manageable. Thus, Wideco had capabilities in achieving certifications, documentation, product development, production, as well as the technology prior to the international push in 2016, but lacked sales capabilities which have been continuously added through recruitment since then. The adaptation of the sales process to increase internationalization efforts placed added pressure on the organization. As priority shifted towards international sales, the product development department and production had to be responsive and aware of the international strategy. Therefore, internal cross-functional processes & routines were added in the form of bi-weekly meetings between sales and production departments to support internationalization. To maintain close knit collaboration was considered important to ensure that everyone within Wideco are aware of what, why, and how the firm will move forward to realize its ambitious growth targets.

Wideco has also adapted components in the value proposition dimension to fit international markets. While not changing the actual products, the value of the offering differs and is flexible depending on local market demands. Wideco was able to change monitoring practices in China by simplifying the monitoring process and eliminating manual monitoring of pipe and manhole systems. In the US, the value is tied to safety and accident avoidance in connection with US steam heating systems, as incidents causing bodily harm can result in costly liability lawsuits. Similarly, some markets are less receptive to services offered by Wideco, which also impacts the revenue model. Wideco is forced to be flexible in the pricing depending on markets and customer size, and also considers it harder to sell services on a recurring payment basis in markets with less institutional trust, e.g. the Middle East. Another obvious adaptation is the increased focus on indirect channels, as the firm relies heavily on selected distributors and agents to sell the products. The customer relationship does not significantly change depending on market, except for prioritization of customers in markets with the most growth potential, resulting in more arms-length relationships in certain markets. Although the sales staff tries to personally visit customers in international markets on a regular basis. In closing, the participant explains what business model adaptations facilitated internationalization the most according to him:

“Absolutely, the technical competency is actually the same as it was 10 years ago. Those who know the product... nothing has changed, other than that it has evolved. What really changed was everything around, particularly sales. Looking back to 2015 and prior, back

then we lacked the ability to venture abroad. Now we have a sales team that can go on this journey” - Head of Sales

4.5 AB Regin

AB Regin was founded in 1947 to develop and produce humidistats and has since managed to develop a broad indoor climate product portfolio. In 1989, Regin made a conscious decision to internationalize and focus on exports. Today, Regin has approximately 220 employees and has offices in Sweden and roughly 20 sales and production subsidiaries around the world. Regin has sales in more than 90 countries, with about 60-70% of the revenue stemming from international markets. Internationalization has occurred stepwise, based on maintaining a strong position in the home market of Sweden and Scandinavia to support internationalization to other markets.

4.5.1 AB Regin’s business model

Understanding AB Regin’s business model(s) starts with the three customer segments; ventilation installers & contractors, system integrators, and OEM-customers. Regin considers these three segments to entail three separate business models. These segments determine the other business model components and how they relate to the customer segment.

“[...] these three legs; installers & contractors, system integrators, and OEM. These are different ways to sell, different ways to get paid, different ways to market to”

- Global Sales Director

Regarding the rest of the value proposition dimension, Regin’s value offering is based on a complete product line of ventilation control and regulation products aiming to increase accessibility, convenience, and time-savings for customers. Regin’s products and services offers value-added to customer’s own value offerings, specifically to the OEM-customer segment. Both participants emphasize the goal of having personal, close, and long-term relationships with customers. This includes face to face meetings, continuous communication, and close co-development of solutions with customers, mainly to OEM-customers. The degree of closeness also depends on the competency-level of the customers and partners, as some are more self-sufficient. The channels utilized to deliver value is mainly offline direct sales and export, either through the local market unit, or for markets without local presence by the export sales department based in Sweden. However, Regin also has its own web-shop. Further, Regin

utilize indirect sales channels through partnerships with distributors, as well as acquired system integrators and distributors in specific markets.

Continuing with the value creation dimension of the business model, Regin has strong capabilities in the form of broad knowledge of HVAC control and regulation solutions, and how to solve customers' problems. This includes long international experience, strong reputation, and knowledge on how customers can achieve additional sales using Regin's services and products. Regin's technology is mentioned to be of high quality, although the innovativeness of the technology is equal to the industry standard. However, Regin has a broad product portfolio in HVAC control and regulation, to meet a wide variety of market needs. Regin owns most processes related to creating and delivering value to customers, with the Sales Director emphasizing that competitiveness is achieved largely due to strong sales processes and product development processes. The sales process is focused on direct sales of standardized products to ventilation installers & contractors and system integrators, as well as a close co-development process with OEM-customers to create complex solutions. The local sales teams are dedicated to specific customer segments in respective markets, and an international sales team in Sweden is dedicated to customers in markets where Regin does not have subsidiaries. The sales teams are, beyond selling, also responsible to report feedback from customers in each market to the product development teams in Sweden. The product development department develops both hardware, software, makes adaptations and updates to products, and is mostly based in Sweden. Production is kept both in-house and outsourced, with own production units in Sweden, Italy, and Taiwan, although 80% of manufacturing occurs in Sweden through a contract manufacturer. Even in cases of outsourced production, Regin is responsible for sourcing, product planning, and supply chain management. The partners assisting in value creation are the long-term production partner in Hultsfred where the main electronics production is, and distribution partners that operates two of Regin's Swedish distribution stores. Distributors are also used as sales partners, and acquired subsidiaries are almost always old partners or customers that are well-familiar with Regin.

The cost-structure is defined by costs associated with in-house sales departments, in-house product development departments, some in-house production units, and most costs are allocated to the Swedish operations. There is a large internal focus on product development with over 10% of revenue re-invested in product development annually. The revenue model is mainly product sales, but also services that can be either a recurring customer charge, individual

payment, or included in product sale. The pricing strategy is flexible and depends on the complexity of sale, local market price levels, and market preferences.

4.5.2 AB Regin's business model adaptation for international markets

AB Regin has a flexibility in the business model with regards to international markets and has several international processes to support internationalization. Starting with the value proposition adaptation, although Regin tries to approach all three customer segments with equal focus in each international market, this is not always possible. Thus, requiring adaptation to the rest of the business model according to the customer needs in specific markets. The complete product line is the result of and prerequisite for internationalization and enables Regin to serve most markets, but the product line is also receptive to be supplemented with new products from acquired international firms. Furthermore, although the end-value offered to customers is essentially the same, the argumentation of the value offering differs among various markets. While the value of sustainability can be emphasized in certain markets, others are more compelled by the cost savings. The international channels are mainly indirect through distributors, local subsidiaries that sell directly in important markets, and direct exports to customers. When establishing local presence abroad, Regin also frequently acquires a majority stake in downstream partners or other firms better able to distribute Regin products in international markets. The customer relationships do not significantly change as the focus is on close personal relationships regardless of market.

The adaptations done in the value creation dimension have been substantial. Long international experience is a specific capability related to Regin's knowledge of customer needs and how to solve customer problems. The many establishments on international markets have also given Regin capabilities in proactive and long-term strategizing regarding market evaluation, market entry, and market establishment. Some technological resources have been acquired and integrated to the firm's product portfolio, coupled with company acquisitions in certain markets. Thus, firm processes have been developed regarding firm acquisitions, to facilitate the integration of acquired units and implement learnings, products, and processes from acquired firms into the Regin organization.

“We want to know that they [acquired partner] have a personal commitment and that they have years to continue working. It is less risk and headache for us. That way we know that both firms have similar culture” – Export manager

The sales process has also been adapted to international markets, not only in the form of documentation and language adaptations but also by dedicated subsidiary units which have been added in important markets, and a dedicated export organization focusing on working with distributors and customers in other markets. The sales teams are responsible for relaying customer feedback from international markets to the product development department in Sweden. This department is then responsible for adapting products and update software based on market needs. Adaptions or updates are always made compatible for multiple markets to utilize resources efficiently. The main product development department is based in Sweden, although there are international personnel tied to the Swedish development unit in various locations. The production processes have been made international by starting in-house manufacturing units in both Italy and Taiwan, and best practices in production is transferred between various manufacturing units. Regin has partnerships with several actors to facilitate value creation in international markets, mainly distributors and system integrators that act as sales channels. In these sales partnerships, acquired system integrators and distributors are also counted, as well as OEM-customer that can be described as internationalization partners to new markets where Regin has not previously been present.

“Many of our OEM-customers that work globally have helped us establish in new markets. The last 10-15 years we have grown through companies contacting us, saying - “please can we do business?” – Sales Director

The large adaptation in the value creation dimension has also led to adaptations of the value capture dimension, predominately in the cost-structure. Acquisitions of international firms have led to local subsidiaries and sales offices being part of the costs. Also, two production units in Italy and Taiwan have been added to the cost structure. The revenue model does not differ substantially and have not been directly adapted as a result of internationalization. The sale of products and services is the standard in Sweden as well as internationally, although the pricing strategy is flexible depending on local market price levels, and services being more difficult to charge for in certain markets, particularly Asian markets.

Lastly, while Regin tries to stay relatively close to the main business model(s) of selling to the system integrators, ventilation installers & contractors, and OEM-customer, the business model is relatively often adapted to fit in specific markets, whether it is different channels, processes, partners, or cost-structure. Both participants highlight the need to be adaptable to customer needs and listen to what the customers want, and this results in adaptations to the business model(s) for international markets.

“We always start with the customers perspective, how we can emphasize the customer need and increase customer satisfaction, how we can help our customer sell more, how we can increase energy efficiency, and everything after that is flexible” - Sales Director

4.6 Babcock & Wilcox Vølund AB

Babcock & Wilcox Vølund AB (B&W Vølund) was founded in 1988 as Götaverken Miljö AB, then a spinoff of Götaverken Group. The firm has been international since the 1990s and initially faced problems with exporting parts of the technology due to the high level of sophistication of district heating systems used in Scandinavia. The internationalization path has been incremental with a focus on Scandinavia first, with subsequent steps to other markets in Europe where the technology was applicable. Internationalization has been dependent on the business network of the firm, as the firm has been a subsidiary of the Danish company B&W Vølund A/S since 2010 (referred to as sister company), in turn a subsidiary of the US multinational Babcock & Wilcox Enterprises Inc. Currently approximately 50% of the revenue stem from international markets, and the firm is mainly active in Europe, but also has individual project tenders in other markets, e.g. Indonesia.

4.6.1 B&W Vølund AB's business model

B&W Vølund AB's business model revolves around offering flue gas treatment products and plants, as well as a dioxin absorption product (ADIOX[®]) to customers. The flue gas treatment products and plants reduce emissions and energy usage to comply with regulations regarding emissions and reduce costs by reusing energy, while ADIOX[®] remove dioxin to meet regulatory emissions requirements. The products are offered to customers operating waste incineration plants or in any industry (e.g. chemical or thermal treatment industries) affected by regulatory requirements to fulfil flue gas treatment and dioxin absorption. Due to the quite environmentally and politically sensitive nature of emitting dioxin, to understand the customer need and to offer a solution to a problem not willfully made explicit by the customer, requires a high degree of trust. Therefore, B&W Vølund tries to induce trust through close personal relationships. Furthermore, trust is generated through knowledgeable staff able to educate customers on sensitive issues during face to face meetings, and the firm also host customer days with lectures of current topics to market products and manage customer relationships. The channels used are direct sales of both flue gas treatment plants and dioxin products, as well as indirect sales through agents and sister companies.

In order to create value; B&W Vølund have strong technical capabilities to solve complex problems for customers with regards to both product development and sales, focusing on maintaining trusting relationships with customers. The firm has highly innovative technical products and resources in terms of an exclusive license to market and sell the ADIOX® process worldwide. The main processes are sales, product development and design, as well as project execution, and these processes also overlap in solving customer problems. The sales process is highly technical to generate trust with customers and often involves deep analysis of customer needs. The sales process involves marketing activities such as organizing customer days, lectures, and participation in networking activities with export organizations. The product development process involves basic and detailed project design of flue gas treatment for waste- and biofuel-fired plants and to develop new products and solutions for customers. The execution process involves partners such as contractors to do the actual construction of the waste- and biofuel-fired plants, and contract manufacturers to produce dioxin absorption products. Additionally, B&W Vølund have a close partnership with a German research institute Karlsruhe Institute of Technology from which the licensed technology (ADIOX®) was purchased. The firm decided to maintain the partner relationship even after license was purchased as collaboration was considered beneficial for development of future technology, and updates to existing technology. Similarly, partners are utilized in the sales process, where sister companies and agents act as indirect channels.

The ability to maintain relationships is considered to be affected by the language competencies within the firm, as well as the nature of the relationship with agents. B&W Vølund have managed to maintain the relationship with the German research institute, as well as other German customers, in part due to the Head of Development's ability to speak German. The relationship with the Italian agent is instead possible due to a long history and personal relationship.

“We only have two agents, where the one in Italy works great, but the other not so much. That's where we're at today. It is extremely personality related, with long-time contacts.”

– Head of Sales

B&W Vølund value capture dimension is defined by its sales and product development departments which absorb almost all costs, except for more general overhead costs. The revenue model is based on sale of projects in the form of flue gas treatment solutions for waste- and biofuel-fired plants, some sale of services, as well as sales of the dioxin absorption product.

The pricing strategy for larger projects is mainly determined by public procurement and is focused on producing plants for the lowest possible cost while not risking any quality measures.

4.6.2 B&W Vølund AB's business model adaptation for international markets

Due the fact that the technology has been developed in a Swedish context and regulations set by European Union, the business model has not been significantly adapted for internationalization. However, the main adaptation for international markets is the emphasis on partnerships, which has also influenced other parts of the business model. A clear example of this focus on partnerships is that B&W Vølund mainly reaches new markets and projects through its Danish sister company that take the main projects in international markets. Thus, the sister companies act as both sales partners and channels internationally, and B&W Vølund delivers only parts of projects. In cases where B&W Vølund have been the technology supplier without cooperation with its sister company, there have been a strong local partner that can build the plants. Thus, as the sister company usually fronts the project in international markets, the customer relationship becomes somewhat less focused on close personal relationships, as the firm is not the main face towards customers. Nevertheless, focus remains on close personal relationships being the project owner. The revenue model is not changed for international markets, although sale of services is mostly applicable in Scandinavian markets.

Furthermore, there is a strong partnership with Karlsruhe Institute of Technology, which have led to the development of new products, such as ADIOX®. This partnership required the product development department to develop the technical aspects of this product. The development of the dioxin absorption products from the partnership with Karlsruhe Institute of Technology has also had effects on the business model, as the technological resources of the firm have been enhanced as a result. There have been efforts to establish distribution and agent networks to sell this product as well. However, the sale of this product is less dependent on partners, due to the sensitive nature of the product, requiring direct and discrete contact between the firm and customer. Nevertheless, two individual agents are still utilized in international markets, where the collaboration between firm and agents have worked relatively well. Thus, the sales process and channel differ in various markets, depending on the partnerships available in specific markets. B&W Vølund have also participated in international marketing activities through Swedish export organizations such as Business Sweden and Business Region Gothenburg.

Lastly, as the business model was largely developed around a technology that was developed for the highly regulatory Swedish context. The first international venture that went to Denmark was based on business model fit without adaptation. The Danish market had the right preconditions and B&W Vølund AB (then Götaverken Miljö AB) had a fitting solution to solve a customer problem. The internationalization strategy of searching for fit between a relatively static business model and markets remain today, as the European market is thought to mature in terms of improved environmental standards in the future.

“[...] finding projects and markets where our products are competitive. And where we see that they have a potential to be competitive. There are new regulatory requirements in Europe that creates an interesting potential, more than before.” – Head of Sales

4.7 KTC AB

KTC AB started in 1985 as a digital data systems hardware and software firm developing a variety of computer connecting products and systems for monitoring buildings' energy usage. The firm has been international on and off since the early 2000s with few international establishments in France, Norway, and China. Internationalization has largely been dependent on KTC's business network and existing customers, as the firm has followed customers to specific markets. The internationalization efforts have been scaled down over the years and is today solely focused on Norway. Currently the firm employs roughly 80 people.

4.7.1 KTC AB's business model

KTC AB's business model is based on the firm's vision of free energy and zero emissions, where the value offering is to provide energy-optimization projects, products, and services to building- owners and managers, connecting and linking energy systems in the building for increased control. The value provided to customers is reduced energy costs, lower climate and environmental impact, and increased customer satisfaction of tenants. The offering is mainly based on contracting projects where KTC offers the entire value chain from pre-study with energy analysis, system-design, project installation and deployment, to service operations and support. The firm also delivers several services and products that aid energy optimization, although the largest focus is on contracting projects. The main customer segment is public and private housing owners and managers, commercial real estate owners and managers, construction contractors of said real estate, and OEM-customers are a small part of the customer segment. The channels through which the value is delivered to customers are direct, and mostly focused on sale of projects where KTC is the energy optimization partner, helping contractors

meet energy consumption targets. The value offering is mainly aimed at real estate owners or managers and can be distorted when operating through construction contractors.

“It [the value] is distorted through layers of consultants, procurements, price bargaining, and what not.” - KAM

The distortion of the value offering and the disconnect from end-customer also affect the customer relationships, which is focused on a continuous dialogue. However, both participants highlight the potential benefits of a closer customer relationship with end-users, and that this customer relationship is currently unclear:

“[...] we don't have a clear customer relationship, no clear way to work with our customers. Our relationships are through our contractors. Our end-customer, like real estate owner, usually that business goes through our contractors.” - CEO

The main capability in the firm is technological knowledge of how to control and optimize energy systems in buildings to reduce energy consumption. The technology used in the products and services is of high quality, but the level of innovativeness is on par with the industry standard. The processes used at KTC are internal sales processes with sale of projects, services, and products to customers. The product development department focuses on producing new products, services, or design systems for contracting projects. Throughout the company history, the technological aspects of the business have been prioritized. Seeing as the firm offers contracting projects, a large part of the internal processes is related to delivering projects, where the firm offers a full range of energy services, service and maintenance, delivering systems and installing these in buildings. The firm handles most processes internally, although there are partnerships with a contract manufacturer for KTC's products, and a partner which helps with software development.

The value capture is defined by KTC's emphasis on multiple revenue models, with revenue from sale of products, sale of services, but most revenue stem from sale of contracting projects. The pricing strategy is relatively standardized with regards to products, but more flexible depending on the complexity of service or project. The cost structure is focused on the project organization, with costs allocated to both sales and product development functions.

4.7.2 KTC AB's business model adaptation for international markets

KTC has limited internationalization and currently only have sales in Norway outside of Sweden, therefore few business model components are adapted for international markets.

Essentially, only the customer segment is adapted, as the customer in Norway is an OEM-customer purchasing KTC products, where the firm uses existing solutions and direct sales. Previous internationalization attempts have also been hindered by the lack of adaptation to local markets according to the KAM. As an example, in the UK, KTC's products and offerings were too sophisticated for the general operations management of buildings and would have needed adaptations for the UK market. Previous internationalization to France and China has also been through the business network where customers acted as internationalization partners.

In China, KTC made a purposeful internationalization effort with more business model adaptations, after initially following an OEM-customer to this market. The firm adapted the cost structure and internal processes as the firm set up an internal production unit in China and sold products directly to the Chinese market. Thus, both production and sales processes were adapted for the Chinese market, and to some extent also the customer segment as the reason for establishment was an OEM-customer. However, the Chinese operations have since been scaled back and divested, with no current market presence. According to the KAM, one of the reasons for this is that KTC did not adapt the business model enough for the Chinese market, specifically the value offering.

Both participants, the current CEO and the KAM, stated that the reactive strategy of going after opportunities wherever they present themselves have sometimes led the firm astray. Mainly because customers have been followed abroad without proper preparation, backing, and understanding from within the organization.

“I would say - if we were to do that type of journey again, even with a country like Norway; a repeat attempt requires that we sit down first and answer questions like: What does it take for us to manage a venture like this? What targets do we have in that market and how much can we allow it to cost to reach those targets?” - KAM

Though, no future internationalization push is currently in the pipeline. KTC first need to clarify the firm's role in the home market, according to the CEO. The Swedish business model, the project-based model is regarded by both participants as non-exportable. Whether to develop and sell more physical products is debated. On one hand, a focus on implementing own products abroad could be a strategy, as the KAM considers KTC to have the product development capabilities to create viable products, although he believes the firm to lack the “go-to-market skills” to currently make it happen. The CEO further develops on the dual identity of being a project organization and product organization, considered to be somewhat divisive:

“It’s only KTC who buys our products. That’s the reason to why I call us a contracting company with products.” - CEO

4.8 Ecopilot AB

The brand and solution Ecopilot have been around for a decade, originally as part of former owner Kabona AB’s offering. When Kabona was bought by Latour Industries, Ecopilot was spun-off in 2017 to form a new company Ecopilot AB. Ecopilot has been international since day one of the spinoff, and to some extent also before as Kabona marketed the solution abroad. Currently there are nine employees and the sister company Elvaco has around 65-70 employees. Elvaco is of relevance as it is the sister company and strategic partner. Together with Elvaco and NODA; Ecopilot forms part of the unit for building automation, metering, and energy efficiency in the parent firm Bemsig AB, which in turn is owned by Latour Industries.

4.8.1 Ecopilot AB’s business model

Ecopilot AB’s value offering is delivering software services to optimize and control energy usage in buildings, thereby providing cost savings through energy efficiency and improvement of in-door climate for the occupants. The value offering is predominantly directed towards building owners, the end-users. However, Ecopilot primarily targets building automation installers and contractors. These de facto customers (referred to by Ecopilot as a partners) use Ecopilot’s solution as a value-added service to include in their own offering. By utilizing Ecopilot’s value offering, the building automation installers and contractors can increase their sales and revenue. Ecopilot has a high focus on partnering with these which is illustrated by the channels used for sales, as Ecopilot work exclusively with indirect channels through building automation installers and contractors, similar to using distributors. The end-user relationship is therefore also indirect, except for a few touchpoints with end-users and participation in industry conventions for marketing purposes. The partner/customer relationship with building automation installers and contractors is however a close collaboration with continuous meetings, education on how to sell, and assistance in certain end-customer meetings. The market segments are essentially any building owner or manager, but Ecopilot specifically targets partners that operate in the building automation market.

The value creation is built on Ecopilot’s capabilities, namely: knowledge of advanced technology to reduce energy consumption in buildings, and business development knowledge. The high technological capabilities are also reflected in the highly innovative software utilized in the offerings. The software is also compatible with the most common communication

protocols (e.g. BACnet and Modbus) to be widely applicable. The technological capabilities are also reflected by the processes where product development has a central role. There are internal sales processes related to maintaining and developing partnerships with strategic partners and customers in the building automation market. Furthermore, there are processes related to ease delivery to said partners. Thus, there is a lot of emphasis on the partnerships Ecopilot surrounds itself with. This includes strategic partnerships with the sister company Elvaco that assist in the sales process to building automation partners. Elvaco has particular knowledge in indirect selling, which have benefitted Ecopilot. However, Ecopilot's customers building automation partners are also part of this focus on partnerships. Furthermore, Ecopilot has a strategic partnership with Elvaco when it comes to hardware, as it produces some of the units that the Ecopilot partners use in the installations.

Regarding the cost structure, the main costs stem from product development, accounting for approximately 70% of all cost, with the business development department making up the remaining 30%. The revenue model is built on sale of service with an annual licensing fee. The price is based on the complexity of the buildings' control and regulation systems and how many buildings are connected to the software. Ecopilot recommends a price, but the building automation partners are free to set their own price for the eventual end-user. Ecopilot and the partner often shares the revenue, to a varying degree depending on sales volume.

4.8.2 Ecopilot AB's business model adaptation for international markets

Ecopilot's business model is purposefully internationally scalable and therefore requires little adaptations. The fact that Sweden has historically been at the forefront of implementing building automation solutions and energy efficiency measures, have created opportunities to take the Ecopilot solution abroad. However, the early adoption led to Sweden implementing Modbus, a communication protocol, on a broad scale. When other countries later moved towards building automation, a new standard protocol emerged; BACnet. Therefore, the Ecopilot software is made to be compatible with both protocols, thus enabling selling on a broader scale outside of Sweden. Furthermore, the software has a language motor that makes it easy to switch language. Thus, the value offering is adapted with minor technological adaptations to offer in-building server hosting, with partners responsible for installation. Nevertheless, what becomes evident is that the value creation is stable regardless of foreign market entry. The same goes for value capture, as both the revenue model and cost structure are the same in Sweden as elsewhere.

“Technological aspects are adapted, not business model. Some are really scared of the cloud and then we must offer local installation within the building. But from a pure business model perspective, no adaptations are made. And I haven’t perceived it as a barrier either.” - Head of Sales and Markets

Some adaptation occurs in the value offering with regards to sales arguments. The susceptibility for the value of sustainability, such as lowering CO2 emissions, differs between countries. According to the participant, Nordic countries are more prone to see the value to market their properties as energy efficient, whereas as Germans are more interested in the return on investment (ROI) - the bottom line. Though, climate and sustainability consciousness in other Western European markets have started to emerge as well, it is not as pronounced as in the Nordics. However, investing in energy efficient measures for the sake of sustainability is mentioned to never trump ROI. Lastly, the choice of target market is less dependent on where the firms want to be, and more on where the solution is viable. As the business model supports entry to many different markets:

“It doesn’t really matter which market we choose; any is bigger than what we have here. So, market selection has come down to – where do we get traction the quickest? More than actually making a strategic choice to enter a determined market.” - Head of Sales and Markets

4.9 Summary of findings

The tables below (table 2-9), have been compiled from the findings of each firm in this section, and aims to express the business model design that the firms have adopted, as well as what specific adaptations have been made to the business model when internationalizing. The tables were developed to enable the subsequent cross-case analysis in chapter 5, and the findings have therefore been categorized according to the three business model dimensions: value creation, value proposition, and value capture.

Table 2: ReVibe Energy AB's business model design and adaptation

ReVibe Energy AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> Innovative patented technology. Product development & business development capabilities. Sales and product development processes. Partnerships in the manufacturing and sales process. 	<ul style="list-style-type: none"> Sales process Product development process Utilizing network partners
Value Proposition	<ul style="list-style-type: none"> Customizable, cost-efficient and convenient value offering. B2B customers in heavy industry. Close, collaborative customer relationships. Direct and indirect channels. 	<ul style="list-style-type: none"> Indirect channels: distributors Customer relationships
Value Capture	<ul style="list-style-type: none"> Costs related to sales and product development. Asset sale, flexible pricing. 	*

Table 3: Bevent Rasch AB's business model design and adaptation

Bevent Rasch AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> Product development and customer support capabilities. Manufacturing, product development, and sales process. Partnerships with customers and sales partners. 	<ul style="list-style-type: none"> Sales process Product development process Establishing international sales partnerships.
Value Proposition	<ul style="list-style-type: none"> Convenience, predictability and customizable value offering. B2B customers in the building market segment. Close customer relationship. Direct and indirect channels. 	<ul style="list-style-type: none"> Less convenience in value offering abroad. Indirect channels abroad: agents and distributors
Value Capture	<ul style="list-style-type: none"> Costs related to ownership of the entire value chain. Asset sale, flexible pricing. 	*

Table 4: Lum-n-lux AB's business model design and adaptation

Lum-n-lux AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> Technological capabilities and experience. Product development, sales, and manufacturing processes. Arm's length partnerships with suppliers. 	<ul style="list-style-type: none"> Product development process New manufacturing process in China Capabilities in administrative tasks related to internationalization. Initial joint venture partner in China.
Value Proposition	<ul style="list-style-type: none"> Cost-efficient, convenient and customizable value offering. OEM-customers (B2B) in lighting industry. Close and personal customer relationships. Direct channels. 	<ul style="list-style-type: none"> Value offering adapted to become more finished lighting products.
Value Capture	<ul style="list-style-type: none"> Costs related to ownership of the entire value chain, and international production unit. Asset sale, flexible pricing. 	<ul style="list-style-type: none"> Manufacturing plant in China added to the cost structure.

Table 5: Wideco Sweden AB's business model design and adaptation

Wideco Sweden AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> • Technological, sales capabilities, and experience. • Sales, product development and manufacturing processes. • Partnerships in product development and sales. 	<ul style="list-style-type: none"> • International mindset and sales capabilities. • Sales and product development process. • Cross-functional processes to support internationalization. • Partnerships and networks for international sales.
Value Proposition	<ul style="list-style-type: none"> • Cost efficient, safe, convenient, and integrable value offering. • B2B customers & OEM in district heating and cooling industry. • Close customer relationships. • Direct and indirect channels. 	<ul style="list-style-type: none"> • Highlighting different aspects of value offering. • Prioritizing close customers relationships in attractive growth markets. • Indirect channels through international sales partners.
Value Capture	<ul style="list-style-type: none"> • Costs related to ownership of entire value chain. • Asset sales, flexible pricing. • Service sale (one-time or recurring), flexible pricing. 	<ul style="list-style-type: none"> • Cost structure adapted to support international sales process. • One-time asset & service sales internationally.

Table 6: AB Regin's business model design and adaptation

AB Regin	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> • Technological, sales capabilities and experience. • Product development, sales and manufacturing processes. • Partnerships in sales and manufacturing. 	<ul style="list-style-type: none"> • Acquiring local firms where certain customers segments are not available. • Sales and product development processes • Creation of cross-functional processes to coordinate and integrate learnings and products from acquired foreign firms. • Manufacturing processes added in Italy and Taiwan. • Establishing sales partnerships.
Value Proposition	<ul style="list-style-type: none"> • Convenient, cost-efficient and customizable value offering. • Three main customer segments in HVAC industry (B2B and OEM). • Close, collaborative customer relationship. • Direct and indirect channels. 	<ul style="list-style-type: none"> • Focus on each of the three segments vary between international markets. • Value offering slightly adapted to varying customer needs. • Customer relationships varies in closeness: in markets without local sales office, the export sales department maintain relationships to customers and foreign partners.
Value Capture	<ul style="list-style-type: none"> • Costs related to ownership of the entire value chain, and international production and sales unit. • Asset sales, flexible pricing. • Service sale (one-time or recurring), flexible pricing 	<ul style="list-style-type: none"> • Cost structure: manufacturing plants in Italy and Taiwan, and costs of coordinating international business units. • Revenue model does not change internationally, though certain markets are less receptive to services.

Table 7: B&W Vølund AB's business model design and adaptation

B&W Vølund AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> • Technological capabilities and the ability to induce trust. • Project design & development and sales process. • Partnerships in product development, manufacturing and sales. • Patented, licensed technology, and high technological standard. 	<ul style="list-style-type: none"> • Partnerships with international sales, production (contractors), and technology partners. • Technological resource: patented dioxin removal product. • Product development process.
Value Proposition	<ul style="list-style-type: none"> • Problem-solving (emissions) and cost-efficient value offering. • B2B customers in heat and power plant industry. • Close, trusting customer relationships. • Direct channels and indirect channels. 	<ul style="list-style-type: none"> • Indirect channels: sister company and agents. • Customer relationship closeness varies depending on the channel.
Value Capture	<ul style="list-style-type: none"> • Costs related to sales and product development. • Project sales. • Asset sales. • Service sales. 	<ul style="list-style-type: none"> • Service sale mainly possible in Scandinavia.

Table 8: KTC AB's business model design and adaptation

KTC AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> • Technical capabilities. • Product development, sales, and project delivery processes. • Partnerships in manufacturing and product development. 	<ul style="list-style-type: none"> • Norwegian OEM-customer as internationalization partner.
Value Proposition	<ul style="list-style-type: none"> • Cost-efficient and climate friendly value offering that increases tenant satisfaction. • B2B customers in the real estate market segment. • Direct channels. 	<ul style="list-style-type: none"> • OEM-customer segment abroad.
Value Capture	<ul style="list-style-type: none"> • Costs related to project organization, sales and product development. • Asset sale, standard pricing. • Service sale, standard pricing. • Project sale, flexible pricing. 	*

Table 9: Ecopilot AB's business model design and adaptation

Ecopilot AB	Business model Design	Business model Adaptation
Value Creation	<ul style="list-style-type: none"> • Technological and business development capabilities. • Highly innovative technology. • Product development and sales processes. • Partnerships in sales and manufacturing. 	*
Value Proposition	<ul style="list-style-type: none"> • Cost-efficient and integrable value offering. • B2B customers in the real estate industry. • Close, collaborative partner/customer relationship. • Indirect channels. 	<ul style="list-style-type: none"> • Minor value offering adaptations in the aspect of sustainability. • Minor technical adaptations to customer preferences.
Value Capture	<ul style="list-style-type: none"> • Costs related to product development and sales. • Service sale (recurring revenue from annual subscription license), flexible pricing. 	*

5. Analysis

The following chapter presents the cross-case analysis based on the empirical findings in chapter 4 and is structured to address the key concepts of the conceptual model. First, the analysis of the case firms' business model design themes is presented. Second, the case firms' business adaptations are analyzed and discussed. Third, the relevance of business networks in relation to both internationalization, business models, knowledge and learning are analyzed. Lastly, the analysis moves on to discuss the importance of strategy in relation to business models and internationalization.

5.1 Business model design themes of Swedish cleantech firms

The Swedish cleantech firms in this study exhibited some general characteristics regarding their business model design, as illustrated by the summary of findings in section 4.9. These findings suggest a degree of commonality between the business model designs as illustrated in tables (2-9), which are likely facilitate internationalization. Many of the design themes identified in the empirical findings have been mentioned to facilitate rapid internationalization by Kraus et al. (2017), such as having sales and R&D capabilities, utilizing direct channels to customers (although most firms also utilized indirect sales), having close relationships with customers, and customizable solutions.

Both Rask (2014) and Child et al. (2017) created distinct international business model typologies, and similarities to these typologies can also be identified among the case firms in this study. Primarily, we found that most firms utilized an export-based international business model (Wideco, Bevent Rasch, ReVibe, Ecopilot, B&W Vølund), focusing primarily on the downstream activities internationally, as suggested by Rask (2014). However, Regin and Lumn-lux had moved towards a more semi-globalized business model (Rask, 2014), having both production and sales subsidiaries abroad and a focus on direct sales internationally. KTC can also be described as having an export-based international business model, seeing as the firm currently sells directly to an OEM-customer in Norway and have also had other customers abroad. However, KTC previously had a production facility abroad, showcasing a regression from more of a semi-globalized business model, a direction not discussed by Rask (2014).

While similarities can also be drawn to Child et al.'s (2017) international business model typologies, such as extensive use of partners and customers in internationalization and exploitation of existing offering with minor adaptations, it is difficult to place any of the cases

in this study according to the design themes developed by Child et al. (2017). However, we do agree with Child et al. (2017) that industry is most likely a strong influencer on individual firms' choice of business model design. This is evident in the commonalities among the cases, as all firms serve B2B customers, most firms focus on cost-efficiency and customization in the value offering, and most emphasize close personal relationships to customers and partners. Comparatively, an industry or sector such as retail is instead characterized by B2C customer focus, standardized solutions or offerings, other channels, and less personal customer relationships.

5.1.1 Business model with customer centricity for internationalization

Our findings indicate that the Swedish cleantech firms in this study have a business model based on knowledge of the customer, in line with Teece (2010) and Tolkamp et al. (2018), showcasing customer centricity. The most obvious indications of customer centricity among the cases are in the value proposition dimension. This is evident by the value offerings emphasizing simplification of the customers' business through convenience (all cases except Ecopilot, KTC, and B&W Vølund) and customization or integration (all cases except B&W Vølund and KTC) and yielding returns on investment through cost efficiency (all cases except Bevent Rasch). The customer relationship was defined as close with personal communication by all cases except KTC, showcasing a focus on understanding customer contexts and need. However, even KTC mentioned an intention of forming close customer relationships going forward. Lastly, the channels are designed to reach the customers any way possible, be it directly or indirectly, although some notable differences in design exists. For instance, KTC, Lum-n-lux favored using only direct channels. The findings therefore seem to be in line with Teece's (2010; 2018) argument that firms need to create business models that are built on knowledge of customer- and market needs. It also supports Kraus et al. (2017) who found that internationalizing firms tend to create strong relationships with customers. As stated by KTC, Regin, Lum-n-lux, and Bevent Rasch; they internationalized through customers, where customer centricity is a fixed business model trait or design theme facilitating internationalization. It also supports Dunford et al. (2010), as it seems that that firms first create some fixed design traits (in this case customer centricity), which is then replicated with smaller adaptations in international markets. Further, the findings suggest that the business model can be designed to overcome the liability of outsidership as suggested by Johanson and Vahlne (2009), and further supports Kraus et al. (2017) that internationalizing firms design business models in distinct ways.

Moreover, customer centricity seems to start in the demand-side of the business model, namely the value proposition, although it needs to be supported by the value creation (e.g. processes and partnerships) and the value capture (revenue model and cost structure). For instance, product development processes need to be in place to customize products, particularly to OEM customers, as shown in the cases of Regin, Lum-n-lux, ReVibe, Bevent Rasch. The revenue model has to be flexible, as customization, local adaptation of products, and extra service costs are often added to the product price, which was evident in the cases of Regin, Lum-n-lux, Revibe, Wideco, Bevent Rasch, and Ecopilot. Regin and Lum-n-lux also set up manufacturing facilities abroad in order to support customer centricity in the business model (KTC had done so previously). This all highlights the need for dynamic consistency as the components are interdependent (Demil & Lecocq, 2010; Landau et al., 2016), and in order to have a customer centric value proposition, the value creation and capture dimensions must be responsive.

Lastly, some firms incorporated feedback loops from customers or partners in international markets as suggested by Tolcamp et al. (2018). Wideco and Regin created cross-functional processes between sales and product development to include foreign market needs in their product development process. Thus, while Cao et al. (2018) suggest that firms create new processes for individual markets, processes can also be designed to support internationalization in a more general sense. The value creation dimension of business models can therefore be designed to extract and disseminate knowledge of international markets within the firm, through certain processes and partnerships. This ability is imperative to make well-grounded internationalization decisions as shown in theory (Nummela et al., 2014; Weerawardena et al., 2007).

5.1.2 Focus on product development and sales

Our findings show product development and sales as the most common internal processes & routines to create value, as all cases had these processes in-house to some extent. The focus on these processes are also reflected in mentioned capabilities, as technological capabilities were mentioned by all firms, and all firms produced solutions with high technological standard, which did not necessarily mean the most innovative or boundary pushing products. This shows that firms seem to align their capabilities to create value (Demil & Lecocq, 2010) with the processes and activities that they actually perform, referred to as the activity system by Zott & Amit (2010). Similarly, Wideco, ReVibe, Regin, and Ecopilot all mentioned sales or business development as a distinct capability. Bevent Rasch and B&W Vølund did not mention sales as such, but instead emphasized being sensitive to customer needs as a distinct capability. These

capabilities are reflected by all firms performing the sales process in some manner. Even Lum-n-lux and KTC that did not mention sales capabilities, had an internal sales process, albeit without use of partnerships in the sales process seen in the other cases. Having strong capabilities in sales and R&D and having the processes & routines reflect these, therefore seems to be an important element to internationalization, supporting Kraus et al. (2017) propositions. These capabilities can also be the unique knowledge (Oviatt & McDougall, 1994; Knight & Cavusgil 2004) needed to facilitate internationalization.

Furthermore, as mentioned above, the capabilities of firms seem to take expression in the processes a firm sets up, influencing how they work with partners and networks, in turn influencing channels, and customer relationships. This was evident in all cases where sales partnerships were utilized (ReVibe, Bevent Rasch, Wideco, Regin, B&W Vølund, Ecopilot). The establishment of sales partnerships meant a change to the channels used, as they became indirect, meaning that the customer relationships became more distant. For ReVibe and Wideco, this meant prioritization of customer relationships according to the largest potential gain. It also required stronger relationships with the sales partners instead of the end-customer, much like the cases of Regin, Ecopilot, Bevent Rasch, and B&W Vølund. This interdependency shows the importance of business models responding to internationalization decisions and strategies, as the choice to internationalize to a foreign business network has implications on various business model components. Thus, the networks act as a way to access international markets (Johanson & Vahlne, 2009). However, the network or partnerships a firm creates is a function of the sales process established to create value (Zott & Amit, 2010). What sales process a firm establishes is in turn determined by capabilities and knowledge of the firm (Demil & Lecocq, 2010; Knight & Cavusgil, 2004).

5.1.3 Extensive use of partnerships in the business model

The findings show that all Swedish cleantech firms in this study emphasize the importance of partnerships in the business model. Sales, marketing and networking partners, were used at some capacity in the cases of B&W Vølund, Bevent Rasch, Ecopilot, Regin, Revibe, and Wideco. Thus, much like existing research suggesting that internationalization is facilitated by utilizing business networks (Cavusgil & Knight, 2015; Coviello and Munro, 1997; Coviello & Munro, 1995; Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003), the findings show that to create and deliver value to customers in international markets, partnerships are invaluable. Thus, this is an element of the business model that can purposefully be designed. However, as KTC, Regin, Lum-n-lux, Wideco and Bevent Rasch also internationalized with customers, it

seems that firms' international business model includes both partners and customers as internationalization partners, supporting the findings of Child et al. (2017). Some firms (B&W Vølund, Bevent Rasch, Ecopilot, Regin) created strong partnerships with sales partners. It could therefore be that to support an export-based, or semi-globalized business model (Rask, 2014), partnerships in sales are as important internationally as customer relationships. This is also logical as these partners in turn maintain the actual customer relationships in international markets, acting as indirect sales channels.

Moreover, the findings show that partners were involved in manufacturing or product development in all cases (except Bevent Rasch and Lum-n-lux), though the participants did not mention these upstream partnerships to be internationalization partners in the sense suggested by Johanson and Vahlne (2009) and Sharma and Blomstermo (2003). Nonetheless, the use of such partners illustrates that partners can free up valuable resources to allow for focus on core aspects of the firm's business. Thus, using partners could be a source of efficiency in the business model as suggested by Kraus et al. (2017), giving firms room to focus on business development, both in- and outside the home market. Therefore, it seems that the network and partners are not only important for gaining access to international markets, as is often the case in internationalization research (Cavusgil & Knight, 2015; Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003; Coviello & Munro, 1995). However, the network can also be means to create efficiency in the business model by utilizing partners in the external organization as suggested by Demil and Lecocq (2010). Thus, upstream partnerships with manufacturers or product development partners in the business model can be considered indirect internationalization partners.

5.2 Business model adaptation for internationalization

The findings show that all eight firms adapted their business model for internationalization in some capacity. Certain firms made more substantial adaptations (Regin, Lum-n-lux, Wideco), some made smaller adaptations (Bevent Rasch, B&W Vølund, KTC) while others had business models designed to be internationally viable where only minor adaptations are needed (ReVibe, Ecopilot). This adaptability illustrates that international markets might inherently place different requirements on the business model that managers need to have knowledge of, for instance market barriers and cultural aspects (Barkema et al., 1996; Kahiya, 2013; Kogut & Singh, 1988; Saarenketo et al., 2018).

Moreover, while all dimensions and components of the business model were found to have been adapted, some components were adapted more than others. For instance, all firms except Ecopilot adapted processes & routines for international markets, with emphasis on product development process of adapting products to local market regulations, standards, or certifications. The sales process was also adapted in the cases of Bevent Rasch, Regin, ReVibe, and Wideco to include attention to local culture and local customer needs, as well as to incorporate learnings to overcome this barrier, with many firms turning to local partners or export organizations. These adaptations are also to be expected for any cleantech firm internationalizing, as political and market risk barriers are prevalent in this sector (Saarenketo et al., 2018; Kahiya, 2013), and that cultural differences are present (Barkema et al., 1996; Kogut & Singh, 1988). This is in line with the suggestions of Weerawardena et al. (2007), that firms need to have a strong learning and networking capabilities, as firms seem to learn that processes & routines, to some degree, needs be adapted to local market requirements. Often this is done by initiating efforts to establish partnerships with local network actors such as distributors, or export organizations (e.g. Business Sweden), hence concordant with internationalization theory (e.g. Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003). It is also illustrative of several authors' suggestions (Teece, 2010; McGrath, 2010; Rask, 2014; Dunford et al., 2010) that business models naturally involve a learning aspect, and therefore needs to be updated and adapted as knowledge of international market requirements is acquired.

Furthermore, although B&W Vølund, KTC, Regin, and Wideco sold both products and services, the revenue model remained mainly asset sale oriented, especially internationally. Regin and Wideco particularly expressed services as more difficult to market abroad as the degree of institutional trust might vary from country to country, requiring adaptations depending on market. Illustrating regulatory and standard barriers, and the impact that cultural differences could have on business models (especially revenue model) in international markets (Kahiya, 2013; Barkema et al., 1996; Kogut & Singh, 1988). Regin and Wideco, two firms who utilized both asset and service revenue models internationally, singled out East Asia and the Middle East as markets especially hard to sell services to. An interesting aspect was that all firms had flexible pricing strategies as part of their revenue model. This is interesting as this was an area of built-in flexibility to the business model, that enabled them to adapt the pricing according to customer needs and local market price levels, as mentioned by Regin and Wideco. Lum-n-lux and Bevent Rasch instead mentioned this flexibility in relation to market specific adaptations made to products or the cost of attaining required certifications.

5.2.1 Adaptations to maintain customer centricity

As mentioned previously, customer centricity in the business model seems to facilitate internationalization when it comes to following customers abroad (KTC, Regin, Wideco, Bevent Rasch, and Lum-n-lux). Customer centricity in the business model seems to enable firms to be less concerned with adapting to country specific needs and more concerned with customer specific needs, again emphasizing knowledge of customers as suggested by Teece (2010) and Tolcamp et al. (2018). A reason for this adaptability to customer needs could be that the firms mainly targeted B2B customers (often OEM-customers), where product development and sales processes are adaptable to deliver customizable value offerings. Making customer centric adaptations also involve a level of adaptability in both value offerings and pricing to international markets. This was evident particularly in the cases of Regin, Wideco, Bevent Rasch, and Lum-n-lux. Illustrating that external barriers related to markets are less important than overcoming the internal barriers of internationalization, such as difficulties with marketing mix adaptations, in line with Kahiya (2013). It could also be suggested that the built-in adaptability of the customer centric business model could help managers overcome internal barriers related to internationalization.

Nevertheless, though the firms would like to maintain the same levels of close customer relationships abroad, many had to work through partners (B&W Vølund, Bevent Rasch, Ecopilot, Regin, Revibe, Wideco), and adapt the closeness to customers depending on the attractiveness of the market (Wideco, Revibe). Further, stretching the business model abroad required adaptations to processes & routines, where customer feedback was funneled from the customer facing departments to the product development departments, illustrating customer feedback loops as suggested by Tolcamp et al. (2018). This was observed particularly in the Regin and Wideco cases, both of which made a point of listening to customer demands and creating cross-functional processes to make the entire organization aware of the internationalization progress. Hence, the value creation dimension must be able to respond to the varying degrees of complexity that international customers and customized value offerings require. This shows the importance of knowing how to disseminate knowledge to create knowledge intensive products as suggested by Wearwardena et al. (2007). Obviously, being able to learn from foreign market networks is important in setting up these processes & routines to disseminate knowledge (Joahnsen & Vahlne, 2009; Sharma & Blomstermo, 2003; Wearwardena et al., 2007).

Furthermore, the cost structure needs to respond to added costs of stretching the customer centric business model abroad. Wideco added travel-related costs to visit international customer, which was also evident for ReVibe although they tried to minimize travel for this reason. Regin and Lum-n-lux set up international production units, adding to and adapting their cost structure. KTC, much like Lum-n-lux followed an OEM-customer to China and set up production there. However, KTC did not adapt processes & routines sufficiently or plan for the changing cost structure and manufacturing processes to adequately ensure quality of operations abroad. Thus, simply reactively adapting the business model with regards to processes & routines internationally is not enough and setting up international production is a complex decision. This showcases the need for dynamic consistency as business model components are interdependent and adaptations to one require adaptations to other (Demil & Lecocq, 2010; Landau et al., 2016). Also, it suggests that upstream internationalization might require more proactive and well-grounded internationalization decisions (Child & Hsieh, 2014; Nummela et al., 2014; Schweizer, 2012). Showing that adopting an import-based or semi-globalized business model (Rask, 2014) needs to be well-grounded due to the level of complexity involved.

5.3 The network influence in internationalization and business models

Business networks and partnerships plays a significant role in the international business model designs of Swedish cleantech firms, as shown in all cases in this study. Thus, our findings seem to confirm most of the internationalization research consulted in this thesis (Cavusgil & Knight, 2015; Coviello & Munro, 1995, 1997; Johanson & Vahlne, 2009; Sharma & Blomstermo, 2003). The firms in this study (KTC, Regin, Wideco, Bevent Rasch, and Lum-n-lux) have followed customers, often OEM-customers, to various international markets. Further, B&W Vølund, Bevent Rasch, Ecopilot, Regin, Revibe, and Wideco established partnerships with distributors or sales agents, acting as indirect channels, internationalizing in that manner. In other words, the firms in this study have internationalized both proactively and reactively (Child, & Hsieh, 2014) through partnerships with customers and/or sales partners. Partnerships with OEM-customers and the close nature of the customer relationship have enabled following customer to international markets (e.g. Lum-n-lux).

Furthermore, while the network was found to be predominantly positive in internationalization of the firms as it acted as a source of efficiency in the business model, it also had some unanticipated drawbacks. Coviello and Munro (1997) mentions strong network partners as possible roadblocks for smaller firms increasing their internationalization efforts. Lum-n-lux, seemed to exhibit a network lock-in effect due to its position in the value chain, where the

customer relationships to downstream customers prevented Lum-n-lux from changing value chain position. As all firms were in a mid-value chain position with their current business models, all firms could therefore be limited in how much they can change their position in the value chain. Instead, internationalization can enable creation of alternative business models in other value chain positions, as firms do not risk alienating customers in one market by changing value chain position in other markets, as suggested by the Lum-n-lux case. Similarly, Regin have developed three business models of varying complexity and value chain position from which they could readily use in any market. This supports Dunford et al. (2010) that firms can experiment with different business models in other markets. It also showcases that at certain points, the networks can create a need for firms to make proactive and rational choices (Child, & Hsieh, 2014; Nummela et al., 2014), not only in relation to internationalization, but to what business model to compete with internationally.

5.4 Business model internationalization as the realized strategy

Separating the firms in our study was the degree of proactiveness in internationalization. Regin decided on a strategy in the late 1980s, namely rapid growth within the global HVAC industry, and therefore employed three business models to realize it. Lum-n-lux's strategy was equally proactive – to grow with customers in any market, home or abroad, and the business model reflected this strategy. Wideco, also proactive since 2016, showcased value creation adaptations and changes to the business model design in terms of added capabilities in sales, international mindset and cross-functional product development processes. These three firms (Regin, Lum-n-lux and Wideco) made decisions on strategy and business model design changes and adaptations to reflect these decisions. The findings therefore suggest that a firm must decide upon a strategy and design a corresponding business model, thus in accordance with Casadesus-Masanell & Ricart (2010) and DaSilva & Trkman (2014).

Other firms were more reactive. Bevent Rasch and KTC were reactive in their internationalization, taking opportunities that presented themselves to sell abroad. B&W Vølund were also reactive in a sense; having a strategy of waiting for the external environment to align with its business model. This could be due to B&W Vølund's ownership structure, as they were owned by a US multinational through a Danish subsidiary, meaning that B&W Vølund's strategy might not be entirely of its own making – instead its business model could be a smaller cog realizing a larger global strategy devised by the group owner. Further, the implications of not having a clear internationalization strategy and a business model with

dynamic consistency (Demil & Lecocq, 2010; Landau et al., 2016) was evident with KTC, that professed that the unsuccessful venture in China were due to a lack of a clear strategy and commitment to business model adaptations. Further, Bevent Rasch mentioned an unwillingness to adapt the business model too much, as to not change what has made them successful domestically. Revibe Energy and Ecopilot, the two BGs, were reactive in the sense that they would readily sell to any customer regardless of origin, as their business models were purposely internationally viable, thus they cannot be considered reactive in internationalizing but somewhat reactive or flexible when it comes to destination. Thus, it seems that having a proactive strategy is beneficial for making substantial adaptations to the business model when internationalizing, although firms can still internationalize when being reactive.

The empirical findings suggest that the firms with reactive internationalization strategy (KTC and Bevent Rasch) mainly made adaptations to the value proposition and capture dimensions. They have a domestic business model that they extend abroad (Landau et al., 2016) and the adaptations they make are the minor ones the business model allows – i.e. tactics (Casadesus-Masanell & Ricart, 2010). Whereas the proactive internationalizing firms (Regin, Lum-n-lux and Wideco) have come further, beyond international extension of the business model. They have made major adaptations to the value creation dimension, particularly with internationalization of manufacturing activities and processes supporting it. It can be argued, that Regin and Lum-n-lux have come further according to Landau et al.'s (2016) business model adaptation phases. Thus, Regin and Lum-n-lux belong to the second phase, local emergence, as major value creation adaptations are part of that phase. Wideco on the other hand have not established sales offices or subsidiaries abroad. Though purposeful strategic decisions to internationalize have been made to design and adapt the business model accordingly (Casadesus-Masanell & Ricart, 2010) by adding capabilities and processes & routines to support such endeavor. Hence, Wideco made adaptations to the value creation dimension prior entry to a specific market, to ensure readiness for eventual internationalization, a finding that somewhat contradicts Landau et al.'s (2016) findings of value creation adaptation in a second phase of local emergence. However, Wideco is not a major automotive MNC with unlimited resources to extend their business model internationally without the need for prior value creation adaptations.

6. Conclusion

This chapter starts with an answer to the research question, where the main conclusions of this thesis are presented. The conclusions and answer to the research question also showcase findings that calls for a revision of the conceptual model. The theoretical and managerial implications of the conclusions in this study are then discussed to address the purpose of the study. Finally, the limitations of the study and suggestions for future research are presented.

This thesis was guided by the research question: ‘*How does business model design and adaptation facilitate internationalization of Swedish cleantech firms?*’. The findings of the multiple case study of eight Swedish cleantech firms and subsequent analysis have shown how the business model has been utilized and adapted to facilitate internationalization. The analysis highlighted some general business model design traits that seem to have facilitated internationalization of Swedish cleantech firms, namely: customer centricity; focus on business and product development; extensive use of partnerships and networks. Similarly, business model adaptations are a prerequisite when internationalizing as international markets and customers places a strain on the business model which needs to be addressed. Therefore, we suggest that business model design and adaptation are integral to explaining how certain firms can internationalize their operations.

Customer centricity differs between individual firms and varies in its intensity, as some firms will inherently be more attentive to customer needs than others. We propose that providing value offerings such as cost-efficiency, convenience, and customization are most likely appealing to any customer, domestic or international, and therefore works in any market. Having close personal relationships with customers enables firms to propose suitable value offerings, as closeness enable insights to customer needs and wants, which again is important for both domestic and international markets. However, in markets where direct channels are not available or suitable, firms must instead establish close personal partner relationships with sales partners such as distributors or agents, to maintain customer centricity in the business model. Consequently, having customer centricity in business model design facilitates firms’ internationalization efforts, as the customer, regardless of geographical location, guides internationalization.

Furthermore, business networks have a large role in internationalization as firms reach international markets through their business networks (Johanson & Vahlne, 2009), but these network actors are also integrated in firms’ business model designs. Business networks,

particularly customers and partners, play an important role as value creation partners, delivery channels, and sources of foreign market- and customer knowledge. Thus, business models can purposefully be designed to utilize partners to access new markets as indirect channels, as well as to free up resources (e.g. outsourcing activities) to allow increased focus on certain value creating activities such as business- and product development. Partnerships included in the business model design can therefore have a dual facilitating effect on internationalization, both as channels to international markets in the value proposition and as value creation partners to make the business model more efficient. Moreover, we found potential drawbacks of strong business network partners, as these might resist firms changing business model as means to increase internationalization commitment, much like suggested by Coviello & Munro (1997). However, we argue that firms can make strategic choices to design new business models for markets where the strong business network partner is not present or a direct competitor in.

Moreover, firms need to be prepared to make some business model adaptations to internationalize. Customer needs, standards, regulatory environment, and culture differ between markets, and firms do not always have the resources or capabilities to sell directly to customers in all markets. Thus, business model components require adaptations. The level of adaptations differs, depending on both the internationalization strategy a firm has as well as how much adaptations the original business model design requires. Generally, the sales process and product development processes will need to be adapted in some manner to abide by local market requirements, and customer needs. Moreover, to internationalize, partnerships and sales channels often need to be adapted as partners (e.g. distributors, agents, export organizations) can act as sources of foreign market knowledge and as indirect sales channels. Partnerships and the business network are therefore not only important design elements of the business model for internationalization, but also as sources of knowledge from which a firm can base the business model adaptations needed to internationalize.

Lastly, business models should not be investigated in vacuum as the business model should be considered the realization of a conscious strategy. Having a clear strategy enables firms to take well-grounded and rational decisions when choosing and adapting a business model to reach international markets. Thus, there is a need to have awareness on what strategy to follow and how well the chosen business model realizes that strategy.

6.1 Revision of the conceptual model based on the conclusions

The conclusions indicate that our original conceptual model was largely correct regarding how business model design and adaptations facilitate internationalization. The conclusions also illustrate the importance of the business network for internationalization, as it provides knowledge on which business model adaptations to make. However, the conclusions also show that strategy plays an important and interrelated role in creating an internationally viable and adaptable business model design.

Casadesus-Masanell & Ricart (2010) distinguishes strategy, business model and tactics by considering that firms initially (strategy stage) decides on a business model to compete with to realize a strategy, and then makes a series of tactical choices (tactics stage) contingent on the chosen business model. Therefore, we make the argument that business model adaptations for internationalization are related to tactics, whereas business model design is more related to strategy. To avoid a Ship of Theseus-like metaphysical discussion of whether or not the business model can be regarded the same if all constituting components have been adapted - we argue that as long as the business adaptations are done to realize the strategy without changing it, the business model design is not new. However, strategy is not static and may change as well, which in turn can influence what business model is employed. Much like business model adaptations stem from learnings of prior adaptations and continuous knowledge feedback from networks and markets (Teece, 2010, 2018; Berends et al., 2016), similar arguments can be made for strategy being emergent and not planned (Mintzberg, 1978). Thus, firms also gain strategic knowledge from their business networks which influences how their strategy is developed or changed.

Consequently, we propose a revision of the conceptual model (see figure 3). The addition is the left-hand box of strategy, emphasizing the strategic choice of what business model to employ. Furthermore, the knowledge arrow, feedbacking knowledge from the networks is split into two: tactical and strategic. Tactical knowledge enables business model adaptation, as the firms gain knowledge from the network of what the available business model adaptations are to realize the firm strategy and internationalize. The latter arrow of strategic knowledge is also gained through feedback from the networks, as knowledge from network actors enables firms to alter or reinforce their strategy. A new strategic orientation might require the creation of a new business model, major alteration or adaptation of the existing business model, or might be compatible with the current business model. Nonetheless, the principle of the conceptual model

is still the same: that the business model chosen determines how the firm can internationalize to foreign business networks (where customers and partners are most prominent).

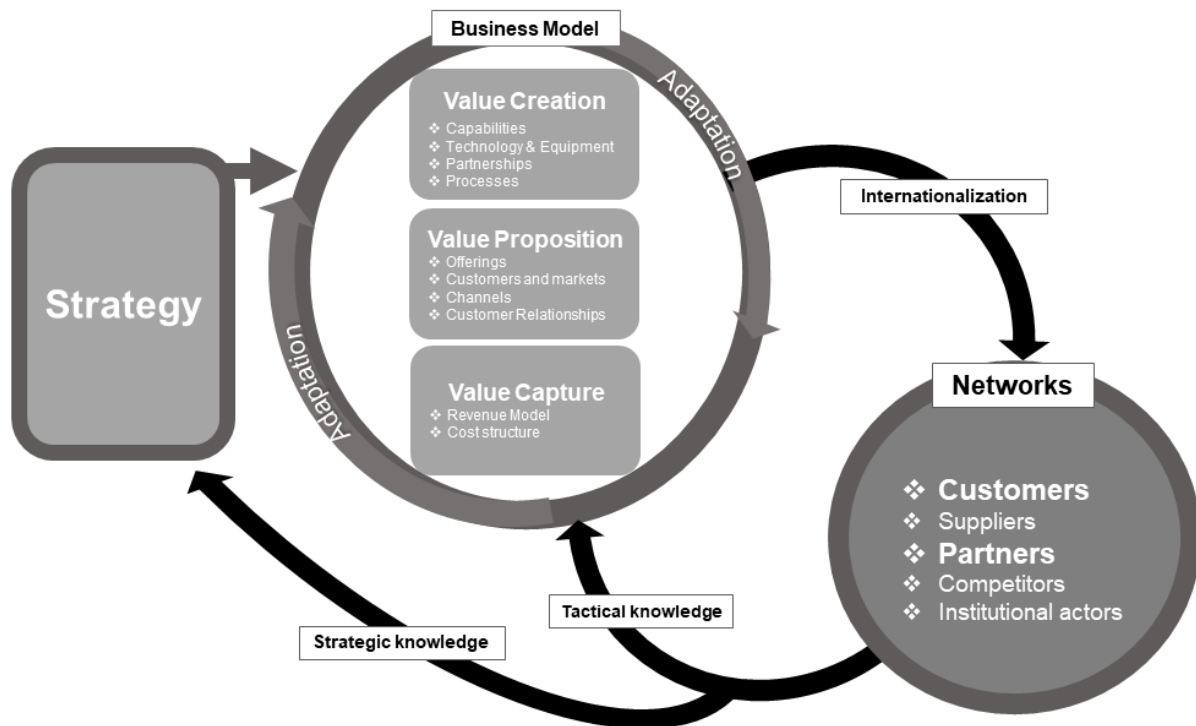


Figure 3: Revised conceptual model based on the analysis and empirical findings

6.2 Implications and contributions

6.2.1 Theoretical contributions

The primary theoretical contribution of this thesis is that the business model has been found to be a facilitator for internationalization of the firm, and that international business researchers can utilize the business model as a conceptual tool to explore internationalization. We have illustrated that the business model perspective contributes to the understanding of how internationalization strategies are implemented, thus providing a useful new perspective in internationalization research, as called for by Cavusgil & Knight (2015). The revision of the conceptual model highlights the role of strategy in designing and adapting business models for internationalization. Specifically, the revision show that the business network contributes with knowledge on strategy formation affecting the consequent business model design, as well as knowledge on available business model adaptations. Moreover, we have contributed with empirical evidence on how Swedish cleantech firms work with the business model during internationalization, providing valuable research that can be used to promote

internationalization among Swedish cleantech firms. Lastly, these contributions illustrate that we have helped bridge the research gap between business model research and internationalization research.

6.2.2 Managerial implications

Internationalization of the firm is a complex endeavor that places inherent strain and requirements on firm's business models. Our conclusions suggest that Swedish cleantech managers need to consider what their internationalization strategy is, how the business model should realize the strategy, and what business model adaptations will be needed in different markets. Managers should be mindful of the entire business model as business model adaptations are interdependent. Hence, if utilizing partnerships with distributors as indirect channels is the intended entry mode to markets, managers need to consider how that choice influence the customer relationships, the value offering, the revenue model, etc. Moreover, Swedish cleantech managers can use the business model perspective to evaluate the internal and boundary spanning firm preconditions and whether they facilitate internationalization. For example, evaluating the current capabilities, processes, and partnerships could help determine whether some specific capabilities, processes, or partnerships need to be added when selling to international customers. The business model perspective also highlights what tools managers have at their disposal when internationalizing, e.g. flexible pricing in the revenue model, adding indirect channels, changing the value offering, go after new customer- or markets segments, adapting the customer relationship, etc.

6.3 Limitations and recommendations for future research

This thesis has provided both theoretical and managerial contributions, although there are some limitations to our study that needs to be addressed. This study was limited to Swedish cleantech companies within the energy efficiency sector, and the transferability of the findings to other contexts might thereby be limited. However, we still argue that the results of this study allow for analytical generalizability (Yin, 2014), and the research methodology is transferable to another contexts. To strengthen the results of this study, we welcome future studies to investigate how business models are designed and adapted when internationalizing in other contexts and other sub-sectors of the Swedish cleantech sector. Similarly, quantitative studies could measure the impact of business model design themes and business model adaptations on international performance to allow for statistical generalizability. Another limitation is that the study was completed within a short timeframe and could only capture the managers recollection

of events and decisions made. A longitudinal study could overcome this limitation and capture real-time decisions regarding business models and internationalization. Furthermore, an interesting avenue for future research could be that researchers address how firms' use business models to realize internationalization strategy, which could give further insights into how the concepts relate.

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Interviews

Andersson, R. Head of Sales at Wideco Sweden AB (face-to-face interview on the 11th of March in 2019).

Anonymous CEO of Lum-n-lux (face-to-face interview on the 8th of March in 2019).

Blom, S. Sales Director at AB Regin (phone interview on the 28th of March in 2019).

Hendén, T. Export Sales Manager at Bevent Rasch AB (face-to-face interview on the 6th of March in 2019).

Hervéus, J. Export Sales Manager at AB Regin (face-to-face interview on the 15th of March in 2019).

Kling, E. Head of Business Development at ReVibe Energy AB (face-to-face interview on the 5th of March in 2019).

Lindgren, P. Head of Sales at Babcock & Wilcox Vølund AB (face-to-face interview on the 25th of March in 2019).

Magnusson, PM. CEO at Bevent Rasch AB (face-to-face interview on the 6th of March in 2019).

Strid, R. CEO at KTC AB (phone interview on the 25th of March in 2019).

Wikström, E. Sales and Marketing Director at Ecopilot AB (face-to-face interview on the 29th of March in 2019).

Åkerskog, M. Key Account Manager at KTC AB (face-to-face interview on the 25th of March in 2019).

Appendices

Appendix A – Interview guide

General Questions

1. Can you describe yourself shortly? (Name, Education, International Experience, Number of years of employment, Title and responsibilities)
2. Can you describe the company shortly? (Company history, Number of employees, Number of years with international experience)

Business model understanding

3. What does the business model concept mean to you and your firm?
4. Do you have one or more business models?
5. How would you describe the firm strategy?

(Present the participants with a business model figure to explain business model conceptualization used, e.g. appendix B)

Business model

Value creation

6. What is the firm's primary capabilities?
7. How innovative is the technology used in your products & services / production / payment in comparison to competitors?
8. What processes and activities do you perform to create value for customers?
 - a. What processes are most important for your firm to deliver its products and services?
9. Are there value creation processes where other companies are involved, i.e. partners?
 - a. In which case; what processes do they participate in?

Value proposition

10. How does the firm create value for its customers?
11. How do your products or services solve customer needs?
12. Who are your customers?
 - a. What customer segment does the firm deliver products or services to?
13. In which markets are you active?
14. How do you sell your offerings?
 - a. What channels are used for sales?

15. How do you communicate and interact with customers?
 - a. Do you work towards long-term relationship or is there more distance in the customer relationship?

Value capture

16. What revenue model does the firm employ? How do you get paid for your products or services? (One-time transaction / Recurring revenue / Subscription / Build-operate-transfer / leasing, etc.)
 - a. How flexible is your pricing & revenue model?
17. How is the cost structure of firm?
 - a. Do you have high fixed or variable costs?

Internationalization

18. What motivated your first international sale?
19. How many countries are you active in today?
 - a. Why these?
20. How are you active in these markets? (Exports / sales office / imports / production)
21. Have you experience any barriers or difficulties in your internationalization?
 - b. How did you overcome these issues?
22. Have you utilized your contacts and network for internationalization?

International business models

23. How has your business model affected your choice of international markets?
24. Have you had to adapt to local conditions?
 - a. How?
25. Has your business model changed during the years?
 - b. How and how often?
 - c. Reason for change?
26. What has been the primary gain from internationalizing?
 - d. What has the greatest learning been from internationalizing?
27. Has your international presence changed any aspect of how your firm operates?
28. How did you develop your current business model?

Finishing Question

29. Do you have anything else to add regarding business models or internationalization?

Appendix B – Business model figure

<u>Partners</u>	<u>Processes & Routines</u>	<u>Offerings</u>	<u>Customer relationships</u>	<u>Customers & markets</u>
			<u>Channels</u>	
<u>Technology/Equipment</u>	<u>Capabilities</u>			
<u>Cost structures</u>		<u>Revenue models</u>		