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# Family Firms and clean technologies

A qualitative study exploring how a firm's ownership status influences implementation of clean technologies

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# Bachelor Thesis in Business Administration

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## Abstract

**Background:** Sustainability practices have become a crucial factor for firms since there are external and internal pressures that expect firms to act environmentally friendly. Especially within organizations that are owned by family, being sustainable enables them to pass their firm in a good condition to the next generation. One way firms can be sustainable is through adopting clean technology strategy as it can provide both environmental and economic benefits to firms. Being sustainable and having the ability to implement clean technology requires a long-term vision or long-term orientation (LTO); a characteristic often associated with family-controlled businesses (FCBs).

**Purpose:** The purpose is to examine the adoption of clean technology within family-controlled firms (FCBs) and non-family-controlled firms (Non-FCBs). The aim is to explore if there are certain characteristics of FCBs that facilitate implementation of clean technologies.

**Method:** This research is based on qualitative research method with an abductive approach and interpretivism philosophy. The primary data is collected through semi-structured interviews with four companies of which three are family-controlled businesses and one is a non-family-controlled business.

**Conclusion:** FCBs are more inclined to invest in clean technologies. The extent to which a company does or does not implement clean technologies depends not only on the institutional values of an organization but also how deeply one or more of the three LTO dimensions are implanted in those values.

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# 1. Introduction

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*Background of thesis paper is presented in this section. In addition, the readers will also be introduced to problem discussion and the purpose of this study.*

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## 1.1. Background

Saving the planet from ecological disaster is a \$12 trillion opportunity (Elkington, 2017). This figure validates the proposition made by Hart (1995), some 25 years ago: “it is likely that strategy and competitive advantage in the coming years will be rooted in capabilities that facilitate environmentally sustainable economic activity” (p.991). In the recent years, sustainability has become a major challenge for companies to ease the conflicts among environmental deterioration, high-energy consumption and economic growth (Zhang, 2011). Supported by Confente & Russo (2009), “balancing economic and environmental performance has become increasingly important for organizations facing competitive, regulatory, and community pressures” (p.2). Moreover, Business and societal stakeholders (e.g. governments, consumers, activists, environmentalists, employees, etc.) are demanding that businesses uphold a higher standard. These demands create pressures on companies to provide not only economic benefits but to also address environmental and social concerns (Meixell & Luoma, (2015). With increased pressures for environmental sustainability, it is expected that enterprises will need to implement strategies to reduce the environmental impacts of their products and services (Lewis and Gretsakis, 2001; Sarkis, 1995, 2001).

One way companies can be environmentally sustainable is through developing strategic capabilities for clean technology (Brown, 2009; Cristina De Stefano, Montes-Sancho, & Busch, 2016; Hart & Dowell, 2011). Clean technology strategies deal with the way firms build new competences and gain a competitive advantage in dynamic environments by addressing human needs without straining the planet’s natural environment and resources (Hart & Dowell, 2011). Clean technologies significantly reduce or eliminate emissions during production and throughout the product life cycle (Cristina De Stefano et al., 2016), and are therefore superior to other forms of strategies that merely seek to do less environmental damage (Hart, 1995; Hart & Dowell, 2011). Research shows that, while investing in technology that improves the environmental performance may require financial sacrifice in the short-term, they can be offset by the long-term benefits such as lower production cost, greater resource efficiency, increased

productivity and improved reputation (Bansal, 2005; Chavalparit & Ongwandee, 2009; Cristina De Stefano et al., 2016; Lee & Min, 2015). Therefore, building competences for clean technology require “accumulating resources and manage capabilities with a longer-term focus rather than a short-term focus on profits”, in order to achieve long-term profitability by addressing environmental concerns. (Lee & Min, 2015, p. 535).

Sustainability leadership requires long-term orientation (LTO) and obsession with short-term profits is contrary to the spirit of sustainability (Dyllick & Hockerts, 2002). In contrast, thinking of the firm as a social institution generates a long-term perspective that can justify any short-term financial sacrifices required to achieve the corporate purpose and to endure over time (Kanter, 2011). Hence, a shared long-term vision among all relevant stakeholders and lasting partnerships within the industry and between institutions are required for the innovation, development, and implementation of clean technologies (Cristina De Stefano et al., 2016; Hart, 1995; Lee, 2011; Lee & Min, 2015).

Sustainability performance is varied among companies. Some companies consider it to be of utmost importance, while for some sustainability means compliance with regulations (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010). Zellweger (2007) states that family-controlled business (FCB) is considered to have a high level of long-term orientation. Also, being sustainable becomes a crucial factor for family-controlled business (FCB) as it enables FCBs to survive in a long run and maintain their company profile for the future generations (Miller & Breton-miller, 2005), and that being sustainable will increase their socioemotional wealth, and family firms will have a positive image (Berrone et al., 2010). Therefore, since being sustainable requires a long-term vision (Hart, 1995; Aragon-Correa and Sharma, 2003) and that long-term vision can be generally found among FCBs, then one can assume that family firms are likely to be more sustainable than their competitors as long-term visions are likely to be found within family firms (Berrone et al., 2010).

## **1.2. Problem formulation**

According to Poza (2007), one of the characteristics that can distinguish family firms from non-family firms is the desire by family firms to maintain the continuity of the business across generations. Hence, a long-term perspective is frequently introduced as a key source of uniqueness and competitive advantages for family firms (Lumpkin, Brigham, Moss 2010) and

family firms have often been associated with a higher degree of long-term orientation (LTO) than non-family-controlled counterparts (Zellweger 2007).

LTO helps Family Controlled Businesses (FCB) in decision making to choose among several strategies when facing complex situations and when family shareholders and stakeholders have conflicting interests (Meyer & Heppard, 2000; Gino, Moore & Bazerman, 2009; Shepherd & Haynie, 2009). However, not all family firms exhibit LTO (Lumpkin, Brigham, Moss 2010). FCBs with LTO tend to be financially stronger and more effective (Le Breton-Miller and Miller, 2006) Also, LTO can contribute to a distinct advantage in family firms and the senior manager of a family business, where it has LTO, tend to have longer tenures and greater interest in their firm's long-run performance compared to non-family firm (Zahra, Hayton, and Salvato, 2004).

As a consequence, family-owned businesses that have high LTO are more likely to adopt sustainability practices as it benefits the business in the long run, through strengthening a relationship with non-family employees, enhancing stakeholder relationship, building customer loyalty and that they want to leave the business in good condition for their heirs.” (Miller & Le Breton-Miller, 2005). Also, FCB's engage in sustainability practices because they are embedded with locals. Since in small communities, everyone knows each other and there is more closeness among the residents, so they tend to have more encouragement in social cohesion and responsible behavior (Niehm, Swinney, & Miller, 2008). Furthermore, in financial terms due to their LTO, FCBs are more likely to “make investments other companies will avoid because of longer investment horizons” (Lumpkin & Brigham, 2011, p. 1154).

Keeping in line with the arguments presented above, it would be reasonable to assume that since FCBs with LTO, have motivations – for e.g. succession – that go beyond the conventional economic incentives, they are more likely to adopt clean technologies in order to be more environmentally sustainable. In contrast, non-FCBs, face certain conditions – for example, shorter CEO tenures – that incentivizes short-term profit maximization that may put the social and ecological incentives at the periphery while defining organizational strategy (Miller & Bretton-Miller, 2006). Therefore, non-FCBs would be less likely to be proactive in practices for sustainability and as a consequence, less likely to adopt clean technologies.

## **1.2. Research purpose**

The purpose is to examine the adoption and implementation of clean technology within family-controlled firms (FCBs) and non-family-controlled firms (Non-FCBs). Whether or not family firms are more likely to adopt clean technology compared to non-family firms. To achieve this purpose, we examine the drivers behind the adoption of clean technology and to explore the individual characteristics of companies to highlight factors that can accelerate implementation of clean technologies.

## **1.3. Research question**

During our literature review, it became clear that while there is some research between FCB' LTO and sustainability, there exists gaps in the current literature explaining the characteristics of the individual firm that enables clean technology implementation. Therefore, our proposed research question is:

*“How does the ownership status (FCB versus non-FCB) influence adaptation of clean technology?”*

## **1.4. Delimitations**

Since there are several environmental approaches, then to limit the concept, the researchers have decided to focus on clean technology as an environmental approach for organisations. This means that other environmental approaches are not a part of our research. Moreover, this study will only emphasize on family firms and non-family firms that are in Gnosjö region. Therefore, this study does not represent the overall view of family firms and non-family firms.

## 2. Literature Review

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*The purpose of this chapter is to provide a clear understanding of clean technology, sustainability and the differences between family-controlled business and non-family-controlled business.*

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### 2.1. Sustainable Development

The literature on why organizations incorporate consideration for sustainability within organizational strategy is organized by two broad sets of factors (Bansal, 2005). The first set provides considerations for external factors and includes theories like Stakeholder Theory and Institutional theory. According to the stakeholder theory, a firm's profitability is linked to the satisfaction and acceptance of persons that are affected by, or have an interest in, an organizations' activities (Clement, 2005; Donaldson & Preston, 1995; Zink, 2007). The other most prominent theory is Institutional theory according to which a firm's consideration for factors like fines and penalties, risk avoidance through mimicking industry practices as well as negative publicity can be the motivating forces behind adopting sustainable development strategies (Bansal, 2005). The second set provides factors that are firm-specific, internal factors that link firms existing resources and capabilities as drivers for sustainability (Bansal, 2005) and includes theories like Resource based Theory and Natural Resource Based View. Natural Resource Based View (NRBV), builds upon the Resource Based Theory (RBT) – which links a firm's internal capabilities, and its rare, valuable and inimitable resources to competitive advantage (Barney, 1991; Hart, 1995) – through developing three key strategic capabilities: pollution prevention, product stewardship, and sustainable development; and incorporating these capabilities into firms' environmental strategy to gain competitive advantage by addressing the environmental impacts of economic activity (Hart, 1995; Hart & Dowell, 2011; Lee & Min, 2015).

Since we are interested in understanding the relationship between firm ownership and clean technologies, we will use NRBV as the contextual background for sustainability because of the following reasons. Firstly, it separates sustainable development into two broad categories where Base of the Pyramid which is concerned with strategies for poverty alleviation, while clean technologies deal with the way firms build new competences and gain a competitive advantage

in dynamic environments by addressing human needs without straining the planet's resources (Hart & Dowell, 2011).

Secondly, according to NRBV, sustainable development does not merely seek to do a little less environmental damage but rather to produce in a way that can be maintained into the future (Hart, 1995; Hart & Dowell, 2011). Hence making a clear distinction between green strategies such as product stewardship and sustainable development strategies such as clean technologies (see for example: Cristina De Stefano et al., 2016).

Thirdly, the theory argues that two firms that are faced with similar external environments can develop similar, but not identical, capabilities as the capabilities themselves are dependent upon the firms' existing structures, strategies, and resources (Hart & Dowell, 2011). This allows us to define the boundaries to analyse the relationship between firm ownership and implementation of clean technology. For example, through sampling firms in a specific industry and location, i.e. facing similar external pressures, and comparing how ownership status influences sustainability choices. Moreover, According to Hart (1995), sustainable development requires a shared, long-term vision of a future, that proliferates not only all organizational functions but transcends organisational boundaries to includes partnerships between public and private institutions. Hence, representing a strong social-environmental purpose to corporate and competitive strategies (Hart, 1995; Hart & Dowell, 2011).

Finally, NRBV entails "accumulating resources and manage capabilities with a longer-term focus rather than a short-term focus on profits", in order to achieve long-term profitability by addressing environmental concerns (Lee & Min, 2015, p. 535). Which supports our initial assumption that family firms with long-term orientation should be more sustainability conscious as opposed to non-FCBs.

## **2.2. Clean technology**

### **2.2.1. What is clean technology?**

Several authors have defined the meaning of clean technology. Rennings, Ziegler, Ankele, & Hoffmann (2006) have defined clean technology as clean technology that helps in eliminating all environmental impacts throughout the manufacturing process while Frondel, Horbach, &

Rennings (2007) stated that “in contrast, cleaner production technologies reduce environmentally harmful impacts at the source by substituting or modifying less clean technologies” (p.573). Also, González (2005) stated that “clean technologies are changes in production processes that reduce the quantity of wastes and pollutants generated in the production process or during the whole life cycle of the product (clean products)” (p.52)”. Examples of clean technology activities are pollution controls, cleaner in manufacturing process, and waste management (Kemp & Volpi, 2008). Hence, we can conclude that clean technology is an environmental strategy that helps in reducing emissions, pollutants, and wastes at the beginning of the production process or during the entire product life cycle.

### 2.2.2. Benefits

Moreover, one can expect that clean technology will provide benefit to adopting firm (Montalvo, 2008) and that clean technologies provide more benefits to firms compared to other environmental strategies. As Frondel et al. (2007) stated that clean technology can provide more economical and environmental benefits than other strategies such as end-of-pipe. Also, Hammar & Löfgren, (2010) suggested that the advantages of clean technologies are “(1) They reduce emissions and discharges generated by the production process itself. (2) They make it possible to use production inputs that have less of an impact on the environment. (3) They involve completely new equipment and processes that have less environmental impact” (p.3645). Thus, the adoption of clean technology will lead to increases in production but without a rise in emissions and increase the effectiveness of input use, while adopting other strategies, such as end of pipe solution, will only reduce emissions but does not have any positive effect on production process or efficiency in input use.

As supported by researchers that implementing new and cleaner technologies will lead to productivity improvement (Radonjič & Tominc, 2007). Apart from helping firms to be sustainable, there are more benefits from adopting this strategy. For example, clean technology strategy aids firms to face the challenges and constraints resulting from the future scarcity of natural resources (Salvadó, de Castro, López, & Verde, 2013). Also, clean technology has the potential to boost productivity and reduce the production cost (Salvadó et al., 2013). Furthermore, clean technology is one of the most preferable methods from sustainability viewpoints since it eliminates the potential environmental problem from the beginning of the process (Coenen and Klein vielhauer, 1996). Apart from that, clean technology becomes more attractive for some firms since it helps in increasing firm’s productivity and competitiveness,

whilst other strategies, like end-of-pipe technology, cannot provide (González, 2005). Chavalparit & Ongwandee, (2009) while examining the application of clean technology in the tapioca starch industry in Thailand, reported that the companies that adopted clean technology options “showed success in improvements of consumption efficiency of raw materials and energy resources, and reduction in production cost” (Chavalparit & Ongwandee, 2009, p. 110). Hence, firms that implement clean technologies can perceive a wide range advantage.

### 2.2.3. Drivers

Some researchers suggest that internal (organization, firm’s competency) and external sources (competitors, institution, customers) are factors that influence the adoption of clean technology (González, 2005). For example, customers that value the environmental performance of firms or the life cycle impacts of its products. For instance, for internal sources, firms that have knowledge of environmental dimensions embodied in the organization are more likely to adopt clean technology while companies with imperfect information on sustainability or environment, are likely to adopt familiar routine. Also, firms can be pushed to adopt such a sustainability project due to the awareness of stakeholders that are highly concern about environmental and sustainability issues (Montalvo, 2008). However, external sources of pressure for clean technology adoption differ across sectors and firms (González, 2005).

### 2.2.4. Barriers

However, González (2005) suggests that there are some barriers for implementing clean technology. For example, in order to adopt clean technology, firms are required a high initial investment which is more costly than other environmental strategies, then it takes long payback periods on investments since the profitability of clean technology mostly happen in medium to long run while costs are acquired in a very short term (González, 2005). As supported by Hrovatin, Dolšak, & Zorić, (2016), that a market driven factor, i.e. the availability of financial resources, is a key driver to invest in clean technology. Hence, some firms rather invest in low cost investment strategies or prefer to use their existing environmental activity since it will be difficult to recover such a high investment and they maybe lack of financial resources to support in adopting new technology. Also, existing strategy and switching cost are considered as another barrier in adopting clean technology (González, 2005). Since firm may think that their current strategy is carried out well enough to meet regulations, so there is no motivation for firms to invest, in such a large amount of money, on a new strategy. Also, since implementing

a new strategy requires a replacement in equipment and training employees, then the switching costs to new strategy will be significant (González, 2005).

Clean technology innovation requires radical innovation as opposed to incremental innovation (Cristina De Stefano et al., 2016). Here, incremental innovation is denoted by small adjustments to the existing technology, while radical transformation involves fundamental changes in the technology (Dewar & Dutton, 1986). Since these radical technologies are new for the firm and the market, it not only requires the creation of new infrastructure but also requires changes in consumer behaviour (Cristina De Stefano et al., 2016). Similarly, since clean technologies are complex, it requires cooperation among stakeholders such as institutions that provide assistance in terms of providing critical components or knowledge for the development of a clean technology (Cristina De Stefano et al., 2016) As a consequence introduction of clean technological innovations could be impeded by the negative market response to green products, or by higher investments compared to incremental innovations. Hence reducing the short-term incentives for investments and requiring the organizations to take a long-term approach in the development of clean technologies (Cristina De Stefano et al., 2016; Lee & Min, 2015)

### **2.3. Sustainability and Family-controlled business**

Sustainability performance is varied among companies. Some companies consider it very important while some are sustainable just to comply with regulations (Berrone, Cruz, Gomez-Mejia, & Larrazza-Kintana, 2010). As argued by Dimaggio (1988), that organization adopt a particular environmental strategy can be driven “not by processes of interest mobilization but by preconscious acceptance of institutionalized values or practices” (p.17). In addition, Berrone et al. (2010) suggests that family firms are more likely to be more sustainable than non-family business, since family firm wants to protect their socioemotional wealth, then one way to do is to be sustainable by having more excellent environmental performance than non-family business (Berrone et al., 2010). Socioemotional wealth is “the stock of affect-related value that a family derives from its controlling position in a particular firm” (Berrone et al., 2012 p.259). For example, “succession, family harmony, and maintaining goodwill in the community” (Lumpkin & Brigham, 2011, p.1150)

There are several reasons why family firms engage in sustainability practices and one of the reasons is local embeddedness. For instance, Berrone et al. (2010) also states that “when a firm

is under the control of a family, it is more likely to respond to institutional pressures in a more substantive manner than is its nonfamily counterpart, particularly when the firm concentrates its operations in a local area and the institutional pressures involve environmental actions, which have great impact on the local area” (p.82). Also, it is stated by Henriques and Sadorsky (1996, 1999) that environmental practices within family firms are positively influenced by locals. Hence, if there is a strong tie between family firms and locals, then family firms will want to act as a good citizen by being sustainable or being a part of a social network, or even being a sponsor for events that have values to locals. So that it helps to increase firms’ image and socioemotional wealth (Berrone et al., 2010)

Also, one study suggests that family firm should have a better performance in sustainability as family firm tend to care about their social legitimacy, hence they are likely to influence their firm into unilateral compliance to environmental demands (Oliver, 1991). For family firm, apart from achieving a financial goal, but the top priority goal is to “preserve the family’s good name for future generation” (Berrone et al., 2010, p.87). Thus, if family firms have poor environmental performance, then it will lead to a negative image of firms which will later lead to a decrease in family’s socioemotional wealth (Berrone et al., 2010).

Moreover, “family owners are more likely to value the legitimacy associated with environmental initiatives, even if “social worthiness” is economically risky” and that family firms tend to “bow to these environmental pressures because there is socioemotional reward for family firm, even if there is no evidence that substantive compliance serves its economic interest” said by Berrone et al., (2010, p.83, 84). Meaning that family firms will rather protect their socioemotional wealth than reduce their financial risk as adopting environmental strategies can be economically risky for firms (Berrone et al., 2010). Hence, in the research of Berrone et al. (2010), it can be concluded that family firms are more environmentally friendly and have a better environmental performance than its competitors. Especially if family firms operate in the local area, they will strongly emphasize on environmental practices. (Berrone et al., 2010).

#### **2.4. Distinguishing characteristics of Family Controlled Businesses**

Family firm research has gained increasing amount of attention in recent years, largely due to the economic importance of this sector of firms (Dyer 1986, Handler 1989, Ward 1987). Olson

et. al. (2003), defined family business as a business that is owned and managed by one or more members of a household of two or more people related by blood, marriage or adoption.

When distinguishing between family and non-family-controlled business, a family business is often assumed that it is a small size of business since Daily and Dollinger (1993), attempted to offer a defining logic built on the assumption of family businesses being a smaller enterprise. However, researchers have found that some of the largest companies are family-controlled such as M&M Mars, Carlson companies, Continental Grain, Cargill, Bechtel group (Henkoff, 1992). Hence, family firms should not automatically be thought of as an inherently smaller enterprise.

However, there are many factors that can distinguish family firm and non-family firms. For instance, one study has found that vision, intentions, and behaviour are what should be used to distinguish family business from all others (Chua, Chrisman, & Sharma, 1999). Also, Dyer (1986) and Schein (1986) suggested that the distinction between family and non-family businesses may be attributable to the different management styles and motivations of founders versus professional managers. Also, Handler (1994) suggests a vast majority of family-controlled business fail to survive the first generation and are unable to pass firms to the next generation due to lack of successful planning and that successful planning can mostly be found within non-family-controlled businesses. However, senior managers of FCBs tend to have longer tenures and greater interest in their firm's long-run performance than non-FCBs (Walsh and Seward 1990; Zellweger 2007). The tenures in family-controlled firms typically exceed 15 years (Le Breton-Miller & Miller, 2006)

Moreover, when it comes to customer service, several researchers argue that family businesses, compared to non-family firms, better understand the importance of customer service and perceive it as critical to their future success. For example, Tagiuri and Davis (1992) find that providing good service is one of the top goals of family business chief executives. Similarly, De Wulf, Odekerken-Schröder, & Iacobucci (2001) reports two-thirds of family businesses maintain that serving their customers well is fundamental to survival and profitability.

#### 2.4.1. Long-term orientation as a distinguishing factor

Another factor that can differentiate a family-controlled business from non-family-controlled business is long-term orientation (LTO). Hence, in this section, we will use long-term orientation as a distinguishing dimension of family-controlled business. Long-term orientation

(LTO) can be defined as “priorities, goals, and most of all, concrete investments that come to fruition over an extended time period, typically, 5 years or more, and after some appreciable delay” (Le Breton-Miller and Miller 2006, p.732). Also, Lumpkin and Brigham (2011) defined long-term orientation as “a higher order heuristic that the dominant coalition employs to realize its long-term aspirations and priorities” (p.1151).

According to Poza (2007), one of the characteristics that can distinguish family from non-family firms is the desire by family firms to maintain the continuity of the business across generations. Also, a long-term perspective is frequently introduced as a key source of uniqueness and competitive advantages for family firms (Lumpkin, et al., 2010) and family firms have often been associated with a higher degree of long-term orientation (LTO) than non-family-controlled counterparts (Zellweger 2007).

Researchers suggest that family firms will be more long-term oriented than non-family firms (Lumpkin, et al., 2010). The biggest objective of a family firm is to pass the business on to the next generations of family and build a lasting family legacy (Ward 1987, 2004). This objective gives many family businesses a long-term orientation (LTO). Also, researchers suggest that family-controlled business outperform non-family-controlled business within the financial and performance outcomes and the reason being that “the LTO of high-performing FCBs is thought to be a major reason why they outperform non-family businesses” and that key characteristic of successful family firms is an LTO (Miller and Le Breton-Miller 2005). Within a long-term perspective of family firms may promote strong performance rather than impede it (Lumpkin et al., 2010). Moreover, Lumpkin et al. (2011), argues that there are three dimensions of LTO, futurity, continuity, and perseverance. What follows is a brief summary of each dimension.

#### 2.4.1.1. Futurity

Futurity refers to being mindful of the considerations for desired future while “forecasting, planning, and evaluating the long-range consequences of the current actions” (Lumpkin & Brigham, 2011, p. 1153). Succession planning is a defining feature of the family business (Lumpkin & Brigham, 2011). “Succession planning means making the preparations necessary to ensure harmony of the family and the continuity of the enterprise through the next generation” (Lansberg, 1988, p. 120). Considerations for futurity manifest itself in the succession planning in two distinct ways. Firstly, by ensuring that the business survives in the long run and secondly, the policies and goals adapted for this purpose are desirable to not only

the family members currently in control but also to the future generations that will inherit the business (Lumpkin & Brigham, 2011).

#### 2.4.1.2. Continuity

Continuity refers to not only the value the dominant coalition associates with continued ownership and control of the business by future generation but also the value it associates to the legacy, or the influence of founders on the future generations' decision making and LTO (Lumpkin & Brigham, 2011). Since past investments, policies, and institutionalized wisdom are responsible for the current success they should be leveraged to ensure success in the future (Le Breton-Miller & Miller, 2011). Hence, "the preservation of past assets sustains the present and thus becomes a vehicle to a robust future" (Le Breton-Miller & Miller, 2011, p. 1172).

#### 2.4.1.3. Perseverance

Perseverance means being steadfast in the will to "persist over time" and is reflective of the belief that "efforts made today will pay off in the future" (Lumpkin & Brigham, 2011, p. 1154). Miller and Le Breton-Miller (2011) define perseverance as the culmination of discipline, patience and hard work required to make short-term sacrifices by the firm in order to be able to "afford" an LTO. This is especially true when considering long-term investments, as "perseverance enables FCBs to make investments other companies will avoid because of longer investment horizons" (Lumpkin & Brigham, 2011, p. 1154). Since, as compared to non-FCB that face external pressures from shareholders, FCBs tend to exhibit greater persistence and discipline over time with their financial investment due to their willing to use patient capital (Lumpkin & Brigham, 2011). Hence perseverance is an important dimension of LTO

After reviewing the existing literature, it becomes clear that family-controlled businesses are more likely to be more sustainable due to the fact that first, they have long-term orientation which this is a crucial element to become sustainable. Secondly, being sustainable enable them to preserve their firm image and keep firm in a good condition for future generation. Also, they maybe have a close-knit relationship within locals which can be another factor that influences FCBs to become more environmentally friendly. Moreover, it can also be assumed that family firms are more likely to adopt clean technology as clean technology requires long-term vision and this factor can be easily found in family firms rather than non-family firms. Clean technology requires a high investment, which again leads to the assumption that FCBs are more

likely to invest in this strategy that other companies will avoid due to its longer investment horizons.

### **3. Methodology**

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*Overall methodology of the thesis and motivation for chosen research choices are outlined in this section. In addition, the method of analysis, data collection along with why this particular region (Gnosjö) are also presented here.*

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#### **3.1. Research Method**

There are two research methods which are quantitative and qualitative approach. In this paper, we choose qualitative research as our method. Several authors have suggested that qualitative method is suitable for a research that seeks to understand underlying perceptions and behaviour of people, while a quantitative research examines the relationship among variables which are quantifiable and mostly used within descriptive research (Creswell, 2013, Bryman & Bell, 2011). Hoepfl (1997) mentioned that “qualitative research can also be used to gain new perspectives on things about which much is already known, or to gain more in-depth information that may be difficult to convey quantitatively”. Supported by Malhotra (1996), it stated that the main purpose of conducting qualitative research is that research can get an in depth understanding of people’s preferences, their behaviour, and reason and motivation of attitudes. Since it focuses on understanding complex phenomenon and people’s attitudes, therefore, the data mostly consists of non-numeric data (Creswell, 2013). According to Saunders, Lewis & Thornhill (2009), quantitative research focuses on numerical data while qualitative research focuses on non-numerical data or data which has not been quantified.

Since our research needs to investigate how the ownership status relates to implementing clean technology, then choosing quantitative approach will not give the right answer since statistical data would not explain firms’ perception perfectly. Hence, qualitative approach is the most appropriate in term of analysing human behaviours and views.

#### **3.2. Research Philosophy**

Research philosophy is the “overarching term relating to the development of knowledge and the nature of that knowledge in relation to research” (Saunders et al., 2007, p.107). There are two major ways of thinking of the research philosophy namely ontology and epistemology. According to Saunders et al. (2007), “ontology is concerned with nature and reality” whereas “epistemology concerns what constitutes acceptable knowledge in field of study” (p.110,112).

There are two main aspects of ontology which are objectivism and subjectivism while epistemology consists of two approaches namely positivism and interpretivism (Bryman & Bell, 2011).

The objectivism, it “portrays the position that social entities exist in reality external to social actors concerned with their existence”, in contrast, subjectivism “holds that social phenomena are created from the perceptions and consequent actions of those social actors concerned with their existence” (Saunders et al., 2007, p.110).

Moreover, “interpretivism advocates that it is necessary for the researcher to understand differences between humans in our role as social actors. This emphasises the difference between conducting research among people rather than objects such as trucks and computers” (Saunders et al., 2007, p.116). In other words, it aims to interpret and understand the complexity of social phenomenon and the perception of individuals in a social setting (Collis & Hussey, 2014, Remenyi et al., 1998). In Addition, in order to understand the habits of others, feelings and emotions are required to involve in interpretivism (Saunders et al., 2012).

However, positivism emphasizes on “highly structured methodology to facilitate replication, and the end product can be law-like generalizations similar to those produced by the physical and natural scientists and that it advocates working with an observable social” (Saunders et al., 2007, p.598, Remenyi et al., 1998, p.32) and that it is often associated with quantitative research (Collis & Hussey, 2014). Since the aim of our research is to understand the perception of firms regarding their adoption towards certain sustainability strategy (Clean technology). Hence, interpretivism is appropriate to use in our research as it helps us to understand companies’ perception and get more in-depth knowledge about ‘why or why not companies decide to adopt clean technology’.

### **3.3. Research Approach**

There are different methods that can be used in research approach which are deductive, inductive and abductive research approach. Deductive approach is about conducting research based on existing theory and it presents the view of the relationship among theory and social research (Bryman & Bell, 2011; Bryman, 2012). In addition, Bryman (2012), states that deductive approach is “an approach to the relationship between theory and research in which the latter is conducted with reference to hypotheses and ideas inferred from the former” (p.754).

Hence, the deductive approach starts when, in the beginning, researchers develop theory, which leads to a hypothesis that is later rejected or affirmed. Moreover, deductive approach is often associated with quantitative research (Bryman, 2012)

In contrast, Dubois & Gadde (2002), states that the inductive approach starts when the researcher first gathering specific evidence and then collect the data and ends up with creating the theory based on the collected evidence. Also, Saunders et al., (2016) states that induction will be an appropriate tool when the research is new or insignificantly developed and when researchers intend to use qualitative method. Also, it will be accessible to generate new data and knowledge through small samples which are underlined by the inductive research (Collis & Hussey, 2014). So, the significant difference between inductive and deductive approach is that the inductive approach starts by findings/observations which later leads to theory while deductive approach is the other way around (Bryman, 2012). Hence, inductive approach does not require any existing theory to do research since the theory will appear once the data is gathered.

However, there might be sometimes when researchers aim at using both deductive and inductive approach, then the researchers will consider using abductive approach as it resembles the concept of inductive and deductive approach which mean that it combines the findings with developed theories. Additionally, abductive approach aids researchers to understand and clarify observation together with existing theories. This approach is suitable for researchers who want to create new conceptions, explore new ideas or develop theories rather than ratifying the existing theories (Dubois & Gadde, 2002). Thus, this approach aids the researchers to understand the collected data and the chosen literature/theories, then the researchers will be able to identify the gap between data and theories.

Since the relationship between long-term orientation and clean technology is somewhat developed, we will take an abductive approach to validate questions and extend theory with regards to how long-term orientation facilitates clean technology development. However, since the purpose of this thesis is to identify if there exists a relationship between ownership status and implementation or adaptation of clean technologies as part of an organization's sustainability agenda, we think that an inductive approach would be suitable. Since there exists no research to the best of our knowledge, and we hope our research would be a starting point towards further theoretical development of the topic.

### **3.4. Data collection**

For our data collection, we choose interviews as our primary data. Interview is one method that provides an opportunity for researchers to understand the feeling of interviewees towards the interview topic (Malhotra, 1996). There is a different type of interview but semi-structured interview with opened ended question will only be focused in this research.

Semi-structured interview with open-ended questions was found to be the most appropriate method since we are interested in understanding companies' ideas and attitude. Within the semi-structured interview, questions can be prepared ahead of time to ensure the discussion of main topics of interest, other questions are developed during the course of the interview (Collis & Hussey, 2014; Wengraf, 2001). In addition, open questions are used to obtain opinions or information about experiences and feelings (Collis & Hussey, 2014). Open-ended questions benefit the researchers since using open-ended questions enable the interviewee to give longer answers, which afterward allow the researchers to gain a deeper understanding. In order to understand the reasons behind the adoption of clean technology between FCBs and non-FCBs, we must understand firms' perspectives. We, therefore, choose semi-structured interview with open-ended questions as it will help us to gain an in-depth understanding of companies' viewpoints.

There are two ways to collect data which are primary data and secondary data. According to Collis & Hussey (2014). "primary data are research data generated from an original source such as your own experiments, questionnaire survey, interviews or focus group while secondary data are research data collected from an existing source, such as publications, databases or internet records and may be available in hard copy form or on the internet" (p. 59). Also, several authors stated that a combination of both primary and secondary data often provide benefit to researchers (Bryman, 2012; Saunders et al., 2009). Hence, in this research, data will be collected through both primary data and secondary data since we use companies' website to gain an insight knowledge about companies' history and information.

#### **3.4.1. Sampling**

Our sampling is influenced by the proposition made by Hart & Dowell (2011), they argue that two firms that are faced with similar external environments can develop similar, but not identical, capabilities as the capabilities themselves are dependent upon the companies' existing structures, strategies, and resources (Hart & Dowell, 2011). This allows for us to define the

boundaries to test the relationship between firm ownership and implementation of clean technology. For example, through sampling firms in a specific industry and location, i.e. facing similar external pressures, and comparing how ownership status influences sustainability choices.

Originally, we had chosen to interview companies located in Gnosjö region exclusively, the reasons for which are detailed in a later section. However, due to lack of response or unavailability of certain managers from the companies approached for an interview within the region, and because of time considerations, we decided to include companies in close proximity to the Gnosjö region. Similarly, while choosing the industry, it became apparent while finding companies to approach in the region that a lot of these companies were manufacturers supplying to various industries. Initially we had decided to choose the companies operating in the automotive industry. However, due to some unforeseen circumstances such as last minute cancellations or unavailability of certain officials, we had to include a glass manufacturer to our sample. All of this was done in order to create as much homogeneity and consistency as possible in the external factors influencing firms' decision.

We have contacted twenty two companies in total and as result four companies agreed to interview which all located within a 61 km radius (Appendix 3: figure 1). Companies that we chose are Shiloh industries AB, Rudhäll Group AB, Gnosjö Automatsvarvning AB and Värnamo Sliperi & Glasmästeri AB. The first company is a non-family-controlled business and latter three companies are family-controlled businesses. Moreover, we wanted to gain insights on the phenomenon from the perspective of decision-makers, therefore the participants chosen are mostly upper management (Appendix 1: Table 1).

These companies were contacted primarily through utilizing personal connections with certain officials within these organizations, in some cases, the individual participants were approached through referrals because the original participants felt their colleagues were more suitable to our research. Moreover, interview questions were prepared ahead. Preparing questions layout is useful in order to not retrieve irrelevant information, which can happen when the respondent is allowed to speak freely. Furthermore, since our questions required some technical 'know-how', our participants wanted time to extract relevant information. Therefore, we provided a general outline of the main topics to our participants so that they could prepare ahead of the interview. As a result, same questions were provided to all four companies in two languages,

Swedish and English (Appendix 2: Questionnaire 1). The interview length is varied between firms. It took 35 minutes to interview Gnosjö Automatsvarvning, 55 minutes for Shiloh industries, 22 minutes with Rudhäll Group and 28 minutes with Värnamo Sliperi & Glasmästeri AB.

#### 3.4.2. Why Gnosjö region

Gnosjö region is located in southern of Sweden. Gnosjö region consists of four municipalities which are Gnosjö, Värnamö, Gislaved, and Vaggeryd (Wigren, 2003). It is known as a famous place for its enterprising and networking culture. Wigren (2003) stated that Gnosjö is known as an industrial district that had the highest economic growth in Sweden. There are approximately 350 manufacturing companies and the majority of firms are owned by family. Also, the characteristics of Gnosjö are that it has profitable firms, a low level of unemployment and high degree of cooperation between firms and networks (Wigren, 2003).

Owner-manager of companies that operate in Gnosjö takes strong responsibility of communities. According to Helling (1995) firms that operated in Gnosjö do not emphasize on financial profits as much and instead emphasize on social responsibility they bear towards the community and locals. Moreover, Gummesson (1997) said that it is not what companies produce that matter, what matter is how it is being produced, therefore it is important for firms to ensure that they produce their goods with the use of environmentally friendly process/equipment. Also, “the industriousness and imagination of the region were founded on the close-knit feeling between local people” (Wigren, 2003, p.17). Hence, due to a close-knit relationship among firms and locals, it leads to the assumption that firms take environmental issues seriously and that firms ‘must’ engage in sustainability activities in order to prevent any damages that could arise from their productions. Thus, it becomes very interesting to investigate “sustainability practices” in this particular area due to its local embeddedness which is one of the reasons why FCB, especially, engages in sustainability activity (Niehm, Swinney, & Miller, 2008).

#### 3.4.3. Research ethic

It is extremely important for researchers to make sure that the research is conducted in an ethical manner. Therefore, it is crucial to ask permission and inform participants about the purpose and scope of the research beforehand. The researchers approached potential participants through emails and phone calls. The researcher(s) introduced him/herself, the purpose of the study and

why their participation, as well as their opinions, would be important for this study. The participants were informed about the expected duration of an interview so that the interviewees can manage their schedule. The researchers sought participant's consent before recording the interview. In addition, the recordings were used only for this research, it was not used for other purposes or shared with other parties. Lastly, in order to be transparent, we have included a translated version of interview questions in the appendix 2: Questionnaires 1.

### **3.5. Method Analysis**

There are several methods to conduct data analysis such as thematic analysis, template analysis, grounded theory method, discourse analysis, content analysis and narrative analysis to (Saunders et al., 2016). There are slightly differences among these approaches which are the way how it is done and the way of coding and categorizing data. Moreover, Saunders et al. (2009) point out that semi-structured interview might be utilized to explore and clarifying themes from data collected in the research process. Since we used semi-structured interview to gather primary data, then thematic analysis seems to be a suitable approach for our research. Within the use of thematic analysis, we will be able to analyse the data collected from the semi-structured interviews and efficiently identify patterns (themes) in the interviewees' views and perspective.

Braun & Clarke (2006) defined thematic analysis as a method for identifying, analysing and reporting patterns (themes) within data (p.6). Moreover, Braun & Clarke (2016) defines a theme as "captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set" (p.10). Furthermore, the benefit to divide the data into themes is that it provides a possibility to define, clarify and examine the contrast (Ryan & Bernard, 2003). In addition, the purpose of thematic analysis is to seek for patterns and themes that occur during data set (interview) and this approach is an approachable and adaptable approach that also provides a systematic analysis of qualitative data (Saunders et al., 2016). There are six phases in thematic analysis namely familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report (Braun & Clarke, 2006). In addition, thematic analysis is a simple approach that is easy for generating themes from interview data and that it is often used by students and novices (Braun & Clarke, 2013).

After we collected data, we transcribed the interviews and read through several times to become familiar with all data and to be able to identify themes. Therefore, four themes were identified and it will be presented in empirical findings and analysis.

### **3.6. Trustworthiness**

It is of the utmost importance to ensure that this research has quality and is considered to be trustworthy. In order to do that, we applied the four criteria that were introduced by Guba (1981) which are credibility, transferability, dependability, and confirmability. We choose these four criteria due to the fact that these are the most appropriate tool when analysing the trustworthiness of qualitative research (Bryman & Bell, 2011).

Credibility refers to the accuracy of the research (Collis & Hussey, 2014). This means that the researchers should ensure that all conducted data is described and explained accurately. In order to provide accurate findings, we recorded the conversation during the interview in order to avoid missing details. Also, respondents were asked supplement questions as our intention was to make respondents explain more about a certain topic so that we can get a clear understanding. Transferability refers to whether findings of the research can be applied in another situation or not (Collis & Hussey, 2014). However, our research is based on organizations in Gnosjö region, Sweden and that our samples are quite small. Therefore, our findings cannot be considered as the overall picture of family-controlled firms and non-family-controlled firms in Sweden. Dependability is concerned about the stability of data (Guba, 1981). The research should be consistent and can be repeated. If other researchers use similar method and sampling, then the result should be similar. To ensure that this research is dependable, the researchers provide a clear step of research method, so that future researchers can use this as a guide on how research should be conducted. Confirmability is concerned about the findings, which it should be based on interviewees' perspective, not the researchers' perspective and that there should be no bias (Lincoln and Guba 1985). In other words, it is important for researchers to ensure that their findings are based on the perception of respondents, not the researchers as this will help later to eliminate bias. However, bias is already minimized since this research is conducted by two individuals. Other than that, this research has been proofread by fellows which include the opposition during the thesis seminar and our tutor which ensures that this research has no bias.

## 4. Empirical Findings

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*This section serves to present participants' background and empirical findings from the interviews. It will start with introductions of companies' background followed by interview results. The empirical findings are presented according to common themes that emerged after transcribed interviews.*

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### 4.1. Companies' Background

#### 4.1.1. Gnosjö Automatsvarvning AB

This is a family-controlled business which was founded in 1974 by Olle and Solweig Fransson. The company is specialized in producing high-precision complex parts to the Swedish engineering companies which mostly are connected to automotive industry. The generation changed during 1988 as, their daughters, Anna Sandberg and Linda Fransson, holds a majority shareholder and Linda Fransson is the company's managing director. However, Olle Fransson still holds the A shares and still has the right to vote. The company is currently employing 53 people. The company is currently certified with ISO 9001, ISO/TS 16949 and ISO 14001 ("Gnosjö Automatsvarvning AB," n.d.).

#### 4.1.2. Shiloh Industries AB

The company is a non-family-controlled business which was established in 1950. It was first operated blanking facility in Mansfield, OH. The current president/CEO is Ramzi Y. Hermiz which joined the company in 2012. Shiloh Industries is a leading manufacturer of products within body structure, propulsion systems and chassis; operating on a global scale and one of the key partners to Volvo. Shiloh industries is currently have approximately 4,200 employees globally within 33 operations throughout Europe, Asia and North America. The company is currently certified with ISO/TS 16949 and ISO 14001 ("Shiloh Industries, Inc. – Lightweighting Without Compromise®," n.d.).

#### 4.1.3. Rudhäll Group AB

This company was previously a family-controlled business which was founded in 1952. The company was acquired by Bufab Group in 2018 and now operates as a subsidiary of a publicly listed corporation ("Press Release Bufab acquires Rudhäll Industri AB", n.d.). They are specialized in cutting processing and supplying customers with different kind of parts

depending upon customers' needs, as well as providing consultancy to the automotive industry in both Swedish and international market. Ruddhall Group has 90 employees and comprises of 4 production units in Gnosjö, Värnamo. Their partners are in both Asia and Europe which they supply parts in sheet metal and wire, cold cutting, plastic components, and castings. In their mind, quality and environment is a vital part of their long-term work. The company is currently certified with ISO 9001, ISO/TS 16949 and ISO 14001 ("Rudhäll Group," n.d.). However, for the purpose of this study, we will be considering Rudhäll a family-controlled firm as the recent sale of the company does not affect its past conduct.

#### 4.1.4. Värnamo Sliperi & Glasmästeri AB

The company is a family-controlled company. The company was established in 1933. The company has four different working department which are stone processing, car glass, glass process and glazery. The company provides a variety of products and services. For example, kitchen facilities, repair and replace vehicles' glass, repair and changing any kind of glasses, mirrors and windows. The current co-owner is Reine Johansson and the current CEO is Michael Johansson. Also, the company is currently having 30 employees ("Värnamo Sliperi & Glasmästeri," n.d.).

#### 4.1.5. ISO

ISO stands for International Organization for Standardization which creates documents with guidelines for firms to meet specific requirements in order to ensure that all products are fit their objective ("ISO" n.d.). Moreover, the certifications act as proof to confirm that companies meet the management standard ("ISO Certification," n.d.) ISO 14001 is a certificate for the environmental management system. It helps companies to be more concerned about their production activities, to act more environmentally friendly and control the factors that can contribute to environmental issues. ("ISO Certification," n.d.). Furthermore, ISO 9001 is a quality management, which ISO/TS 16949 is also a quality management but regarding designs, production and development ("ISO" n.d.). ISO 9001 is a certification that shows company's stakeholders and customers that you deliver what you promise. Also helps companies to make sure that they meet a specific requirement of their customer while delivering a high quality of goods and services ("ISO Certification," n.d.).

## 4.2. Empirical Findings

*The purpose of this research is to examine how ownership status (FCBs VS Non-FCBs) influence adaptation of clean technology. After the data was collected, we have identified the overarching themes which are lack of frameworks for clean technology, proactive compliance, values extend investment periods beyond the 'quarter economy', and the Gnosjö factor.*

### 4.2.1. Lack of frameworks for clean technology.

Through the course of the interviews with all four companies, it became clear that most companies did not have a clear strategy or framework that was utilized in making decisions for implementing clean technologies. Most companies took an intuitive approach while making those decisions. However certain similarities surfaced based on the ownership structure. Compared to the non-FCB and another FCB, the two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, struggled to provide definitions for sustainability. Moreover, these two FCBs did not implement rigorous systems for measuring environmental performance but had greater collaboration with partners to improve their environmental performance. In contrast, the non-FCB and the other FCB fared better at measuring their environmental performance. Furthermore, two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, in general made clear distinctions between clean technologies and pollution prevention strategies. Finally, two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, implemented more clean technology compared to non-FCB Shiloh Industries and the other FCB Rudhäll Group.

#### 4.2.1.1. Intuitive approaches to sustainable development

Gnosjö Automatsvarvning, could not give a clear definition of sustainable development because they perceive sustainability as doing good; which is part of their family values. Hence, they try to be sustainable with everything they do. The FCB does not have any written definition of what is sustainable development and that they don't put words to describe or limit the action that implies to what is sustainability.

*“You can, of course have a lot of things written, and say this is how we do it, but we do the opposite way. We do things and we don't write it down that much” – Solveig Fransson, Gnosjö Automatsvarvning*

The official further added that their consideration for the wider societal concerns are reflected in the prize that was awarded to the company by the Gnosjö. The award was in recognition of

their efforts towards implementing a number of systems that improved the organisation's environmental performance. An example includes creating more sustainable sources of heating for their company through utilizing geothermal heating systems.

*“We got a prize from Gnosjö Kommun some years ago [...] because when we moved here (to the new premises in 2001), we made a lot of new systems when we built this building” – Solveig Fransson, Gnosjö Automatsvarvning*

Similar sentiments were expressed by Värnamo Sliperi & Glasmästeri.

*“What does it mean really, you mean that we recycle? Difficult question... I don't really know how to answer.” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

The official could not present a clear definition and instead mentioned a number of initiatives they have put in place to try to reduce the environmental impact of the organisation. Furthermore, the official claimed that for the FCB, the environmental, social and economic consideration are of equal importance, despite customer pressures for improved environmental and economic performance.

*“For us economic, social and environment (considerations) are quite equal.” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

Shiloh industries, on the other hand, took a different approach. In response to our question, the responsible manager provided us with a definition that she claimed had been copied from Wikipedia:

*“an ideal location for society with living conditions and resource utilization meet human need without endangering the sustainability of ecosystem and the environment that future generation can meet their needs. It's somehow a cooperation between humanity and nature so that both can keep on existing” – Marina Månson, Shiloh Industries*

We were informed that the non-FCB prefers this definition because it shows a clear link between nature and humans and how the latter is damaging the former, and that it is not something the organization wishes to contribute to. However, copying definition from Wikipedia seems like a haphazard way of coming up with answers and puts into question the devotion or adherence to the proposed approach. The official also argued that the automotive industry contributes to the society because it provides a valuable service, i.e. better mobility as

compared to public transportation. The argument was further strengthened by adding that since metal can be recycled and reused indefinitely, their industry is superior than for example those producing plastics and other materials that cannot be reused or recycled.

*“For us here, this part is quite well!” - Marina Månson, Shiloh Industries*

Rudhäll Group’s definition, was perhaps the most inadequate. The official seemed to confuse adherence to regulations and industry standards with sustainable development. However, this could in part be explained when considering the job description of the official interviewed. Since the FCB does not have a dedicated person working with sustainability or environmental issues, the production manager that we interviewed for this study, assumes the responsibility of the compliance aspects of the operations. Which was then reflected in his given answers:

*“we have certain requirements to fulfil and we choose processes and energy alternatives or whatever accordingly. So that’s what we drive towards” - Joakim Emanuelsson, Rudhäll Group*

The official did not wish to elaborate on the role of the organization within the society.

#### 4.2.1.2. Varied frameworks for measuring environmental performance

It also became apparent that there is not a fixed universal criterion for measuring environmental performance within the industry. Businesses either did not measure environmental performance, or only measured those processes that could also improve resource efficiencies or minimize pollution.

Shiloh Industries measure their environmental performance through three key performance indicators (KPIs) which are monitored every month:

1. Energy Consumption (kWh) / Produced tonnes of goods where energy = Heat + Electricity.
2. Hazardous waste (kg) / tonnes of goods produced
3. Extra Transport (Thousands of SEK)

The official claimed that measuring environmental performance is considered important for the company because they want to reduce waste and utilize more renewable resource in production. They also try to minimize the use of oil and chemicals and substitute harmful chemicals with environment-friendly chemicals. The official also mentioned that doing this also helps the company control financial costs as well as environmental costs. For example, while elaborating

on the company's approach for transportation of goods, the official argued that being efficient with minimizing the environmental impacts caused by extra-transport allows the non-FCB to minimize the associated financial costs as well.

*“it's a lot of money and it's also worse for the environment.” - Marina Månson, Shiloh Industries*

Similarly, with regards to the suppliers, the non-FCB tries to exert influence on suppliers but those efforts are not always successful. For example, when discussing the environmental considerations for oil and other chemicals, the official expressed frustration with some of the suppliers, as their lax approach towards sustainability also affects Shiloh's environmental performance.

*“Now we have a supplier for different kinds of oil and they never write anything like that. It is a huge company and I always kind of fight with them sometimes.” - Marina Månson, Shiloh Industries*

Rudhäll group has a somewhat similar approach but it seemed to be more organized as compared to other companies. The FCB has a management group dedicated to measuring environmental performance. This management team meets on a quarterly basis and measures and compares the result according to set criteria which includes measurements for electricity, gas consumption, waste products such as combustibles etc.

*“...and we do the measurements all the time with regards to how much we have produced and how many days we have worked.” - Joakim Emanuelsson, Rudhäll Group*

However, this proactive approach is limited to the FCB's internal operations and Rudhäll Group is not concerned with the suppliers.

*“We don't measure how our suppliers produce in China, we only measure what we ourselves produce.” - Joakim Emanuelsson, Rudhäll Group*

Värnamo Sliperi & Glasmästeri has a somewhat lax approach to measuring environmental performance since the products produced are considered environmentally safe. The FCB implements controls for electricity consumption every two or three months, and collaborates with suppliers to gain insights in how to utilize energy more effectively required for heating during the production process.

*“I ask companies I buy from, how they do it to be cleaner but otherwise, glass is very clean so there’s no dangerous materials in it. It’s only sand and stone etc...” - Michael Johansson, Värnamo Sliperi & Glasmästeri*

Gnosjö Automatsvarvning, on the other hand, does not have any criteria for measuring environmental performance. The FCB had some difficulties in the past with convincing suppliers and customers to organize transport more efficiently and because of that failure, the company stopped measuring environmental performance.

*“...if we will have customers like that, we have to do it like them. So, I can’t say we measure them.” - Solveig Franson, Gnosjö Automatsvarvning*

The only thing that they considered was not wasting resources unnecessarily. The FCB had mechanisms in place to measure how much material was being scrapped and try to improve continuously on utilizing materials more efficiently.

*“And next time, when we go back to a production order, we try to do a little better.” - Solveig Franson, Gnosjö Automatsvarvning*

However, when it comes to working with the suppliers, the company takes a proactive and collaborative approach to develop new technologies. The official elaborated this by providing an example of their ongoing collaboration with their oil supplier to develop a vegetable based substitute of their current fossil-based oil.

*“We have tested with them for some years...and they are trying to convince us that this oil will be the best.” - Solveig Franson, Gnosjö Automatsvarvning*

#### 4.2.1.3. Misinterpreting clean technology

Most companies considered technologies that prevent pollution as being the same as clean technologies. Throughout the duration of interviews, both clean technologies — such as windmills or solar panels – and pollution prevention technologies – such as recycling, waste disposal technologies and strategies – were provided as examples of clean technologies. This leads to the assumption that these companies consider pollution prevention strategies or technologies to be the same as clean technologies.

For example, Shiloh Industries provided biofuel powered distant heating as an example of clean technology while discussing their plans to utilize renewable energy sources. Similarly installing

solar panels, minimizing the amount of waste, utilizing cleaner oil and chemicals were presented at different occasions as examples of clean technology by the non-FCB.

*“For our business, it is important to reduce energy consumption and use renewable energy sources, and now we are installing distant heating from the municipality and I think they are going to heat it with oil from Raps (biofuel).” – Marina Månson, Shiloh Industries*

Rudhäll industries claimed choosing the cleanest technology available when making new purchases. However, during the course of interview, the FCB presented examples of both clean and pollution prevention technologies as examples of clean technology.

*“For example, sun panels, there should be more recycling and utilizing the excess heat for different processes. There can be different alternatives for production so that we can use fewer chemicals or oils in the production.” – Joakim Emanuelson, Rudhäll Group*

Värnamo Sliperi & Glasmästeri AB, was the only company that specifically asked the interviewer to provide examples of clean technologies. The FCB then claimed that it does implement clean technology though utilizing solar panels, wind turbines and because of their new facilities that is built to be more-energy efficient. However, the official stressed that this investment was not based on purely economic reason but also because they aspire to be more environmentally sustainable.

*“We did it because it was economical of course, we save money because of it, but it’s also for the environment...” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

Only Gnosjö Automatsvarvning provided clear examples of their clean technology initiatives. The FCB was the most consistent in giving examples of actual clean technologies while elaborating on different questions regarding clean technologies. The company is also the most advance among the companies in our sample in terms of implementing clean technologies. The company has made significant investments in wind turbines, solar panels, geothermal heating and cooling systems, and oil reuse systems that also provides heating for the dining rooms and other staff facilities. Some of these systems such as the geothermal heating and oil reuse systems are the FCBs own inventions, made possible through collaboration with different partners.

*“Because we don’t change oil, we have the same the whole time, we just boost it with some components it needs for machining and so on...” – Solveig Franson, Gnosjö Automatsvarvning*

#### 4.2.2. Proactive compliance:

All of the companies interviewed overwhelmingly expressed the sentiment that legal regulations and customer requirements affected their environmental strategies. Furthermore, all companies adapted a proactive attitude towards compliance with regulations and customer requirements. For example, Rudhäll industries proactively invests in technologies when they believe that government regulations might change. Some companies, such as Gnosjö Automatsvarvning, were significantly ahead of the current regulations and customer demands and argued these issues were not necessarily a concern for the FCB. What was more interesting was the fact some companies expressed sentiments that they would welcome more stringent government regulations and customer demands.

##### 4.2.2.1. Non-existent supply-chain pressures in the automotive industry

What was interesting for us was the fact that the end manufacturer, especially within the automotive industry – such as Volvo – does not have a very proactive approach towards improving environmental performance of its suppliers. While the end-manufacturer does place certain requirements on the suppliers in form of ISO-certifications, it does not support or collaborate with its suppliers on improving their environmental performance, for example, through developing or implementing clean technologies in production.

*“Only this demand about being certified according to the ISO 14001, that is the only thing. Otherwise, they don’t have any engagement at all. It is only that-.” – Marina Månson, Shiloh Industries*

Furthermore, for some companies, customer demands seem to be extremely important. For Shiloh Industries and Rudhäll Group, these demands affect their investment decisions to a great extent and some of the interviewees linked implementing more clean technology in the future to stricter customer requirements. The company was of the view that if the customer would demand more clean production, then they cannot continue ‘business as usual’ and instead utilize a completely different process. This process does not only involve different types of machines or tools for production but also a different kind of ‘mindset’; one that is more susceptible to

making pro-environmental investments. However, in order for this transformation to occur, the customer has to demand those requirements.

*“It’s actually customer requirements completely that decides our clean technology implementation.” – Joakim Emanuelson, Rudhäll Group*

Gnosjö Automatsvarvning, on the other hand, expresses completely different sentiments. The FCB acknowledged that customer requirements can be the driving factor for clean technology implementation, it did not affect their clean technology implementation. Since, the company is more concerned with doing good to begin with.

*“The end customer (Volvo) does not influence our clean technology implementation. I would like that, but no! Their only consideration is certain certifications and the right price.” – Solveig Franson, Gnosjö Automatsvarvning*

However, according to all of the companies in automotive industry, the major consideration for Volvo is sourcing components at the cheapest possible price. These price pressures in turn act as barriers for implementing clean technologies for some companies. Shiloh Industries claimed that these price pressures coupled with the quarter economy policy were the major barriers for implementing clean technologies for the non-FCB. Gnosjö Automatsvarvning in contrast, argued that even though it is difficult to execute, the FCB endeavours not to give in to these price pressures because they do not want these pressures to affect their environmental performance.

*“...we don’t do that because the things that we do cost more so we try to keep the prices up. Difficult!” – Solveig Franson, Gnosjö Automatsvarvning*

In complete contrast to the automotive industry, Värnamo Sliperi & Glasmästeri reported facing greater pressures for environmental performance by the end customers. Furthermore, these demands are revised every year, and in effect improves industry-wide environmental performance on a yearly basis. What is even more interesting is that the end-customer does not put specific demands for certification — such as ISO 14001 — within the industry but rather operates on what seems to be a continuous improvement methodology for the entire supply-chain.

*“... a lot of big customers ask for this (clean technologies), and if we are able to deliver it to them, they ask us to do something to be better every year actually!” Michael Johansson, Värnamo Sliperi & Glasmästeri.*

#### 4.2.2.2. Planning for compliance

Similarly, almost all companies placed a great deal of importance on the legal frameworks and regulations that the companies are obliged to comply with. For some, for example, Rudhäll Group, it not only seemed to be the driving factor for their implementation of clean technologies, but the FCB also linked planning for compliance with regulations to maintaining competitive advantage; suggesting a proactive approach to compliance within the organization.

*“...then you have the laws and regulation that you must fulfil, and they change every day, so it pushes you behind 10 years (if you don't have the technology for compliance)”*  
– Joakim Emanuelson, Rudhäll Group

Gnosjö Automatasvarvning claimed that they were significantly ahead of the legal regulations or certifications. This was elaborated through an example of a procedure that the company had implemented in 1995 but which had only become an obligation for business in the recent years. The company was one of the early adopters of Personal Computer (PC), in addition the company started making use of a programme that allowed them to save different measurements during production. This procedure that the FCB has been applying for the past 24 years only became a requirement earlier this year in 2018.

*“You know that's gigantic mass of measurements! And now in this new quality system, it was told you have to save.” - Solveig Franson, Gnosjö Automatasvarvning*

Similar sentiments were also expressed by Värnamo Sliperi & Glasmästeri. The FCB argued that they were ahead of the regulations and industry demands by providing an example of how the company sometimes gets ‘very big forms to fill’ by different customers or government. The official argued that these forms either do not apply to their business or they contain questions about processes they have already implemented.

*“(the questions) may be about the producing, the water system. We have a cleaning system for all the machines for example, which I can tell them but for the material there’s nothing dangerous in them!” Michael Johansson, Värnamo Sliperi & Glasmästeri*

#### 4.2.2.3. Calls for stringent regulations

Furthermore, some interviewees not only expressed frustrations with the legal institutions monitoring the environmental performance but also hoped for stricter regulations in the future. Shiloh Industries, for example, provided a previous engagement with Länsstyrelsen (County Administrative Board) as an example. The institution had ordered a list of chemicals from the non-FCB, which the company provided in form of a detailed report and that is where the engagement stopped. The official claimed that ‘this wonderful list with all the cast-numbers for the different substances in chemicals, and all the risk-assessments’, could have been used by the authorities to suggest improvements or enforce regulations. Instead, the authorities left the company to their own devices. The official was of the view that since most companies face difficulties in making decision for these investments, if there’s a demand from the authorities these investment decisions may become easier to implement.

*“Instead of saying, now you know everything about chemicals, do something about it, they have the wrong way of approaching it. You have to put a demand for something to be done, it’s a lot easier that way!” – Marina Månson, Shiloh Industries*

#### 4.2.3. Investment horizons: going beyond the quarter economy

During our research, it became evident that companies that had a long-term approach towards financial investment tended to implement more clean technologies. From our observation two FCBs were not only more inclined to consider the environmental benefit of the new purchases but also had a longer investment period compared to non-family business and Rudhäll Group. For both the FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, these investment decisions were easier to implement because they were driven by family values while expectations for economic rewards seemed to be secondary sources of motivation. The Shiloh Industries and Rudhäll Group’s efforts for implementing clean technologies in contrast were either limited by the continuous improvement approach – i.e. improve only what is broken or necessary – or by ‘quarter economy’ policies for returns on investment.

#### 4.2.3.1. Quarter economy and investments for continuous improvement

A common theme that occurred throughout the interview with Shiloh Industries was that the non-FCB had limited flexibility with investments in clean technologies because they had a payback period of three months for all new investments. This three month period was referred to as quarter economy. The official claimed that because investments in technology that improves a firm's environmental performance requires substantial investments initially, it is not usually possible to recuperate that investment within the quarter economy. The official elaborated by presenting an example of how a suggestion put forward by her to install solar panels on one of the production facilities was rejected because of the quarter economy. The official claimed that should that investment had been made then, it would have been paid off completely by now but due to 'the lack of vision' of her superiors, it did not come to pass.

*"... you always have an initial investment in the start and then you have a payback time for maybe one year, two years, maybe 5 years or 10 years and then it just keeps on working and then you are getting everything for free but you never reach that if you have a payback time for three months." - Marina Månson, Shiloh Industries*

However, Rudhäll Group expressed completely different sentiments. The interviewee claimed that while they invested continuously in different technologies and had a 3 year payback period. The FCB, however, was more circumspect with their investments. While choosing an investment, the company would opt for the technologies that provided the most environmental performance for the money and that continuous improvements were preferred over radical transformations. The official elaborated this by providing an example of how the company doesn't completely changes its conventional lighting systems to LED based lighting in one large investment. The official argued that even though doing so would result in reduced financial cost and better environmental performance but doing so entails an initial investment of about 1 million SEK. This is not something the non-FCB is willing to invest in and instead, the company replaces the broken halogen lamps with LED on a continuous improvement basis.

*"So, we don't really change for change's sake, the barriers are actually financial." - Joakim Emanuelsson, Rudhäll Group*

What we found most interesting was the fact the company had a more aggressive plan now as a subsidiary of a publicly held corporation. The official claimed that it was because the new

owner had more resources while the previous owners had to be circumspect with their investments as they depended on the savings to survive during the low-revenue seasons. However, these investments are still primarily made on the continuous improvement methodology.

*“Today we’re part of a publicly listed cooperation with really high resources so today we can put forward another kind of investment plan that is more long-term than the one we had before.” - Joakim Emanuelsson, Rudhäll Group.*

#### 4.2.3.2. Values based investments

Gnosjö Automatsvarvning in contrast to the non-FCB and Rudhäll Group, takes a radically different view of their investments in clean technology. The basic philosophy is that if they consider it ‘good’ they will do it regardless of the financial considerations or investment periods. For example, the company pays 0.5 SEK more per unit of electricity because they source their electricity from water-powered facilities. They do so simply because they do not want any ‘dirty electricity’. Moreover, what is more remarkable is the fact that for some investments the company did not even expect a return on investment, they just invested because they felt it was the right thing to do. For example, while constructing their new building in 2001, the FCB wanted to utilize geothermal heating for their new facilities. They consulted three different consulting companies and were informed by each that either it won’t be possible to implement such a system or even if they managed to do it somehow, they will never recuperate their investment. The company however, not only went ahead with the investment and implemented the system themselves, but were also able to recuperate the investment in six months’ time. Similarly, the company has been investing for the past 15 years in wind turbines and has occasionally suffered financial loss because of it. However, their recent investments in two wind turbines are expected to bring the expenses to a break-even this year. The official claimed that the economic considerations are not as important for the FCB as their main motivation is to do ‘good’.

*“But most of all if we think it’s good for us, we just do it and we later find out that it was ok (financially profitable as well).” - Solveig Franson, Gnosjö Automatsvarvning*

Värnamo Sliperi & Glasmästeri, also reiterated similar sentiments and linked its investments in clean technology to not only as means for better economic performance but also as tools to do

good for both the environment and the society. The company has made substantial investments in building a facility that utilizes several clean technologies such as windmills and solar panels to improve its energy consumption and environmental performance.

*“We do it because it was both economical of course, as we save money because of it, but it’s also for the environment.” – Micahel Johnson, Värnamo Sliperi & Glasmästeri*

However, the company differed from Gnosjö Automatsvarvning in certain aspects. Firstly, the company did not implement as wide a variety of clean technology because the company produces environmentally friendly products and thus the only resource intensive element of their production is the heating and the water cleaning systems. The company utilizes the best possible technologies available for these systems. Similarly, in contrast to Gnosjö Automatsvarvning the company does have a 5 or 10 year payback period depending on the investments and also considers financial barriers to be the biggest obstacle for implementing clean technologies.

*“The barrier can be the money of course, the cost. Because when you do these kinds of things it’s always very expensive. Especially in the beginning when it’s a new technology.” – Michael Johnsson, Värnamo Sliperi & Glasmästeri*

When probed for explanations for investing in clean technologies, for both FCBs Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, family values seemed to be the primary motive. Gnosjö Automatsvarvning argued that when the FCB earn money, they want to share it with the community, and not spend it on buying ‘fancy cars and vacations’. One way of sharing their wealth is by making investments to improve the natural environment.

*“For us, it’s not financial. We don’t have a three-month or three-year payback thing either. When we have money we really want to do as good possible for the environment”  
- Solveig Franson, Gnosjö Automatsvarvning*

Furthermore, the official claimed that as long as their family was the owner of the business, they will continue to make investments without concerning themselves with financial repercussions. The company is going ahead with a lot of substantial financial investment and they are hoping that the financial sacrifices being made for developing these innovations would

pay off in the future as they have done in the past. The official claimed that these values have also been passed on to the future generations and the business will continue to operate with the belief that investments in improving environmental performance does not affect the business, as long as it remains in the family.

*“We don’t think making those investments affect our business so much. As long as it is our family, it doesn’t... I think we raised our daughters the same way, they are also very concerned about this. That’s how we live it, we try to do what we say.” - Solveig Franson, Gnosjö Automatsvarvning*

For Värnamo Sliperi & Glasmästeri these family values were also the driving factors. Not only did the FCB associated it with pride in family legacy and maintaining goodwill in the local community, but in particular, the owner wanted to ensure the company and its legacy were in good condition when his children resumed ownership.

*“...I want them to have a good position, and not give them something bad for the future.” – Micahel Johnson, Värnamo Sliperi & Glasmästeri*

The FCB also explicitly attributed their ownership status to their ability to invest in clean technologies. The official argued that since they owned the company, they did not face external stakeholder pressures that can act as a barrier towards implementing clean technologies.

*“...I can make big investments and longer without too much pressure.” – Micahel Johnson, Värnamo Sliperi & Glasmästeri*

#### 4.2.4. The Gnosjö Factor

Companies that reported greater involvement in the local communities also happen to be implementing more clean technologies. In contrast, companies with limited involvement displayed more inclination towards pollution prevention strategies. Moreover, two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, that had the most engagement with local communities did not attribute their implementation of clean technologies as a response to local pressures. Instead, this engagement was motivated by family values and pride in the family name. Furthermore, most companies admitted to being in some way influenced by the ‘Gnosjöandan’ or the Gnosjö spirit. For these two FCBs, in particular, the mindset

inspired by Gnosjö spirit not only improved their competitive advantage but also facilitated technological flows between companies.

#### 4.2.4.1. Local Embeddedness as a driving factor

Rudhäll Group and Shiloh industries in general didn't seem to be involved in their local communities. Furthermore, when probed for examples of engagement with local communities, the FCB and non-FCB related examples that primarily included collaboration with local municipalities or government institutions. For example, Rudhäll Group, a FCB claimed that their collaboration with local community includes yearly visits from the Gnosjö Kommun and the Swedish Work Environment Authority. These visits allow the company to receive feedback and suggestions for improvement. Shiloh Industries related purchasing distant heating from the local municipality as example of their collaboration with the local communities. However, both companies acknowledged that their social outreach was limited and that they try to compensate for it by making environmentally friendly decisions in their business.

*“We have always worked to be as environmentally friendly as possible. And it's not that we call it a sustainable strategy or something like that but it has been the intention in this factory here in Forsheda for many years.” - Marina Månson, Shiloh Industries*

The other two FCBs on the other hand, presented clear examples of being involved in the local community for example by sponsoring various sports organisations or by donating money to local as well as international charities. For example, Värnamo Sliperi & Glasmästeri, provided examples of how they contribute to different sports organisations and that they wanted young people to do sports. Moreover, they provided donations to organisations that helped children. Similarly, Gnosjö Automatsvarvning actively promotes sports activities for girls for example through financial donations to local horse-riding organisations and event. Furthermore, the FCB claims to be one of the biggest donators in the area for different charities in the area.

*“I think it's us and one other company that gives the most, there's not many companies that do this. When we earn money, we want to share.” - Solveig Fransson, Gnosjö Automatsvarvning*

Similarly, both FCBs claimed that their implementation of clean technology or other environmental initiatives were not influenced by pressures or demands by local communities.

Instead, family values, pride in family name and being idealized by the community were mentioned as motivations for making pro-environmental choices.

*“...I think that the local community looks up to us when we do good things so it’s very important for us to do good things.” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

#### 4.2.4.2. The Gnosjö spirit

Another interesting finding of our research was the Gnosjö spirit. Most companies at some point during the interview brought up the ‘special nature’ of this region. The only exception was Rudhäll Group, when probed about if this special trait of the region had some effect on their business, the official replied with a brisk, ‘Maybe, I can’t say for sure’, and did not wish to elaborate further. What was particularly interesting was the fact that Shiloh Industries that has limited engagement with the local communities or organisations, also acknowledged this special trait. The official argued that there exists ‘a special way of thinking’ in this region which promotes using only what is needed and not wasting resources unnecessarily. For the non-FCB this ‘special way of thinking’ improved their environmental performance as the local workforce inhabited this mindset.

*“...so you have a mind-set that it’s good to save as much as possible. And that is almost always good for sustainability and for the environment.” - Marina Månson, Shiloh Industries*

Värnamo Sliperi & Gläsmasteri not only relates to the Gnosjö spirit but also considers it a symbol of pride. The official reiterated the sentiment expressed by Shiloh Industries regarding the workforce. The official claimed that he had a very good relationship with his employees and added that he also didn’t have to ask his employees to work over-time. If they felt the work needs to be finished that day, they stayed an extra hour and finished the job. The official claimed that since a lot of companies in the region relate to this mentality, there’s significantly more collaboration between different companies compared to other regions. The official claimed that if he required something for his business he could just go and borrow it from his neighbours while in other regions of the country this kind of collaboration was impossible to conceive.

*“...If I have a problem, I go to my neighbour, ‘Can I borrow this? I need this for my company’ and they say ‘no problem! we’ll help you’. If you do the same in Stockholm, it doesn’t work. They are like dogs and cats!” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

Finally, the official argued that Gnosjö spirit increases the competitive advantage of their company because larger customers preferred companies in this region over others. Since, this cooperation among companies ensures quality and timely deliveries. Furthermore, the official also linked technological flows between companies to this spirit of cooperation. According to the official if he visits some company and comes across a technology that he thinks would be good for his company, he also considers implementing it.

*“...I think it is very good for our competitive advantage and I think technology flows from one company to another because of it.” – Michael Johansson, Värnamo Sliperi & Glasmästeri*

## 5. Analysis

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*The analysis of empirical findings is presented in this section. Since we use long-term orientation as our aspect, the empirical findings will be analysed in relation to the three dimensions of long-term orientation which are futurity, continuity and perseverance.*

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### 5.1. Lack of frameworks for clean technology

#### 5.1.1. Intuitive approaches to sustainable development

One of the most consistent and perhaps the most consequential theme of study was the fact that each business perceives sustainability from their own view of reality in connection to their business. This validates the assertion made by Hart & Dowell (2011) that the lack of literature linking sustainable development to firm performance is due to the failure in obtaining consensus for a clear definition of sustainability in a business context, which in turn makes researchers wary of approaching the phenomenon. Business like Gnosjö Automatsvarvning, that put emphasis on personal values in their organisational conduct, tended to take a more intuitive yet effective approach to sustainable development. In contrast, Shiloh Industries presented – overlooking the fact that it was borrowed from Wikipedia – the most concise definition of sustainable development. However, in practice, it seemed to consider the environmental and social concerns as externalities, i.e. the cost of doing business. It was clear that the organization's primary objective was to create economic value and reducing the company's environmental impact was not necessarily a priority. This observation seems to imply that a firm's performance on sustainable development is more dependent on the moral values of the decision-makers instead of its ability to articulate what sustainable development is.

#### 5.1.2. Varied frameworks for measuring environmental performance

It was also very interesting to find out that there was not a fixed criteria on how companies measured environmental performance. Moreover, companies that invested to a lesser extent in clean technologies displayed more rigorous approach to measuring environmental performance. In our opinion, this approach is reflective of the incremental innovation and continuous improvement schemes associated with pollution prevention or product stewardship strategies (Cristina De Stefano, Montes-Sancho, & Busch, 2016; Hart, 1995; Hart & Dowell, 2011). As these strategies are aimed at either making small changes in the existing technologies, (Cristina De Stefano et al., 2016) and continually measuring and improving procedures for reducing wastes and emissions (Hart, 1995; Hart & Dowell, 2011).

Gnosjö Automatsvarvning, in contrast, did not implement very rigorous systems for measuring environmental performance but instead made considerable long-term investments in technologies that eliminated waste and emission either completely or to a great extent. For example, the company's investment in geothermal heating, windmills, oil reuse systems and solar panels are all technologies that adhere to the radical innovation and beyond-green schemes associated with sustainable development in the NRBV literature (Cristina De Stefano et al., 2016; Hart, 1995; Hart & Dowell, 2011).

### 5.1.3. Misinterpreting clean technology

Furthermore, both Shiloh Industries and Rudhäll Group are focussed on incremental innovation and continuous improvement strategies associated with pollution prevention approaches to environmental strategy (Cristina De Stefano et al., 2016; Hart, 1995; Hart & Dowell, 2011; Lee & Min, 2015). This is reflective of their current implementation of what these companies presume to be clean technologies. For example, Shiloh Industry is currently involved in implementing a new distance heating system that is going to be power by biofuel. Brown (2009), argues that crop-based biofuels should not be classified as clean technologies because not only it requires vast amounts of water, which is increasingly becoming a scarce resource in many countries but that the land allocated to growing those crops could instead be utilized to address the growing food insecurity on our planet. In contrast, clean technologies should instead help firms face the challenges and constraints resulting from the future scarcity of natural resources (Salvadó, de Castro, López, & Verde, 2013), not cause it.

As mentioned previously, not only did the two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, make distinctions between clean technologies and pollution prevention strategies, they also implemented more clean technologies compared to non-FCB and the other FCB. This seems to suggest that even in the absence of rigid frameworks or conscious strategizing, certain characteristics of these two FCBs influenced adaptation of clean technologies.

In our opinion, the two FCB's, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, implemented more clean technologies because FCBs place emphasis on not only economic performance of the company but also the environmental and social performance. Furthermore, these considerations come about as a consequence of family values of doing good. This behaviour resembles closely to the FCBs 'preconscious acceptance of institutional values' and their tendency to value socioemotional wealth over financial gains especially when considering its environmental performance (Dimaggio, 1988, p.17; Berrone et al., 2012). Since

socioemotional wealth is “the stock of affect-related value that a family derives from its controlling position in a particular firm” (Berrone et al., 2012 p.259). Hence, considerations for the futurity is an integral component for preservation of this socioemotional wealth (Lumpkin & Brigham, 2011). In our opinion, the FCBs strategy for implementing of clean technologies – albeit driven by intuition – is reflective of taking into consideration the long-range consequences of current actions, and their desirability to future successors of the business (Lumpkin & Brigham, 2011). Since, they seem to be aware these technologies can be maintained indefinitely in the future and would be beneficial for maintaining competitive advantage for the future generations. As clean technologies do not only address future scarcity of natural resources, they also ensure perseverance of the natural environment (Hart and Dowell, 2011). Finally, the tendency of the two FCBs in our sample to prefer radical innovation over continuous improvements. This tendency can also be linked to making aggressive investments and taking unilateral actions as the driving factors for preserving social legitimacy, family name, social image and worthiness (Oliver, 1991; Berrone et al. 2010).

## **5.2. Proactive compliance**

### **5.2.1. Non-existent supply-chain pressures in the automotive industry**

Volvo as a customer doesn't take a leadership role in its suppliers' sustainability strategies. Particularly, when considering the fact that the manufacturer claims to be the most sustainable in the automotive industry (Volvo Group, n.d.). The glass industry, in contrast, seem to be more proactive in implementing measure for improving environmental performance. This observation becomes even more remarkable that the end customers do not put requirements for specific certification but rather operates on what can be termed as a yearly improvement methodology. Within the NRBV literature, such a methodology can be interpreted as establishing a shared vision within the supply chain that enables firms to accumulate resources required for sustainable development faster than the firms operating in supply chains that lack such capabilities (Hart, 1995). Finally, the ability of Gnosjö Autmatsvarvning to resist price pressures from the end consumer can be explained by the fact the firm values its socioemotional wealth more than it fears the financial repercussions from losing a customer. At the same time, the end-customer might be willing to overlook this inflexibility because the company not only uses advanced technologies but also offers value associated with firms in the Gnosjö region.

### 5.2.2. Planning for compliance

Not only did the FCBs emphasized compliance with regulations but both Shiloh Industries and Rudhäll Group actively planned for compliance with regulations by being mindful of the foreseeable changes in regulations and upgrading technologies accordingly to preserve competitive advantage.

The two FCBs Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, in contrast, were not only complying with regulations but exceeding them. For example, Gnosjö Automatsvarvning by implementing internal controls as elaborated by the example of how the company has been saving their measurements since 1995. However, since the company continuously invests in new technologies, it can be argued that there's some strategizing involved in maintaining that lead. And therefore, involves an element of planning for compliance. Furthermore, investing in technology and implementing policies and regulations 25 years ahead of the industry is reflective of the perseverance mindset of the decision makers which consequently affects the futurity of the firm as well. In that, the firm is not only willing to use patient capital but also implements policies that ultimately benefits the business's successors (Le Breton-Miller & Miller, 2011; Lumpkin & Brigham, 2011).

### 5.2.3. Calls for stringent regulations

The calls for more stringent regulations in the automotive industry are reflective of the inability of the decision-makers to be proactive with their investments in clean technologies. In our opinion this constraint can also be because the CEOs or decision makers of this non-FCB and Rudhäll Group might have shorter tenures (Walsh and Seward 1990; Zellweger 2007). As a consequence, they more likely to give into shareholder pressures and make investments that create immediate economic benefits. Furthermore, since these investments are usually substantial (González, 2005), fear of sunk costs especially when investing in new technologies may discourage a proactive attitude to clean technology implementation. Hence in the absence of LTO, compliance seems to be the most viable alternative for these companies.

From the arguments presented above, following insights can be derived. Firstly, for some companies being sustainable is very important, while for others sustainability equals compliance with regulations (Berrone, Cruz, Gomez-Mejia, & Larraza-Kintana, 2010). Not only did the two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, respond to institutional demands in an excessively substantive manner (Berrone et al., 2010), certain LTO dimensions such as futurity and perseverance also point towards some degree of planning

for maintaining their lead on compliance (Lumpkin & Brigham, 2011). Similarly, the tendency of valuing environmental performance more than financial gains can also be linked to considerations for continuity (Berrone et al., 2010; Lumpkin & Brigham, 2011). Since poor environmental performance will affect firm reputation and family name, maintaining higher environmental standards, as the firms has in past, could prevent that from happening. These motivations therefore could explain why these two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, preferred sustainable development and why they proactively maintained lead over current regulations.

In contrast, the non-FCB and Rudhäll Group in our study seemed to be much more interested in being compliant with regulations. Not only did these companies surrender to price pressures, they also favoured planning for compliance over taking a proactive approach to clean technology implementation. Finally calls for stringent regulations seemed to be aimed at making up for timid decision-making. In line with these arguments, it may be reasonable to assume that for non-FCB and Rudhäll Group, proactive compliance was favoured over sustainable development

### **5.3. Investment horizons: going beyond the quarter economy**

#### 5.3.1. Quarter economy and investments for continuous improvement

Both Shiloh Industries and the literature on clean technology seem to agree on the fact that clean technology implementation requires substantial initial investments and longer payback periods (see for example: Cristina De Stefano et al., 2016; González, 2005; Lee & Min, 2015). Similarly, González (2005) argued that firms that are content with compliance to regulations are more likely to implement low investment strategies that does not involve switching costs or radical changes to existing technologies. This proposition seems to be line with our findings, and holds true not just for Shiloh Industries but also for Rudhäll Group, a FCB. The former specifically avoids investments in clean technologies to avoid the higher switching costs associated with replacing existing technologies. Instead, the FCB implements an investment strategy based on incremental improvements to existing technologies, and favours this over radical transformations; similar to what is proposed by Cristina De Stefano et al., (2016).

Furthermore, Rudhäll Group's claim of having a more aggressive investment plan as part of a public corporation, can be explained in the following way. Firstly, it not only implies that LTO is a trait not specific to family firms, but also that not all FCBs have LTO. An alternative

explanation could be that while as a family firm, the FCB might have been willing to invest but could not afford to. In contrast, while being part of a more resourceful corporation, the investment plan may have improved, it is still based on the incremental improvement mindset. Which seems to imply that, clean technology implementation requires a combination of not only the financial condition of the firm but also the willingness – or ability – to invest those resources.

### 5.3.2. Values based investments

Two of the three FCBs reported better economic performance as a result of implementing these clean technologies which again, is also in line with the findings in our literature review (see for example: Chavalparit & Ongwadee, 2009; Frondel et al., 2007; Radonjič & Tominc, 2007). Moreover, as mentioned previously, FCBs with the exceptions of Rudhäll Group were inclined to take unilateral actions through aggressive investments in clean technologies in order to preserve their social legitimacy in their communities (Oliver, 1991; Berrone et al. 2010). Furthermore, some these investments were indicative of these FCBs tendency to value socio-emotional wealth more than economic gains. For example, Gnosjö Automatsvarving was not only willing to pay a higher price for clean electricity, the FCB also made several risky investments without the expectation of returns (Dimaggio, 1988, p.17; Berrone et al., 2012). Furthermore, longer tenures of the decision makers – enabling bigger investments over a longer period – can positively influence clean technology implementation, this also confirms our initial assumptions.

Since, implementing these clean technologies are reflective of FCB's tendency to prioritize the long-range impacts of decisions made today that will be realized in the distant future (Le Breton- Miller & Miller, 2006; Lumpkin et al., 2010). It can be argued that these FCBs family values were reflective of the FCBs LTO. Moreover, these 'family values' inhabit all three dimensions of LTO which can be uncovered upon closer examination. In that, both firms explicitly relayed wished for future generations to inherit their business – 'as long as it's our family' – i.e. concerns for Futurity. Implementation of clean technologies is therefore suggestive of taking measures now that would not only ensure survival of the business but also be acceptable to the future generations (Lumpkin & Brigham, 2011). For example, through addressing future resource scarcities or better economic returns (Chavalparit & Ongwadee, 2009; Salvadó et al., 2013). Similarly, passing on values to future generations – 'we have raised our daughters the same way' – coupled with aggressive investments that are driven by values like pride family legacy and maintaining goodwill in the local community points to

considerations for continuity. That which has worked in the past has value, so if better environmental performance has maintained good will in the past, it should do so now and in the future as well (Le Breton-Miller & Miller, 2011; Lumpkin & Brigham, 2011). And finally, these values enable firms to invest patient capital and sacrifice ‘fancy cars and vacations’ now for better environmental performance and both socio-emotional and economic returns in the future (Le Breton-Miller & Miller, 2011; Lumpkin & Brigham, 2011). For example, investing money in technologies for clean energy now so that future scarcity of fossil-fuel, or environmental regulations does not only affect the business but possibly create competitive advantages (Brown, 2009; Salvadó et al., 2013). These factor as here, can may be explaining Rudhäll Group’s weak performance with sustainability. Since, the family sold their business, it can be argued that maybe the firm didn’t have considerations for succession or family legacy and therefore did not care to implement policies or utilize patient capital for implementing more clean technologies. These findings presented above imply that personal values of decision-makers, that encompass or uphold one or more of these LTO dimension – futurity, continuity, perseverance – can significantly expand investment horizons of clean technologies.

#### **5.4. The Gnosjö factor**

##### **5.4.1. Local Embeddedness as a driving factor**

The two of the three FCBs in our sample behaved similarly to the observations made in the family firm literature. For example, both FCBs in contrast to their non-FCB counterparts, responded to institutional pressures more substantively because they were concentrated in a local area (Berrone et al., 2010). Similarly, both FCBs, valued social legitimacy over economic gains not only with their decisions on environmental performance (Oliver, 1991) but also with their social engagement by donating money to sports organisations and charities that had value to the local communities (Berrone et al., 2010). Furthermore, being idealized by the community and taking steps for preserving family’s name for future generations (Berrone et al., 2010), is reflective of the LTO of the FCBs. Particularly, their mindfulness of the considerations relating to the ‘continuity’ of their business (Lumpkin & Brigham, 2011; Le Breton-Miller & Miller, 2011).

##### **5.4.2. The Gnosjö spirit**

According to our study, the Gnosjö spirit mentality of the local force not only positively influenced the family firms as suggested by Henriques and Sadorsky’s (1996, 1999), but also

seems to positively impact environmental practices within non-FCBs. Furthermore, the cooperative environment between the companies in region, particularly that of the two FCBs, seemed to be increasing both competitive advantage and implementation of clean technologies. Hence, it would be reasonable to assume that the Gnosjö spirit not only improves the environmental and economic performance of the companies in the region but is also highly conducive for the implementation of clean technologies.

Furthermore, our findings confirm two important assumptions of the NRBV theory. Firstly, Hart's proposition that in the future competitive advantage will be linked to capabilities that facilitate environmentally sustainable economic activity (Hart, 1995, p. 991) for example by producing better quality products thorough clean technologies. And secondly, that a shared long-term vision among all relevant stakeholders and lasting partnerships within the industry and between institutions are required for the innovation, development, and implementation of clean technologies (Cristina De Stefano et al., 2016; Hart, 1995; Lee, 2011; Lee & Min, 2015).

## 6. Conclusion and Discussion

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*The final section discusses conclusion along with contribution, implications, limitations and also provides suggestions for future research.*

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The aim of this thesis was to increase the knowledge in the area of clean technology implementation, in particular to explore how a firm's ownership status (FCB vs non-FCB) influences the implementation of clean technology. To be able to answer our research question, we decided to conduct a qualitative study. A literature review was conducted in order to construct a theoretical background and explore gaps in the existing literature. In order to collect our primary data, interviews with four companies were conducted in order to inform the reader with first-hand accounts. As consequence of which 4 interesting themes emerged. The findings of our study were not only able to validate the existing literature but also revealed some new insights.

Our finding validated that there exists a clear link between economic performance and clean technology implementation (Chavalparit & Ongwandee, 2009; Frondel et al., 2007; Radonjić & Tominc, 2007). Moreover this study seems to suggest that even in the absence of rigid frameworks or conscious strategizing, certain characteristics of FCBs influenced adaptation of clean technologies. Similarly, we could also validate that a shared vision within the organization and between cooperating partners can accelerate sustainable development (Hart, 1995) and as a consequence implementation of clean technologies within an industry. According to our research, this shared vision can stem from multiple sources. For example: through a cooperative culture in a region, through local culture and values of the workforce and also through responsible behavior of the supply chain leader. Furthermore, our research not only validated the propositions that financial considerations were a major barrier towards implementation of clean technologies (González, 2005), but also extended this proposition by including the willingness to invest those resources as an important factor. Moreover, according to our study, clean technology implementation requires a mindset more inclined to radical transformations instead of incremental improvement (Cristina De Stefano et al., 2016). As elaborated by our study, companies that implemented strategies for continuous improvement or proactive compliance were not as successful at implementing clean technologies as those that took a more radical and long term-approach (Cristina De Stefano et al., 2016; Lee & Min, 2015). Hence, the

mindset or the values of the decision makers plays a significant role in implementation of clean technologies.

According to our study, two FCBs, Gnosjö Automatsvarvning and Värnamo Sliperi & Glasmästeri, were significantly ahead of the other two companies in implementing clean technologies. The reason for which can be associated to the high levels of LTO of these two FCBs compared to the other FCB and non-FCB in our sample. For these FCBs, their socio-emotional wealth generated as a result of economic activity was more important than the actual financial gains conventionally associated with business (Berrone et al., 2010). In other words, these FCBs displayed tendencies involving both conscious and unconscious strategizing in order to improve their environmental performance, not only in the present but also in the future. Since these FCBs associated their family values to their ability to invest in clean technologies. However on closer evaluation, these family values revealed an amalgamation of different LTO dimension, which anchored the organizational strategies for implementing clean technologies. For example, considerations for futurity, being 'good' with the environment in the present, underscored considerations for addressing future scarcity of resources (Salvadó et al., 2013), environmental deterioration (Brown, 2009), or loss of competitive advantage affecting the successors of the business (Lumpkin & Brigham, 2011). Similarly, the tendency to be excessive with investments could be linked to a strategy to appease local communities, and the continuity of the family legacy and business. And finally, being patient with investments also implied considerations for perseverance (Le Breton-Miller & Miller, 2011; Lumpkin & Brigham, 2011). Furthermore, our study showed that LTO is a trait not specific to family firms, but also that not all FCBs have LTO (Lumpkin, Brigham, Moss 2010). Instead, the extent to which a company does or does not implement clean technologies depends not only the institutional values of an organization but also how deeply one or more of the three LTO dimensions are implanted in those values.

### **6.1. Contribution**

Based on our results, we not only validated quite a few suggestions within the existing literature but also added to literature with some original contributions. We confirmed that FCBs in general are more inclined to invest in clean technologies and provided explanations on how the presence of certain LTO dimensions with in institutional values enables this. Furthermore, we also added to this field by suggesting regional characteristics can accelerate implementation clean technologies. Furthermore, we also elaborated that supply chains pressures or government pressures can also influence implementation of clean technologies.

## **6.2. Implications**

Since this research has been based on the adoption of clean technology within family-controlled business and non-family-controlled business, the most practical application of this would be for top managers, i.e. production managers, sustainability managers or founders, of either FCBs or non-FCBs. Moreover, we believe that we have provided sufficient information about clean technology such as its drivers, barriers, and benefits. Therefore, if any organization is seeking information about adopting clean technology, this research can be a useful guide. Also, we believe that this research would also be applicable to any kind of industry that would like to, or is currently implementing environmental strategies (clean technology).

## **6.3. Limitations**

Since we had to conduct this research within a limited timeframe, due to a rather rigid sampling criteria, at least initially, we were not able to include a second non-FCB in the study. We acknowledge that this omission may have significantly affected the accuracy of our findings. Similarly, unequal representation of the glass industry may also have undermined our research. Furthermore, since this study was based on one particular location, Gnosjö region, there is a possibility that the findings would be different if the research was focused in another area.

## **6.4. Suggestions for future research**

In our opinion, this study opens up a number of avenues for future research. Firstly, since our research was limited, factors exploring the unique characteristic of the local workforce and its influence on a firm's sustainable development strategy could be further explored. Secondly, a comparative study involving a broader set of industries, exploring the effect of supply chain leader's policies on clean technology implementation. And finally, a comparative study examining Gnosjö region's performance in relation to a similar region for e.g. Mullsjö, could also highlight there is indeed a relationship between clean technology and especially technology transfers as a result of collaboration among partners.

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## 8. Appendices

### 8.1. Appendix 1 - Table of participants

*Table 1 A brief overview of the participants involved in the study.*

No	Participant	Organization	Title	Organization Summary
1	Michael Johansson	Värnamo Sliperi & Glasmästeri AB	Chief Executive Officer (CEO)	Värnamo Sliperi & Glasmästeri AB is a glass factory that offers a variety of products and services to different business industries.
2	Solveig Fransson	Gnosjö Automatsvarvning	Co-founder	Gnosjö Automatsvarvning specializes in producing high-precision complex parts to the automotive industry
3	Marina Manson	Shiloh Industries	Regional Environmental Manager	Shiloh Industries is a leading manufacturer of products within body structure, chassis and propulsion systems; operating on a global scale and one of the key partners to Volvo.

4	Joakim Emanuelsson	Rudhäll Group	Production manager	Rudhäll Group comprises of 4 production units in Gnosjö and Värnamo, producing components, as well as providing consultancy to the automotive industry in both Swedish and international markets.
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## 8.2. Appendix 2 - Interview questions

*Questionnaire 1. Initial questionnaire provided to the Participants ahead of the Interview.*

*In English:*

1. *How do you define sustainable development? What role do you think your organization has in the larger social and environmental context?*
2. *How do you measure your company's environmental performance?*
3. *From your perspective, what is the definition of clean technology strategy?*
4. *Are you currently implementing clean technology strategy? If so,*
  1. *How and since when did you implement this strategy?*
  2. *What were the reasons for it?*
  3. *What were the benefits?*
5. *What are the barriers to successful implementation or transition towards clean technology? Are there any non-economic barriers?*
6. *What role does the supply chain leader (end manufacturer) plays on your organisation's implementation of clean technology?*
7. *In your opinion, how important is the transition towards clean technology to your industry? Is there a relationship between clean technology and competitive advantage?*
8. *How can companies incorporate more clean technology in the future?*

*På Svenska:*

1. Hur definierar ni hållbar utveckling? Vilken roll tror du att din organisation spelar i kontexten samhälle och miljö?
2. Hur mäter ni ert företags miljömässiga prestationer?
3. Ur ert perspektiv, hur skulle ni definiera ren teknologi (clean technology strategy)?
4. Tillämpar ni strategiskt ren teknologi (clean technology strategy)? I så fall,
  1. hur och när började ni tillämpa strategin?
  2. Vad fanns det för anledningar bakom beslutet?
  3. Vad fanns det för fördelar?
5. Vad finns det för hinder för att på ett tillfredställande sätt kunna införa ren teknologi? Finns det några icke-finansiella barriärer?
6. Vilken roll spelar ledaren för leverantörskedjan (sluttillverkaren) för implementationen av ren teknologi?
7. Enligt er, hur viktig är övergången mot ren teknologi i er industri? Hur kan ren industri kopplas till konkurrensfördelar?
8. Hur kan företag inkorporera mer ren teknologi i framtiden?

### 8.3. Appendix 3 - Geography location

Figure 1. Geographical location and distance between organizations participating in the study.

