SMES ENTRY MODE CHOICE: FINNISH CLEAN-TECH COMPANIES IN CHINA

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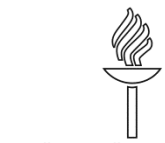

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ABSTRACT

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Abstract

Entry mode selection process is a profound step in firm's international activities. Despite the increasing prevalence of study on this issue, many research questions on SMEs (Small and medium-sized enterprises) remain open. Given SMEs play a prominent role in world economy, a better understanding on their entry mode selection process is needed for academy and managers. Rise of Finnish cleantech SMEs and huge market potential of Chinese market drive the market-orientated motivation of this thesis. The aim of this thesis is to explore the decision-making process on entry mode selection in Finnish cleantech SMEs heading into Chinese market. This thesis, employing transaction cost theory as theoretical ground and qualitative case study as research method, examines three Finnish cleantech companies to draw out the patterns of their decision-making process and one Finnish organization to observe the work from a third-party angel. Assets specificity, internal uncertainty and external uncertainty from transaction cost theory are the three key dimensionalities in analysis work of the case companies' entry mode selections and performances. Second-hand information and working experience of author have also greatly assisted in the process.

The primary findings of this thesis are: 1. Assets specificity, especially characteristics and the customized of products or service, scopes the preliminary entry mode options which are all related to local collaboration. Local collaboration is an effective means for SMEs to release their dilemma of resource restraint. 2. International experience and intensive working experience in target country of managers or top management team can reduce bias, distrust and uncertainty from decision makers as natural human beings. 3. Deep analysis of external environment is neglected but shall penetrate into actual industry environment, target customer behaviors, relative policies from government and competition situation. Through that, possible project opportunity can be allocated and detailed strategy can be justified and sharpen.

Further research is recommended to assess the relationship between firm's selected entry mode made based on transaction cost theory and performance in a longer time scope from process perspective and extended into other high-tech industry.

Keywords Decision-making process, Finnish Cleantech, China

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CONTENTS

1 INTRODUCTION

"What distinguishes a high performance economy is its capacity to adapt efficiently to uncertainty."

--- Oliver E. Williamson

Internationalization has been studied in business strategic management for a long time. Along with acceleration of globalization and development of technologies of information communication and transportation, internationalization has become a more constant topic of strategic business research field. (Swoboda, 2012) (Gary A. Knight, 2004) (Crick, 2009) Hence, study on internationalization entry mode and mode selection process, deriving from traditional strategic management, can and have greatly helped researchers further understand constantly changing global economy environment and top manager teams to make better decisions in practice.

The constraint of domestic market demand and size, like Finland with only population of 5 million, has strongly limited the development and growth of companies. Therefore many small-and-medium-size companies (SMEs), especially new born technology companies, starts seeking international development opportunities and models and adopting internationalization activities at its very early stage and focusing on particular markets. (Gary A. Knight, 2004) (Crick, 2009)This kind of company is called as "international new venture". For international new venture firms, internationalization is their destiny. In Finnish economic structure, 99,8% of enterprises are SMEs, which have contributed 62% of added value of Finnish economy during 2010-2015 (Small Business Act for Europe , 2017). SMEs, especially technology-based SMEs, play a preeminent role in Finnish's economy. Study on those SMEs internationalization activities could improve the understanding of their internationalization process and behaviours as well as provide pracmatic suggestions for their own future development and other Finnish SMEs heading to internationalization.

Giant multinational companies are having enough resource, time, finance and channels to make a rational decision by hiring a group of experts, collecting enough needed information, and following existing decision-making process and principles. (Quan, 2012) Normal entry modes for firms' internationalization are exporting, licensing, acquisition, joint venture and sole venture. In SME, the constraint of resource, knowledge, experience, finance and networking pushes decision-makers in to a stiffer situation. Therefore, entry mode selection is crucial for SMEs. SMEs would not be able to recover from failure of a solid resource commitment. In most of time, manager, owner and decision maker are played by the same person(s). Their mindset, experience, education, and other personal determinants, can strongly influence the decision-making process

(Musso & Francioni, 2012; Quan, 2012; Swoboda, 2012). This is one crucial focus of this thesis.

Although While Williamson (Williamson, 1985) and Barney (Barney, 1991) have paid significant attention on academic and conceptual study of generalized SME's internationalization entry mode, there is a strong calling for deeply studying SME's internationalization entry mode elective process based on real cases, which can help entrepreneurs in pragmatic ways. Meanwhile perspective of process in entry mode selection has been addressed by Brouthers, Andriesson &Nicolaes (1998) and Harrison (1996). There is no perfect solution that can be made at once but adherence of firms and managers on their resolution leads them to constantly search for the answers and adjust their sails toward the goals.

In last 30 years, since Chinese economy reform, China has scarified its beautiful and clean natural resources and people's health for its dramatic economy growth and place of the second greatest economy in the world. When China's natural environment rings the warning bell, clean technology has become the emerging needed in this market. But there is no existing competitive clean technology originally from China. It needs to import advanced clean tech. Meanwhile, Finland is ranked as the most second innovative clean-tech country in the world. (WWF, 2017) Finnish clean technology, which is constituted by numerous SMEs, is going to be the most promising business enhancing Finnish economy, and China has the most attractive market demand and huge potential for all kinds of Finnish clean tech companies, which are eager to grow at international level. Interestingly, there is very little academic research in this filed. Enhance, this thesis is to feed the research gap of SME internationalization on how Finnish clean tech small-and-medium-size companies make decisions on internationalization toward Chinese market in order to answer following research questions:

- How is the strategic decision-making process of Finnish cleantech SMEs entering Chinese market?
- What are the factors influencing the top management in the decision-making process?

This thesis will, based on transaction cost theory, which has been widely used in research on internationalization of firms. Transaction cost theory's application in strategic decision-making process on entry mode selection has been well studied and development in previous academy like, Williamson (1981), Anderson and Gatignon (1986), Madhok (1997) and Brouthers and Nakos (2004). In transaction cost theory, assets specificity, international uncertainty and external uncertainty are the three main parameters which help managers gather valid real-time information, make good evaluation on their products and resource, list possible entry modes, refine the options through internal managerial system and chose the final mode. Qualitative research case study is applied as research method by interviewing managers of 3 Finnish cleantech companies and 1 organization and collecting first-hand market information from author's working

experience and second-hand relative data and information. It is not only observing the entry modules that have been applied in those Finnish companies, but also exploring the decision-making paths those companies have gone through. It will be stunning journey to join in.

This thesis is divided mainly into four parts: theoretical framework --- theory ground and analysis structure; methodology--- research strategy: case study; analysis---integrated interview result and second-hand data picturing the patterns of decision making process; conclusion---research result comparison and collectively answers to research question. This thesis is also going to be a strong market-orientated study which can be a pragmatic research to help managers in this industry make better decisions in internationalization activities. May it will help managers to reduce risk, mitigate biases and predict environment uncertainties during decision making process and eventually approach to a rational and accurate decision.

A contribution of this thesis will make is according to study the three Finnish case companies, analysis their real-time situations based on transaction cost theory from assets specificity, internal uncertainties and external uncertainties, to explore the factors influencing their strategic decision-making process, present how these factors ground their behaviours from managerial and firm levels and influent their entry mode selection process and eventually reach performances. The research found that perception of business attribute of product or service selected for target market will ground the degree of resource commitment and lead to directional entry mode options which are under scope of local collaboration with different control levels for SMEs, like joint venture and local proxy. Further, degree of the customized of products, which determines the distance between core technology and mother company, decision makers' international experience and knowledge about target market, which reduces irrational bias, as distrust, uncertainty, overprotection, during decision-making process, and environment uncertainty and potential opportunity and risk, which vary in different industries though in the same target country, jointly and miscellaneously highlight the final entry mode among those options. Those elements form a complete strategic decision-making process based on transaction cost theory. If research on internationalization is a long line, this thesis is filling the space of molecules of this line after being magnified under microscope and then being part of this line.

2 THEORETICAL FRAMEWORK

2.1 Focus on SMEs' Internationalization

Recent years the attention of scholars on Small and Medium-sized Enterprises (SMEs) has been rising significantly because of the change of global economic environment and the development of technologies, e.g. internet and logistics, which accelerate the speed of globalization and provide a much wider platform with lower barriers to allow more SMEs to enter in. Internationalization patterns of SMEs has been well researched, studied and developed, as SME internationalization research: past, present and future (Ruzzier, et al., 2006), SMES' internationalization patterns: descriptives, dynamics and determinants (Swoboda, 2012), Internationalization patterns of small and medium-sized enterprises (Kuivalainen, et al., 2012). They have concluded a comprehensive and macro view of internationalization of SMEs.

Rather than taking a macro view of internationalization of SMEs, another stream of scholar is going deeper in another direction, concrete study: how SMEs cross the border and which modes have been applied. In international entry mode research, Brouthers and Hennart (2007) have concluded that there are four mainstreams: transaction cost analysis (Williamson, 1985), resource-based view (Erramill, et al., 2002), institutional theory (Erramilli, 1996; Pan, 2002) and Dunning's eclectic framework (Dunning, 1980). As traditional business study, most of early researches concentrated on large companies. But with the increasing numbers of SMEs, the research on the entry mode of SMEs is increasing as well, such as Brouthers, Brouthers and Werner (1996), Yi-Sheng, Po-Yuk, & Wai-Sum (2001) and Brouthers and Hennart (2007).

Further in practise, researchers (Jacob, et al., 2004) from four Nordic countries has pointed out the new role of academic research in SMEs, which may disclose the existing situation of SMEs in Nordic countries, explore the challenges and possible opportunities, close a number of gaps, provide detailed and feasible suggestions to complete the policies for SMEs, and call for more attention in this sector, while in the past 5 years, SMEs has represented 99% of all business in EU and generated about 85% new jobs (European Commission, 2018). On the other hand, some scholars, like Coviello &McAuley (1999), Murray (2000)and Brouthers &Nakos (2004) have implicated that SMEs are not smaller version of large multinational companies, but behave in totally different ways for the restrains of capital assets, human assets, international experience of managers, eta. Their first decision on international entry mode with profound interest and long-term implication.

2.2 The Application of Transaction Cost Theory in SMEs' Entry Mode Choice

Williamson (1981) has published the tenable and unambiguous conclusion and statement of Transaction Cost Theory, from its origin, antecedents, rudiments and initial solid frame. After that, Transaction Cost Theory has not been out of date but repetitively tested and applied, e.g. (Shrader, 2001; Brouthers, 2002; Brouthers & Brouthers, 2003; Brouthers & Nakos, 2004). It is one of the most popular theory in entry mode choice, besides the resource-based view, institutional theory, and Dunning's eclectic framework (Brouthers & Hennart, 2007). It has been suggested that transaction cost-based analysis of mode choice can helpfully estimate better entry mode for firms, given transaction costs theory is focusing on how companies are organizing, integrating, developing and managing its assets and activities internally and making the most profit from market (Williamson, 1985; Brouthers & Nakos, 2004; Robert & Greenwood, 1997).

In 2001, Lu and Beamish (2001) found the strong connection between entry mode usage and the performance of SME in foreign market. Based on that, in 2004, Brouthers and Nakos (2004) have further confirmed the connection by studying 450 Greek SMEs and 419 Dutch SMEs via quantitative research method, questionnaires. Brouthers and Nakos applied transaction cost theory (Anderson & Gatignon, 1986; Brouthers, 2002; Brouthers & Brouthers, 2003) to enhance the relationship between entry mode choice and SMEs' performance from perspectives of
1. asset specificity,
2. behavioural uncertainties, and
3. environmental uncertainties.

The three aspects are the core criteria of transaction cost analysis. They will be further introduced and their application in this thesis in later sections.

It is a quite comprehensive research work, which has covered the major factors generating transaction cost: market transaction cost and control costs. It has concluded that:

SMEs prefer equity modes of entry, e.g. jointed venture, when:
1. SMEs is making more asset-specific investment; or
2. Uncertainties of environment are perceived to be low or reduced; or
3. SMEs have developed a more developed system of internal control

SMEs prefer non-equity modes of entry, e.g. licensing, when:
1. SMEs is making less asset-specific investment; or
2. Uncertainties of environment are perceived to be high; or
3. SMEs have a raw system of internal control

The findings of Brouthers and Nakos have provide top managers and decision makers of SMEs a matter-of-fact and useful tool for making internationalization expand. Therefore, it is very interesting, valuable and important to explore further in this direction. However, Brouthers and Nakos also mentioned, there are some other limits in their research, e.g. industry, entry modes, variane, nationality of SMEs.

Further, Shrader (2001) has specifically focused the problematic and difficult transaction of know-how/key knowledge of high-tech SMEs, which have limited resources to hire enough physical and human assets to protect its know-how and in which managers, normally the funders of SMEs and main strategic decision makers, are influenced by bounded rationality and opportunism. The two perspectives can be attributed to asset specify (know-how) and behavioral uncertainty (bounded rationality and opportunism). Because the research target of this thesis is Finnish clean-tech SMEs. How to transfer their key know-how into a market with highly possible uncertainty and critical attractiveness is the crucial question in the decision makers' mind.

2.3 Transaction cost theory

Within the development of Transaction cost theory, scholars have gradually set "control" and "boundaries" into the central of their research. It is a quite natural development because firms, especially SMEs, cannot finish all the business activities of entering a foreign market alone. Firms have to decide which resources they should keep and develop internally, and which resources they lack and need collaboration with other partners, to select the appropriate entry mode and eventually to reach the most efficiency and best performance of their resources. When the very limited resources of SMEs, including capital resource, human resource and experience resource, restrain most of SMEs to consider wholly ownership, collaboration stands out its important role.

Asset specificity
When we look at Transaction cost theory, it is inevitable to pour the nature and attribute of business of SMEs into eyes. They are on the perspective of asset specificity. As Williamson (1981) has stated, "asset specificity is (both)the most important dimension for describing transactions." It influences what kind investment particularly for the transaction need to be made in the foreign market. Williamson came up with three asset specificities: site asset, physical asset (of-

fice, production line, sales distribution, etc.) and human asset (experience managers, administrative people, technology key person, etc). They are concluded as more "tangible" and fit into "a narrow range of transactions " (Anderson & Gatignon, 1986). In later study, proprietary knowledge has been raised up and frequently discussed (Anderson & Gatignon, 1986; Buckley & Casson, 1998; Shrader, 2001; Chen & Yu, 2002; Brouthers & Nakos, 2004; Murray, 2000). For the rapid development of technology industry or those industries related to technologies, firms are facing a more complicated situation when proprietary knowledge has become the core competence of them. In this thesis, research object is high-tech companies and proprietary knowledge/product are crucial strength of them in the market. It is natural to have a deep understanding on how companies define the border between its internal mechanism and outside partner and decide how much knowledge can be shared with the outside partner while still avoiding dissemination risk of knowledge.
Anderson and Garignon (1986) suggested and Chen and Yu (2002) later confirmed from their experimental findings that highly proprietary products/knowledge will managed more efficiently with entry modes with greater control. Greater control implies entry modes: wholly-owned subsidiary, dominant shareholders(different level of partnerships). Obviously, these modes are hardly acceptable to SMEs because of the high transaction cost, e.g. new office, new employee, training, market knowledge, administrative, etc. and unpredictable uncertainties/risk in the target market. More importantly, as Murry (2000) concerned, SMEs are restrained by their limited resource to behave like so. But when they slid into entry modes with lower control, e.g. licensing, proxy, franchising, implication of contract and relative business activities become more challenging.

Environmental/External uncertainty
Environmental/external uncertainty refers to the political, market drives, business cultures, mindsets, nature, etc. of domestic and target countries. Their influence on the entry mode selection is on a macro level and varies in different countries. Therefore, in order to make a better understanding toward the theme of this thesis, the details on environmental/external uncertainty will be discussed in section 3, market background.

Internal uncertainty
Anderson and Gatignon (1986) suggested that "Internal uncertainty exists when the firm cannot accurately assess its agents' performance by objective, readily available output measures. " This vogue statement becomes more understandable when we link this uncertainty to its corn points. Williamson has clearly pointed out that bounded rationality and opportunism have direct relationships to transactional factors, for people cannot behave purely rationally (Williamson, 2002) . When decision makers cannot receive enough, accurate, updated information about the information over their decision and in most cases of SMEs with limited resources to collect those information, manager's rationality will be influenced. When top managers have their own interest, cheating, distortion of information/knowledge, dearth of responsibility and other dishonest behaviors,

opportunism appears (Brouthers & Nakos, 2004; Williamson, 1985). Though it is still not possible to scope all the internal uncertainties, prior studies are trying to approach them and get a closer look. International experience (of firms), sociocultural distance, size of foreign business community in host country are considered as the internal uncertainties in entry mode chose and influence control of ownership of business in foreign market (Anderson & Gatignon, 1986). Prior studies, including Anderson &Gatignon, predominately focused on the research on large multinational companies and international experience has been considered as the international activities made by the companies and personal international experience of top management teams.

Along with the growing influence of SME, researchers realized that strategic decision-making process is changing as well. Unlike strategic decision-making process relying on a relatively mature decision mechanism within numerous top managers and in large multinational companies, strategic decision making process in SMEs is purely relying on the funders/entrepreneurs in most of cases. Therefore, academy has weighted their interest on top managers of SMEs. It has been proved that international experience (e.g. working in international business activities, living in foreign countries etc.), nationality, education, skills (e.g. foreign language skills) of top managers have strongly confirmed influence on the decision process of internationalization of SMEs (Musso & Francioni, 2012; Reuber & Fischer, 1997; Nielsen & Nielsen, 2011). Therefore, in this thesis, the study focus will lay on the role of top managers of SMEs and will take them as the major channel to study their firms.

2.4 This is a process

"Strategic decisions deal with the long-term health of the enterprise" (Bass, 1983) . Selecting among several entry modes based on external market situation and internal capabilities of organization is one of the most important strategic decisions made by top managers for an enterprise's development in a foreign market and will reflect favorably on other parts of the enterprise. How do decision makers make this kind of strategic decision? It is not a moment like snapping fingers. Nevertheless, making a strategic decision is a process (Harrison, 1996) . It means making a decision on the model of entering a market is a dynamic situation, rather than a foregone conclusion. It requires universal information, solid supply of finance and time, sufficient experience. It is already extremely difficult for big companies. Big companies will also need to learn from their failure and adjust their strategies consistently. As Edith Olenjnik Bernhard Swoboda (2012) suggested, after reviewing the internationalization patterns of 3,500 German SMEs, internationalisation is still a challenge for SMEs. For SMEs with the dearth of capability of enough information acquisition and resource acquisition and limit of cognition of decision-makers, the situation is even more

challenging. It is hard to make a perfect decision at once. However, there are still many SMEs successfully is conquering or have conquered the challenges. It is worthy of taking an observation of those SMEs in the "Process" or a review of those after the "Process". This mindset will greatly help later understanding and analysis work with a developing insight.

2.5 Motivation of Thesis

In Finnish economic structure, 99,8% of enterprises are SMEs, which have contributed 62% of added value of Finnish economy during 2010-2015 (Small Business Act for Europe , 2017). High-tech companies in environmental protection sector have been listed in national strategic development. They will be the most intangible asset for this nation. With 5 million of population, which is still dropping, in domestic market, Finnish SMEs have rather sensitive sense of internationalization. Studies on internationalization of Finnish SMEs will strengthen these SMEs' competitiveness at international stage, find possible opportunities for better development, and create a heathier environment for their growth. Fulfilling the blank area in academic research, Offering academic research based on real cases and providing efficient suggestions for Finnish government and companies are the fundamental interest of this thesis.

After economic crisis, Finland has gone through a long way to recover and still is facing high unemployment rate. Finnish government is knee to seek the solutions. Being part of EU and neighbor of Russia, Finland is being a difficult and sensitive political place as well. Therefore, it starts looking for a further cooperation with one of the most powerful countries, China, who needs more friends from Nordic as well as great technologies to solve its serious environmental problems. China's nimble and friendly reaction confirms the potential and long-term meaningful cooperation.

From academic perspective, there are rare researches in this specific sector and in such specific environmental technology industry. Given Finland and China has a long cultural distance but huge interest and potentials to each other, this thesis is going to study Finnish clean-tech SMEs entering Chinese market, by review the behaviours of clean-tech firms in entry mode selection process from perspective of asset specificity, behavioural uncertainties and environmental uncertainties, via qualitative research method, case study and first-hand working experience.

3 MARKET BACKGROUND

3.1 Cleantech market potential in China

Cleantech is the product or service, which can improve energy consumption and performance, productivity and efficiency of industry, transportation and daily life, and reduce pollution to environment. (Wikipedia, kein Datum) (The Climate Group, 2014) Rapid economy growth makes us sacrifice the purity of our clean and healthy environment. Until we have paid the huge price with forest, water, energy and health, cleantech start getting attention and interest from people.

In 2014, World Bank projected that for next decades in 145 developing countries the market size for clean technology and relative business is about 1,6 trillion USD out of 6,4 trillion in total, which is specially for SMEs to emerge. By 2023, there will be about 1,5 trillion USD invested in Chinese market. (The World Bank, 2014) (The Climate Group, 2014) Beside investment coming over from oversea, Chinese government has also made its resolution of changing environment of China. In 2016, total investment in environmental prevention in China was over 1.85 trillion RMB, of which over 45% was coming from Chinese government. Though the growth of green investment is still growing very fast, it is still a long way to reach the estimated market size 17 trillion RMB by 2020. (PWC, 2017) Below is a bar chart (Figure 3-1) from report Chinese Cleantech Market Opportunities 2017 from PricewaterhouseCoopers, dedicating the most popular cleantech sectors in Chinese market: waste management, water, air, monitor, energy efficiency, etc. They are also reflecting the emerging serious environmental problems on the land, 9.597 million km2.

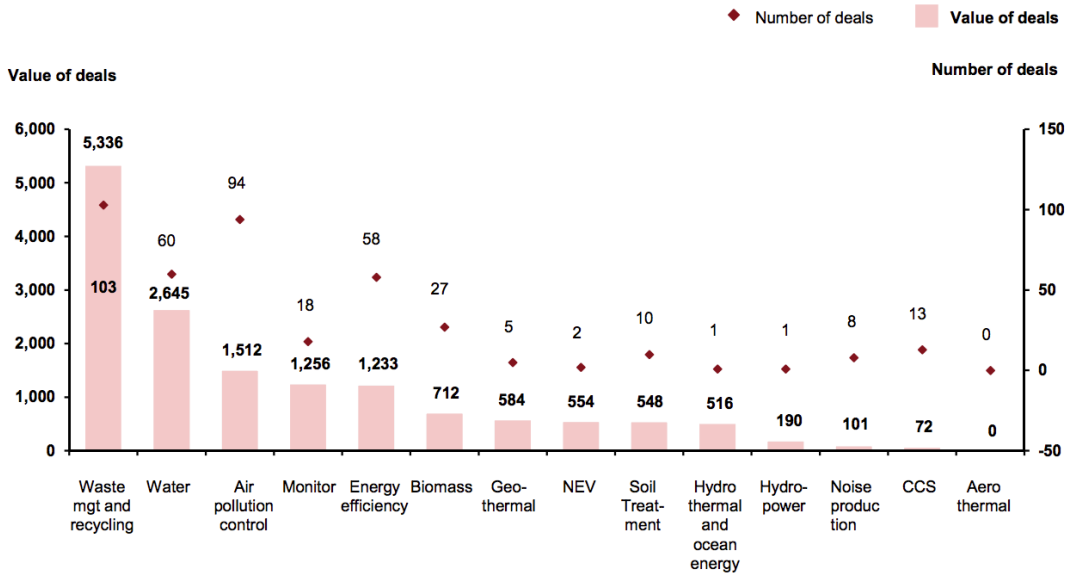

Figure 3-1 investment from financial investors in China's clean technology, million RMB (PWC, 2017)

China, with the largest population of 1.33 billion in the world, generates 152.14 million tons of municipal solid waste (hereinafter referred to as MSW) per year, of which most goes to landfill. According to The Earth Engineering Centre of Columbia University has calculated that every 10 tons MSW takes 1 square meter to deposit. (Themelis & Zhang) (Hoornweq & Bhada-Tata, 2012) Lacking of proper professional waste treatment technology and management brings Chinese citizens and government serious problems on environment, living quality and land use. In Chinese national strategic plan, 12-five-year plan, "Notice of the General Office of the State Council on the Issue of Infrastructure Construction Plan for Treatment, Recycling, and Reuse of Urban Sewage", it shows that the central government of People's Republic of China (hereinafter referred as P. R. China) will invest 263.6 billion RMB (about 33 billion Euro) on MSW waste treatment in national-wide region and cooperate with local government to improve the MSW treatment and people's living life. (National Development and Reform Commission of the People's Republic of China, 2012) That indicates the government's determination on MSW treatment, but also those urgent problems waiting for solutions.

PM2.5 is an index for fine particles which are 2.5 micrometres in diameter or smaller and able to enter human body, hair and blood and cause series of irreversible lung and heart problems, and possibly to death. Normally, it is ok to have PM2.5 below 50. When it is over 151, it is deemed unhealthy. (United States Environmental Protection Agency, 2017) From China air quality management evaluation report 2016 (Hongxing, et al., 2017), Beijing, Tianjin, South of Hebei Province, inner land of Shandong Province and Henan Province are the most PM 2.5 polluted area. Some area in winter time could have PM 2.5 over 1000. During 2016, Beijing had only 198 days with healthy air quality and the rest of days are polluted more or less and residents are not encouraged to be

outside. Students have to read the index in order to know if they are allowed to be outside.

Action speaks loud than words. Those dejected facts needs more help and actions than complains. The strong calling from the market is for those technology pioneers to contribute and improve the environment, for there is only one Earth.

3.2 Nature of Cleantech Market in China

China is a mysterious market. In cleantech market, it is even foggier, because since the implement of "Opening door" policies 30 years ago, most of companies as well as government put their development strategies on economic development. After the collapse of old Chinese feudal society, which had lasted for over 50 centuries, World War I, World War II, establishment of new China, cultural revolution, China has suffered miserable poverty, hunger and been behind the times. Therefore, when China started Chinese economic reform in 1970, it has GDP 92.6 billion USD as US with 1.076 trillion USD (WikiPedia, 2018). Depositional desire for wealth has leaded China into a new era. Along with the development in past 40 years, China has become the second large economy in the world with GDP 11.2 trillion USD in 2016.

On the other hand, China's development has been criticized for its serious environmental problem. Environment protection had barely gotten any attention until very obvious results of serious environmental pollution start to influence the life of public. China's first Environmental Protection law was published in1989. Other relative laws have been constantly perfected and improved. Implication and cooperation among different governmental departments are still on the way to be mature.

Therefore, this industry is too young but extremely popular in China. However, this industry is less than 30 years old and still on the way of forming a stable market environment. Unlike retail or other business, most of environmental-protection technologies, projects and products are involved in big engineering projects, in which government is heavily involved in the relative policies establishment, healthy business module forming process and public complicated bidding process. Given land in China is having public ownership and government has the right to decide the use of all the land according to law, the gate fee for treating waste is priced by local government as well, free market mechanisms are still not properly applied in this market.

This kind nature of this market makes the barriers of entering more difficult for foreign small companies which are newly born. Huge amount of valid information, limit sources, limit channel of gaining market information, limit time and finance can probably block a start-up to make a rational decision in a sys-

tematical way. On the other hand, they have to recognize and decide fast and respond to the market.

3.3 The competitiveness of Finnish cleantech at international level

In *The Global Cleantech Innovation Index 2017* (WWF, 2017), in which report country has been studied and measured through four parameters: General Innovation Draivers, Cleantech Specific Innovation Drivers, Emerging Cleantech Innovation, Commercialized Cleantech Innovation, China is ranked as 18th but Finland is ranked as the second of the most innovative cleantech country in the world, right after Denmark, leading before USA , Sweden and Canada.

In Figure 3-1, it has displayed that China has a unsatisfactory performance in cleantech innovation for the weak development of cleantech in the past half century. Its scores are same as average or slightly over. The report has granted "stable" for this situation, which suggests that in the last several years there has been barely changes in Chinese cleantech development. For its forehead said historical reason, the environment, policies, mindset for cleantech development are not ready or mature.

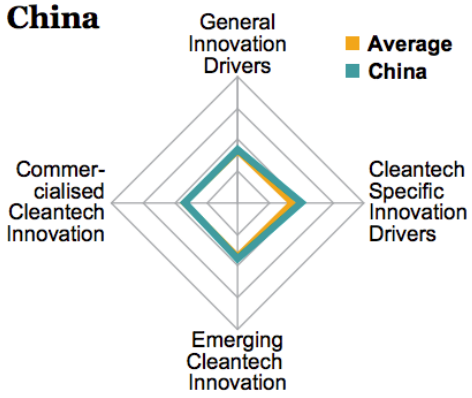

Figure 3-2 China in Cleantech Innovation Index

As it has been shown below in Figure 3-2, Finland has strong performance in Cleantech specific innovation drivers and emerging cleantech innovation for Finnish government has made "state support" to provide research and development grants and funding tools, subsidies, tax benefits, state investment and other public support to cleantech researchers. In other words, Finland has a great environment for breeding, sprout, research and development of cleantech (Perfilyeva, 2017) . Over one third of government research fund has been used in cleantech research sector. (Wang, 2017) But it has still problem to convert the

advanced technology into commercialized innovation. Finland has 5 million population. The home market is too small for Finnish cleantech's further commercialized development.

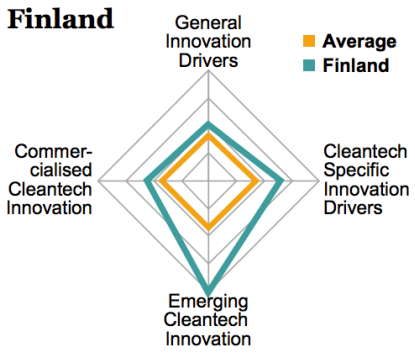

Figure 3-3 Finland in Cleantech Innovation Index

To compare the indexes of two countries, it is natural to make reciprocal recombination of the two markets. From the leaders to privates of both countries have seen the huge changes. Year 2013, Finland National Technology Innovation Bureau TEKES and International Cooperation Department of China Environment Ministry have signed memo for improving air quality in Beijing and launched Bueatiful Beijing Project. Year 2015 is the 65th anniversary of diplomatic relationship establish between China and Finland. In the interview of Finland President Sauli Niinistö for anniversary celebration, he has addressed that Finland has invested huge resources in its cleantech industry and one of the key technologies to be introduced to China and improve both-side trade relationship is cleantech. After that, more and more Finnish companies are swarming into this red ocean and this is how this thesis begins.

4 RESEARCH DESIGN

4.1 Research Method

Research questions of this thesis are:
- How is the strategic decision-making process of Finnish cleantech SMEs entering China?
- What are the factors influencing the top management in the decision-making process?

To answer the two questions, it requires a research method which can help researcher comprehensively understand the whole decision making process with all details of each research target and provide a replication in a rich, real-world context. It cannot be reached within a massive quantitative research in a large scope. "Qualitative research is highly descriptive, emphasizes the social construction of rality, and focuses on revealing how extant theory operates in particular examples" (Eisenhardt & Graebner, 2007). Since this thesis uses transaction cost theory as theoretical support and analysis ground but researches on internationalization of SMEs in cleantech industry is not supplement and at an initial stage, it is more interesting to deeply study some prominent examples and find out inductive insight for organizations and other researchers in the same field. Situation of Finnish cleantech in China is still chaotic. Firms and academy need studies with rich case studies to dissect successful and unsuccessful real experience and generate useful theories and tools for their future development and research. Studies like Baranovskaja (2015), Öhman (2014), Asemokha (2016) which studied in the similar area with different research directions have all applied case study method. Given Gephart (2004), Suddaby (2007), Siggelkow (2007) and Eisenhardt&Graebner (2007) have all emphasized the persuasion power of case study and encouraged researchers lean on cogent explication from real-time experience, qualitative and inductive research method is the research strategy applied in this thesis.

Semi-interview is the major way of data collection for interview is regarded as the best way to incorporates from everyday phenomena like intermittent and strategic decision making process (Eisenhardt & Graebner, 2007). With intensive and close interaction with the decision makers, interview data has high value which can straight reflect real thoughts and impressions of interviewees and mitigate biases, uncertainties, slapdash answers and hesitations which may more often happen in other data collection way, like survey. Eisenhardt and Graebner (2007) pointed out that interview from real-time case with other sources as observation, archives and news can help decrease retrospective sensemaking and impression management. Therefore, second-hand data is widely used in the research to enrich gradation of background information

support, later analysis stage and offer readers more a wide view on these case companies. Major resources of second-hand data are from homepage of case companies, relative news websites in Finnish, English and Chinese, article database, market analysis, etc. Another advantage of author is that author has been working in a Finnish cleantech start-up for 4.5 years until now and built a solid networks from which author can collect various forms of information and informants during the working life. It can great help author more accurately search out the wanted information.

4.2 Sample selection

CleanTech Finland is a national cleantech project supported by Finnish government and aiming to promote Finnish clean technologies into global market as well as attract investment into Finland (Clentech Finland, 2016) (Wikipedia, 2015). As the most important cleantech hub, CleanTech Finland has gathered almost all the talented clean technologies and companies in air quality, bioproducts and materials, clean water, clean web and IOT, energy and resources efficiency, renewables and smart grid, smart transport and logistics, waste-to-value, 8 clean technology categories, from Finland as its members, in total 293 companies by 31st May 2016, in case there are more companies leaving or joining into this group. Therefore, research sample collected from Cleantech Finland are having relatively mature established business model and market orientation, that significantly matches the pre-condition of research targets in this research.

There are in total 93 companies listed in the website of Cleantech Finland and most of them are involved in more than 1 clean technology categories, see appendix 2. By studying the current business situation with Chinese market and products of the 93 companies one by one, fliting by size of company, there are 7 SMEs selected for this research. Interview invitations were sent to the 7 companies via email. 3 of the 7 companies positively responded and interviews have done accordingly. One company is making master plan for eco-city. One company is providing energy-saving solutions with a key drive case product. One company is having a joint venture with a Chinese partner and setting up a production line in China. The three companies represent different natures of business and the maps their businesses are driving through, entering Chinese market.

Besides studying companies, a third-party institution is also playing a very important role in the process of entering Chinese market. In small countries, like Finland, with limited sources and domestic market size, the role of this kind of third-party institution is highly integrated and usually played by government. It is a witness, assistant, organizer and point of networking for all Finnish companies, which are entering Chinese market. Therefore, Jaani Heinonen, head of

region East Asia, Finpro China has been interviewed and given unique experience and views for the research question.

Thus, this thesis is going to study 3 companies and 1 organization all together.

Company 1. Tengbom Eriksson Architects
Company 2. WE TECH Solution
Company 3. LifaAir
Organization. Finpro China, Head of Region East Asia, Jaani Heinonen

4.3 Data collection and analysis process

As mentioned in section 4.1, semi-interview is the major data collection means. Interviewees are all CEO of the case companies. Thus interview time is precious and must be used the most efficiently. Solid preparation and background prestudy are necessary to be done before interview. A group of leading questions (see 7 Appendix 1) are designed based on research questions and sent to interviewees before interviews and agreed by both sides. Company size, core business, company history, activities in China, personal background of interviewees have been studied in advance. Leading questions are specifically formed according to background information as studied before. So interviews can focus on the core research topic and it is no need to waste time to discuss such knowledge which can be searched from internet or other second-hand information resources.

Interviews with Company 1, 3 and Organization had been done face to face and the one with Company 2 on Skype because of limit of time and location. All interviews have been recorded by voice recorder and author had taken notes during interviews as well. Interviews followed the order of leading questions. However, author extended questions when it was needed to search for more information and "knee-jerk" reaction. Designed interview duration was 30 minutes, but the actual interview average duration was about 50 minutes. Interviewees ware inspired to share more. Record transcripts ware written out from record for later analysis.

In analysis process, the first part is company introduction including the basic information of company, internationalization activities in target market, background of CEO, selected entry mode and its performance, etc. It frames the case analysis phenomenon. Then the case is organized and analyzed from three key points, assets specificity, internal uncertainty and external uncertainty mentioned in theoretical background. Though transaction cost theory is the ground theory of this thesis, during analysis, author is not testing applicability of this theory in cleantech SMEs cases, but observing and searching for the subtle differences if there are. In the end, a horizontal comparison summary in words

and figure will be made and provide a big picture for readers to check the differences of each case and track their decision-making patterns and compare.

5 RESULT ANALYSIS

5.1 Company 1. Tengbom Eriksson Architects

Introduction:
Tengbom Eriksson Architects was founded in 1979 by Architects Patrick Eriksson. For Mr. Patrick Eriksson is the interviewee in the research interview and the most soul person of Tengbom Eriksson Architects' activities in China, which happened around 2010. Later there were some iterative changes to company's top management, shares and strategy guidelines. Therefore, this interview and case study would focus on Tengbom Eriksson Architects' most vivid activities in China and draw its development track there. By 2013, company employed 32 and locates in Helsinki until now. Tengbom Eriksson Architects' previous partner and now joint owner Tengbom is a famous Swedish architect company, Tengbom, located in Stockholm.

Given Chinese government stands for urbanization and calls people living the rural area to move to city for a more collective population management and service. People seeks more social resources and opportunities, better payment and life in cities, despite it is sometimes extremely difficult to stay. By 2018, urban citizens in China reaches over 0.8 billion and still increases. With this trend, since 2007, Chinese new residence property market has dramatically increased and the highest increase rate of Chinese residence fixed asset investment had been 50% at national level. Urbanization has significantly pushed the development of Chinese cities, especially the first-tier, like Beijing, Shanghai, Shenzhen and second-tier cities. But it brings unbalanced resource distribution, densely-populated living condition and heavy environmental pollution as well.

While people in those windless metropolis are eager to a better life quality, concept of eco-city entered into China. Professor Eero Paloheimo as pioneer in eco-city design and development field was the first one bringing "eco-city" from pure Finland into China and constantly dedicates his efforts into it. Tengbom Eriksson Architects follows Professor Eero Paloheimo's footprints strode into China.

Findings and analysis:
During interview, two key projects, Mentougou project and Kunming project, and a recent good news of Tengbom Eriksson Architects were discussed between interviewer, author, and interviewee Mr. Patrick Eriksson.

Mentougou is 30km away from Capital Beijing, China. Mentougou local government has signed 24 projects agreement with Chinese and other foreign companies. Mentougou local government and Finnish government had signed the agreement on this project in 2010 and it was estimated to attract 1 billion euro

investment to build up an eco-city having high-tech industry part, health care center and wild training center. Tengbom Eriksson Architects joint this project with support of Finnish government, VTT and professor Eero Paloheimo. Their competitors are from Denmark, France, Canada, Sweden, Germany, etc. Though Tengbom Eriksson Architects' design had entered the final competition round, unfortunately it did not win to the end.

Picture 1 Tengbom Eriksson's design for Mentougou (Source: designboom https://www.designboom.com/architecture/eriksson-architects-mentougou-eco-valley/)

Kunming, southwest in China and Jyväskylä, in middle Finland have been sister cities for over 10 years. Naturally Kunming has a closer relationship with Finland. In 2012, Tengbom Eriksson Architects designed a master plan for Cheng Gong City, southern subarea of Kunming. The aim of this eco-city is to "enable ecosystems from the mountain and inner areas towards the lake, and to shape the building environments in clearly orientated structures on both sides of the south highway." It is a brilliant idea to solve difficult water pollution problems, which had lingered there for a long time, and provide clean natural environment to residences in an elegant way. Mr. Eriksson had visited Kunming several times to listen to customer, observe the site, approach the customer and explain the great idea behind their design. It had deeply touched Kunming's government and eventually won the bidding.

Picture 2 Master Design of Cheng Gong Ecocity from Tengbom Eriksson

After some unsuccessful experiences in Chinese market and some internal administrative changes, Mr. Eriksson retired to step in China in 2015, attending Hebei Foreign Conference on International Energy and Urbanization with a Finnish delegation, and 2016 won 3rd prize at Nanjing Sino-Finnish Cooperative & Exchange Center Prize Ceremony. The competition was organized by the Embassy of Finland, the Chinese Society for Urban Studies and the Nanjing Southern New Town Development and Construction Management Committee. It seems a new chapter has been released. So far, there is no further news from the two events.

Before the following analysis, it is necessary to have a general understanding of "eco-city" and the nature of Tengbom Eriksson Architects' business. "Eco-city" is a concept of a city built from the most environmental protection means, eliminating the carbon consumptions, utilizing local distributed green energy supply, connecting people with their most daily need, like shopping center, hospital, schools, agricultural, waste management, water treatment and supply, etc. so people can reach natural and urban life easily and simultaneously. Building an eco-city demands forward-looking planning, ultrahigh leading skills, tight connection and cooperation between different departments of government and social capitals and huge investment. An eco-city could be a life-long project with different generations of people, development of technology, changes of climate and economy.

Tengbom Eriksson Architects, combining cutting-edge clean technologies and green concepts, provides the initial, elegant, general concept design and drawing to Chinese customers and later relative services for change and improvement from architectural perspective. Customers play an extraordinary important role in the whole project, looking for finance, land selection, construction permission from local government, construction subcontractors, other clean tech suppliers, etc.

- Assets specificities

Unlike other industries with tangible products involved in production line transaction and relative training and quality control, the most specific asset in architectural design is human asset. Normally business trip is adapted by Tangbom Eriksson Architects. But soon, Mr. Eriksson realized it was not suitable for in China the accompany with customers cannot be satisfied by few or even frequent visit but staying with them. It demands a long time to approach Chinese customers. Mr. Eriksson showed it was a helpless situation. Swedish government supported Swedish architectural companies by connecting them to Chinese government and potential customers through Swedish embassy in Beijing and granting those companies several million euro in total which is sufficient for them to stay in China for a long time, like months. From Finnish government, it is too challenge to get such amount of financial support. Finnish government cannot hold their hands till that far.

Balancing between present company situation and tempting but vague opportunities, Mr. Eriksson could only fly to China when it was needed. They tried to hire Chinese employees, project coordinate and architect.

- Behavioral uncertainties

Mr. Patrick Eriksson retried on 9th Feb 2017 and still contribute as senior consultant. This was his second time of retirement. The first time was in 2014. In 2015, company had some internal change and Eriksson decided to retake the wheel and lead the company into China again. Since then Swedish company Tengbom Architects has become one of the major shareholder of Tengbom Eriksson Architects. Mr. Eriksson established this company in 1970s and has achieved many extraordinary projects and achievements indigenously and internationally. His abundant international experience and high education background enables him capable and skillful in internationalization activities.

During interview, Mr. Eriksson completely expressed his interest in Chinese market. From perspective of a high-profile architect, he has the sense of mission to contribute his efforts and ambition to make difference in the most popular city in the world with serious environmental problems and city planning. However, complicated Chinese networks (Guanxi) in business and government would never be an easy thing to hand over. Mr. Eriksson shared his “Joulu Kuusi” (Christmas tree in Finnish) strategy for this situation, which he learnt from one Olympic-win sailor.

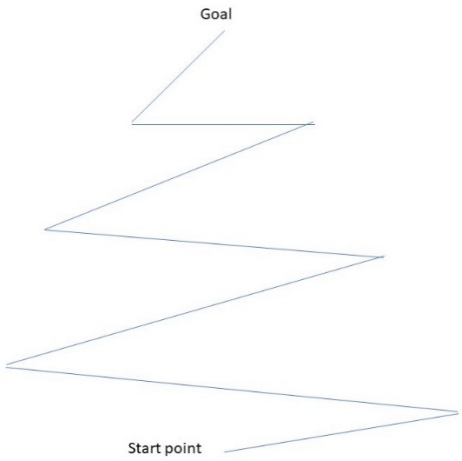

Figure 5-1 Joulukuusi strategy

Mr. Eriksson explained: "the goal is clearly seen from start point as you know what you want from the beginning. But because of the influence of wind and current, it is now possible to reach the goal in a straight way in ocean. You must adjust your sail and direction which might not point to the final goal directly. When you don't know how or where to begin, you still need to rise your sail, and try it in practice. Later, you will get closer and closer to you goal by repeating the adjust moves. " In Chinese market, in such field, everything about eco-city was new for government, people, urban designing administrative and international players. The only thing you can do is to try and adjust your sail against wind and current.

So far, there has been no any successful eco-city established, though there have been more than 10 eco-cities publicly launched for over 5 years. Here eco-city means the city which really is built to organize the human activities and nature development in a harmony way, reduce carbon and oil use, manage all waste in any environment-friend way, not just to add more parks or artificial pools in the between of towering buildings. It is hard to say they all failed. At least, they all are moving extremely slow. However, there is no absence of tenacious people like Mr. Eriksson, who dedicate their efforts constantly to the end.

- Environmental uncertainties

The sense of helplessness suffused the interview for it was obvious to sense the invisible pressure and barrier from that market. Following Mr. Eriksson's Joulukuu strategy, setting a target is the first step. Eco-city project belongs to city planning and designing, the duty of local government. Local government and relative design administration are the costumer Mr. Eriksson approaches. In construction industry, customer would only pay the design fee under the certain circumstances of decision of embedding the design in practice. It is not just a will but a serious rigorous decision to implement.

Like all public infrastructure project in other countries, Chinese local government holds a bidding process and calls interested developers and subcontractors to join in. Developers are only attracted for visible profit. On the other hand, local government is alternated for every five years. The decision maker from government could only be responsible for their decision for five years. The next replacement officer normally would like to have their own political achievement rather than to accomplish the former officer's. It is riskier to accomplish the unfinished projects with unknow difficulties left from the former. As mentioned before, eco-city project would last for several decades or even longer. Government, in a role of leader and resolution, needs to present its perseverance and pass it in generations. When the understanding of eco-city is still about simply adding some parks, planting more trees and digging more artificial lakes, the resolution is hardly formed or formed in a very fragile way. This is the most difficult barrier for all eco-city designers in China.

5.2 Company 2. WE TECH Solution

Introduction:
WE TECH is a Finnish company, based in Vaasa, providing variable frequency drives and permanent magnet generator technologies for shipping industry and helping ships operate more energy-efficiently and safely. It was established in 2009, not relatively young. However, in 2016, its turnover was 6.188 million euro with only 13 employees and 8 partner offices in another 8 different countries. Their services and delivers have covered more than 50 countries.

Shipbuilding and marine industry is quite complicated for the owner and main constructor are usually not the same one, neither from the same countries. It is a global-born business. Different subcontractors from all over the world try to be involved in and constantly approach constructors to get the order. Purchase decision are made by owner or representative of owner through thick hierarchies. For example, a Brazilian ship owner decides to build a ship, which is designed in Germany, but built in China and running in South America. This made people in this industry inadvertently and naturally interact at an international level. It is arduous to define firms' market boundary and official time to enter a new territory. Therefore, in this case, WE TECH could not precisely retrospect the time when they started doing business in China and it is not necessary to stick on it. Its business model would be more interesting to focus on. Exclusive agency has been greatly employed in WE TECH's internationalization strategy.

Findings and analysis:
According to WE TECH press information, it became active in Chinese market in 2014. It has constantly delivered 5 solutions to ships built in Chinese shipyard or Chinese ships by 2018. They have participated exhibition Marintec China 2017 end of December in Shanghai. It headquarters in Vaasa, Finland and manages its international branches. One of them is in Shanghai and its manag-

ing director is a local Chinese. WE TECH has granted exclusive sales right in the territory to this agent in the very beginning when they confirmed their corporation relationship. WR TECH's managing director Mårten Storbacka pointed that they got to know the partner through their business networks and WE TECH deemed the capability of this agent. They have kept this stable relationship until now.

- Asset specificity

Asset specificity is based on the nature the product or business. WE TECH offers technology solutions according to ships type (cargo ship, cruise, engineering ship, etc.), sailing area (fresh water or sea water; equator area or icy area), sailing speed, propeller speed, engine capacity, gear box capacity and other customized requirements of the target ship. The solution helps ship to organize its engine, gear box, energy distribution, optimize the ship operation condition and save energy.

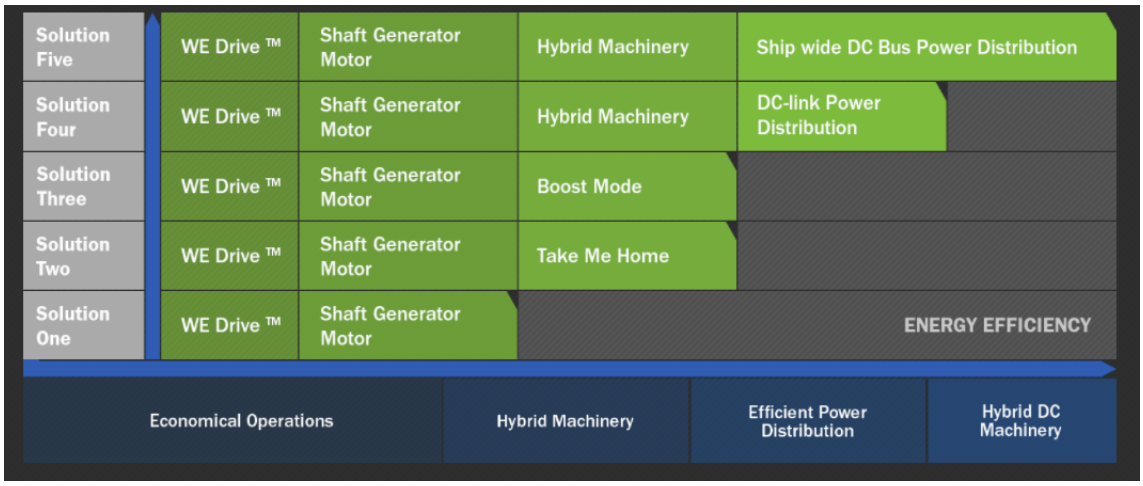

Figure 5-2 WE TECH solutions matrix

Above Figure 5-2 displays the solutions WE TECH provides to customers based on the type of ships and demand for the ship conditions, collectively five solutions, of which WE Drive is a tangible distribution box intergrading the solutions and installed in ships with gearbox and motors. WE TECH guides customers how to utilize its current facilities and purchase other necessary equipment and facilities. WE Drive's manufacturer and testing company, Switchboard, employing over 360 globally; Permanent Magnet Generator/Motor's manufacturing and testing company THE SWTICH, employing over 200 globally; Frequency Drive manufacturing and testing company, VACON, employing over 1600 globally, are all allocated in the same industry area in Vaasa. This enables WE TECH has a close control of the production process and product quality as well as makes WE TECH evade the burden on heavy investment of production assets.

WE TECH can finish the design work basically in office, besides some necessary onsite visiting and technical meeting with customers; then they deliver the pro-

duction order to next manufacturing and testing company. If it is needed, on-site supervision service. location assets, physical assets and human assets are not really needed to transact into the target market China. Therefore, in this case, transaction cost risen by asset specificity is relatively low. As Burgel and Murray (2000) hypothesized, highly customized productions are more likely to be delivered directly from supplier to customer for "the professional and tacit knowledge required to configure a product according to customer's detailed specification are more likely to reside with the manufacturer than with the intermediary." WE TECH holds its core technology and the close touch with its customers. Mårten Storbacka explained that there is no need to invest more assets there so far. With limited resource and technological advanced products, WE TECH choses to collaborate with Finnish local production partners and global talent sales proxies.

- Behavioral uncertainty

Shipping industry and shipbuilding industry have a long history and played a decisive role in human being's development and territory expand. Ship has been the most important transportation means for human being's internationalization. However, there is a long-term downturn for it after 2008. Global shipbuilding reached its development peak in 2008, at 392.9 million GT by end of the year. Alone with market saturation, effected by price of oil, rise of freight logistical means and customer's demand for speed, in each following year, the new order of ships has declined to 184.1 million GT by 2012. (Council Working Party on Shipbuilding (WP6), 2016) On the other hand, climate change and ocean contamination touched people's nerve on climate and ocean environmental protection. No matter from academies (OECD Council Working Party on Shipbuilding (WP6), 2010) (Klein, 2007) (Papaioannou, 2003), or from industry, environmental protection issues started to influence shipping industry and shipbuilding industry. Many shipbuilding companies started to offer more green and cost-efficiency solutions to ships. Mårten Storbacka is definitely one of the peers.

With over 12-year working experience from Wärtsilä, a world leading listed company in marine and energy markets, Mårten Storbacka left Wärtsilä as General Manager and established WE TECH. Storbacka nested his strong networks in extensive networks of experts in Vaasa in his previous working life. WE TECH sales manager Martin Andtfolk had worked in Hogia Ferry System, a mission critical system to travel, transportation and tourism for over 10 years. Peter Lindström, another WE TECH sales manager, had worked in ABB for over 14 years. This experiential management team embeds mature strategy-making process and sales management and channel from their previous working experience into WE TECH's business. Meanwhile they have the freedom and flexibility to compress massive administrative procedure and improve it into a way which is more cost-efficient and manageable for the small team.

Anderson and Gatignon argued that the firms collective international experience positively influences the control degree of its foreign business. Marine, shipping, and shipbuilding industries have their international nature and people working in this industry are naturally connected at intensively international level. WE TECH's sales team is formed by experiential talents. On contrast, they chose a low control mode in all foreign markets. This may be influence by different social cultural distances between host country and foreign countries, and limited resources of WE TECH.

- Environmental Uncertainty

WE TECH's target customer is owners of different vessels, which are normally logistic companies, marine engineering companies and tourism companies allocated all around world, because owners of different vessels finally decide how to optimize their vessels and what to purchases for that. By this definition, WE TECH dose have clear territory division. However, as foresaid, shipbuilding is a complicated and long process. Uncertain influential elements are flowing in the air.

The demand of solutions that improves energy consumptions like WE TECH is influenced by ship market, which is chain reaction of activeness of world economy. When world economy is vivid, a large amount of transportation demand from international import and export could only be finished by ship logistic. On the other hand, expected passengers to international ocean cruise travel in 2017 is 25.8 million, increasing significantly from 17.8 in 2009. (Cruise Line International Association, 2016) Accordingly, ship owners would invest their ships for a better energy-efficiency operation when ship demand is positively influenced by world economy. So far, shipping and shipbuilding industry are in a wait-and-see situation. Some unpredicted political and trade conflicts, like between China and American can also sensitively effect these industry.

Another threaten/uncertainty for WE TECH from external environment is large shipbuilding companies which develop those kinds of solutions and have incomparable networks and resources for them to reach any customers, like Storbacka's former employer, Wärtsilä. Storbacka expressed that their expertise and impressive list of references would be great proof of their capabilities to their potential customers and in fact more small and middle size companies would like to cooperate with them.

5.3 Company 3: LifaAir

Introduction:
LifaAir is a high-tech Finnish company, founded in 1988 in Helsinki, focusing on improving indoor air quality. Their products are widely used in hospital,

military application, mansion and households. Wide product range is quite interesting to pay attention in later the observation of its development. LifaAir is an active international company, of which 90 percent of turnover, 10 million, is coming from oversee market (Team Finland, 2017). In 2000, LifaAir has established its Asian Headquater in Honkong and later expanded into other Asian countries. It started to offer air purification equipment for hospitals, hotels and other public buildings in Hongkong, Macau, Singapore, etc. Since then, CEO and founder of LifaAir, Vesa Mäkipää, who had been lived in Hongkong for 8 years, was the interviewee in this interview. Offering the ventilation equipment for sport hall and athletes' accommodation became the most important milestone in history of LifaAir in China. Later in 2008, they have contributed air quality improvement work in Beijing Olympic Games, responsible for cleaning air in sport halls and athletes' accommodation facilities.

Though LifaAir had achieved quite outstanding performance in Asia market, it still realized that its resource limited it to distribute its special designed products for middle-class Chinese households in a wider territory and in a more efficient way. Therefore, in 2015, LifaAir chose to establish a joint venture with a local Chinese company. This step leads LifaAir to officially enter into mainland China market. This is the core matter this thesis is going to study.

Findings and analysis:
In end of 2014, Vesa Mäkipää leading LifaAir participated event Beautiful Beijing, which was hold by TEKES, Finnish Funding Agency for Technology and Innovation, and Finpro, to connect Finnish and Chinese companies in cleantech sector. From there, Mäkipää had met Edifier and soon they both sides confirmed their partnership. In October 2015, they announced news of joint venture publically in Beijing. LifaAir LifaAir received 21 million euro investment from a Chinese LifaAir adopted Joint Venture model with a local Chinese company, Edifier, of which the core business is headphone. Edifier has 70% share of the joint venture so as LifaAir 30%. The joint venture company is located in Dongguan, Guangdong province and employees over 70 people by interview time. It is meant to manufacture air cleaning system in China. Its annual production capacity is 500,000 units of air cleaning units, 500,000 units of automotive air filters and 5,000 units of air cleaners for IV machines.

LifaAir launched 4 air-purification products for household in 2015. Until 2018, it has expanded its product range into individual products (mask), household smart air purification robot and car air purification units and cooperated with the very top Chinese e-commerce, Jingdong, WeChat and Taobao to help them distribute their products. In Figure 5-3 displays one of the household products in its own website. It shows the picture of the product on the right and product codes and other basic product information on the left. Under the product information, the three icons strand for three e-commercial channels, red Jingdong, green WeChat, orange Taobao. Customers can purchase the product direcly by clicking those icons. In 2017, there are over 533 millions out of 1.3 billion population online shoppers in China (ableau, 2017). LifaAir's strategy definitely

matches its target customers' shopping habits. It has been estimated that in next two years since 2017, Lifa Air's turnover will reach 25 million euro. (TeamFinland, 2017) Mäkipää said it is a real breakthrough in company's history.

Figure 5-3 LifaAir product LA350 display on its Chinese website

How could they find this good local partner and decide so fast to take joint venture model which leads them to a great success? It was the core theme during the whole interview. "lucky guess" is definitely not the proper word for it. It seems that author found the clues in following perspectives:

- Assets specificity

LifaAir provides indoor air cleaning devices. Considering the major customer target is households. It is business to customer (B2C) module as forehead said. This business module has large customer base and indicate intensive sales volume. In order to match the local demand, local production line would be the most preferable mode. In theoretical background, it has mentioned that assets specificity can rise three different ways: site specificity(location), physical asset specificity, and human asset specificity.

The distance between Dongguan, location of joint venture company, and Hong Kong, location of LifaAir's own branch office in initial time, is about 100 km. Having manufacturing facilities in mainland China, particularly in Dongguan area, where has significant lower production cost for land and raw materials, considerable and skilled manpower, and convenient distribution channel to inner land of rest of China, is a typical choice for companies located in Hong Kong. Hong Kong is also an international harbor, granting great freedom to goods to the rest of world. Switching from Hong Kong to Dongguan is a natural move.

Secondly, given Edifier has 70% share of the joint venture, it bears the major cost of production facilities. LifarAir controls products quality by sending key production manager to there and continues its research and development with Finnish local research center.

Thirdly, besides sending some key production managers to China, LifaAir's has hired local Chinese sales manager and some staff in office. Its CEO Mäkipää and general sales manager Johan Brandt are frequently flying between China and Finland.

Thus in this case, the transaction cost from assets specificity is relatively low.

- Internal understanding (Internal Uncertainty)

In the very beginning, Mäkipää and its team has realized that they could not enter mainland China on its own limited resource. Though they have archived some outstanding milestones, developed incipient networks in Asia market, built up office in Hongkong over 5 years by the joint venture, they still thought mainland China is another world and different from other markets they have been. They need a local partner. There have been many successful Finnish companies in China already. However, it makes more sense to have a local player who understands the market mechanism, customer, market potential and rules.

An accurate self-understanding or -evaluation can greatly help company/entrepreneur allocate its position in the market, strength and weakness, and space to improve. In decision-making process, rational self-understand or -evaluation can be diminution of internal/behavior uncertainty and increase the accuracy approaching the correct choice. In big firms, they usually will take a prolix and complicated evaluation process, demanding cooperation between departments,
hierarchies and top managers, huge time and capital resources. Sometimes, a third party, like consultant company, offers such costly service. In SME, this process becomes more simple and straightforward. Top managers or entrepreneurs must capture the ability of understanding the nature of its company.

Managing the company over 25 years by the establishment of joint venture company and distributing its products in over 25 countries, Mäkipää has collected rich international business experience. His 8-year living experience in Hong Kong has also made him very attached to Asian, particularly Chinese culture. During interview, Mäkipää repeatedly expressed his foresight and courage to change and break obsolete complexion. He admitted that there was a downturn time previously but never gave up seeking for another chance to rise up again.

- external understanding (external uncertainties) and partnership

It is admired to analyze LifaAir's angle and strategy cutting into mainland Chinese market. Unlike their traditional business sector, great air cleaning unit for public places, hotels and hospitals, they chose 4 individual household products to join into the joint venture. Thus the joint venture company has only right to manufacture and develop on the 4 products. LifaAir has realized that B2B business in China has extreme difficulties and barriers, engages various government

departments and procedures. It makes the whole project period unpredicted long, gain more external uncertainties and demand loads of resources of human, time and capital. Small company's cash flow is not able to bear that for a long time.

On the other hand, Edifier has been well experienced in B2C business via its original business, household appliances. Especially they have collected bunch of individual/ household customer information via its strong online sales channel. Allocating customers, analyzing the demand of customer and market trend, making accurate estimation could already be done before LifaAir enters into this market and this can reduce or exclude uncertainties from market, politic, culture distance to a great extent.

Besides foresaid advantages brought by this potential partner, there is one more reason to explain LifaAir's choice on this partner. Edifier is from another business sector than LifaAir, but the CEO of Edifier had realized indoor air cleaning business would certainly be a remunerative coming ocean to jump in, given air quality problem has become a national problematic calling. Mäkipää recalled that the sincere passion of CEO of Edifier deeply moved Mäkipää and made him knew in the very first time. Mäkipää said, even though there is language barrier between them, but they both spoke the same business language and understood each other immediately. This judgement would not take very long to make.

LifaAir has granted the right to the Edifier to redesign the looking of the 4 products to meet the taste of Chinese customers. Real-time data detection and smart appliance connection functions have also been added into the devices based on the calling of customers.

This great partner brings not only the investment but also well-built market channel to LifaAir. It converts external uncertainties into inner strength to LifaAir.

5.4 Organization. Finpro China

Finpro is part of Team Finland, which is a networking institution supported and steered by Finnish government and helping Finnish companies expand in international market and attracting investment abroad into Finland as well. Finpro is a public organization and a synthesis of Export Finland, Visit Finland and Invest in Finland. Compared with Team Finland, Finpro is more focusing on Finnish SMEs and their activities in oversea market and providing professional internationalization advices and helping them find suitable partners in local/target market. Finpro has 36 Trade Centers abroad and 6 offices in Finland. In China Finpro has offices in Beijing, Shanghai and Guangzhou which

are the most important and influential finance centers and industry cities in China. (Finpro, 2015; Team Finland, 2015)

Mr. Jaani Heinonen joined in Finpro as Vice President, Head of Region East Asia in April 2015. Before joining in Finpro, Mr. Heinonen has over 20-year abundant experience in global business, e.g. being head of division of Team Finland and Ministry of Employment and the Economy, and Chief Representative in Tekes Shanghai, and living in Shanghai over 9.5 years.

Therefore, it is honored to have Mr. Heinonen interviewed and his valuable and deep insights and objective observation on advantages and barriers of internationalization of Finnish clean-tech SMEs entering into Chinese market and conductive suggestions for those SMEs. This interview is also offering an interesting angel from a third-party institution assisting to have better understanding and analysis.

Findings and analysis:

The major service from Finpro is advising Finnish companies, building networks, discovering new business opportunities for Finnish companies, generating sales leads and external partner, expert search and evaluation. There have been more and more small and middle Finnish companies getting interested in Chinese market after Nokia's great success there. Mr. Heinonen addressed that those services are exactly what young and small Finnish companies need when they land in China for the first time when it is much riskier for those small companies than big companies. Big companies are capable to cover some mistakes and learn from the past. Small companies may not be able to recover from any mistake they might have. Therefore, Mr. Heinonen suggested to establish a center which can help those small companies to have risk control and turns into FINCHI until now. Forums and delegation are the major activities arranged by FINCHI and Finpro to bridge Chinese and Finnish companies. However, SLUSH, as the most popular forum activity for Finnish companies, is arranged by a private Finnish company and gets great support from Finpro in China nowadays. Beijing and Shanghai are the main locations.

It takes about one year since SMEs joins Finpro's activities and delegation in which they initiate the contact with Chinese partners until the both parties meet the eventual cooperation relationship, besides some exception like 6 months. Many Finnish companies are aware of market opportunities, like environmental problems in cleantech sector, and have basic understanding of China. "But they only can experience and understand the market when they are diving there. " said Mr. Heinonen.

About control in entry mode strategy making process, Finnish companies still prefer to have high-degree of control in their home company rather than any foreign control. In joint venture or any other cooperative entry mode, there is more trust between Finnish and Chinese companies. Finnish companies would

like to rely on its local partner in product distribution and marketing campaigns. Invisible risk of being

Sense of IPR in China has been valued since last 10 years, given China wants to be the leader of technology at world level and valuing IPR would be the best way to protect itself. In Figure 5-4, World Intellectual Property Organisation shows from 2007 to 2016, patents filled by Chinese companies and individual has grown up by 10 times, trademarks about 7 times, industrial design 3 times, leading to result that GDP doubled. It greatly mitigates the worry and distrust from foreign companies on their own IPR protection and control of it in decision making process. This suggests that if there is conflict between Finnish and Chinese companies on IPR or know-how, it is more likely to solve such problems within international rules, regardless in China or Finland. Unlike as Shrader (2001) worried that effect of IPR protection in contract is weaken and it is super costly for SMEs to get protection and compensation when there is leakage, contractual constraining force on IPR and know-how in this case is enhanced and more feasible to implement. Finpro and other international organization are also providing local help.

IP Filings (Resident + Abroad, Including Regional) and Economy

Year	Patent	Trademark	Industrial Design	GDP (Constant 2011 US$)
2007	161,308	679,230	274,689	9,601.15
2008	204,268	673,522	328,075	10,528.08
2009	241,434	838,071	369,593	11,517.70
2010	308,326	1,113,120	448,121	12,742.74
2011	436,170	1,445,916	563,532	13,957.94
2012	561,408	1,694,024	717,863	15,054.51
2013	734,096	1,940,908	761,027	16,222.39
2014	837,817	2,358,580	673,538	17,406.24
2015	1,010,615	3,059,652	729,551	18,607.31
2016	1,257,439	4,199,467	791,338	19,854.00

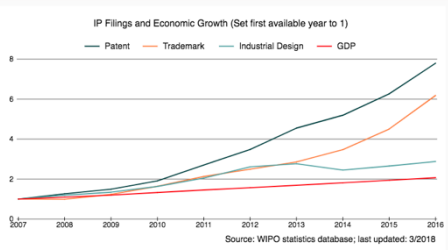

Figure 5-4 IPR statistical country profiles-China (World Intellectual Property Organization, 2016)

From some unsuccessful projects, like eco-city, it has been learnt that there would be some misunderstanding from Finnish and Chinese sides on the same project for the different ways of doing business and philosophy of commercial rules. Unrealistic expectation from Chinese customer/government on eco-city became deterrent for Finnish companies. This also reminds other companies to have sufficient communication and market study during their decision-making process.

Finnish companies are a relative some group in Chinese market, even though some of them are in the same industry or even competitors. However, Mr. Heinonen advised, cooperation and leveraging and sharing resources should be the way Finnish companies shall apply with in Chinese market, because the market scape is much more huge than they can image.

6 CONCLUSION

Result conclusion

The major objective of this thesis is based on transaction cost theory to have a deep understanding of firm's behaviours during its internationalization activities and entry mode selection path through three case study, accordingly to answer the research questions:

- How is the strategic decision-making process of Finnish SMEs entering into China?
- What are the factors influencing the top management in the decision-making process?

Arguably, the three studied companies have followed the regular pattern of transaction cost theory. But there are some exceptions. Three dimensionalities, assets specificities, environmental uncertainties, internal uncertainties, are applied in thesis analysis process. The three case companies respectively select direct sales, exclusive agency and joint venture. Simultaneously, author focuses on the details of decision making process and would like to give pragmatic messages to all other Finnish companies which have the same situations.

During the strategic decision-making process, attribute of their businesses, the decisive factor of the demand of resource commitment, is the first thing settling the base of the mode selection. In fact, business attribute is root of assets specificities. Separate address of business attribute indicates that managers shall clearly understand the key elements of their business' growth and development as important elements and vitamins pregnant women need to take for their babies. Accordingly, transaction cost for human asset and physical asset to be invested will be more accurately estimated. In case of LifaAir, when the business attribute provides a tangible device or product, but with low customization and high sales volume in target market, firm prefers to establish local production line. In case of WE TECH, when the business attribute provides a tangible device or product, with high customization and relatively low sales volume in target market, firm prefers to hold its core technology and match customer's need directly. In case of Tengbom Eriksson, when the business attribute provides design service and work with ultrahigh customization, intimate customer relationship is certainly demanded. Thus, customization is one of the most important factors in business attribute allocation. Decision makers shall put more attention on it.

Analysis and understanding of business attribute are made under rationality. However, during decision making process, decision makers are normally irrational. Manager's power of coalition building, lobbying, information manipulation and agenda control decides how much they will influence in decision-making process (Brouthers, et al., 1998). Managers from the three case compa-

nies are all the CEO and founder of their companies. They all have decisive power to make the decision, and even the solo one. From perspective of management characteristics, they have all gained great international experience from their previous work life. Based on their experience, at different level, in target country, their mode selection and degree of market permeation are very different, which positively influenced firms' performance.

As Nielsen and Nielsen (2011) indicated, "international experience and nationality diversity represent different managerial jresources in the international strategic decision-making prcess, leading to different strategic choices." In case of LifaAir, Mr. Mäkipää had lived and done business in Hongkong and subarea like Macau, for 8 years and participated ventilation and indoor air control work in athletics accommodation in 2008 Beijing Olympic Games. Immersive working experience helped Mr. Mäkipää develop a comprehensive understanding of Asian/Chinese business culture and way of doing business. It speeds up the process of his market knowledge acquisition. Eventually, it took him only half year to confirm the partnership with another local Chinese company as well as establish a joint venture. Now they have launched 4 household applications, car solutions and personal products. In 2017, their predicted global turnover is 25 million euro. In case of WE TECH, Mr. Storbacka and his sales team have gained collectively over 30-year international working experience and transnational management skills from giant firms in the same industry. Plus, this industry is born-international and they naturally have contact in Chinese market and keep intensive interaction. They selected their exclusive agent from their previous working networks. Before the official partnership is confirmed, they have already knew the agent for a long time. Trust and suitable co-working habits have been developed. They have finished 3 projects for Chinese companies by 2018, according to their website announcement. In case of Tengbom Eriksson, they stepped in Chinese market in 2010, invited by Finnish and local government. Before that, they had not been involved in project with China directly. Mr. Eriksson has studied and been aware of serious environmental project in China before that and later was giving amount of presentations and lectures on eco-city and promoting concept of eco-city in China. Anyway, his experience in Chinese market gained while the development of their projects in China moved at the same pace. Mr. Eriksson and his young Chinese assistant are nearly the only two participating Chinese project. From Mr.Eriksson's Joulukuusi strategy, it manifests that (they are trying to approach but have not reached and) they still have dilemma of understanding the market and in the process of grope. Unfortunately, they have not successfully sign a commercial contract. With the retirement of Mr. Eriksson, this goal becomes vogue again. To sum up, long experience of management team in target market reduce the time of knowledge acquisition and transaction cost, helps managers make faster and more accurate decision in entry mode selection.

While setting research questions of this thesis, environment uncertainties were considered less specific than the other two for promiscuousness between "general country uncertainty" and "environment uncertainties". Obviously, here,

"environment uncertainties" refers to not only a general country situation, but detailed industry analysis. During the thesis research process, author realized that it is very necessary to have detailed environment uncertainty analysis in decision making process rather than just having a general market background.

Brouthers, Andriessen and Nicolaes (1998) have even listed recognition of changes in the environment and opportunity discovery as the first step of strategic decision-making process. At this stage, manager shall consider market opportunity, market allocation, target customers, suppliers, production, distribution networks, etc. Many SMEs companies had made the same mistakes. They attended some events and presentations to adopt general information about China, but neglected to regress to business attribute and market hierarchy. Allocating target customers, analyzing customer habits, industry uncertainties, relative political trend and impact, business regulations in Chinese market would be the most effective way for decision makers to understand the market better. In the three cases, though the target country is same, their target customer, business rules, industry environment, etc. are all different. Government has also its propensity to make beneficial policies on some certain industries. In case of LifaAir, their original products are for large public building. When they entered Chinese market, they chose to promote household applications first, which is much easier and faster to be accepted by market and customer and the purchase chain is quite short. This is due to their cleaver insight that air quality problem stimulates people's nerves in every breath and indoor air at home or small space will be the nearest thing people can control on their own. Market environment for such products is mature. Target customer is nailed. Market opportunity is greatly refined and set. After such valid and good-quality information collection and market evaluation, managers shall make equilibrium between firm's existing resources and control in target market. From this step, firms can basically selection few possible entry mode. If heavy asset investment on production is needed, to provide sufficient products to market in time and be close to the market, but the firm has no resource to invest, local cooperation shall be considered in the final decision-making.

From the research result, it further confirms that transaction cost theory is imperative for SMEs during their entry mode selection process. Transaction cost theory provides three very efficient dimensions, assets specificity, internal uncertainty, external uncertainty, to managers and researchers to establish or review their decision-making process. The three dimensions are at the same level rather than in a chronological order. First they need to understand their business attributes and accordingly make evaluation and judgement on their assets to be invested with their limited resources. It is encouraged to seek local partner or outside support with consideration of level of control and compromise to benefit. Secondly, management team in SMEs, though it is formed by few people and undeveloped management system, shall value its international experience and gain more experience in target market, or even expand the team with such knowledge and human assets. Their knowledge on target market and networks in target market even out the entry barriers, especially internal uncer-

tainties, like personal bias. At last, to combine with the first two points, environment uncertainties projects not only the general target country environment, but in details of industry, projects, customer habits, customer's decision making process in the target market. This analysis makes the uncertainties stereoscopic and visible, even solvable.

Below Figure 6-1 horizontally compared the three case companies and gives a clear view.

Insights and advices for Finnish SME heading into Chinese market:

Between China and Finland is huge culture difference. In Finnish education and culture, trust building is a manifest step and life-long process. It is one of the most trusted countries in the world. It is easier to build trust between Finns than between Finns and foreigners. Though as Mr. Heinonen mentioned trust between Chinese and Finnish companies has been built much more than a decade ago, from author's perspective it is still a long way to go for huge business culture distance and differences of philosophies of business rules between the two countries will cause aggravating distrust and accordingly rise transaction cost from internal uncertainties from both sides. Managers shall reduce their bias, uncertainty and hesitation by gaining more international experience, especially in target country, being more open, building up decision-making routine and system to ensure decisions deliberated. Appropriate expand of management team or decision-making members is encouraged for suitable size of decision-making team may counterbalance. Decision and strategy are refined in the whole process.

Competition is all-around, not just at a specific point, like most Finnish firms focus on production/service design and quality very much. It is not wrong but it is also necessary to keep in mind that marketing and comprehensive preparation from customer's perspective are also very important on the way to make customer better understand the idea behind products and service. Cleantech industry is still very young in China. the market, business environment and relative principles and systems are still quite deficient. What Chinese customers need are usually more than the single product or service provided, but the way how to embed them in Chinese market. Their dependency is quite strong. Finnish company shall catch the chance to get more involved in and listen to them rather than assuming Chinese customers are mature and independent and distancing. If the chance is missed, then competitors from America, Germany, or any other countries will come or have come. Here firms are classified by nationality for Finnish SMEs shall not refer each other as competitors but try to cooperate and share resources or even build alliance.

	Company 1	Company 2	Company 3
Business Attribute	Master Design for eco-city	Energy-saving solutions for vessels with drive distribution box	air-cleaning house applications, air-cleaning solutions and devices for large public buildings
Asset Specificity rises or lows transaction cost	+human specificity: design talent +highly level of customer-specific adaptation	+human specificity: production and design +highly customized product and solution -location specificity: geographically close to production alliances	+human specificity for quality control and sales management -location specificity: production great location in target market
Internal Uncertainties rises or lows transaction cost	-rich international experience -firmed resolution +dearth of (successful) experience in Chinese market	-rich international experience -strong sales teams and networking +raw system of management (13 employees in total)	-rich international experience in target market -developed management team
External Uncertainties rises or lows transaction cost	+strongly relay on local government with lazy political situation +unready market environment +huge resource commit-	+unstable world economy +declining orders of shipbuilding +strong competition from large companies -increasing demand for en-	-high demand from market -existing healthy sales channel from partner -prosperous e-commerce in target market

	ment for customer -	ergy saving and environmental protection in marine industry -increasing demand for better performance of vessels	
Entry Time	2010	2014	2015
Entry Mode	Direct sales	Exclusive Proxy	Contractual Joint Venture
Level of control*	high control	low control	medium control
Performance	no signed commercial contract	expected global turnover in 2017: 8 million	expected global turnover in 2017: 25 million
comments for future development	1. start with small residence project 2. alliance with other suppliers of solutions and devices for eco-city	1. more control in sales management 2. develop after-sales services	1. expand product range in target market

Figure 6-1 research results comparison

Note:

"+" means to rise transaction cost

"-" means to low transaction cost

*Level of control is evaluated based on the work of Anderson and Gatignon, in which they made 17 entry modes and classified them by level of control. (1986)

For future research

This thesis focused on Finnish start-ups for Finland is the most innovative country and has a great environment for star-ups. However, to extend the study scope of start-ups to other countries as well as target market can definitely complete the picture of SMEs' behaviours during internationalization entry mode selection process. SMEs with its born innovativeness keep the world economy vivid and are leading the trend of world economy in next decades.

Following Brouthers (1999), Brouthers (2002) and Brouthers and Nakos (2004), this thesis emphasized that it is important to track company's mode selection pattern and its performance in chain because decision making process is an on-going process and SMEs adapt more knowledge and better understand during its remorseless attempt and grope. It would be worthy to have a deeper study on some or even same companies in a longer time scope so it is possible to track the whole trip and its performance corresponding the selected or changed entry mode.

7 APPENDIX 1 LEADING QUESTIONS IN INTERVIEW

1. Discussion on company basic information
2. What kind of potential have you seen from Chinese market?
3. China trip
4. What entry modes does you company apply in China?
5. How did you/ company make the decision on entry mode selection?
6. What kind of role do you play during the selection decision making process?
7. Have you meet any challenges, while entering Chinese market?
8. How do you leverage limited resources of your company?

8 APPENDIX 2 CLEANTECH COMPANIES LISTED IN CLEANTECH FINLAND WEB-SITE

	Company	Air Quality	Clean-web&IOT	Energy&Resource efficiency	Clean water	Smart transport& logistics	Bioproducts and materials	Renewables and smart grid	Waste to value
1	LifaAir	Y							
2	Airmodus	Y							
3	720Degrees	Y	Y						
4	TM System	Y		Y					
5	Dekati	Y							
6	Tamturbo	Y		Y					
7	Extor	Y							
8	Tassu ESP	Y							
9	Wetend Technologies	Y		Y	Y	Y			
10	Blue Ocean Solution	Y		Y					
11	Genano	Y							
12	IC2 Feeniks	Y		Y	Y				
13	Envitems	Y							
14	Airo	Y							
15	NaturVention	Y							

16	Halton	Y		Y					
17	Saalasti			Y			Y	Y	
18	Neste Jacobs			Y			Y	Y	
19	Inray			Y			Y		
20	Watrec			Y			Y		Y
21	Mikko Ahokas Consulting			Y			Y		Y
22	Raute			Y			Y		
23	Risutec Oy		Y	Y	Y		Y		
24	MHG Systems			Y			Y		
25	Raumaster Group			Y			Y		
26	Envor Protech						Y		Y
27	Indufor Group			Y			Y		
28	Ductor						Y		
29	Neste						Y	Y	
30	Jarmat						Y		Y
31	BioGTS						Y		Y
32	St1 Biofuels						Y		Y
33	UPM						Y	Y	
34	SFTec			Y			Y		
35	Winflow Water			Y	Y				Y
36	Keypro			Y	Y			Y	
37	KL-Lämpö			Y	Y				
38	Valmet			Y	Y				
39	Outotec			Y	Y			Y	

40	Aquazone				Y				Y
41	Exel Composites			Y	Y			Y	
42	Fenno Water				Y				
43	Solar Water Solutions				Y				
44	Tengbom Eriksson Architects			Y	Y	Y			
45	Risutec Oy		Y	Y	Y		Y		
46	Sansox			Y	Y				Y
47	Innovesi				Y				
48	SH-Trade			Y	Y				
49	Evac				Y				
50	Wetend Technologies	Y		Y	Y	Y			
51	Relining Group			Y	Y				
52	Aquaminerals				Y				
53	Kemira			Y	Y				
54	Leanheat		Y	Y				Y	
55	Jake Rakennus		Y	Y					
56	Citrus Solutions		Y						
57	FF-Automation		Y	Y					
58	Tieto		Y	Y					
59	Distence		Y	Y					

60	OptiWatti		Y	Y				Y	
61	There Corpo-ration		Y	Y				Y	
62	Seneqo		Y	Y					
63	BaseN		Y	Y				Y	
64	FINNOPR Ltd		Y	Y					
65	HögforsGST		Y	Y				Y	
66	Protacon		Y	Y					
67	Sensire		Y	Y				Y	
68	Conexbird		Y	Y					
69	Remion		Y	Y					
70	Fourdeg		Y	Y					
71	ionSign		Y	Y				Y	
72	Vexve			Y					
73	Jukolux			Y					
74	MSc			Y				Y	
75	Inray			Y			Y		
76	Ensavetec			Y					
77	SKS Au-tomaatio			Y					
78	Buildercom			Y					
79	MariMatic Oy			Y		Y			Y
80	Solved-The Cleantech Company			Y					
81	Green Energy Finland							Y	

82	AC2SG					Y		Y	
83	Finnwind							Y	
84	Valoe			Y				Y	
85	Finess Energy			Y				Y	Y
86	Finno Energy			Y				Y	
87	Teraloop							Y	
88	Norelco			Y				Y	
89	SciTech-Service			Y				Y	Y
90	Farmi Forest					Y			
91	Konecranes			Y		Y			
92	Citec			Y		Y		Y	Y
93	SeaHow				Y	Y			

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