Venture Capital

– A Way to Enter the Chinese Water Treatment Market

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Master Thesis
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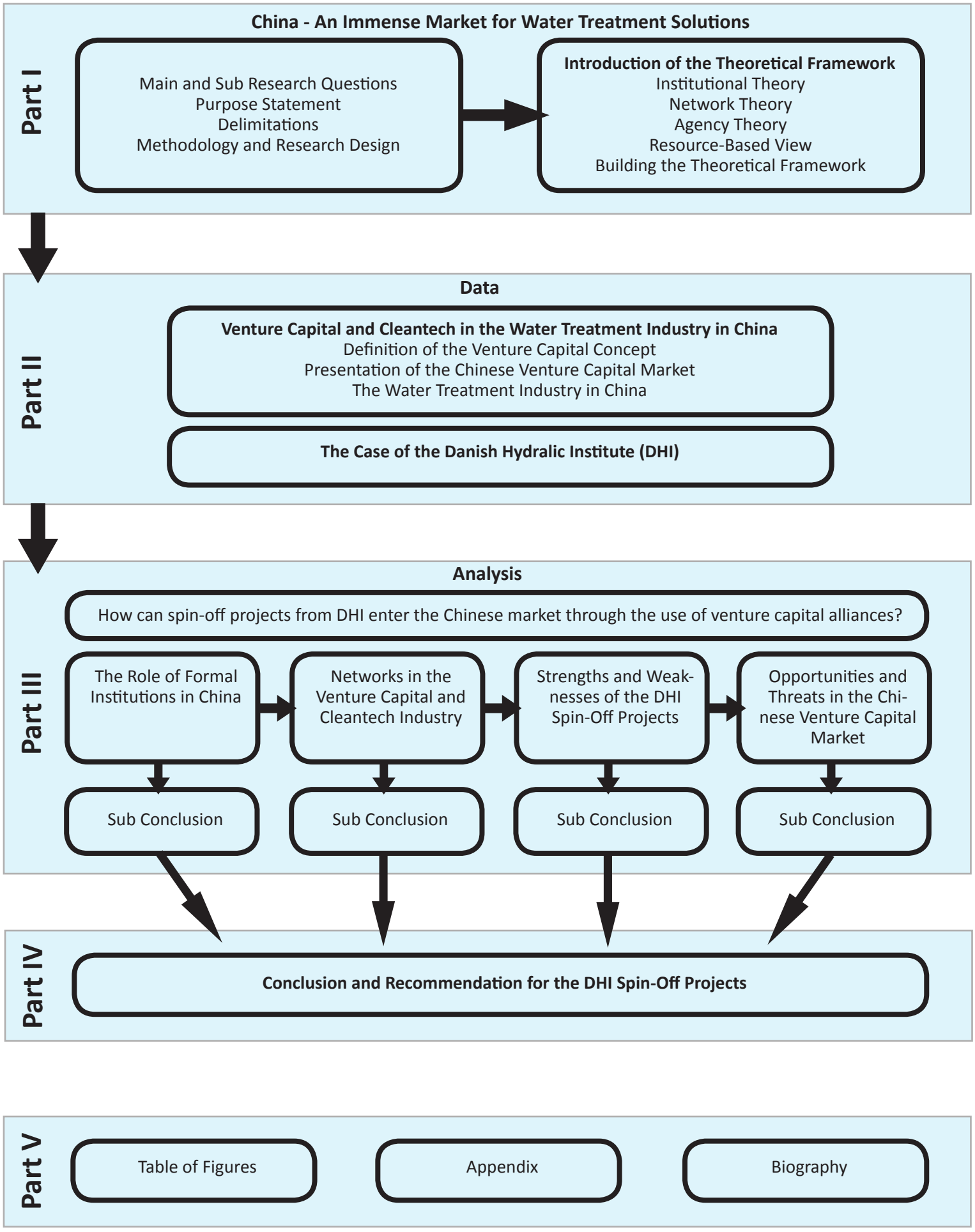
August 2009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Abstract

China is today facing severe water challenges and is increasingly focusing on attracting cleantech solutions to assist the country with water treatment products which provides an immense market for international as well as domestic cleantech ventures. The thesis builds upon the case of DHI spin-off projects which arise from the Danish cleantech water treatment company, DHI. The company aspires to move the new projects that lie outside their core competences from Denmark to the expanding Chinese market. However, these projects lack funding and expertise to successfully transfer the solutions to China. Venture capital is hence a key instrument for the spin-off projects from DHI as this type of funding provides capital and business knowledge simultaneously. The question is therefore what main possibilities the DHI spin-off projects have to engage in venture capital alliances to enter the Chinese water treatment market. The findings of the thesis are that the spin-off projects possess several strengths to attract venture capital investors present in the Chinese market which facilitates the entry to the country. Four different types of venture capital investors exist in China. However, we recommend the spin-off projects to engage in an alliance with the government and the foreign venture capital investors as these combined present the best opportunities for the new venture. The government venture capital investors provide access to the water treatment industry as well as vital networks in the market whereas the foreign investors contribute with capital, commercialisation expertise, and business knowledge. In order to create the alliance with the government and foreign venture capital investors the DHI spin-off projects are required to compensate the knowledge and accesses from the investors by providing shares in their venture and admittance to their research and development.

However, we recommend that the sacrifice is beneficial as the alliances create a major potential for success of the DHI spin-off project in the Chinese water treatment market.

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Part 1

1. China – An Immense Market for Water Treatment Solutions

In the last two decades, China as a transition economy has experienced an economic miracle, lifting millions of people out of poverty. However, this miracle has led to an environmental disaster with sky rocketing air and water pollution, severe desertification, and growing resource scarcity. (Economy, 2007) International awareness is increasingly focusing on the impact China has on the global environment as a renowned expert indicates by stating; "As China goes – so goes the world" (Friedman, 2008).

Rapid urbanisation, industrialisation, growing agricultural demands, and ecological degradation are all factors that imply potential environmental threats to the management and utilisation of China's water resources[1]. Nearly 700 million people daily drink water contaminated with animal and human waste and more than 75% of the river water flowing through China's urban areas is considered unsuitable for drinking or fishing (Xie et al., 2009; Economy, 2007). Access to clean water supply is therefore the most severe environmental challenge that China faces today. The fact that China has 22% of the world's population but only 8% of the global fresh water resources, underlines the critical situation (Toh, 2008). Consequently, the Chinese government is changing its focus from fossil to renewable sources of energy. Laws and regulations in the field of renewable solutions are being implemented to create incentives to attract foreign technology and innovation to the country. The incentives by the Chinese government on environmental responsibility open an immense market for water treatment products within the cleantech industry.

A world leader within this segment is Danish Hydraulic Institute (DHI) which is a cleantech research and development company with focus on water treatment products and solutions (Mikkelsen, 2008). Through their conducted research, several new products are being developed some of which lie outside their core competences. These products are considered to be candidates for later spin-off projects through the AddVenture strategy of

[1] Xie et al., 2009; Friedman, 2008; Varis & Vakkilainen, 2001

the company. DHI is facing a saturated home market and therefore aspire to transfer their innovative solutions from Denmark to the immense market in China. As the parent company does not have the financial means or sufficient commercial know-how to proceed, funding and further expertise regarding the Chinese market is required in order for the spin-offs to succeed. (H. G. Enggrob, personal communication, June 17, 2009, March 23, 2009)

In this light, venture capital present in China is an essential instrument for assisting DHI spin-off projects to profitably enter this market with their pioneering water treatment products (Ernst & Young, 2005; Bartzokas & Mani, 2004). Venture capital implies transacted, early stage equity and expertise investments typically provided to small and medium-sized innovative firms or projects with a high growth potential. Venture capital is therefore an optimal solution for the company. (Ahlstrom et al., 2007)

Difficulties, however, do exist as the resources and options provided to the venture capital industry by the institutional environment are still in a developing phase (White et al., 2004). Nevertheless, opportunities are expected to be plenty for the DHI spin-off projects in the Chinese water treatment market - if managed with consideration to the institutional setup.

The purpose of this thesis is to analyse how cleantech ventures, exemplified by the DHI spin-off projects, can succeed in the Chinese market through the use of venture capital available in the country by answering the following main research question;

1.1. Main and Sub Research Questions

What are the possibilities for DHI spin-off projects to engage in venture capital alliances to enter the Chinese water treatment market?

To answer our main research question, four sub research questions are posed to obtain a clear focus within the study. Our four sub research questions presented below are used throughout the thesis to enhance the understanding of venture capital in the water treatment industry available to the DHI spin-off projects in China.

Sub research question one analyses the Chinese formal institutional macro-environment for the venture capital and cleantech industries, shaping the actions of venture capital

investors and cleantech spin-off projects. The cleantech industry where the DHI spin-off projects operate is implemented as this specific sector is significant to the venture capital investors. The formal institutional setup is therefore important to comprehend for the spin-off projects from DHI before searching for venture capital. The impacts of the formal institutional environment on the venture capital and cleantech industries will therefore be investigated by answering the following sub research question;

1. What role do formal institutions play in regards to improving the venture capital and cleantech industries for water treatment solutions in China?

Following the analysis of the formal institutional impact in the Chinese market for venture capital and cleantech, the next sub research question will focus on the importance of normative and cultural-cognitive institutions in the form of dynamic networks in China. These networks are the centre of attention as strong social norms on interpersonal relations are prominent in the Chinese business environment. The use of network strategies is therefore influencing the business methods in the venture capital and cleantech industries which impact the options of the DHI spin-off projects options in the Chinese venture capital market. Hence, sub research question two is formulated as follows;

2. How do networks affect venture capital in the cleantech industry for water treatment solutions in China?

At this point, sub research question one and two combined presents the overall institutional environment for operating on the venture capital market as a cleantech venture, like the DHI spin-off projects. Sub research question three narrows the analysis down to a firm-specific level as it explores the capabilities required for the spin-off projects from DHI to attract venture capital in the market presented in sub research question one and two. Sub research question three, thereby, analyses the strengths and weaknesses of the DHI spin-off projects within the SWOT framework by answering the following sub research question;

3*. Which strengths and weaknesses do spin-off projects from DHI possess in regards to attracting venture capital in China?*

The fourth sub research question builds upon the identified internal capabilities of the DHI spin-off projects from sub research question three on the market presented in sub research question one and two. Sub research question four thereby continues within the SWOT framework by investigating the opportunities and threats for the DHI spin-off projects in regards to alliances with the different types of venture capital investors present in the external Chinese venture capital market. The sub research question to be answered is therefore;

4. Which opportunities and threats exist in the Chinese venture capital market for the spin-off projects from DHI?

The four posed sub research questions will guide the analysis towards a conclusion and recommendation for DHI spin-off projects, which will answer the main research question. The thesis will provide a broadened understanding of venture capital in the cleantech industry in China and serve as a foundation for future cleantech enterprises considering operating in the Chinese water treatment market through venture capital alliances.

1.2. Purpose Statement

The following section presents and defines the key terms used within our thesis and the reason for our selected topics. Our aim with this thesis is to analyse venture capital in the cleantech industry and how the DHI spin-off projects can utilise this type of investments when entering China with their water treatment products.

The purpose is to broaden the understanding of venture capital in China available to the cleantech industry for water treatment. This is presented through the case of DHI and their AddVenture strategy as the company has the aspiration to enter the Chinese market with new innovative water treatment projects through the use of venture capital alliances. In addition to the development of innovative solutions for the customers of DHI, the water treatment company actively develops new products that are considered candidates for later spin-offs, if the products lie outside the core competences of the parent company. The programme for the spin-offs of DHI is called the AddVenture strategy which assists the projects to leave the parent company. DHI is hence chosen to explain how spin-offs

from a Danish cleantech research institute can attract venture capital and thereby utilise the Chinese demand for water treatment products as their new market.

The reason for focussing on venture capital is that the industry provides both expertise and funding to small and medium sized high-tech companies needing start-up capital and managerial assistance to experience high growth against obtaining a share in the given project that receives the investment. (Ahlstrom et al., 2007; Bruton & Ahlstrom, 2002). Venture capital is provided to start-up companies and projects to boost their development towards commercialisation where the venture capital investors receive their return on investment. Our focus is therefore on the possibility of the DHI spin-off projects, which by definition are start-ups, to attract venture capital as interviewed professionals within the field are of the conviction that venture capital can boost cleantech ventures in China[2].

Start-ups and spin-offs are defined as being high-tech upcoming companies in their early stage of development that require equity and know-how to expand their activities. (Avnimelech & Teubal, 2006) Investing in a start-up project therefore implies a high risk, often making it unsafe for traditional sources of bank equity, but likewise the potential for high growth, making the right start-up company a golden opportunity for the venture capital investor (Ahlstrom et al., 2007; Bruton & Ahlstrom, 2002). Risk is understood throughout this thesis as an indicator that may cause severe financial loss or vitally undermine the competitive position of a given enterprise (Ernst & Young, 2008).

Our focus on cleantech is chosen because the industry addresses the roots of ecological problems by formulating new science that develops solutions emphasising a natural approach which adds economic value through lowered costs or improved profitability (DeWoskin & Mahoney, 2009). Cleantech products embrace knowledge-intensive solutions, services, and processes that deliver value using limited or zero non-renewable resources while creating significantly less waste than conventional offerings (Pernick and Wilder, 2007). The cleantech technologies range from alternative forms of energy generation to smart materials and water treatment solutions (Mikkelsen, 2008). Although cleantech is often more costly to implement than their conventional and traditional

[2] U. W. Sørensen, personal communication, June 2, 2009; S. Houmøller, personal communication, May 19, 2009; A. M. Mathiesen, personal communication, May 12, 2009; H. G. Enggrob, personal communication, March 23, 2009

counterparts, the solutions are more cost effective and environmentally friendly in the long run as the products rely on renewable sources (Ernst & Young, 2007).

Water is the single most significant resource and a fundamental substance to all life on our planet (Xie et al., 2009). More than half of China's 1.3 billion people live without any form of sewage treatment as water treatment capabilities in China are underdeveloped (Toh, 2008). Consequently, water related problems alone cost China approximately US$ 35.8 billion per year (Economy, 2007). Although China is experiencing severe difficulties in other environmental areas, the critical water situation is our centre of attention in relation to other areas of cleantech. As a result of the increasing water problems and the focus of the government on environmental issues, cleantech solutions to the water situation have great business potential for foreign as well as domestic investors and Chinese as well as international cleantech companies (Cleantech Group, 2008; Cleantech Group, 2007). The Chinese water treatment market is therefore likewise an immense opportunity for the DHI spin-off projects with their pioneering solutions.

The geographical area of research is China, as the transition economy is moving towards the end of its rapid growth period, since the environment cannot cope with the consequences of such large scale production. China is the country in the world where the need as well as the potential for cleantech is strongest (Cleantech Group, 2009). The environmental challenges that China is facing today is of a size that neither the Chinese people nor the rest of the world can afford to ignore (Economy, 2007). China is therefore an obvious choice for the products of the DHI spin-off projects.

1.3. Delimitations

This chapter is a description of the niche the thesis operates within. The delimitation will thereby act as a clarification of why we have chosen our specific focus amongst the many related interesting concepts, theories, and happenings within the field of cleantech and venture capital in China.

Finance, risk management, and financial accounting are important topics related to investing in a cleantech spin-off, but these elements are not the focus of this thesis as we analyse the concept of utilising venture capital and the potentials for the involved parties.

In addition, the ongoing global financial crisis is a current issue dominating the financial world. The critical economic situation affects all aspects of the venture capital process from investing to exiting through mergers and acquisitions or an initial public offering (IPO). Consequently, venture capital within the cleantech industry is decreasing overall and the tendency is visual in various articles and discussion forums. However, the financial crisis influences the scope and behaviour of venture capital, but not the specific concept. The centre of attention is on how the DHI spin-off projects can enter the Chinese market though the use of venture capital alliances. The focus is therefore on the nature and impact of the value-added that exists in a venture capital and cleantech alliance in the water treatment industry and not on contemporary ups and downs in the financial world.

The area of research takes place in China, which is characterised as both a transition and emerging economy. An emerging economy is defined by its rapid pace of economic development and governmental policies favouring economic liberalisation (Hitt, 2006). In this thesis, however, we have decided to emphasise China as a transition economy because the country is undergoing a transition from a planned to a market economy which influence the institutional setup (Peng & Zhou, 2005). Transition economies are strengthening their market mechanisms, the stabilisation of the country, as well as encouraging private enterprises which is a central aspect of our thesis. The transition therefore has an impact on the manoeuvring abilities of both the cleantech and venture capital industries (Hoskisson et al., 2000).

Water treatment will be used throughout the thesis as a definition of the need for sustainable solutions within all fields of China's water challenges. We thereby delimit ourselves from looking into a specific sphere of water treatment which could have been waste water, rivers, factories, and likewise sectors and thereby primarily investigate the overall water treatment possibilities.

Zooming in on the case of DHI, we delimit our research from studying the company as a whole to focus on their spin-offs born within DHI that can receive venture capital through the AddVenture strategy (Appendix 8.5.). In addition, we do not concentrate on one specific project presented by DHI. The focus is on the ability of spin-off projects to enter the market through the use of venture capital to broaden the understanding of the

possibilities for innovative ideas created in Denmark to be transferred through venture capital to the immense water treatment market in China.

The cultural aspects have an important influence upon acting and succeeding within the Chinese context (Batjargal & Liu, 2004). The idea of social capital in the Chinese context involves the embedded social phenomena, guanxi, which is the Chinese term for connections and networks (Batjargal & Liu, 2004). We recognise the important role of guanxi in venture capital practices (Bruton & Ahlstrom, 2003), and will implement this concept in the form of network strategies in the Chinese institutional setup. We are aware that the cultural aspect plays a significant role when foreign enterprises operate in the Chinese market. However, a static Hofstede approach will not be applied as culture in this thesis is addressed in the form of firm specific strategic planning dependent on the given context and not as a socio-economic stereotyped ideal of 'the other' (Clegg et al., 2007).

When creating the theoretical framework, we focus on new institutional theories combined with agency theory, network theory, and the resource-based view of the firm. However, the old institutional theories will not be discussed as the majority of the research seen today is built on the new institutional approaches. New institutionalism represents a distinctive approach to the study of social, economic, and political science which have different areas of focus, but have the common conviction that institutional arrangements and social processes matter (DiMaggio & Powell, 1991). As the centre of attention of the political approach is on political decision-making and the ways in which political structures shape political outcomes, this approach will not be discussed further (DiMaggio & Powell, 1991). Additionally, the theory of new institutional economics is centred on the transaction cost theory which would facilitate the implementation of this theory. However, as the transaction cost focuses on the ability of enterprises to in- or outsource activities regarding economic exchanges it is not implemented in this thesis of how a DHI spin-off can enter the Chinese market by the use of venture capital.

DHI has already decided upon entering China with their spin-off solutions. The question is therefore not if, but how these spin-off projects can enter the market. This is why we delimit ourselves from Porter's Diamond Model as we do not investigate whether DHI spin-off projects are competitive but how they can use their internal capabilities to attract venture capital. This leads us to the next delimitation as we have decided to focus solely

on penetrating the Chinese market through venture capital alliances and thereby do not pay attention to other alternative entry modes.

1.4. Methodology and Research Design

The research design is the methodological considerations regarding how we have approached the research and which kind of data we have gathered to answer our four sub research questions to pose the conclusion and recommendation for the DHI spin-off projects on our main research question. The section encloses our research structure, research strategy, and the data collection used to conduct the research.

1.4.1. Research Structure

This section explains the structure of the thesis by providing an overview of the different chapters and how they correlate. We encourage the reader to pay attention to the fold out model of the thesis in order to follow the progress of the different parts though out the reading process.

'Part I' of this thesis is designed to establish a profound understanding of the research field and initiates the thesis in the introduction which leads to the main research question and the four sub research questions. The four sub research questions are used to structure the analysis and to conclude on the main question in the final conclusion and recommendation section for DHI. The purpose statement hereafter explains key aspects and terms in regards to the research questions to clarify the focus of the thesis. Our attention is further defined in the delimitation section to determine our niche of research. Hereafter, the methodology clarifies how the research is conducted and outlines how the data sources are collected and applied. Finally, the theories are presented which creates the theoretical framework for the analysis.

'Part II' presents the venture capital concept in the way that we understand it and apply it throughout the thesis. This is followed by an explanation of the venture capital market in China before introducing the Chinese water treatment industry where the DHI spin-off projects are expected to become active players. The final section portrays DHI and the

DHI spin-off projects as our case company. In this way, the section explains the field of interest which is the data fundament for the analysis.

'Part III' is the analysis of the four sub research questions used to present the conclusion and recommendation for the DHI spin-off projects on our main research question. Sub research question one analyses the formal institutional macro-environment for the venture capital and cleantech industries. Sub research question two investigates the normative and cultural-cognitive institutional environment by focussing on networks and their impact on our case. This is followed by sub research question three analysing the internal strengths and weaknesses that DHI spin-off projects need to possess before attracting venture capital in the Chinese market analysed in sub research question one and two. Our fourth and final sub research question builds on the former sub research questions by analysing the opportunities and threats existing in the Chinese venture capital market for the DHI spin-off projects. Each of the four sub research questions will end with a sub conclusion.

'Part IV' is the conclusion and recommendation for DHI where the sub conclusions from each of the sub research questions will contribute to advise DHI spin-off projects in regards to attracting venture capital in the Chinese market for water treatment solutions. Additionally, a recommendation of which alliances between the DHI spin-off projects and the different types of venture capital present in the Chinese market is the most suitable is provided.

'Part V' contains of the table of figures, appendix, and bibliography.

1.4.2. Research Strategy

The focus in this section is to present the methodological approaches to address the main and sub research questions. The section will guide the reader through the applied case study, methodologies, and techniques used in the research design.

A case study research is implemented to investigate how a DHI spin-off project can attract venture capital and through the venture capital alliances penetrate the Chinese market. This type of study is a research strategy which focuses on understanding the dynamics

present within a given single setting which will assist to make general conclusions on the matter (Andersen, 2003; Eisenhardt, 1989). In this way, the case of DHI spin-off projects works as an example among many to analyse if foreign cleantech companies can attract venture capital in China. The rationale for this approach is that we, through a case study, can employ an embedded design in numerous levels and thoroughly investigate within the single study. Furthermore, the case can be used to provide a description, test theory, and can generate new theories on the matter.

In contrary to the applied single case study design, investigating a multiple case study could have contributed with valuable insights in the cleantech industry, as several opinions and experiences would be covered and explored. In spite of the replication logic and comparative possibilities when using a multiple case study, the drawbacks include missing adherence to the specific characteristics of the different enterprises and the risk of conducting a superficial analysis. (Eisenhardt, 1989) As our field of research is undeveloped, an individual case study maintains the focus of the thesis.

As our aim with the thesis is to analyse the venture capital industry in China and use the case of DHI spin-off projects to investigate how to successfully enter China through the use of venture capital alliances we have mainly utilised the inductive approach. This is done as the inductive approach provides the opportunity to explore one case and thereby be able to provide a general understanding of the topic. Additionally, this method facilitates to analyse a given concept by searching for suitable theories and sources and from the collected data draw a general conclusion. (Andersen, 2003; Eisenhardt, 1989b) We have implemented a main research question to guide our inductive approach. However, elements of the deductive approach are used as we implement theory which generally predicts how to manoeuvre within the venture capital industry in the Chinese water treatment market (Saunders et. al., 2007).

We discovered that limited research has been conducted on the linkages between venture capital and the cleantech sector in China even though both topics have high priority worldwide. In combination with the inductive approach we use the exploratory research design to cover our area of research by conducting several interviews and implementing our case of DHI spin-off projects which helps us to develop ideas, concepts, and establishing priorities within our research field (Saunders et. al., 2007). The experiences

from our interviewees regarding our research field have assisted us in formulating general conclusions on the matter (Andersen, 2003). This research strategy is combined with elements of the explanatory research design, where we aim to understand the relationship between the variables which influence each other in our analysis (Saunders et. al., 2007; Andersen, 2003). We aim to combine the research strategies in order to conduct a profound analysis of the venture capital market and the cleantech industry in China and thereby be able to create functioning recommendations.

We use qualitative data with limited quantitative data from secondary sources. The rational for performing a qualitative study is that the method facilitates to explore implicit assumptions, identify variables, and overcome the lack of theories that can be employed to explain the exact behaviour of participants (Creswell, 1994). Furthermore, we use the qualitative study to analyse our case (Yin, 1984) as this type of data provides a more holistic picture. We apply quantitative data from reports to get an overview of our research fields as this data type seeks to generate knowledge through the use of numeric data (Andersen, 2003). We combine the two data types as they create synergy, especially in terms of keeping us from being carried away by vivid, but false, impressions in our qualitative data (Eisenhardt, 1989b).

A special note to the thesis is that we have applied a multiple investigation design in the way that we are two researchers (Eisenhardt, 1989b). We believe that different opinions enhance the creative potential of the study as team members have complementary insights adding positively to the data generation. Furthermore, the different perspectives increase the possibility of capitalising on any novel insights, which may be in the collected data. It enhances the confidence in the findings and increases the likelihood of surprising findings. (Eisenhardt, 1989b)

1.4.3. Data Collection

In order to answer our four sub research questions to provide recommendations on our main research question, we have collected different types of data which is distinguished between primary and secondary sources.

The research questions are subjected to empirical inspection by the use of secondary sources, such as published texts being articles, scientific reports, books, the Internet, published statistics, and similar sources. As mentioned in the previous section, the secondary sources in this thesis include both quantitative and qualitative data. Shortcomings of relying mainly on secondary data sources are that we do not have real control over the data quality. As the initial purpose of the data collection deviates strongly from the current usage, and the aggregations and definitions might be unsuitable for the present analysis (Saunders et. al., 2003) combined with our use of the inductive approach is why we find implementation of primary data important.

We have chosen to combine the secondary sources with primary collected data as the secondary data is limited in regards to our specific research topic. We have obtained the primary data information directly from first-hand sources by interviewing active professionals within the field of venture capital, cleantech, and China (Saunders et. al., 2007). The primary sources in this thesis are therefore original as they are collected specifically for the study at hand. In this way, the interviews have contributed to fill out the gaps in theory and secondary sources. In the following figure the interviewees are presented in regards to how they contribute to answer our main research question. Specific information about each interviewee is presented in Appendix 8.1. The firm arrows in the figure show where the interviewees have a direct impact on the main research question and the dotted arrows indicate that they possess limited but some knowledge regarding the topics.

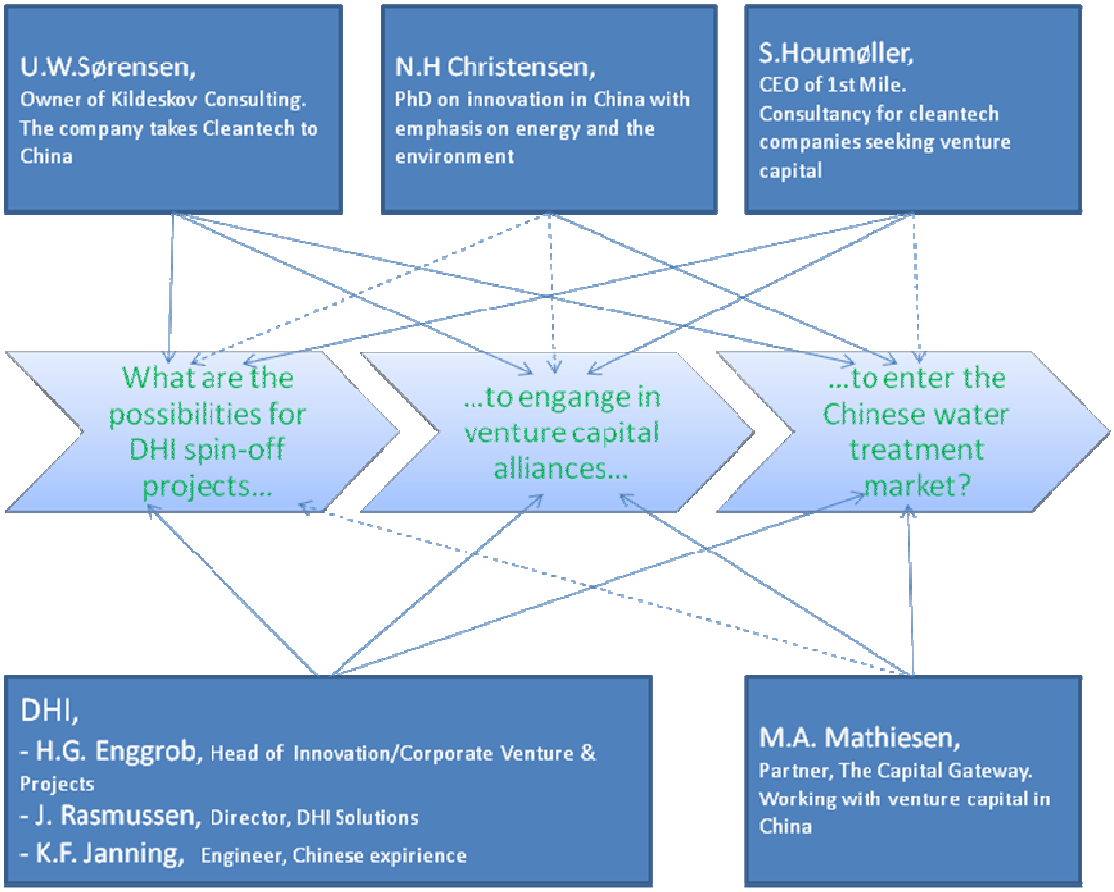


Figure 1: How the interviewees relate to the main research question. Source: Own interpretation

We have conducted semi-structured interviews as this method has the advantage of providing a fairly open framework with focused, conversational, two-way communication. We have chosen this form as a face-to-face semi-structured interview provides a more dynamic, qualitative, and honest answer in contrary to quantitative written questionnaires (Bruton et al., 2002). Prior to the interviews, we made an interview guide with the discussion topics which had to be clarified throughout the conversation (Andersen, 2003). The interviews started with general questions and keywords allowing for spontaneous discussions of problems and solutions as they arise during the interview, giving both the researcher and interviewee the flexibility to probe for details and discuss issues further. The semi-structured interview thereby gave us the opportunity for follow-up questions on topics and development of recommendations that have practical value (Bruton & Ahlstrom, 2003). The interviews took from one to two hours each which gave us the possibility to discuss our field of research thoroughly. As we investigate a new area of study, the benefit of conducting qualitative, in depth, semi-structured interviews provide us the ability to develop a theoretical understanding of the new domain (Eisenhardt, 1989).

The semi-structured method has given us the freedom to make adjustments to the research during the data collection process. Furthermore, by interviewing seven professionals within our field of research we have been able to compare each interviewee with our established knowledge about venture capital and cleantech. Thereby we have achieved a more wide-ranging understanding of the area and as every interviewee serve a specific purpose within our research field, we have followed a replication logic which provides a simple comparison of the statements of the interviewees (Yin, 2003). The risk of the open structure is that the flexibility can make the data collection unsystematic. We are aware of this and have taken our precautions while still being open to the emergence of new themes to improve our research. (Eisenhardt, 1989b)

A point of critique when performing the research is that we did not have the possibility to conduct interviews in the local Chinese setting which would have given a more balanced analysis in regards to recommending DHI spin-off projects on their ability to enter the market. The approach to the Chinese venture capital investors in the Chinese financial market through various e-mails and phone calls failed as we received no useful response from the selected venture capital investors.

Venture capital activity within cleantech in China is a new field of research (Cleantech Group, 2007). Besides using our conducted interviews and secondary sources to elucidate cleantech venture investments, we have likewise used personal interviews from reports conducted by other researchers. In using these interviews, we are aware that the data was not collected with focus on our specific research, thus we combine interviews conducted by different authors to triangulate the information and improve accuracy.

Throughout the thesis, we use the triangulation method by applying multiple data sources and combining different research methodologies in the study of our research topic. Our reason for applying the triangulation method is that through combining several observations, theories, methods, and empirical data, the research will automatically become more critical and avoid the inherent preconceptions stemming from the single method, single-observer, and single theory research. Triangulation is implemented in our thesis as it is frequently used in qualitative research to cross or triple examine data in order to ensure that our data is providing the accurate information and evade

misinterpretations (Saunders et al., 2007). The purpose of using this specific approach is therefore to increase the credibility and validity of our main findings.

We combine all four of Denzin's (1978) triangulation types in the thesis, being data-, investigator-, theory- and, methodological triangulation. The data triangulation can be seen in the way that we apply primary with secondary data sources from various perspectives and professionals. The investigator triangulation is embedded in the research as we are two researchers who bring different perceptions to the analysis. In regards to the theory, the triangulation takes place as we apply four different theories within our analysis to provide a varied picture of the research area. We apply a methodological triangulation by combining inductive with deductive reasoning and explanatory with exploratory strategies. Using the triangulation method therefore gives us a more verified picture of the reality as it proposes applying different sources. As we are combining the different sources, we are aware that no author is objective and that all empirical data used contain a degree of subjectivity. By applying triangulation our aim is therefore to combine the different sources to avoid a stationary view in the research. (Eisenhardt, 1989b; Denzin, 1978)

We have structured our collected data through the use of four sub research questions. The first sub research question analyses the formal institutional setup in China by sorting the data under eight headings inspired by the PEST(LE) but shaped to our specific research. Sub research question two investigates the normative and cultural-cognitive institutional setting with focus on networks where the data is likewise structured under six headings suited for our purpose. The third sub research question analyses the internal strengths and weaknesses and is structure by the use of S. Houmøller's (personal communication, May 19, 2009) criteria for venture capital investing. The fourth sub research question analyses the external opportunities and threats in China and is structured through the four different types of venture capital investors present in the Chinese market. Both sub research question three and four are presented through the use of the SWOT framework as it encompasses internal and external aspects respectively.

2. Introduction of the Theoretical Framework

The purpose of building a theoretical framework is to create an overview of the main theories applied within the field of research and generate the foundation for the theoretical discussion within the analysis. New institutional theory, network theory, agency theory and the resource-based view of the firm will be presented in the coming sections followed by a description of how they interrelate.

2.1. Institutional Theory

We apply the institutional theory to analyse the macro-environment of the venture capital and cleantech industries within the transition economy of China. The foundation of this theory is that all activities of individuals and organisations are shaped by institutions in a given environment and that institutions influence their conscious as well as subconscious actions (DiMaggio & Powell, 1991). Two schools, among several, can be found within new institutional theory; the sociologic approach, known as new institutional theory, and the economic approach; named new institutional economics. Both schools of thoughts are concerned with formal and informal institutions but their emphases differ, which will be explained in the sections below. In the final section of institutional theory, we create an institutional framework where the two approaches are combined to fully analyse and grasp the complexity of the venture capital and cleantech industries in China.

2.1.1. New Institutional Theory

The sociologic view of institutional theory focuses primarily on the creation of a society and how people act within this setting. Sociologists define institutions to include formal rules, procedures or norms as well as symbol systems, cognitive scripts, and moral templates that provide the frames of meaning that guides human action (Hall & Taylor, 1996). The main focus of the sociological school of thought is on legitimacy building and the role-shaping actions of institutions. They believe that the institutional setup shapes the shared beliefs and the way people think and behave in the society. These beliefs can arise out of shared cultural and political systems. (DiMaggio & Powell, 1991)

Richard Scott (2001) categorises institutions into three pillars; regulatory systems, normative systems, and cultural-cognitive systems. The three pillars form a continuum moving from the legally enforced to the taken for granted and from the conscious to the unconscious. Even though, the three concepts overlap they need to be clearly differentiated. The regulatory institutions represent standards provided by laws and sanctions and thereby constrain and regularise human behaviour and interactions. Normative institutions define the actions that are expected of individuals and firms. These institutions are not normally sanctioned by law, but introduce prescriptive, evaluative, and obligatory dimensions into social life and they therefore act as guides and constraints to actions (Bruton et al., 2002). The third dimension, cultural-cognitive institutions, represents taken-for-granted rules and common shared beliefs that are shaped among individuals through social interactions. (Scott, 2001) Although integrating all three aspects, new institutional theory places particular attention on the normative controls and cultural-cognitive forces that influence the regulatory systems (Bruton & Ahlstrom, 2003).

We see the sociologic view of the institutional theory as central within the venture capital and cleantech industries as it facilitates the understanding of the underlying aspects of the Chinese society. The normative and cultural-cognitive aspects will assist us to analyse the commercial conventions and organisational behaviour existing in a society due to the institutional taken-for-granted nature and their self-sustaining ability. Understanding the New Institutional Theory dynamics influencing the actors present in the Chinese venture capital market will create an improved position for the DHI spin-off projects attracting venture capital in the Chinese market.

2.1.2 New Institutional Economics

The economic view of institutional theory, on the other hand, mainly concentrates on the legal environment that regulates economic activities (Bruton & Ahlstrom, 2003). Institutions, in the neo-classical school of thought, are defined as regularities in repetitive interactions, customs, and rules that provide a set of incentives and disincentives for individuals within an economy (North, 1986).

The institutional economist, Douglas North (1990), characterises institutions by dividing them into two categories similar to the three categories of Scott (2001). These categories are the formal and the informal institutions, which combined creates the institutional framework regulating economic exchange. The formal institutions contain political rules, judicial decisions, and economic contracts, which are defined as regulatory by Scott (2001). The informal institutions include socially sanctioned codes of conduct and norms of behaviour that are embedded in the culture and ideology. These institutions are less defined than in the sociological view. Seen from the economic view, the major role of institutions in a society is to reduce uncertainty by establishing a stable structure to human behaviour. North (1990) therefore explains that where formal institutions fail, informal institutions will take over to reduce the uncertainty and provide constancy to individuals and organisations. (North, 1990; North, 1986) However, the focus of New Institutional Economics is primarily on the formal institutions.

North (1990) furthermore distinguishes between organisations, being political, social, economic, and educational bodies described as “the players of the game” and institutions being “the rules of the game”. How organisations come into existence and how they evolve is fundamentally influenced by the institutional framework. In turn, the organisations influence how the institutional framework develops as they interact and change over time. This framework is therefore seen as providing the foundation for production, exchange, and distribution within a society. (North, 1990)

We are of the conviction that New Institutional Economics plays a significant role in the venture capital and cleantech industries in China. The theory emphasises the role that the formal institutional environment have upon the industries and shapes the platform where the investments take place. An understanding of the Chinese rules and regulations for both venture capital investors and the DHI spin-off projects is therefore significant to enter the Chinese market through the use of venture capital alliances.

2.1.3 The Institutional Framework for the Analysis

In the institutional framework for this thesis both institutional approaches are of equal importance and will be applied on a complimentary basis. Most economists primarily focus

on economic or political rules of the game, namely the formal institutions. On the other hand, sociologists find institutions deeply embedded in every aspect of society, namely normative and cultural-cognitive institutions (DiMaggio & Powell, 1991). Although both institutional schools of thought operate with all levels in society, their emphasis differs.

Our reason to combine the two approaches is that the economic view of the New Institutional Economics cannot exist without the sociologic view of New Institutional Theory as it describes the setting within which the formal institutions take shape. Furthermore, the economic and sociological views build upon one another as the factors consistently influences each other and change accordingly. We thereby use the findings of both theories to provide a combined theory framework to analyse how the macro-environment is shaping the arena for venture capital and cleantech industries and consequently DHI spin-off projects entering China through the use of venture capital. From this perspective, we thereby utilise North's (1986; 1990) theory to analyse the formal institutions (sub research question one) as this approach provides a more in-depth picture of the constantly changing legal environment. In regards to understanding network strategies (sub research question two) we implement the normative and cultural-cognitive approaches presented by Scott (2001) as the sociologists provide a more thorough presentation of the dynamics within a society.

In this way, the formal institutions create laws in society that are influencing the normative and cultural-cognitive institutions. Additionally, to make the laws applicable to a given society, they have to be formed with respect to the normative and cultural-cognitive institutions in society as the society otherwise may not follow the rules (Young et al., 2008). In this respect, it is important to emphasise that formal institutions generally evolve faster than normative and cultural-cognitive institutions as it is more time-consuming to change the embedded behaviour and norms in a society (Granovetter, 1985).

In other words, institutions in this thesis are presented as dynamic and understanding their complexity is a key when DHI spin-off projects enter the Chinese society through the use of venture capital. Attracting venture capital is a context-dependent process which therefore requires a fit between the strategy and the conditions of the environment (Zhang & Wong, 2008). The presented institutional framework can therefore assist to examine the impacts of the institutional factors on the behaviour of the DHI spin-off projects and provide

a theoretical platform for the analysis of the venture capital and cleantech industries in the water treatment industry in China. We therefore find that a thorough analysis of the venture capital market in a transition economy cannot be made without a combination of the sociological and the economical view of the institutional theory.

2.2. Network Theory

Taking the institutional theory further, network theory provides an approach to understand the complex nature of contemporary business networks and strategy making in a given society. The theory is central in this thesis in order to comprehend the strategic decisions made in the venture capital industry and cleantech ventures in regards to manoeuvring within a transition economy.

Network theory describes relationships between nodes, defined as the individual actors within the network. Networks are characterised as being directional, meaning a close link between the nodes such as friendship, or non-directional, being that their liking is mutual. Within directional relationships, the relation is characterised as reciprocal when a give and take manner between the two parties are involved. A network can furthermore consist of pairs that operate via an intermediary node, classified as triads, and is explained to be transitive or balanced if there exists direct links between all parties involved. Furthermore, the theory predicts that nodes are more likely to be successfully connected with each other if they are geographically close. That can furthermore be related to homophilous relationships which are defined as having more common social attributes, like the same social class, why of thinking or beliefs. (Kadushin, 2004)

We have chosen network theory as it is often used within transition economies where fixed power structures are being gradually replaced and undermined by a more fluid economic system (Jacobsen, 2008). The institutional changes shaping the room for economic transactions are therefore perceived as dynamic and according to Peng and Zhou (2005) “The only constant in emerging economies in Asia is change”. The theory predicts that regardless of how global an economy becomes, local specificities have a major impact on business practices (Jacobsen, 2008). Network theory incorporates the concept of culture as interpersonal relationships. The concept of local versus global is thereby being

demystified and intertwined in order to understand the actual workings of relationships in the contemporary market in China. (Peng & Heath, 1996)

A network strategy undergoes constant change as relationships, defined as ties, differs in strengths and in content throughout the different phases of the transition[3]. The strengths of ties can be measured by a combination of the amount of time spent, reciprocal services, the intimacy, and the emotional intensity within the relationships (Granovetter, 1973). Strong ties are associated with exchange of finer-grained, high quality information and tacit knowledge (Peng & Zhou, 2005; Powell, 1990). They may even serve as an informal alternative to formal contracts to lower the risk of opportunism by providing a social control mechanism based on trust (Peng & Zhou, 2005; Granovetter, 1985). Weak ties, on the other hand, are more wide-ranging, less redundant, and thereby better able to bridge so-called 'structural holes', defined as discontinuities between reciprocal relations (Peng & Zhou, 2005). The benefits of weak ties are that they generally require less time, energy, and finances to maintain than strong ties and excel at connecting with distant others having unique and novel information for entrepreneurial actions (Granovetter, 1973).

Although used to explain the dynamics in transition societies, networks strategies are not transition economy phenomena. Peng (2003) explains that network based business groups are also important in developed economies with less institutional variance and ingrained dependence on the rule of law. The widespread preference for transacting with individuals of known reputations implies that few are actually content to rely on either generalised morality or institutional arrangements to guard against trouble (Granovetter, 1985).

We find that network theory is essential when analysing the possibilities for the DHI spin-off projects to attract venture capital in China as it provides a comprehension of how venture capital investors and entrepreneurs operate in the Chinese market. The theory will therefore primarily be used in sub research question two. However, the theory will likewise be implemented in sub research question three and four. As venture capital funding is built on well functioning relationships with the receivers, an understanding of the network relations is essential as social relations are responsible for the production of trust in economic life rather than formal institutional arrangements.

[3] Peng & Zhou, 2005; Peng, 2003; Granovetter, 1973

2.3. Agency Theory

Building on our theoretical framework, the agency theory is implemented as it incorporates the incentive problem and the concept of risk and information to comprehend managerial decisions within an organisation. Different approaches exist within the framework and a combination of the classical agency theory, incomplete contracting theory, and the principal-principal theory will therefore be applied to present a more dynamic agency theory framework suitable for our field of research.

In the classical agency theory, the separation of ownership and control is central (Osnabrugge, 2000). Within this approach, one party, known as the principal, delegates work and responsibilities to a subordinate, known as the agent, who performs the work on behalf of the principal (Jensen & Meckling, 1976, Osnabrugge, 2000). As a result the principal-agent problem occurs when the principal compensates the agent for a given act that is useful to the principal, but costly to the agent (Jensen & Meckling, 1976). Thereby, the classical agency theory focuses on resolving two agency problems that occurs when parties have different goals and division of labour (Eisenhardt, 1989; Jensen & Meckling, 1976). The first agency problem is concerned with moral hazard (hidden action) and adverse selection (misrepresentation by the agent). The second problem is risk sharing, which arises when the principal and agent have different attitudes towards risk. This implies that the principal and the agent may prefer different actions due to their different risk preferences. (Eisenhardt, 1989)

The classical agency theory is implemented as it provides an understanding of the complex cooperation between a venture capital investor and cleantech spin-off projects as the major issue in the agency relationships is ensuring that the agent acts in the best interests of the principal. The relationships are therefore usually ruled by contracts. Issues such as opportunistic behaviour, uncertainty, information asymmetry, moral hazard and risk are present as the principal does not know to what extend the contract of the relationship is being satisfied. (Jensen & Meckling, 1976) The trade-off between the cost of measuring behaviour and the cost of measuring outcomes and transferring risk to the agent are therefore central (Eisenhardt, 1989).

Relying on contracts is however challenging in the Chinese setup as their effects are limited and a weak institutional setup diminishes the effect of the written contracts.

Therefore, we combine the classical agency theory with the incomplete contracts approach emphasising that contracts are always incomplete (Hart, 1995). The assumption here is that writing a good contract is itself costly and since contracts cannot be written on returns, they can only be written on assets (Hart, 1995). In this view, an optimal contract cannot be reached due to the inability to contain all future scenarios making monitoring of the venture capital investment a central activity. Security in the investment is achieved through an active involvement in the firm which is a central aspect in venture capital investments especially in the Chinese market. The incomplete contracting theory is thereby emphasising the importance of being present and cooperating in stead of relying on contracts, which is problematic in China.[4]

The two before mentioned agency theories are products of developed economies where the formal institutions provide an efficient enforcement of arm's lengths contracts (Young et al., 2008). In a transition economy like China, the legal institutional environment is weak and we thereby implement the principal-principal approach, which addresses the formal institutional underpinning of strategic behaviour and corporate governance (Wright et al., 2005). This theory clarifies the agency complications that exist when either a venture capital investor or a cleantech spin-off project achieves a minority share in the venture as the formal institutions do not protect the minority shareholder. The focus here is not on how the principal behaves towards the agent but how to make a partnership where partners act in the best interest of each other. The theory predicts that in order to safeguard the investment, it is necessary to bind the partners through a relationship.

In combining the presented approaches, we find that all three agency theories are essential as engaging in alliances with the venture capital industry is complicated and the involved actors have dual roles. The DHI spin-off project is the agent having responsibility to maximise the investment of the investor while simultaneously being the principal safeguarding the cleantech innovation. The venture capital investor, on the other hand, likewise has a dual role, being the principal in regards to monitoring the investments in the water treatment venture and agent to the fund providers with a responsibility to maximise their returns on invested capital (Lahti, 2008). Thereby both the venture capital investor and the cleantech entrepreneur are principals in the venture. Therefore, the three

[4] Wright et al., 2005; Osnabrugge, 2000; Hart, 1995; North, 1990

approaches are combined to comprehend the dynamics in a transition economy between cleantech spin-off projects and venture capital investors in the Chinese market. As a result, the combination of theories will be used throughout the four sub research questions in the analysis.

2.4. Resource-Based View

The theories presented until now are all characterised by dealing with the surrounding environment for an enterprise to successfully operate in the Chinese market. We therefore implement the resource-based view which takes a different approach as it gives an explanation of the importance of the strategic resources of the firm. This aspect has an immense influence on the accomplishment of the DHI spin-off projects in the Chinese venture capital market.

The resource-based view of the firm, established by Wernerfelt (1984), Rumelt (1984) and Barney (1991), is described as an economic tool that determines the strategic resources available to the firm. A resource is defined as anything that can be thought of as a strength or a weakness of a given firm, which can be knowledge of technology, skilled employees, trade contacts, efficient procedures and more (Wernerfelt, 1984). The idea of the resource-based view is that the basis for a competitive advantage of the firm is the way firms apply their valuable resources (Rumelt, 1984; Wernerfelt, 1984).

We find the resource-based view important for our research topic as it explains how a venture can transform short-term competitive advantages into sustained competitive advantages by possessing resources that are diverse and not perfectly mobile. Furthermore, all resources are not of the same importance or have the potential to be a source of sustainable competitive advantage. Due to this fact advantage-creating resources are characterised as being valuable, scarce, inimitable, and durable. (Barney, 1991) Thereby the competitive advantage of a given enterprise is primarily based on internal competencies and the abilities of the management to consolidate these assets and turn them into opportunities on the external market (Prahalad & Hamel, 1990).

The resource-based view of the firm is implemented as it describes the importance of the internal resources of the DHI spin-off projects necessary to attract venture capital. The

resource-based view is primarily applied in sub research question three and four as it perceives the resource selection as a function of both within-firm decision-making, being internal strengths and weaknesses of the project, and external strategic factors, being external opportunities and threats. The theory predicts that managerial choices within the DHI spin-off projects are guided by economic rationality and by motives of profitability, effectiveness, and efficiency. (Oliver, 1997) External influences, on the other hand, are strategic industry factors that impact the spin-off projects from DHI. (Oliver, 1997)

However, the resource-based view has been criticised for not being able to identify the actual sources of competitive advantage, since these resources are often characterised by being firm specific and difficult to imitate (Fahy, 2000). Despite the critique the theory is useful as it provides the opportunity to look within the spin-off projects from DHI and describe the competitive advantage of the new cleantech project and thereby its ability to attract venture capital.

2.5. Building the Theoretical Framework

To explain how the before presented theories build upon each other and create our theoretical framework, the following section describes how they interrelate and contribute to the comprehension of the venture capital and cleantech industries. The institutional theory will function as the overall theory that relates to agency theory, network theory, and the resource-based view.

The aim of the thesis is to understand how a cleantech project can enter the Chinese water treatment market through the use of venture capital alliances. A clear understanding of the institutional setup surrounding the venture capital market is essential as it shapes the actions of firms and individuals in various ways (Bruton & Ahlstrom, 2003). The institutional theory will therefore be the cornerstone of the theoretical framework throughout this thesis which influences the agency theory, network theory, and the resource-based view. The following figure visualises the correlation between the different theories.

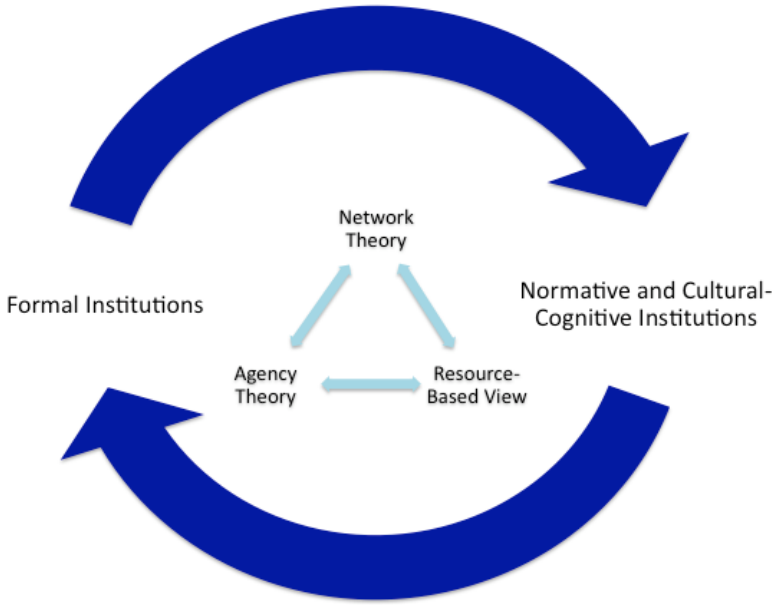


Figure 2: Our theoretical framework. Source: Own interpretation.

The arrows in the figure symbolises that in the fullness of time, all the elements within the model is fully interconnected. The circle symbolises the dynamics within the institutional theory as the normative and cultural-cognitive and the formal institutions interact and continuously influence each other and thereby create our institutional framework. The triangle in the centre visualises how to operate within the given institutional environment. The interaction between agency theory, network theory, and resource-based view is pictured by the arrows. The theories are presented together as they separately only explain parts of the situation.

The network theory has been chosen to complement the institutional theory as the theory offers some constancy and predictability in a market where the formal institutions are weak, which is the case of China. In the longitudinal transition process from a planned to a market economy, the institutions are moving from a relationship-based, personalised transaction structure and network centred strategy into a rule-based, impersonal exchange regime seen in a market centred strategy (Peng, 2003). The argument of Peng & Zhou (2005) is that network strategies adapt to the changing environment, being the institutional setting. In this light, network theory is a response to institutional theory, agency theory, and

the resource-based view as it provides a solution for companies to secure their business in a network.

The nexus of agency theories has been chosen to explain the considerations and risks that a venture capital investor and a cleantech project entail in order to secure themselves from opportunistic behaviour of the other part. The agency theories explain how to manage a given investment within the institutional setup.

The resource-based view of the firm, on the other hand, is in the combination of theories because it provides a theoretical explanation to the role of the strategic resources in the DHI spin-off projects. The theory is included to conceptualise the importance of the innovative mind and competences of the DHI spin-off projects that are essential when searching for venture capital. Internal resources need to be combined with the external environment, where the valuable resources of the firm are developed in order to analyse the competitive advantage of the spin-off project (Barney, 1991). In other words, the strategic resources differ depending on the institutional environment and the theory therefore needs to be seen as part of the whole theoretical framework

Part 2

3. Venture Capital and Cleantech in the Water Treatment Industry in China

In order to answer our main research question being how the spin-off projects of DHI can enter the Chinese market through the use of venture capital alliances, it is necessary to define the concept of venture capital as it will be applied throughout the thesis. In China, however, venture capital is in an early stage and a clear definition does therefore not exist. The following section will present our definition of the term followed by a presentation of the venture capital market in China before introducing the Chinese water treatment industry. These sections provide the data that will be used for the discussion within the analysis.

3.1. Definition of the Venture Capital Concept

Venture capital can be understood and defined in several ways depending on the location of the investment. The main difference between venture capital and other types of equity financing is the combination of expertise and funding provided through venture capital to the companies receiving the investments (Ahlstrom et al., 2007). However, financial support is the main cause for a relationship between a venture capital investor and an entrepreneur (Fried & Hisrich, 1995).

We understand venture capital as a high risk investment invested in start-up companies or projects with high growth potential, but limited access to capital (Wang et al., 2002). In return for the venture capital provided by corporate investors or specialised financial institutions, the investor receives a say in the management of the company and becomes a shareholder (S. Houmøller, personal communication, June 19, 2009). The venture capital investors obtain ownership claims, some control over top management, and the ability to exercise oversight during the post-investment period to accelerate the growth of their investment in exchange for financing. Their role is to add value through their equity stake in order to contribute more to the investees and thereby enhance their own returns.

Venture capital investors thus assist with expertise in areas where the venture needs professional support that they do not possess themselves. (Wang et all., 2002; Gompers, 1995) Venture capital thereby assists the creation and development of entrepreneurial ventures and innovative projects in the societies where they invest (Ernst & Young, 2005).

Investing in start-up companies and innovative projects imply major risks due to the absence of tangible assets and as a consequence some investments do fail (Gompers, 1995). The entrepreneur therefore has limited access to the general capital markets due to the high risk involved (Wright, 2007; Wang et al., 2002). However, the venture capital investor can obtain an immense return on investment from other similar projects which will more than compensate for the loss (Wang et al., 2002; Osnabrugge 2000). Venture capital investors are usually a part of the start-up company or project for approximately five years depending on the type of project.

When receiving venture capital the founders of the cleantech project may lose some control over their venture, but in return they can gain financial capital as well as other valuable support by engaging with a venture capital investor (S. Houmøller, personal communication, June 19, 2009; Wang et al., 2002). The venture capital investors bring legitimacy and credibility to their funded ventures and may provide key contacts in the government and other firms, as they are often part of an extended business network[5].

Venture capital is characterised by having four stages in the investment being; the selection process for the prospective venture, monitoring the venture, value-added activities provided to the funded venture, and exit being the last stage of the venture capital investment (Ahlstrom et al., 2007). Exiting usually happens through an Initial Public Offering (IPO) or by selling to strategic buyers (Wang et al., 2002).

Venture capital is related to the investor type “Business Angels”. They are defined as individuals who often have started their own successful firms in the past and are looking to invest some of their profit and experience gained into a small entrepreneurial project (Lahti, 2008; Osnabrugge 2000). The main difference between business angels and venture capital investors is therefore that the business angels are investing as private persons whereas venture capital originates from a firm or a fund (Osnabrugge, 2000). In

[5] A. M. Mathiesen, personal communication, May 12, 2009; Ahlstrom et al., 2007; Wang et al., 2002

spite of similarities between the business angels and the venture capital investors, our focus is purely placed on venture capital investors who are perceived as more professional investors of institutional assets (S. Houmøller, personal communication, June 19, 2009; Osnabrugge 2000).

Given the above framework of the venture capital concept used in this thesis, the type of funding is different from other types of equity financing. In China, the terms venture capital and private equity are used interchangeably. Therefore, by creating the venture capital framework, the thesis distinguishes venture capital from the broader concept of private equity and later stage cleantech investments.

3.2. Presentation of the Chinese Venture Capital Market

With 22% of the world's population and one of the world's fastest growing economies, China's attractive market is characterised as one of the fastest growing markets for venture capital investing in the world today[6]. In 2008 alone, foreign and domestic venture capital investors with active investments in China managed US$ 24.39 billion which is an increase of 14.4% against the year before (China Venture Capital Annual Report 2008). The perception within the global venture capital industry has been that "Every serious venture capital investor needs a China strategy" (Maschek, 2005). Nevertheless, as the world's financial crisis initiated, the overall uptrend has slowed down which is visible in the following figure. However, as a whole the Chinese venture capital market remained in market growth throughout 2008 compared to 2007 and the market is now experiencing an increasing upswing in the second quarter of 2009 (China Venture Capital Report, Q2, 2009; Zero2IPO Research Centre, 2009).

[6] Toh, 2008; Ahlstrom et al, 2007; Ernst & Young, 2005; Bruton & Ahlstrom, 2003

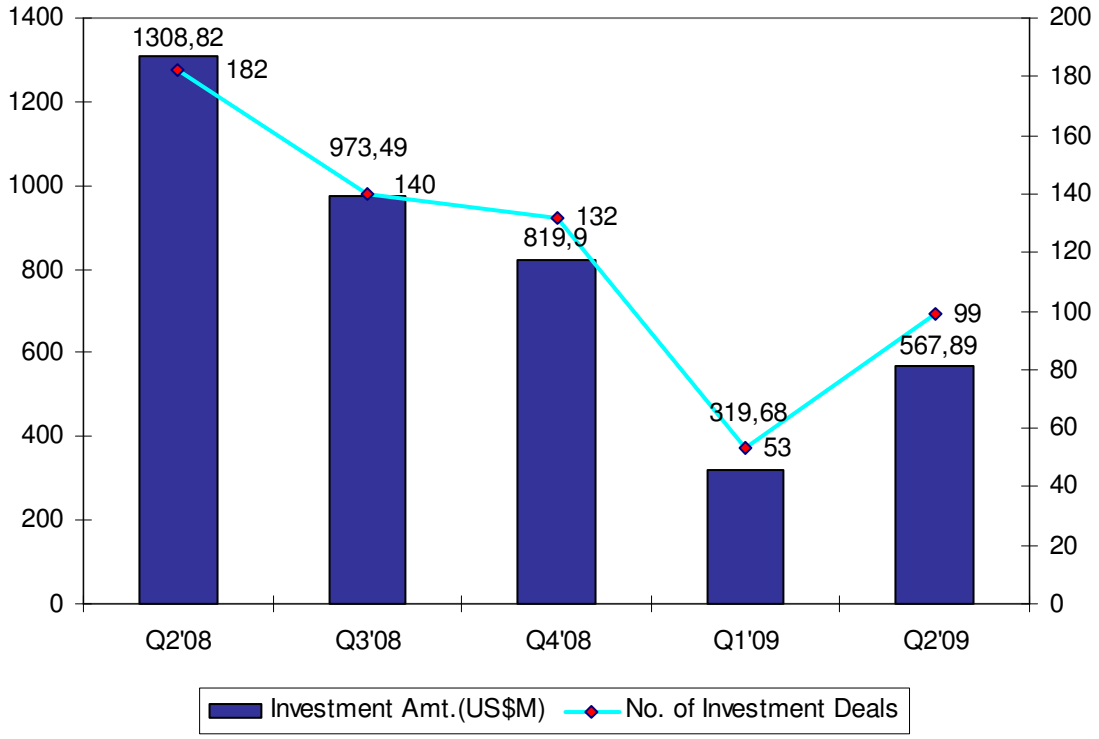


Figure 3: Quarter-on-quarter comparison of venture capital investment amount and deals between Q2'08 – Q2'09. Source: Zero2IPO Research Centre

The venture capital market in China is still in an infant stage (Batjargal & Liu, 2004). The market began in 1985, where the Chinese government for the first time encouraged venture capital as 'a powerful tool' to promote 'fast growing yet high risk technology, research and development projects' (Liu et al., 2006). The venture capital industry was initiated by the Ministry of Science and Technology and the first venture capital organisation was set up in 1986 (Liu et al., 2006; Batjargal & Liu, 2004). The same year, the first foreign venture capital investor, Chinavest, penetrated the Chinese market. Entrants to the industry were still controlled by the authorities and domestic venture capital investors dominated the market (Liu et al., 2006). In 1998 the venture capital market intensified as the Chinese government adopted a number of policy schemes to promote venture investments (Batjargal & Liu, 2004). Venture capital in China has been promoted as a critical mechanism to link national and regional economic and social development with scientific and technological capabilities and outputs (White et al., 2004). More than 85% of the Chinese venture capital investors were set up after 1998 and nearly two-thirds

of these firms were established after 2000 which shows the venture capital industry's early stage (Liu et al., 2006). Successful exit stories attracted many international investors which have become an important factor within this industry (Liu et al., 2006). The international venture capital investors have seen a recent decrease of 2.9% as opposed to an increase of 1.6% for domestic venture capital investors, but the international companies are still taking the lead in the Chinese venture capital market by contributing two thirds of the annual total (Appendix, 8.2; China Venture Capital Annual Report, 2008).

Though the Chinese venture capital market has experienced rapid growth, the industry still faces strong unsolved institutional, regulatory, and human capital issues and the legal environment for venture capital investments is still considered limited (Batjargal & Liu, 2004; Bruton & Ahlstrom, 2003). The formal institutional framework does not clearly define rights and responsibilities under the law and the present central regulations are not binding in mainland China creating a regulatory chaos (Bruton & Ahlstrom, 2003). This unstable situation involves risks to the process by which the venture capital investors raise, invest, and manage their funds (Batjargal & Liu, 2004; Bruton & Ahlstrom, 2003). The central government often plays the role of shareholder, investor, fund manager, and auditor of venture capital investors concurrently (Batjargal & Liu, 2004). The act of the government is emphasised by the fact that 40% of the fund managers in domestic venture capital investors are former government officials, event though only 4% have prior fund-management experience (Batjargal & Liu, 2004; Liu, 2001).

An important aspect of the venture capital industry is the exit possibilities by which the investor can realise their return on investment. The venture capital investors in the West usually exit their investments through IPOs before the venture capital partnership is terminated. This opportunity has proven problematic in China, as the selection of which investors may list on the stock exchange in China remains a state decision. This has led many venture capital investors to exit through strategic buyers or a listing on a foreign exchange such as the NASDAQ.[7] The challenging exit possibilities have created a competitive disadvantage for the domestic venture capital investors that only have limited IPO access compared to a venture capital investor within an economy with active and vibrant stock markets (Liu et al., 2006).

[7] Ahlstrom et al., 2007; Wright, 2007; Bruton & Ahlstrom, 2003

The Chinese venture capital market can be divided into four distinct categories of venture investors; the government venture capital investors, the corporate venture capital investors, the university venture capital investors, and the foreign venture capital investors. The investors have different objectives, operating characteristics, and ways to invest in the Chinese market as well as diverse strength and weaknesses (Ahlstrom et al, 2007; White et al., 2004).

3.3. The Water Treatment Industry in China

For years water shortages, water pollution, and flooding have been increasingly constraining growth and affecting public health and welfare throughout China. The economic tendencies and the population expansion put even more pressure on the restricted water resources of the country and the challenging situation is likely to worsen. According to the latest World Bank report on water scarcity in China (2009), the widening gap between water supply and demand alongside with widespread pollution suggests that a severe water shortage crisis is emerging. (Xie et al., 2009)

According to the work program of the Ministry of Construction and the national 11th Five Year Plan (2006-2010), China's main public statement of policy priorities, the Chinese government will be investing RMB330 billion (US$41.3 billion) in the water treatment market by allocating funds to the local governments. The funds will be invested in the construction of new sewage treatment and recycling facilities to obtain an urban sewage disposal rate of 70% by 2010 (World Watch Institute, 2006). In addition, the RMB4 trillion economic stimulus package further allocates RMB280 billion to be invested in small-scale rural sewage treatment plants (DeWoskin & Mahoney, 2009). The local governments are expected to match the allocated funds from the central government to be invested in water treatment (EIU, 2008). Most of the water treatment industry is infrastructure meaning that the Chinese authorities often are the main customers to water treatment projects (H. G. Enggrob, personal communication, March 23, 2009). However, it is still unclear how well the local government will complete the directives of the central government.

By reforming the water treatment market, the Chinese government is creating incentives and financing opportunities to encourage domestic and international companies to develop solutions to prevent further water shortage and pollution woes (Cleantech Group, 2008).

According to the Foreign Investment Catalogue (2007), foreign shareholders are now allowed to build, operate, and own water treatment facilities in small and medium-sized cities (KPMG, 2008). This is a shift as previously foreign investors have only been allowed to invest in distribution networks by taking a minority stake (KPMG, 2008). Water projects have historically been funded from water tariffs, national and local government budgets, state policy bank loans, government bonds, and occasionally, stock market listings. Investments have been provided by the World Bank, the Asian Development Bank (ADB) and through concessionary financing agreements with foreign governments. Capital and expertise are today increasingly coming from the private sector and hundreds of water supply and water treatment projects have some sort of private sector participation in China. (EIU, 2008)

An important aspect of the 11th Five Year Plan requires that the Chinese government raises water prices to promote conservation and efficiency in a reform of the country's water price system during the period 2006-2010. As outlined by the World Watch Institute (2006), water prices in China do not reflect the full value of the water resources or the wider ecosystem services supplied by watersheds. Traditionally, the prices of water in China have not included the cost of sewage treatment, but the expenditure will now be on top of the regular water prices. (Xie et al., 2009) The aim is to make the polluters accountable for the waste they generate, rationalising the regular water price for households, and motivate residents to economise the usage of water[8].

Including the before mentioned changes in the industry, the opening of the water market in China will make water treatment facilities big business in China (EIU, 2008). This argument is supported by the Cleantech Group (2007) and KPMG (2008) expecting that the water operations and water treatment plants will be the next booming segment due to the serious issues of water quality and resource scarcity (Xie et al., 2009; Cleantech Group, 2007). The water segment thereby provides a favourable environment to domestic and international companies supplying new water plants, technology, and management. The effect is particularly large in urban centres along the coastal regions where residents can afford to pay commercial rates for water services (Xie et al., 2009). Furthermore,

[8] Circular Economy Law – Article 10, 2009; Xie et al., 2009; EIU; 2008 World Watch Institute, 2006

China's urbanising population is increasing with the size of Frankfurt every four weeks which further intensifies the demand (DeWoskin & Mahoney, 2009).

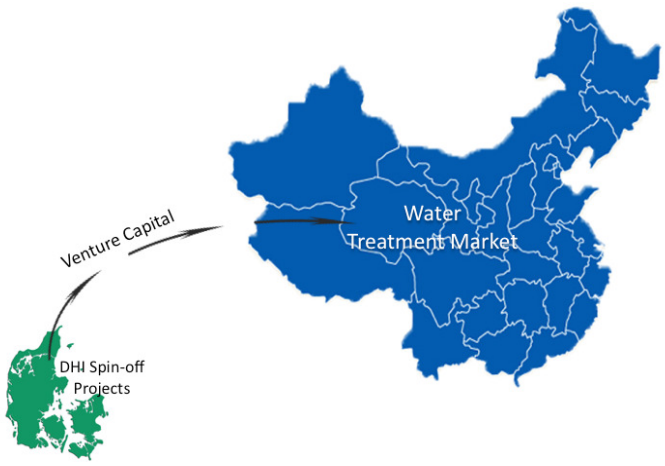
In spite of the major opportunities for foreign participation in water treatment, the sector is risky. Water development and infrastructure involves high capital expenditures, long repayment periods, and inconsistent laws and regulations[9]. Due to the high tariffs created by the legal environment in China, creating revenue growth is challenging[10].

As the government is transforming the water sector in China into a business run on a for-profit basis, the risks of 'inflation' in water projects exists due to the funds available and the push from the central government. The Chinese authorities thereby create a sector that used to be an expense to the local governments and is now becoming a profitable industry. The funds from the central government are blueprinted to be invested in water treatment project but the receiver depends on the local officials which creates a disadvantage for water treatment projects that are new to the field in China. (EIU, 2008) Domestic companies thereby end up becoming the leading players (KPMG, 2008). These companies being Tianjin Capital Environmental Protection, Beijing Capital, Shenzhen Water Group and China Water Affairs have good relationships with local governments (EIU, 2008).

[9] Xie et al., 2009; EIU, 2008; Ernst & Young, 2008
[10] DeWoskin & Mahoney, 2009; Xie et al., 2009; EIU, 2008

4. The Case of the Danish Hydraulic Institute (DHI)

This chapter presents the company DHI and their AddVenture strategy for spin-off projects which will be used as a case when analysing how spin-off projects from DHI can enter the Chinese market through the use of venture capital alliances.



An ideal spin-off project from DHI is according to H. G. Enggrob (personal communication, June 17, 2009) a spin-off project developed through the research and development from DHI and implemented on the immense Chinese market through a venture capital partnership as the home market of DHI is limited. Attracting venture capital will be used as a strategy from DHI to penetrate the Chinese market as the investors provide useful knowledge and market specific information that the project of DHI can utilise. A prerequisite is that both DHI and the venture capital company have clear exit strategies through an IPO or to strategic buyers and that the spin-off project does not become a future competitor to DHI. (H. G. Enggrob, personal communication, June 17, 2009)

The foundation for DHI spin-off projects come from the DHI which is a Danish independent, international consulting and research organisation within the fields of water, environment, and health with the headquarters located in Denmark. DHI was founded as a spin-off company from the Danish Technical University in 1964 and has since been a trend setter in the development and application of water related technologies and software services (Mikkelsen, 2008). The consulting services are based on the development and application of knowledge and technical skills within coastal, urban, river, ports, and offshore engineering as well as ecology, water resources, hydrodynamics, and other areas related to the water environment. The focus of DHI is primarily on software products.[11] The

[11] H. G. Enggrob, personal communication, March 23, 2009; DHI, 2009; DHI Group, 2009

expertise has given the company international recognition for its innovation and expertise and made the company world leader in the field of water treatment software that helps coordinate, manage and optimise the use of water resources (Mikkelsen, 2008).

DHI is a member of the GTS (Godkendt Teknologisk Service - Authorised Technological Group) which is a network involving seven independent Danish research and technology corporations. They are authorised by and collaborating with the Danish Ministry of Science, Technology, and Innovation on technology-based promotion of trade and industry. (DHI Group, 2009; J. Rasmussen, personal communication, May 1, 2009) DHI therefore achieves financial support from the Danish government as part of their performance contract which implies that DHI focuses on research and development within the water treatment industry. The position of being a GTS institute gives DHI an important role to assist small and medium-sized enterprises with expertise in water treatment.

Being a GTS institute prohibits DHI from having services that acts in direct competition with the small and medium sized companies they are assisting. Spin-off projects are therefore created as DHI can not in-source the products into their portfolio. As the spin-off projects are outside the core competences, the DHI managers have limited incentives to finance these spin-off projects which are why the spin-off projects need to attract venture capital. (H. G. Enggrob, personal communication, June 17, 2009; March 23, 2009)

However, as research and development are core competences of DHI, a variety of new products and ideas are constantly evolving, some of which are not within the portfolio of DHI. The 'AddVenture strategy' programme was therefore introduced in 2001 to assist the so-called 'intrapreneurs', meaning entrepreneurial employees from within DHI's organisation, to develop their new innovative solutions and projects into possible spin-offs. The reasons are that the new solutions will boost the entrepreneurial innovative spirit of the DHI employees, provide the water treatment market with improved solutions from DHI spin-off projects that will later acquire the consultancy services of DHI, and make successful spin-off ventures that will ensure the government that DHI is an active and engaged market player. As the innovation comes from within DHI, the company will claim an equity share in the venture, but venture capital is needed to fund the spin-offs and provide business expertise (Appendix 8.5).

AddVenture is divided into three different levels visible in Appendix 8.5. They include the definition stage, which takes place within DHI; the development stage, which is handled by a separate corporate venturing unit; and the commercialisation stage, which is present in the spin-off company. The two last stages will be in focus in the thesis as the search for venture capital is present at these stages. The AddVenture strategy hereby differs from ordinary innovation of DHI by the risk associated, external capital needed, potential, and the time horison.

The DHI spin-off projects can furthermore benefit from the market knowledge and expertise accumulated from the 29 counties where DHI has offices and the 140 countries where the services and solutions of DHI are sold (H. G. Enggrob, personal communication, March 23, 2009; DHI Annual Report, 2008). The global presence provides a competitive advantage as knowledge is transferred through 'innovation highways' between the DHI offices. As the majority of the existing general international research and development takes place outside the Danish borders, DHI holds a favourable position with their international focus. Today 70% of DHI's profit is gained on the international market. (H. G. Enggrob, personal communication, March 23, 2009)

In regards to China, DHI is not asking if but how the spin-off projects can enter through venture capital. The reason is that DHI perceives China to be the next major strategic market for water treatment services (J. Rasmussen, personal communication, May 1, 2009). DHI China was created in 2003 by the manager of DHI China, Mr. Lu. The Chinese manager completed his PhD. for DHI in Denmark while working for the company and thereafter started as a partner for DHI in China in 1992. The competences of DHI China are software and consultancy services and the spin-off projects can thus compensate this focus. Currently 160 people are employed in DHI China which is a number that is expected to double in the coming years.[12]

Further information about the case of DHI and the AddVenture Strategy can be found in Appendix 8.4 and Appendix 8.5 respectively.

[12] H. G. Enggrob, personal communication, June 17, 2009; K. F. Janning, personal communication, June 8, 2009; J. Rasmussen, personal communication, May 1, 2009

Part 3

5. Analysis

The analysis builds upon the presented theoretical framework combined with our conducted interviews and gathered secondary sources. Furthermore, information from the preceding presentation of the venture capital and the water treatment industries in China and the case of DHI will be applied. The funnel below visualises the main research question at the top of the funnel followed by the four sub research questions. They build upon each other and contribute to provide the recommendation for DHI spin-off projects in the bottom of the water funnel.

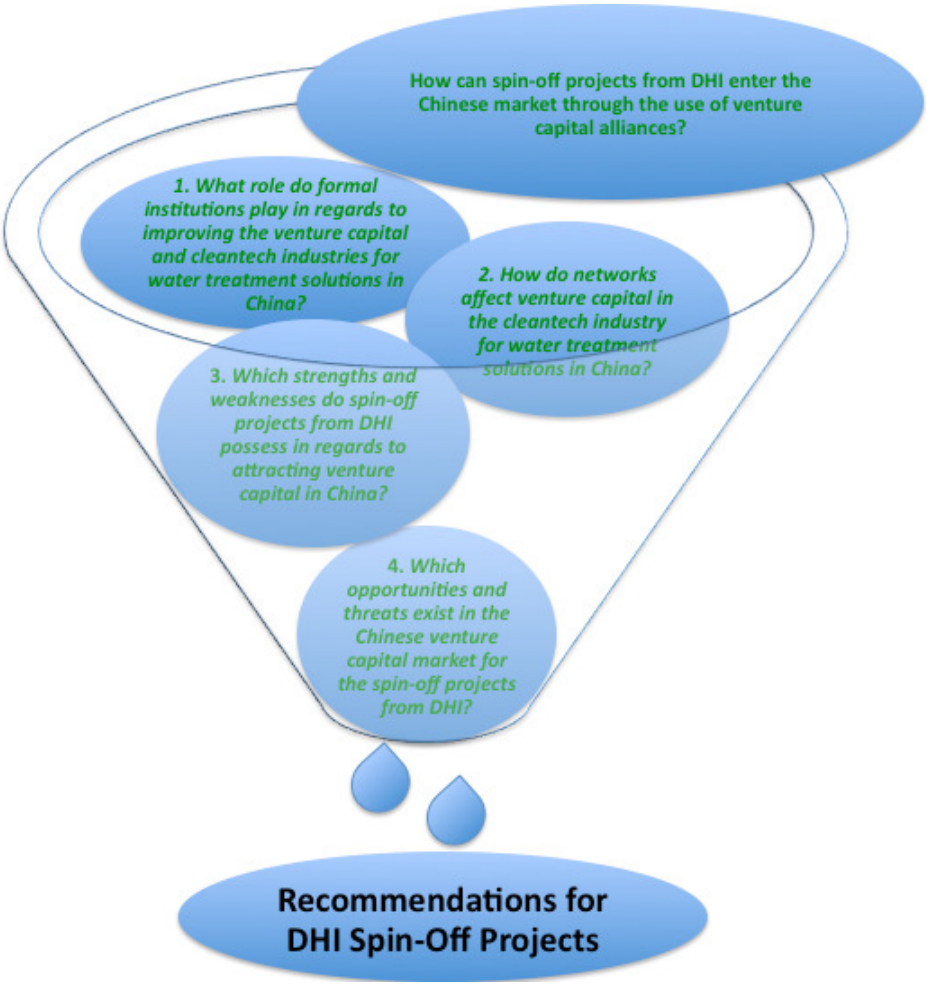


Figure 4: Research funnel. Source: Own interpretation

5.1. The Role of Formal Institutions in China

The first section of the analysis investigates how the formal institutions in China contribute to the possibilities of pioneering water treatment solutions by making incentives and improving the conditions for venture capital and cleantech ventures. The focus on attracting new innovative ideas is visualised in President Hu Jintao's central objective which is creating a harmonious society through scientific developments (EIU, 2009). The importance of analysing the formal institutional setup is to understand how the venture capital and cleantech industries are shaped by these institutions. This comprehension is required in order to answer the main research question on how the spin-off projects from DHI can enter China by the use of venture capital. The question to be answered in the following analysis is therefore; "***What role do formal institutions play in regards to improving the venture capital and cleantech industries for water treatment solutions in China?***"

With the institutional setup as the centre of attention, the institutional theory and agency theory will be applied to explain the distinctiveness of the venture capital and cleantech industries through the institutional approach explained in the previous theoretical framework. When answering the above stated sub research question the following analysis will begin with discussing the importance of the formal institutional setup in 'The Impact of Formal Institutions in China'. The section 'The 11th Five Year Plan and the Circular Economy' will follow to discuss the incentives presented in the current laws and regulations within the field. Whether the laws are locally implemented will be analysed in 'Local Enforcement of Environmental Laws'. The challenges regarding the form in which the central government seeks to solve their environmental problems is explored in 'Cleantech or Cleaner Production'. This aspect will be followed by a discussion on 'Laws Regulating Cleantech Venture Capital Investments' to zoom in on manoeuvring possibilities of the venture capital investors. The section 'Concerns for the Venture Capital Investors and the Cleantech Ventures' investigates the disputes that the actors face when operating in the Chinese market. Another concern is the difficulties when 'Exiting the Investment within China'. The last section 'Cleantech or Status Quo' analyses if the Chinese formal institutions are aiming to actually use the venture capital to promote new innovative ventures or whether the venture capital is utilised as a tool to assist existing companies. The analysis will be summed up in the 'Sub Conclusion'.

5.1.1. The Impact of Formal Institutions in China

When analysing the formal institutional environment in China it is important to comprehend the political structure since the country is built on a unitary and not a federal system. The structure is as a result organised along a typical hierarchy where local governments are supposed to implement decisions outlined by the central government. Hence, the changes that are visual in the local government priorities are usually dictated by the central government of China. (Ye et al., 2008) N. Christensen (personal communication, June 17, 2009) argues that this top-down approach is further seen within the enterprises as the central government dictates what should be produced and focused upon (U. W. Sørensen, personal communication, June 6, 2009). This implies that the central government has a determining impact on the business environment.

As previously clarified, venture capital is transacted, early stage investing of funds and expertise in start-up companies or projects with high growth potential (Ahlstrom et al., 2007; Avnimelech & Teubal, 2006). In China, the institutional environment for venture capital differs in several aspects from the general concept due to the distinct social and commercial milieu grounded in the socialist tradition and culture (Bruton & Ahlstrom, 2003). In this way, the Chinese formal institutions are directly as well as indirectly influencing the path of the venture capital industry to develop in distinct ways with its own idiosyncratic characteristics[13]. This is not a special Chinese phenomenon as formal institutions in any country influence the industrial setup (Bruton et al., 2003). These influences on the industry are important to emphasise in order to understand how formal institutions impact venture capital investors (Peng, 2001) and in turn shape entrepreneurial methods to attract this funding. The spin-off projects of DHI are consequently required to comprehend the institutional setting when operating in China (Bruton & Ahlstrom, 2003).

Looking into the institutional theory in China, formal institutions are often viewed in terms of their constraining nature or lack of adequate regulations for the industry[14]. These institutions are important as “economic and political models are specific to particular constellations of institutional constraints that vary radically both through time and cross sectionally in different economies” (North, 1990). Following this statement, any attempt to

[13] Avnimelech & Teubal, 2006; Bruton & Ahlstrom, 2003; Bruton et al., 2002
[14] Bruton & Ahlstrom, 2003; Peng, 2000; Dimaggio & Powel, 1991

understand a given market must be considered with emphasis on the institutional framework (Peng & Heath, 1996). Focusing on the formal institutional setup in China gives an explanation of how the economic exchanges are regulated, business activities are limited, and whether the formal institutions are able to reduce uncertainty and thereby lowering transaction costs (Bruton & Ahlstrom, 2003; Peng, 2000). Operating in China therefore requires special awareness of the particular formal institutional environment. In regards to cleantech, governments are a natural participant as their role as facilitator and policy-maker is a prerequisite for the emergence of a cleantech sector (Ernst & Young, 2007). However, formal institutions do not only specify limits; they also form frameworks which facilitate actions (Bruton & Ahlstrom, 2003; Peng, 2000). The argument is that understanding and utilising the formal institutional framework to its full potential can assist the spin-off projects of DHI in the water treatment industry.

Consequently, formal institutions set, as described within this section, the frame for the venture capital and cleantech industries and force the actors to adjust to the surrounding environment.

5.1.2. The 11th Five Year Plan and the Circular Economy

When analysing the Chinese formal institutional setup, it is important to emphasise that policy drives much of the interest in the cleantech industries in China as the country is run by the different Five Year Plans[15]. This focus on cleantech is visible in the active 11th Five Year Plan, as the government is promoting environmental protection, renewable energy, conservation of energy and resources. Of special interest, for the thesis, are the investments from the government in the water treatment sector which are encouraging incentives benefiting the DHI spin-off projects and the venture capital investors.[16] This economic plan is not the first in China to address environmental and sustainability issues, however it differs in its intensity. Thus, until mid-2007 no local government in China from inland to the coast expressed serious interest in working with environmental issues (Ye et al., 2008). Today, in 2009 the government is setting targets for reducing energy consumption per unit GDP by 20%, which is a clear change in China's desires for

[15] N. H. Christensen, personal communication, June 17, 2009; Xie et al., 2009; Cleantech Group, 2007
[16] DeWoskin & Mahoney, 2009; Xie et al., 2009; KPMG, 2008

improving their environmental situation (Ye et al., 2008; see Appendix 8.2 for clarification of environmental laws and regulations). The level is considered ambitious (McElwee, 2008), nevertheless it might prove an underestimation (DeWoskin & Mahoney, 2009). K. F. Janning (personal communication, June 8, 2009) further criticises the Chinese government since they, as he explains; "only think of the environment and climate if they have capital for it and implement the environmental issues for prestige and acknowledgement. They could do so much more". N. Christensen (personal communication, June 17, 2009) adds that the cleantech industry is not created as a response to climate and environmental issues but as a response to the 'other economic mode' presented in the mid 1990s. The attention in this mode was on quality instead of quantity and not to rely on export. The focus was as a result on sustainable development in the Chinese society and less on actual environmental issues. (N. H. Christensen, personal communication, June 17, 2009)

This point of critique to the new formal institutional environmental focus is answered by the implementation of the 'Circular Economy Law of the People's Republic of China' passed on January 1st 2009. The introduction of this law indicates "(…) reducing, reusing, and recycling activities conduced in the process of production, circulation, and consumption" (Circular Economy Law, 2009). Consequently, the government actively promotes the concept of the Circular Economy as a way to advance resource productivity, boost eco-efficiency, and strengthen environmental sustainability (China Environment Series, 08/09). The law is expected to have a significant impact on reducing production and consumption to diminish the growing waste problem by 2020 by creating a closed loop of materials within the Chinese system (McElwee, 2008). These changes clearly send a positive message to the cleantech industry and hence the possibilities for the spin-off projects of DHI to promote themselves to venture capital in the Chinese market (Cleantech Group, 2008). This is supported by a Chinese environmental and energy lawyer, stating that "China has shifted its environmental regulatory model from 'command and control' (where the control component was often ignored) to 'sustainability' or as it is known in China – 'the Circular Economy'" (McElwee, 2008). The change in politics is further backed up by an interview with a Environmental Technology Fund partner who argues that "It's rare to have governments lobbying on behalf of a sector and promising to put money in but that's clearly what is happening now" (Cleantech Group, 2009).

The new law is further distinguished from former Chinese practices as: "The development of a circular economy shall be propelled by the government, led by the market, effected by enterprises and participated in by the public" (Circular Economy Law, Article 3, 2009). Seen from this perspective, the Circular Economy Law implies that the government is still the main moderator of the Chinese market, but contrary to the planned economy model, the transitional change in regards to the environment will be led by the market. Enterprises should run the cleantech related functions of the market and the population is expected to participate in the process.

All else being equal, this formal institutional change in regard to demand provides a favourable position for both local cleantech ventures and the DHI spin-off projects as market forces develop a more sufficient competitive environment. However, as the water treatment market is mostly characterised as being infrastructure, the industry is dominated by officials at all levels and the favourable potential competitive position for the spin-off projects from DHI may be obstructed. This new open market does not hinder preferential selections from the local governments for choosing Chinese entrepreneurs to boost the local industry although the DHI spin-off projects may have better solutions. Although the law predicts that the industry should be run by free market forces, the underlying assumptions of the central government is to improve the conditions for the creation of Chinese cleantech companies placing the DHI spin-off project in a disadvantaged position. (N. Høyrup, personal communication, June 17, 2009; K. F. Janning, personal communication, June 8, 2009)

Looking deeper into the water treatment industry, the Circular Economy Law states that industrial enterprises "…shall use advanced or applicable water-saving technologies, techniques and equipment, work out and implement water-saving plans, strengthen water-saving management and exercise control over the use of water in the whole process of production." (Circular Economy Law, Article 20, 2009) The government takes the law further by demanding that the companies should "strengthen quantitative management of water use, be equipped with and use acceptable water measurement instruments, and set up a water consumption statistics system and a water use status analysis system" (Circular Economy Law, Article 20, 2009). Seen from this perspective, the formal institutions implement laws requiring that all industries must have adequate water treatment facilities. This incentive is leading to an expanding market for water treatment

products creating an advantage for the DHI spin-off projects to search for venture funding as the venture capital investors are attracted to the increasing potentials in the cleantech industry.

Every thing ells being equal the 11th Five Year Plan and the Circular Economy Law are in the process of creating a positive development in regards to improving the conditions for the venture capital and cleantech industries in the water treatment industry. This will consequently improve the abilities for DHI spin-off projects to attract venture capital.

5.1.3 Local Enforcement of Environmental Laws

As previously discussed, China has passed a comprehensive set of environmental laws and the government seems to view the promulgation of new laws and regulations as a significant part of the environmental solution in China (Appenix 8.2; McElwee, 2008). Critics argue that the Circular Economy Law will become another obstacle to transparency in the Chinese legal environment and that China lacks environmental enforcement more than environmental laws (McElwee, 2008; China Daily, 2006). In this way the weak enforcement of the formal environmental institutions have been seen as the manifestation of the "clean up later" growth model supporting the economic and industrial development tidal waves of the last twenty years[17].

Historically, local officials have been promoted in the political system depending on how fast they could expand their local economies (Ye et al., 2008; Zhong-Xiang, 2007). Placing environmental stewardship in the hands of local officials, who are concerned with economic development of their own regions, therefore requires strong incentives provided by the central government to change the pattern (Zhong-Xiang, 2007). The 'clean up later'-approach is rooted in the normative tradition and accords little value to some of the core elements of effective environmental governance (Economy, 2004). In this light, the implementation of various laws and regulations to promote the cleantech industries have little value if not put into operation in the local setting. These laws thereby risk becoming a marketing tool to promote China towards the international community more than a concrete tool for change of the environment.

[17] Cleantech Group, 2009; McElwee, 2008; Zhong-Xiang, 2007; Varis & Vakkilainen, 2001

In regards to institutional theory, the formal institutions are now setting the rules and their enforcement to discourage individuals from taking actions that harm the environment. They thereby aim to influence the normative institutions to make environmental protection the norm and what is expected of individuals, firms, and local governments (Bruton et al., 2002; Scott, 2001) while simultaneously creating an improved economic environment for cleantech ventures (North, 1990). The pace of change in the legal environment by the formal institutions is faster than the swiftness of normative institutions making the political change in the local governments time consuming (Scott, 2001). This is emphasised in China where the local authorities need to execute the regulations decided by the central government. The classical agency theory is therefore important as the central government does not know to what extend the regulations are being fulfilled by the local governments (Eisenhardt, 1089). This refers to the first agency problem formulated in the classical agency theory as the execution of the laws are useful to the principal being the central governmental but costly to the agent, being the local government that may have to close production facilities to comply with the environment standards (Jensen & Meckling, 1976).

The lack of adherence to the laws from the local governments, has lead the central government to create the National Leading Group on Climate Change in June 2007 to guide provincial governments on environmental issues (Ye et al., 2008). Consequently, the formal institutions are increasingly making the environment a measurement factor for central, local, and provincial officials who were previously measured on GDP growth and FDI attraction (Cleantech Group, 2009). The local policymakers are now being judged and promoted by their input to decrease climate changes as environmental issues have become an ideological parameter from the central government (N. H. Christensen, personal communication, June 17, 2009; Cleantech Group, 2009). Economic growth and political promotion are closely related within the Chinese setup, however the traditional focus on economic development now has to be balanced with social equity, stability, and environmental well-being (Ye et al., 2008).

To push the change in the normative institutions, the central government is increasing penalties for obvious violations together with the schedules for fines being charged for environmental violations to combat the challenges (Cleantech Group, 2008). The regulatory change can be seen in the will and capacity of environmental officials to promote the environmental agenda (DeWoskin & Mahoney, 2009) and the ability to

sanction environmental infringers by utilising the Criminal Law that was not implemented before 1997 (Appendix 8.2; EIU, 2009). N. H. Christensen (personal communication, June 17, 2009) further concludes that the implementation of the environmental regulations actually functions in the Chinese society in contradiction to many other laws created by the government.

Although the development is positive, local enforcement is likely to be slow and geographically unevenly distributed (McElwee, 2008). The environmental authorities are still weak outside the major cities mainly in inland China which imply that local governments still prioritise economic growth over environmental protection (EIU, 2009). This situation leads to a continued focus from the rural governments on traditional sources creating a disadvantage for the cleantech industry and subsequently the spin-off projects from DHI (Cleantech Group, 2008). The more developed coastal regions, on the other hand, are seen to be better at enforcing the environmental regulations than the rural western regions (McElwee, 2008; Ye et al., 2008). Some examples are Shanghai, Shandong, Anhui, and Beijing which have all issued regulations on energy conservation meaning that enterprises or organisations will face serious penalties for failure to meet certain standards (K. F. Janning, personal communication, June 8, 2009; Ye et al., 2008).

As a consequence of the differences in regional focus, the Chinese country will be divided in two distinct markets for cleantech projects as the emphasis on the industry differs. A problematic aspect of the theme is that the non-existences of water treatment in rural areas produce a major pollution problem in the rivers which run to the high populated coastal areas further complicating the water treatment situation. (Xie et al., 2009) Currently cleantech is centred in East and North China making the market flourish with capital and innovative cleantech solutions (Cleantech Group, 2007). However, as a result of the challenging water crisis, the main cities are expected to push the formal institutions to enforce water treatment regulations more actively in the rural areas which is expected to create a larger market for cleantech projects in the long run.

The formal institutions play a major role in regards to improving the cleantech industry and consequently venture capital as the pool of potential investments expand with the focus from the government. In spite of this, the regulations of the central government alone are not enough to improve the cleantech industry for water treatment in China as it will take

time before all the local governments are ready to embrace the development of cleantech. Hence, the venture capital available for the spin-off projects from DHI is primarily located in the costal areas. However, the situation is expected to improve in the rural districts and thereby creating new locations for the cleantech and venture capital industries, which can be interesting for a spin-off project of DHI to take part of.

5.1.4 Cleantech or Cleaner Production

The Circular Economy Law and the funds provided to fulfil the requirements of the 11th Five Year Plan should be the convincing incentive for every keen cleantech enterprise or project that has doubts that China will be the next market for water treatment solutions (KPMG, 2008). However, reading more into the regulations provides a slightly different story. The environmental plans focus on adapting the existing system to a higher level of environmental protection. It has yet not changed the approach from end-of-pipe to entire process integrated solution management (McElwee, 2008) which may be a critical point for the DHI spin-off projects and cleantech venture capital investors.

End-of-pipe solutions refer to added technical installations to modify the residual products to make them less harming to the environment than non-treated products (Zotter, 2004). In the case of China, this means that the solutions will be applied to the existing water grid in stead of making new process-integrated-solutions, which include recycling solutions, process innovation, and improvement measures (Zotter, 2004). End-of-pipe solutions have traditionally formed the foundation of the environmental regulatory system in China (McElwee, 2008; Zotter, 2004). By enforcing the end-of-pipe regulations, the Chinese government is unable to significantly reduce total pollutant discharges in the future (McElwee, 2008; China Daily, 2006). The regulations therefore have an improving effect, but not a dramatically changing outcome (H. G. Enggrob, personal interview, March 23, 2009), which are necessary to obtain the reduction targets of the 11th Five Year Plan (McElwee, 2008; China Daily, 2006).

The end-of-pipe solution approach is an important aspect in regards to making it favourable for cleantech in the water treatment industry in China. According to the first personal interview with the head of innovation at DHI, H. G. Enggrob (personal

communication, March 23, 2009), fixing existing systems is less favourable than process-integrated solutions for cleantech projects. The reasons to impose end-of-pipe solutions are often unwanted for the given company that needs the solutions because disposing the water has a negative cost and effect on the success of the company. Furthermore, the solutions frequently require energy and raw materials which increases the total consumption of the company instead of reducing it. Specialised enterprises have continuously developed end-of-pipe solutions that are specifically suited to the market. (Zotter, 2004)

The argument is that end-of-pipe improvements to the water system are a greening process rather than cleantech as it does not address the roots of ecological problems with new science and natural approaches (Cleantech, 2009). When the Chinese government promotes water conservation technology in favour of end-of-pipe solutions, they bring a level of legal security to the process, but discourage cleantech venture capital and cleantech (Zotter, 2004). The 11th Five Year Plan therefore presents regulatory driven markets that are unlikely to receive innovative cleantech ventures and venture capital (Cleantech Group, 2009; China Daily, 2006). KPMG (2008) predict that foreign water treatment equipment manufacturers will find major opportunities in renovating the existing system as the need for solutions is simply overwhelming. However, the end-of-pipe technology is a contradiction to the cleantech concept. The growth potential is low due to the customised applications, the operational difficulty of protecting an add-on to an existing technology as well as the effects on the environment when additional energy and materials are needed to make the solution. This means that for a cleantech venture capital investor, these solutions are not favourable as they present limited opportunity for attractive returns (Cleantech Group, 2009; Zotter, 2004).

If the formal institutions aspire to attract cleantech venture capital and high-tech water treatment solutions from cleantech ventures, the focus of the government will have to shift to process-integrated solutions where new technology solutions can be applied from the beginning (H. G. Enggrob, personal communication, March 23, 2009).

The end-of-pipe incentives in the 11th Five Year Plan created by the formal institutions can as a consequence act as an obstacle for cleantech in the water treatment market and will not attract cleantech solutions and consequently cleantech venture capital. This situation is

likely to worsen the ability for the DHI spin-off projects to locate venture capital as the formal institutions are not actively promoting cleantech venture capital since the governmental focus is on products which are not favourable to the venture capital investors.

5.1.5. Laws Regulating Cleantech Venture Capital Investors

Focussing more on venture capital aspects, the enforcement of China's Renewable Energy Law of 2006 has worked like a magnet for venture capital investments in energy-related fields due to the market focus and abilities of the government (Cleantech Group, 2007). In this way, the formal institutions follow North's (1990) assumption that institutions guide and regulate the behaviour of firms and individuals (Bruton et al., 2002). The 11th Five Year Plan and the Circular Economy Law are similarly expected to have the same effect on cleantech venture capital investors and cleantech projects (Cleantech Group, 2007). Writing cleantech into the 11th Five Year Plan is a major step and sends the message that the new focus of the formal institutions is on cleantech related areas (DeWoskin & Mahoney, 2009).

The central government will fund 60% of the environmental improvement efforts presented in the 11th Five Year Plan and the Circular Economy Law, whereas foreign investments and private domestic sources of financing are expected to fund the rest (EIU, 2009). In order to fulfil this expectancy, China's National Development and Reform Commission and Ministry of Commerce now directly encourage foreign investments in research and production in all aspects of cleantech (Cleantech Group, 2009). Furthermore, all sectors of cleantech investing have been classified in the most positive category 'encouraged' making cleantech investments favourable to investors (Cleantech Group, 2008). N. H. Christensen (personal communication, June 17, 2009) further explains that foreign enterprises with a green agenda will have a much better chance of attracting capital than a normal company as the central government promotes sustainable solutions. This creates a competitive advantage for the DHI spin-off projects in their search for venture capital. (N. H. Christensen, personal communication, June 17, 2009)

To support this incentive, the Chinese government has changed the capital market for all types of capital to integrate a sustainability aspect in order to prevent companies without environmental protection in getting funding (EIU, 2009; Cleantech Group, 2008). The implementation of sustainability is supported by the new Corporate Tax Law which gives venture capital companies investing in cleantech a favourable position as they are able to deduct 70% of their taxable income (EIU, 2009). Consequently, venture capital investors are drawn to innovative cleantech ventures, like the spin-off projects from DHI, as they by definition are environmentally focussed or able to assist companies in becoming environmentally friedly. This is likewise a competitive advantage for the DHI spin-off projects as sustainability now has to be thought into the projects before finance can be granted.

Zooming in on the Chinese water treatment market, foreign venture capital companies are now permitted to build and operate water treatment plants in small- and medium-sized cities without any formal restrictions on ownership of the pipe network (KPMG, 2008). The loosened restriction on ownership is a special case in China which is characterised by foreign investors having a minority stake in Chinese companies (KPMT, 2008). The new situation represents a major opportunity for the water treatment industry as more venture capital will be drawn towards this sector which benefits the innovative water treatment spin-off projects from DHI. The before mentioned challenges regarding the rural areas are now turned into business opportunities for foreign venture capital investors by the formal institutions, which the DHI spin-off projects can utilise (KPMG, 2008). This is a method from the government to attempt to implement the rural areas in the focus on environmental issues. It in this light, the formal institutions play an important role in regards to improving venture capital in the cleantech industry for water treatment.

Challenges likewise exist for foreign venture capital investors operating in the Chinese market as the main legal form globally for venture capital investors is limited liability partnership, but this form is not recognised in the laws of mainland China (Batjargal & Liu, 2004). Consequently, foreign venture capital investors are not facing the same rules in China as they are in their home markets but have to register as limited liability companies. The venture capital investors in China are then fund managers instead of partners in their own funds which simply imply funding. This situation implies an agency risk in venture investments and adds confusion to the processes of raising, investing, and managing the

invested funds (Batjargal & Liu, 2004). Taking agency theory further, the principal being the venture capital investor, has no legal rights over the investment and can therefore not fully monitor the actions of the agent being the cleantech venture (Jensen & Meckling, 1976). A lack of adequate rules and regulations in the venture capital industry is therefore complicating the venture capital sector decreasing the capital being invested in cleantech industries.

A shift can, however, be seen in regards to the complication. As venture capital is characterised by the value that they add to the ventures they invest in and thereby support the cleantech industries through their investments, the formal institutions are now trying to nurse and facilitate the venture capital industry (Ahlstrom et al., 2007). A change of the Partnership Enterprise Law that determines the limited liability ownership of venture capital investors is therefore underway (Batjargal, 2007b). The change of the law is a sign that the government is aware that the current regulations cannot provide the requirements for constructing an innovative nation and endorsing private investments. The reason for the renewal is to introduce a new company form, making it easier to attract venture capital and promoting the input of technology and innovation (HKTDC, 2006).

The formal institutions are encouraging venture capital investments in cleantech ventures that will especially improve the industry for water treatment in China by facilitating the venture capital market and making cleantech solutions lucrative. The change in the water restrictions is expected to attract a pool of venture capital investors due to the improved ownership abilities in the sector. The regulations encouraging investments in water treatment combined with the significant investment in this sector as part of the 11th Five Year Plan and the stimulus package have the potential to make the water treatment market the next booming sector within cleantech (Cleantech Group, 2007; Cleantech Group, 2008). The focus is continuing to improve both the cleantech and the venture capital industries. Since the DHI spin-off projects are players within the water treatment field venture capital is expected to be even more available to these projects in regards to other cleantech solutions in China.

5.1.6. Concerns for Venture Capital Investors and Cleantech Ventures

The immense Chinese market, the need for water treatment products, and favourable regulations for the cleantech industry are all favourable factors for the DHI spin-off projects. However, most cleantech projects are experiencing a funding gap for commercialising a product or service within China (H. G. Enggrob, personal communication, March 3, 2009; Ernst & Young, 2008). Thus, venture capital plays an important role in China by providing the much needed capital for starting and growing enterprises that would otherwise have difficulties acquiring the necessary funds to expand. Nevertheless, the venture capital industry likewise faces severe challenges in the Chinese market as the industry is still immature, in a period of transition, and short of supporting laws and regulations.

The Chinese venture capital sector is at the cross-roads. Unless the necessary conditions are in place to sustain and improve the venture capital industry, the pace of investments in cleantech is likely to slow or even be reversed. (Ernst & Young, 2005) Complications include human resources of venture capital professionals and entrepreneurs, available funding, and free stock markets for evaluation and exits (Chu & Hisrich, 2001). The venture capital industry is lacking a comprehensive venture capital law (Ernst & Young, 2005) which makes it difficult for all venture capital investors to manoeuvre in China. The situation is that the rules guiding the sector are inconsistent due to the weak and inefficient formal institutions giving little legitimacy to venture capital investors (Bruton et al., 2002; North, 1990). The result is an unstable regulatory environment with heightened risk and difficulty in gathering correct data and monitoring the cleantech investment which slows the process of a well functioning venture capital industry (Ahlstrom et al., 2007). If these aspects are not in place, the formal institutions are likely to slow instead of boost the development of the cleantech industry for water treatment in China, as the lack of funding will hinder a development of cleantech solutions. This likewise places the spin-off projects from DHI in a challenging position when searching for potential venture capital partners.

A further challenge of the venture capital investors is the shortage of available information about a potential venture (Ahlstrom et al., 2007). The lack of transparency in regards to determining the viability of a proposed investment makes foreign venture capital investors unwilling to enter China which decreases the pool of venture capital available for cleantech

ventures (Ahlstrom et al., 2007). The business environment in China is characterised by not sharing information which was enforced during the central planning system and is thereby embedded in the cultural-cognitive institutions influencing the business environment[18]. Making the venture capital investment depends on the knowledge of the investor about the new venture and its ability to succeed. Without this essential information, venture capital will not be provided to the venture. This cultural-cognitive aspect is therefore a hindrance for a sound venture capital industry which further underlines the need for a venture capital law that protects knowledge sharing provided by the formal institutions.

The weak formal institutional setup surrounding the venture capital industry leads a founding partner of Crosspoint Venture Partners to state "Most if not all early stage venture capital being invested in… China will be lost" (Ahlstrom et al., 2007). In addition, China's corporate assurance, transparency, and corporate governance deviate significantly from international accounting standards as they are aimed at managing production rather than asset valuation. These business practices are not useful to venture capital investors as they are likely to make inaccurate valuation of assets and financial performance[19].

In regards to classical agency theory, conducting cautious due diligence, providing management and personnel assistance, careful monitoring of the investment and well-planned exit strategies therefore needs to be even more emphasised in China than in other places. In this light, formal institutions will need to install regulatory and structural conditions to avoid slowing the speed of investments or loosing the investors' confidence in the market (Ernst & Young, 2003).

However, venture capital investors being present in the Chinese market have the ability to influence the development of the venture capital industry. In this way, the venture capital actors are able to put pressure on the formal institutions to change the setting for the industry which will have a positive impact on the emergence of cleantech. The increased amounts of venture capital investors are pressing against regulatory and structural barriers

[18] N. H. Christensen, personal communication, June 17, 2009; K. F. Janning, personal communication, June 8, 2009; Bruton & Ahlstrom, 2003

[19] Ahlstrom et al., 2007; Ernst & Young, 2003; Bruton et al., 2002

to reveal the challenges facing the venture capital industry and encourage the formal institutions to change (Ernst & Young, 2005).

Whether cleantech projects will attract venture capital depends on the ability of the venture capital investor to reduce the risk associated with investing in a cleantech project in a transition economy (Ahlstrom et al., 2007). In this light, the weak legal environment and lack of formalisation in the formal institutions make the high risk associated with start-up projects even higher (Ahlstrom et al., 2007). The weak formal institutions therefore risk decreasing rather than boosting the venture capital invested in cleantech start-ups in China and as a result acts as an obstacle for the possibility of DHI spin-off projects to attract venture capital.

5.1.7. Exiting the Investment within China

Another obstacle for a well-functioning venture capital market to develop is the difficulties related to the exit possibilities of the venture capital investors which are a prerequisite for any venture capital investment. China is a bank-dominated economy which makes exiting more complicated for venture capital investors than for their counterparts in economies with active and vibrant stock markets (Lui et al., 2006). In general, venture capital investors exit their investments through IPOs which in China would be on the Hong Kong Stock Exchange or the stock exchange within mainland China; Shanghai or Shenzhen. However, exiting through these stock markets has been proven challenging especially as the selection of which firms may list in the Chinese stock exchange remains a state decision.[20] The situation becomes even more demanding as the position of the central government is that venture capital backed firms already have strong financial resources and thereby do not need the capital that stock offerings would provide which undermines the ability to reinvest in new ventures of the venture capital investor (Bruton & Ahlstrom, 2003).

Furthermore, if venture capital investors have an ambition to exit through one of the two Chinese stock exchanges they must satisfy strict requirements about size and profit outlined by the Company Law and Security Law. Even if a venture backed project

[20] Ahlstrom et al., 2007; Kambil et al., 2006; Fung et al., 2005; Bruton & Ahlstrom, 2003

succeeds and becomes listed on the domestic stock exchange further obstacles remain as the shares they achieve are legal person shares which are not tradable within three years. Thereafter, the shares can only be exchanged among legal person shareholders and hence will have no access to general investors which makes it difficult for the venture capital investor to find a buyer for the shares. (Fung et al., 2005) This ability is likely to hinder rather than improve the venture capital and cleantech industries as it is the interest of all parties involved to sell the shares to the highest bidder instantly in stead of waiting for three years.

As a consequence many venture capital investors seek international stock markets when exiting a venture since they thereby avoid the strict requirements and restrictions. In addition, the venture capital investor will gain a better profit as the general stock exchange valuation has appeared to be higher in the overseas markets than on the two Chinese stock exchanges. (Fung et al., 2005) Domestic venture capital investors, however, do not have the possibility to exit through overseas IPOs, as it is forbidden by the government (Fung et al., 2005). This gives the Chinese venture capital investors a major disadvantage in relation to the international investors as cleantech projects might prefer the possibility offered by international investors (Liu et al., 2006). Another way to get around the difficult exiting situation in China is to look for a strategic buyer that can overtake the venture. The takeover can be effectuated through a buy-back from the entrepreneur or an independent buyer (Ahlstrom et al., 2007; Bruton & Ahlstrom, 2003).

Having a controlled and regulated stock exchange market slows down the amount of investments as the possibility to exit is more time consuming and less flexible than on the international market. Furthermore, cleantech will search for international venture capital investors meaning that capital is likely to leave the country instead of being reinvested in China. Thereby, the venture capital becomes fixed within the venture instead of being reinvested in other cleantech projects. The formal institutions surrounding exiting strategies thereby act as one of the major hindrances for the DHI spin-off projects to find venture capital for their development as the exiting challenges makes it difficult for a venture capital investor to operate in China.

5.1.8. Cleantech or Status Quo

The Chinese venture capital industry was founded on the basis that only state-owned enterprises had access to bank loans. As a consequence, when opening up for venture capital to non-state and small and medium sized enterprises, the competition for this type of capital became immense. Still today, both mature and start-up companies are competing for the same equity (Yinya-Li, 2005).

This is contradictory to the concept of venture capital in most other places in the world. Venture capital is known to focus on funding high-risk start-ups in innovative, rapidly growing companies or projects that seem to have the potential to emerge into profitable economic entities (Hung-Gay et al., 2004; Bruton et al., 2002). As previously discussed, venture capital investors face challenges occurring from the formal institutional environment in China (Ahlstrom et al., 2007). As a response to the weak formal institutional setup, the investors are discouraged from funding high-risk start-ups and instead encouraged to fund mature, lower risk firms[21]. The reason is that mature companies can show a better track record than start-ups as their evidence of performance of the enterprise is more reliably discerned (Bruton et al., 2002). Furthermore, mature companies or later stage investment rounds are closer to an IPO or sale which is the exit for the venture capital investor meaning lowering the risk factor of the investor. In this way, venture capital investors have the option to choose mature companies that are close to an IPO to gain fast returns on investments instead of running the risk with the start-up companies (Ernst & Young, 2009; Cleantech Group, 2007). This tendency creates a disadvantage for the DHI spin-off projects as less venture capital investors are willing to invest in their start-up projects.

The just presented tendency is underlined as US$32.9 million was invested in mature companies where as only US$2.4 million, amounting to 16% of the total, was invested with start-up cleantech companies in 2006 (Appendix 8.2.; Cleantech Group, 2007). According to Bo Shao from the Chinese venture capital investor, venture capital investors have not been pushed by regulations to invest in start-ups as the general equity market in China is young (Ernst & Young, 2009). Bo Shao can, however, see a change in this trend as valuations are improving and as he puts it; “those who are disciplined and have the guts to

[21] Ernst & Young, 2009; Cleantech Group, 2007; Bruton et al., 2002

invest [in start-ups] will be rewarded three to five years down the road. For early-stage investment it is now, in fact, not a bad time at all to invest". China is further expected to catch up with the innovation and introduction of new pertinent technologies. This implies that there are major opportunities for cleantech venture investors as this sector will grow in China presenting more projects and opportunities to invest in than in the cleantech sector in Europe and North America (Cleantech Group, 2007). The increasing market for investments is an important aspect in regards to making cleantech venture capital investors see the potential to seek growth opportunities in the relatively new cleantech market in spite of the risks involved (Cleantech Group, 2008), which benefits the spin-off projects from DHI.

Another formal institutional discussion regarding the risks related to venture capital being invested in mature instead of innovative cleantech start-up enterprises or projects is that the formal institutions are directly involved in the venture capital industry (Ahlstrom et al., 2007; Ernst & Young, 2005). As briefly mentioned in the presentation of the Chinese venture capital market, the government plays the omnipresent role of owner, regulator, and shareholder in the Chinese venture capital funds. Furthermore, the government serves as the source of demand as the formal institutions control most central assets going into the venture system as well as dictating what should be focused on in the Chinese society through rules and regulations. (Ahlstrom, 2003; Batjargal & Lui, 2004) State-owned enterprises still employs the majority of industrial and service workers and control more than 50% of all industrial assets in China. The state-owned enterprises therefore play a social services role in the Chinese society in regards to job creation, welfare services, and related tasks. These are benefits that are not expected of private enterprises and they therefore receive more government funding which in this case is government venture capital investments. (Ahlstrom et al., 2007) As many of the privatised state-owned enterprises rely on venture capital provided by the Chinese government they are still under strong influence from the formal institutions (Ernst & Young, 2005). Government venture capital is thereby directly provided to the state-owned enterprises meaning that the capital stays within the system and is not provided for cleantech projects.

Seen from this perspective, venture capital in China is used to restructure the Chinese state-owned enterprises and encourage domestic growth. The tendency then is that Chinese venture capital is invested in Chinese companies.[22] This situation is creating a disadvantage for the DHI spin-off projects as they will have difficulties competing with the local cleantech enterprises searching for the same venture capital.

One of the downsides of the closed loop of venture capital investments and state-owned enterprises is that the cleantech is limited to Chinese innovation, meaning that China is not fully benefiting from the pool of international innovation available (Bruton et al., 2002). State-owned enterprises are characterised by production and the Chinese venture capital is therefore not invested in the cleantech industry for water treatment. In this way the formal institutions are not improving the conditions for venture capital and cleantech industries in the water treatment market and hence the possibility for the DHI spin-off projects to attract venture capital.

5.1.9. Sub Conclusion

To conclude on sub research question one being; ***"What role do formal institutions play in regards to improving the venture capital and cleantech industries for water treatment solutions in China?"*** the formal institutions play an immense role for the external environment that surrounds the venture capital and cleantech industries. The 11th Five Year Plan and the Circular Economy Law are in the process of creating a favourable arena for these industries. The water treatment industry is placed in a favourable position as the formal institutions are generating an increasing demand for water treatment products by implementing more legislation regarding water use and pollution. This is supplemented by the significant investments in the sector from the central government which are further improving the water treatment market. The positive focus on the water treatment industry provides a favourable position for the spin-off projects from DHI when approaching venture capital.

[22] K. F. Janning, personal communication, June 8, 2009; M. A. Mathiesen, personal communication, May 12, 2009; Yinya-Li, 2005; Kadushin, 2004

In regards to venture capital, we conclude that the change in the formal restrictions can attract and create a great pool of venture capital due to the new regulations concerning ownership abilities and the improved position of the water treatment industry creating a broader amount of investments possibilities. The governmental attention on venture capital creates an expanding market for available venture capital that DHI can utilise.

As a result, the formal institutions will in a long-term perspective play an important role in improving the venture capital and cleantech industries in the water treatment market, which consequently creates a good possibility for the DHI spin-off projects to attract venture capital.

However, we conclude that many constrains still remain as the 11th Five Year Plan focuses on end-of-pipe instead of process-integrated solutions. This places the spin-off projects from DHI in a disadvantage position as the focus lies on other products which are outside the venture capital concept. The formal institutions are thus not boosting the venture capital industry with the attention on end-of-pipe solutions. In addition, local governments likewise act as barriers for the development of the cleantech industry if they are not willing to implement the laws from the central government. This situation implies that much of the innovation that exists in China is limited to a certain geographical area meaning that the whole country does not benefit from the pioneering solutions due to the lack of enforcement from the formal institutions. This process is, nevertheless, improving as the Chinese central government has outlined sanctions and incentive systems which have made many local policymakers change their political agenda and consequently creating a new market for DHI spin-off projects.

Furthermore, the legal environment surrounding the venture capital and cleantech industries is weak and makes the risk associated with start-up projects increase for both industries as they are not legally protected. Serious constrains regarding exiting strategies are equally present in the Chinese market which makes investments for venture capital investors even more challenging. The companies that attract Chinese venture capital are usually privatised state-owned enterprises that focus on production. As a consequence, venture capital is only on a limited level invested in the cleantech industry. From this perspective, we thereby conclude that the formal institutions tend to decrease the possibilities for the DHI spin-off project to attract venture capital.

Our overall conclusion on sub research question one is that the formal institutions are improving the situation in order to attract the venture capital and cleantech industries to create a favourable environment for water treatment solutions. Nevertheless, the formal institutions will have to improve the laws protecting both industries if they aspire to boost sustainable solutions in the water treatment sector.

5.2. Networks in the Venture Capital and Cleantech Industry

Building upon the previous discussion, the formal institutions determining the actions of venture capital investors and cleantech ventures are weak and unstable. As the formal institutions in China aspire to make regulatory incentives and laws to encourage both venture capital and cleantech industries, they have not yet created an optimal environment for impersonal exchanges between economic actors[23]. Normative and cultural-cognitive institutions analysed through networks in the following, therefore tend to dominate the Chinese market to compensate for the weak formal institutional environment (Peng & Heath, 1996). Business network strategies during the institutional transition in China are central to understand how network assets of a firm can be translated into a competitive advantage or disadvantage (Peng & Zhou, 2005). The sub research question; ***"How do networks affect venture capital in the cleantech industry for water treatment solutions in China?"*** will therefore be the centre of this part of the analysis.

To answer this sub research question network theory, agency theory, and the resource-based view of the firm will be used together with institutional theory. The importance of network strategies amongst the actors in the Chinese market will be analysed to understand how the DHI spin-off projects can attract venture capital by the use of network strategies. The initial part of the analysis 'Weak Formal Institutions – Strong Informal Institutions' discusses the importance of reducing uncertainty through the use of networks. The section 'Networks in Venture Capital – Not a Chinese Phenomenon' investigates how networks are generic to the venture capital industry on a global level. However, in China networks are socially embedded within society and therefore 'Guanxi and its Importance for foreign entrepreneurs' will be analysed. Networks strategies are highly influenced by

[23] Young et al., 2008; Ahlstrom et al., 2007; North, 1990

connections which will be explored in 'Ties'. This section will be followed by the investigation of 'A Shift from Strong to Weak Ties' taking place in a transition economy. However, the constraining forces of network strategies will be studied in 'Network – An Obstacle for the Cleantech Sector'. The analysis will be summed up in the 'Sub Conclusion'.

5.2.1. Weak Formal Institutions – Strong Informal Institutions

A main theme in institutional theory is that where formal institutions fail, informal institutions dominate the arena to reduce uncertainty in the marketplace (North, 1990). The tendency can be seen in the Chinese society within the venture capital industry. As analysed in the previous sub research question, the government has initiated favourable rules and regulations for venture capital investors and cleantech entrepreneurs but the enforcement is not consequent. In developed countries with stable formal institutional setups, investors can seek to reduce potential risks by relying on legal protection to deal with contingencies such as bankruptcy, opportunistic behaviour of entrepreneurs and similar challenges. In China, conversely, the legal system is underdeveloped and venture capital investors and entrepreneurs thereby have a higher tendency to rely on entrepreneurs they know through their network instead of relying on market methods.[24] In China, these networks are, according to the network theory, characterised as being directional, as there exists a close link between the nodes and reciprocal, as they have a mutual understanding of give and take (Kadushin, 2004). This implies that in the Chinese setting venture capital investors and cleantech entrepreneurs substitute formal institutions with networks which are embedded in the normative and cultural-cognitive institutions[25].

Formal institutional failure obstructs the development of a formal venture capital market relying on formal investors such as banks, corporate investors, and venture capital funds. Instead the involved parties rely to a higher extent on networks, as the implementation of the formal laws and regulations have not been successful and the Chinese population therefore continues to utilise networks in business operations. The laws have therefore

[24] U. W. Sørensen, personal communication, June 6, 2009; Zhang & Wong, 2008; Bruton & Ahlstrom, 2003
[25] U. W. Sørensen, personal communication, June 6, 2009; Ahlstrom et al., 2007; Bruton & Ahlstrom, 2003; Scott, 2001

relatively little institutional support locally, which results in the normative institutions playing a larger role in shaping the institutional environment in which the organisations operate. (Young et al., 2007) In this way, the formal situation in China pushes the entrepreneurs towards an informal risk capital market containing of families, friends or former business associates and hence increases the use of network methods (Zhang & Wong, 2008). As a result, today in Beijing 84% of entrepreneurs use networks when approaching investors for fundraising (Zhang & Wong, 2008). This is an important aspect for the DHI spin-off projects when seeking venture capital present in China, as the reliance on existing relationships makes the process of attracting venture capital difficult if they are not part of a Chinese network.

As the formal institutions are weak, venture capital investors are relying on networks to reduce this risk involved in funding a new venture (U. W. Sørensen, personal communication, June 6, 2009; M. A. Mathiesen, personal communication, May 12, 2009). Seen from this perspective, networks become the safety net for venture capital investors when normative and cultural-cognitive institutions dominate. However, being dependent on networks is costly as they take time to create and maintain (U. W. Sørensen, personal communication, June 6, 2009; Granovetter, 1985). The DHI spin-off projects should therefore be aware of the network they are part of to benefit from the opportunities that lie within it and behave cautiously not to destroy their network connections and thus their business potential in the Chinese market.

These networks are likewise essential in regards to knowledge sharing as information is transferred and shared through the network channels rather than through the use of external markets (Clegg et al., 2007). From the point of view of the cleantech spin-off project, sharing information with venture capital investors that are not pre-approved through the network requires trust due to the weak formal institutional environment as discussed in sub research question one (Young et al., 2008). Being in a network thereby facilitates knowledge sharing about innovative ideas and the funding possibilities in a safe environment. As the Chinese government is in the process of attracting foreign knowledge to support their cleantech industry, the knowledge sharing is a prerequisite for increasing the volume and the variation of sustainable solutions to meet the environmental goals of the 11th Five Year Plan (Ernst & Young, 2005). In order to do so the formal institutions need to safeguard knowledge sharing both within the venture capital and cleantech

industries through legal protection and forums that secures intellectual property. Otherwise, only spin-off projects present in a network will receive funding and China will not benefit from the pool of international innovation as they in the penetration stage are not part of networks (Young et al., 2008). However, being in a network does not explicitly create knowledge sharing as who knowledge is transferred to is dependent on the level of trust in the network. (Clegg et al., 2007) In this way, even though the spin-off from DHI enters into an important network in China it depends on the capabilities of the DHI spin-off to utilise it as information is restricted even within the network (Bruton & Ahlstrom, 2003).

Networks therefore affect the venture capital in the cleantech industry for water treatment in China as they have the capability to approve or fail a new innovative cleantech project. Networks strategies are consequently important for a DHI spin-off project as they provide a security in their search for venture capital in an environment dominated by weak formal institutions.

5.2.2. Networks in Venture Capital – Not a Chinese Phenomena

Networks in venture capital investments are not a new phenomenon linked only to the Chinese society. Using networks to find prosperous high growth cleantech ventures is common for the venture capital industry world wide but further emphasised in China due to the weak formal institutions and their ongoing transition changing the rules and regulations for the industry (Clegg et al., 2007). “Venture capital investors on a global level are very reluctant to share information with each other as some other investor might take the profitable idea before them. They therefore rely on small networks with trusted investors that give each other advice” (M. A. Mathiesen, personal communication, May 12, 2009). In the venture capital industry, network strategies are embedded in the decision and selection making process as well as in the post monitoring of the investment in developed as well as transition economy (U. W. Sørensen, personal communication, June 6, 2009). The tendency therefore is that cleantech ventures are chosen from the network of the venture capital investor due to the credibility being in a network provides. Following network theory, there is a widespread preference to conduct transactions with known

individuals and only few rely completely on generalised morality and institutional arrangements when choosing the best project available.[26]

The networks of the venture capital investors are essential for the entrepreneur as venture capital investments in innovative, but risky, start-ups often involve co-investors. Besides using the network to meet prospective venture capital investors, the investors can likewise help to locate acquisitions or corporate partners to the projects they are involved in (Fried & Hisrich, 1995). Choosing the right network or combination of networks is therefore essential to acquire connections and competences (U. W. Sørensen, personal communication, June 6, 2009). The ability of the DHI spin-off projects to use the network is therefore seen as a determining factor for getting the necessary funding presented in the gap between idea commercialisation and IPO (Zero2IPO, 2009; Ernst & Young, 2008). The mutual utilisation of these networks is therefore strategically important for the cleantech spin-off project as well as the venture capital investor. The networks determine the amount, quality, speed, and cost of obtaining funding, and eventually, the probability of survival and growth of the new venture (Zhang & Wong, 2008).

The argument is as a result that networks have an important effect on venture capital in the cleantech industry on a global level. DHI spin-off projects therefore need to place special emphasis on networks as they influence the ability of spin-off projects in getting access to the Chinese water treatment market.

5.2.3. Guanxi and its Importance for Foreign Entrepreneurs

Networks are embedded in Chinese society and often explained through the concept of guanxi relationships, meaning an extended web of connections ranging from strong personal loyalties to business connections securing special favours and obligations[27]. As China is influenced by collectivistic values rooted in the normative and cultural-cognitive institutions, it is therefore characterised by an interdependent self where people define themselves in relation to others. Friends have an obligation to help each other in a network

[26] M. A. Mathiesen, personal communication, May 12, 2009; Powell, 1990; Granovetter, 1985
[27] Zhang & Wong, 2008; Clegg et al., 2007; Batjargal & Lui, 2004

and the implicit mutual interest is a cornerstone of the guanxi concept (Bjørn & Worm, 2008; Clegg et al., 2007).

The concept of guanxi is not included in this thesis as a mean to explain cultural hindrances to DHI spin-off projects. Instead the guanxi relationships is a mean to comprehend the tacit, taken-for-granted rules and common beliefs that are shaped through social interactions, which are characterised as cultural-cognitive institutions (N. H. Christensen, personal communication, June 17, 2009). The concept is likewise included in the normative institutions which imply the expectations of firms and individuals defined by guides and constraints to actions (Bruton et al., 2002; Scott, 2001). Developing networks through guanxi relationships can promote interpersonal trust and facilitate job mobility, job performance and investment decisions as well as fund searching. Guanxi relationships are thereby important for a DHI spin-off project searching for venture capital in China. (Batjargal, 2007; Batjargal, 2007b) In the form of relationships, guanxi is allowed to be a part of the institutional setup and plays an even more important role than formal institutions in the Chinese society (N. H. Christensen, personal communication, June 17, 2009).

This supremacy of networks and relationships are visual in the statement; "Who you know [in Asia] is more important than what you know" (Peng, 2003). As a result, informal relationship assets are likely to be the primary driver of firm performance (N. H. Christensen, personal communication, June 17, 2009). Innovative spin-off projects desiring to enter China need first and foremost to develop guanxi, seen as the effective use of social capital to advance business relations (U. W. Sørensen, personal communication, June 6, 2009; Kambil et al., 2006). The process of locating the individuals and building the relationship is often time-consuming and expensive but believed to be absolutely necessary (Bruton & Ahlstrom, 2003). However, obtaining guanxi is characterised as one of the most difficult challenges for non-Chinese as guanxi relationships obliges clear boundaries on network membership and thereby limits the pool of possible members to those who meet the criteria for being a member of a particular guanxi-cluster. (Batjargal, 2007)

An interesting question to ask is whether guanxi acts as an obstacle for DHI spin-off projects aspiring to achieve venture capital. Empirical research confirms the effects of guanxi on outcome variables (Batjargal & Lui, 2004). Having the importance of networks in

mind, a tendency can be seen that Chinese usually invest within their network which is in most cases composed of other Chinese (Yinya-Li, 2005) which the network theory describes as homophilious relationships (Batjargal, 2007; Kadushin, 2004). The Chinese venture capital investors rely on guanxi ties to compensate for the weak formal institutional environment to reduce uncertainty within their portfolio which will consequently complicate the ability for DHI spin-off projects to gain Chinese venture capital[28]. The high density and homogeneity makes guanxi relationships less inclusive and, therefore, those who are perceived as outsiders are likely to be excluded from important deals (Batjargal, 2007). In regards to searching for venture capital, the Chinese entrepreneurs therefore turn to already known individuals within their network as the Chinese distrust those whom they do not know (Batjargal, 2007; Clegg et al., 2007). This is an important aspect for DHI spin-off projects. The integration between the foreign and the Chinese venture capital funds and receivers is limited as a closed loop exists between the nodes meaning that guanxi relationship negatively affect foreign unconnected cleantech entrepreneurs in the water treatment industry. As a consequence of the guanxi relationships, foreign cleantech entrepreneurs in China tend to ask for foreign venture capital (U. W. Sørensen, personal communication, June 6, 2009).

Guanxi is no magic elixir but a dynamic aspect of institutional entrepreneurship in China. The success of entrepreneurial ventures is positively related to the level of firm capabilities in the Chinese market and the formation of guanxi relationships as they act to defend the venture capital investor against business threats which are inherent in the dynamic and complex Chinese transition environment. In this way, a DHI spin-off project will have to adopt a combination of managerial competencies and guanxi relationships to navigate and connect with influential parties to minimise the threats associated with manoeuvring in the Chinese economy. (Clegg et al., 2007)

[28] N. H. Christensen, personal communication, June 17, 2009; M. A. Mathiesen, personal communication, May 12, 2009; Batjargal, 2007b; Ahlstrom & Bruton, 2003; Batjargal & Liu, 2004

5.2.4. Ties

Ties are defined as relationships in network theory and are an important aspect of the framework of explaining how networks function and how embedded they are in the Chinese society (Granovetter, 1985). It is essential to get an understanding of the strength of the Chinese ties for a spin-off project from DHI in order to succeed on the water treatment market.

According to network theory, the strengths of ties are measured by the amount of time spent and the intimacy within the relationships which define the distinction between the strong and weak ties (Granovetter, 1973). The Chinese population is characterised as preferring fewer, yet trusted particularistic ties and the emphasis is placed on strong and direct ties to access investors, who were otherwise unavailable to new ventures (Zhang & Wong, 2008; Batjargal, 2007). The Chinese population thereby values the exchange of high quality information and tacit knowledge within their networks (Peng & Zhou, 2005; Powell, 1990). Consequently, the strong ties serve as the informal alternative to formal contracts presented in agency theory in order to lower the risk of opportunistic behaviour by providing a relationship based on trust[29]. The importance of strong ties creates a complicated situation for DHI spin-off projects as these ties are difficult to imitate and takes time to form. However, developing strong ties in China is a competitive advantage and will assist a DHI spin-off project in seeking venture capital.

To shorten this process various firms integrate into alliances with already present corporations with knowledge about the Chinese market. This solution is supported by U. W. Sørensen (personal communication, June 6, 2009) who states: “You cannot be alone in China; you need partners to form the network”. To create a well-functioning network it is likewise essential to be physically present, as the argument of the network theory is that nodes that are geographically close to each other are more likely to be connected. (U. W. Sørensen, personal communication, June 6, 2009; Kadushin, 2004).

As the Chinese society is valuing connections it forces venture capital investors and entrepreneurs to depend on strong ties even with government officials and key sponsors in order to safeguard the venture from excessive interference. These ties are a result of the

[29] Peng & Zhou, 2005; Eisenhardt, 1989; Granovetter, 1985

monopoly control of government over scarce resources and thereby obliging businesses to gain good relationships with government officials. (Peng & Zhou, 2005) Hence, the government directly and indirectly influence and fund a substantial portion of the Chinese venture capital market (Ernst & Young, 2005). Having ties to government sources is seen as a defining factor for success and those informal relationships assets are the primary driver of firm performance (Cleantech Group, 2008; Peng, 2003). The dependence on ties can likewise be seen as mutual as the government use ties as a factor to secure governmental investments in cleantech ventures (Batjargal & Lui, 2004). Thereby, both the government officials and the cleantech entrepreneurs benefit from the cultural-cognitive connections in stead of relying on formal institutions. This is another example of how networks affect venture capital in the cleantech industry and therefore an important aspect of a DHI spin-off project to consider when entering the Chinese market through alliances.

Caution should however be taken when relying on governmental connections due to the unpredictable nature of politics. When the connection is in power the relationship is useful, but when the person leaves the office one can end up with an unattractive investment with few prospects. As a result, venture capital investors and cleantech entrepreneurs need to spend time to build connections with officials at various governmental levels in China. (M. A. Mathiesen, personal communication, May 12, 2009; Ahlstrom et al., 2007)

The institutional setup surrounding the venture fundraising market furthermore influences the types of network ties created. Ties can be divided into personal ties or business ties depending on the setting. Social obligations between the involved parties are the cornerstone of personal ties, being non-business relationships, such as personal friends, families, relatives and more. This is a contradiction to business ties where focus is on the helpful transferring of private information about business competencies to the prospective investor from business associates. (Zhang & Wong, 2008) Cleantech projects relying on strong personal ties will benefit from the stability and durability of network relationships which are features associated with high levels of trust and norms of cooperation (Bjørn & Worm, 2008). Thereby, a DHI spin-off project will have a better possibility to receive venture capital in China when they have strong social ties as these are dominant in venture fundraising markets.

In connection with strong and personal ties, the importance of network triads, defined as trio of actors (Batjargal, 2007b), that operate via an intermediary node (Kadushin, 2004) is a central aspect to include. As there is a strong reliance on trust and personal relationships, a recommendation from a person within the network is highly valued. This practice is seen in the venture capital industry where entrepreneurs and investors are often connected through a third party who proposes founders and venture capital investors to each other (Batjargal, 2007b). The investors either fund the new venture themselves or recommend prospective investors they know to the entrepreneur, due to the fact that they trust the capabilities and integrity of the entrepreneur (Zhang & Wong, 2008; Granovetter, 1973).

By relying on a third party within the network, venture capital investors as well as cleantech entrepreneurs thereby reduce inconsistencies and uncertainties in their formal institutional surroundings as presented in sub research question one. By relying on a third party, they establish a balance in interpersonal relationships and the referee reduces the time and costs of finding venture capital investors willing to invest as they act as a pre-approver of the cooperation. (Batjargal, 2007b) In this light, the importance of triads is on how the recommendations from prestigious referrers endorse the worth of the new venture and thereby influence the decision of the investor favourably (Zhang & Wong, 2008). In China, roughly 50% of private venture capital deals were based on third party recommendations and triads is therefore an important aspect for a DHI spin-off project to consider when entering China through the use of venture capital (Batjargal, 2007b). However, negative aspects often appears when applying this form of reliance, as known persons are likely to overestimate each other's capabilities and resources which might be leading to an incorrect investment decision. In some cases though, these overestimations can likewise lead to a more positive impact on the investor and as a consequence a relationship is earlier built (Batjargal, 2007b).

Since the normative and cultural-cognitive institutions are primarily governing the business environment in the Chinese society, their sanctions are likewise more severe as they are able to sanction the partner that behave in other directions than for common remuneration by disseminating negative information about them trough the networks. Being condemned through the network can destroy the future ability to conduct business (Granovetter, 1985). The networks can reduce agency risk by incorporating the incentive problem into the given

partnership and create strong disincentives for opportunistic behaviour as a good reputation is time-consuming to build, but easily destroyed (Zhang & Wong, 2008; Eisenhardt, 1989). As U. W. Sørensen plainly states it "Your connections will loose face if you screw them over".

If not relying on networks, the triad situation consequently makes it difficult for both venture capital investors and foreign cleantech projects to screen the market for new innovative ideas and capital since the networks are closed and only limited information is available (M. A. Mathiesen, personal communication, May 12, 2009). The actors outside networks therefore have a disadvantage as the network theory predicts that acquiring information from a trusted informant is more efficient as the information received is richer, more detailed, and known to be accurate. In addition, individuals with whom one has a continuing relation with have an economic motivation to be trustworthy and do not discourage future transactions. Therefore, the initial cooperation with a venture capital investor in the Chinese market is essential for the further business operations of DHI spin-off projects as it broadens the opportunities to enter into other collaborations. Furthermore, departing from pure economic motives, continuing economic relations often become overlaid with social content that carries strong expectations of abstention from opportunistic behaviour. It means that the venture capital investor would be more inclined to choose a DHI spin-off at another time if the process has been successful. (Granovetter, 1985)

In a beneficial relationship, the venture capital investors and cleantech spin-off projects are able to gain from each other's competences which are the essence in cleantech venture capital investments. The parties involved share general business knowledge, support, strategies, and work together towards a common goal (Fried & Hisrich, 1995). Following the theory of the resource-based view of the firm, networks play an important role in the Chinese society and thereby act as a strategic aspect to create long-term success (N. H. Christensen, personal communication, June 17, 2009; Barney, 1991). By searching and applying for venture capital, an innovative project can benefit from the broader network that the venture capital investor provides (Fried & Hisrich, 1995). Engaging in a broader network is essential both for further economic support and internally in terms of maintaining and attracting employees from the network (Cleantech, 2008; Ahlstrom et al., 2007). The most important benefit of network strategies in China is therefore to access

valuable resources (Peng & Zhou, 2005). In this way, venture capital investors and cleantech projects can use the networks to reduce uncertainty and transaction costs in the investment.

The importance of trust is argued to be more significant in China than in developed countries due to the weak formal institutional frameworks defining the areas in which business can be conducted. Trust between the venture capital investor and a cleantech spin-off project is the foundation in a venture capital relationship and the networks created in this arena are consequently highly valued. As S. Houmøller (personal communication, May 19, 2009) states it "An investor would rather fund a reliable and trustworthy team than a good idea". The understanding of and trust in the mutually beneficial relationship between venture capital investors and managers is essential for the further success of the investment (Fried & Hisrich, 1995). Trust can be seen to overcome uncertainty and work to diminish agency problems and is thereby an important part of the venture capital investor and receiver relationship (Eisenhardt, 1989). Since China is a transition economy, the formal institutions develop and become stronger and thereby the importance of trust is expected to decline. However, given the network based nature of venture capital, trust will continue to be a determining factor in regards to selecting prospective cleantech venture capital investments.[30]

In this perspective, network ties play an important role in regards to how venture capital investors and cleantech projects meet. These ties are therefore a very important aspect for a DHI spin-off project to consider when entering the Chinese water treatment market through the use of venture capital. Following this argument, social relations are responsible for the production of trust in economic life rather than formal institutional arrangements and developing connections will assist DHI spin-off projects to reduce the uncertainty from the weak formal institutions.

[30] Clegg et al., 2007; Peng & Zhou, 2005; Granovetter, 1985

5.2.5. A Shift from Strong to Weak Ties

In regards to network theory, weak ties are seen as the optimal strength of ties within the business environment. They focus primarily on profit making and market success, since they are less costly to maintain, are less time-consuming and excel at connecting with distant others possessing unique information valuable to the entrepreneur. (Granovetter, 1973) The theory predicts that if firms aspire for long-term achievements, organisations and individuals must move beyond close, strong ties to a broader network where they will be more likely to identify suitable potential exchange partners (Peng & Zhou, 2005). As explained in the previous section, the weak formal institutional setup has led the Chinese population to rely on normative and cultural-cognitive institutions and strong personal ties. However, with the progress of the privatisation process in China, the government controlled resources are diminishing gradually and thereby changing the dependency on strong ties. This is supported by U. W. Sørensen (personal communication, June 6, 2009), who argues that investing in close tie networks is gradually diminishing as the investors increasingly search within a broader network for the best entrepreneur for the given investment. The Chinese are moving from searching for qualifications within a closed niche of network associates to include network associates from the broader association. Hence, investors still invest within the network but there is a tendency towards more weak ties. In theory, weak ties are more likely to generate growth, explore new opportunities, and provide more heterogeneous information than strong ties. These are all critical sources of market competition so firms therefore tend to transform their strong ties networks to weak tie networks as the institutional transition unfolds. (Peng & Zhou, 2005)

Nevertheless, as guanxi relationships are an integrated part of Chinese normative institutions, networks will continue to persist in some form regardless of the marketplace. As the formal institutional setup transforms, the concept of guanxi and consequently networks will conversely change to become mature, more sophisticated, and less visible with more emphasis on business outcomes than on politics and the acquisition of consumer goods. As a consequence of more sufficient laws and regulations, the networks will develop to a higher stage where they do not perform the tasks of the formal institutions. The relationships with their unique code of ethics will, however, remain and be a part of the business environment that foreign entrepreneurs need to adjust to. (Bjørn & Worm, 2008) Organisations operating in the Chinese market will thereby change their

strong ties towards weak ties as the institutional setup evolves but need at the same time to understand the importance of guanxi and implement a network strategy in their business methods.

Although gradually changing from strong towards more weak ties, venture capital investors still search within their network for the most prospective cleantech venture to fund. The networks therefore still affect the venture capital in the cleantech industry and consequently the abilities for DHI spin-off project to attract the funding.

5.2.6. Networks – An Obstacle for the Cleantech Sector

Following the argument up to this point, the use of networks in the Chinese market is essential when doing business successfully. However, these networks can act as constrains for the cleantech industry to develop as close personal relationships dominate the capital market. U. W. Sørensen (personal communication, June 2, 2009) emphasises that spin-off projects need a broad network to support their ideas and present them to investors in order to succeed. This implies that DHI spin-off projects are unable to operate independently which therefore hinders the cleantech industry in developing, as pioneering solutions without a network will experience difficulties to penetrate the market.

However, entering a network is not only a benefit as it involves opportunity costs. The reason is that strong ties within a network may act as obstacles for creating ties in other networks as one network often excludes the other. Being selective in regards to choosing networks and developing a network strategy is therefore essential as different networks create different opportunities. Furthermore, the network relationships that are built over a long period of time become self-reinforcing and can lead to path dependency, as the parties involved can only access and develop resources allowed within the network. (Bjørn & Worm, 2008) These opportunity costs further obstruct the development of a sound cleantech market.

Another obstacle when using network strategies is the difficulty in measuring the economical results as it is challenging to separate cause and effect of the strategy (Bjørn & Worm, 2008). However, when operating in China, networks are socially embedded and are therefore an important business method. Consequently, venture capital investors and

cleantech entrepreneurs have to implement this aspect of the business environment as enterprises without network strategies suffer a competitive disadvantage. As important as networks seems to be when operating in the Chinese market, it cannot guide the direct way to success. The accomplishment depends on the nature of the network, the fit to the given situation, and how reliant the firm is on the network. (Bjørn & Worm, 2008) In addition, the network needs to be rare and difficult to substitute and imitate, to generate sustained competitive advantage as the resource-based view of the firm dictates (Barney, 1991).

Network strategies may even work as major obstacles of the development of the cleantech sector as venture capital investors present in the Chinese market are paying more attention to cultivating relationships with management teams, who understand how to capitalise on China's domestic market. The focus is thereby on important relationships instead of spending time screening new deals within innovative projects. (Cleantech Group, 2008) This tendency may set DHI spin-off projects into a disadvantageous position.

Having the right networks therefore creates a competitive advantage for both venture capital investors and innovative spin-off projects if used properly within the right networks. However, these networks likewise act as constraints of an expanding cleantech sector which may harm DHI spin-off projects as they cannot enter the market independently.

5.2.7. Sub Conclusion

We conclude on the sub research question; ***"How do networks affect venture capital in the cleantech industry for water treatment solutions in China?"*** that the importance of network strategies cannot be understated when operating as they have an immense influence on the business environment.

The weak formal institutional setup surrounding the venture capital and cleantech industries affects the actors to rely on normative and cultural-cognitive institutions to compensate for the inconsistent enforcement of rules and regulations. The Chinese term guanxi is an important aspect of the normative and cultural-cognitive institutions understood as the effective use of social capital to advance business relations. Networks are therefore an embedded part of the Chinese society and the business environment

influencing the cleantech industry for water treatment solutions, which the spin-off projects from DHI are required to comprehend.

Chinese venture capital investors tend to invest in projects with entrepreneurs they have strong, personal ties with to reduce uncertainty and thereby secure their investment. Aligned with the Chinese resistance towards foreign ownerships, these projects are consequently Chinese implying that China is promoting the Chinese cleantech sector. China is thereby only benefiting from Chinese innovation and not the international pool of cleantech as the foreign entrepreneurs do not have the strong ties necessary to penetrate the market. Thereby, networks negatively affect venture capital in the cleantech industry as they may not get access to the most attractive investments.

Furthermore, the Chinese tendency to invest within their network make foreign ventures search for foreign venture capital if they do not take part of a Chinese network. We thereby conclude that not having a network strategy is an obstacle for foreign new innovative projects when attracting venture capital in China.

Connections with government officials are necessary in order to obtain attractive deals within the water treatment industry. Additionally, referrals and triads play an important part when venture capital investors and cleantech entrepreneurs seek each other in the Chinese market and thereby networks are affecting the industry for water treatment in China.

Networks are essential in the global venture capital industry as it is built upon relations since the investors support each other and networks assist to find prospective cleantech projects. Innovative projects searching for venture capital need to focus on the different networks they enter when cooperating with different venture capital investors as one network may exclude another.

However, an understanding and having network relationships with locals do not directly lead to a competitive advantage for the foreign project. The networks need to be difficult to imitate and with usable connections within the business arena of the entrepreneurs to create an advantage. Social relations may be necessary conditions for trust and trustworthy behaviour, but not enough to safeguard the investment.

Our overall conclusion on sub research question two is that network and network strategies affect the venture capital in the cleantech industry for water treatment solutions. They are consequently essential to understand for DHI spin-off projects when attracting venture capital in the water treatment industry in China.

5.3. Internal Capabilities of DHI Spin-off Projects

The discussions to this point of the analysis have investigated the institutional macro-environment for the cleantech and venture capital industries and how network strategies influence cleantech investment decisions. The third part of the analysis will zoom in on the firm-specific aspect. The centre of attention will be on the innovative DHI spin-off projects, which are created as part of their AddVenture strategy from the research and development conducted by the DHI parent company presented in 'The case of DHI' and Appendix 8.5. Being a GTS institute with core competences in software and consultancy services, DHI parent company has limited willingness and ability to finance the projects that are outside the core business areas. However, the company has an interest in capitalising on the spin-offs when the product is not part of their portfolio and do not become future competitors (H. G. Enggrob, personal communication, March 23, 2009). To successfully implement the AddVenture strategy, innovative new projects need venture capital in order to be transferred from the DHI parent company in Denmark to the immense water treatment market in China. The sub research question to be answered is thereby; "***Which strengths and weaknesses do spin-off projects from DHI possess in regards to attracting venture capital in China?***".

The success of the DHI spin-off project to attract venture capital will be analysed through the 'SW' factors of the SWOT framework as it provides an explanation of the internal values of the project in the Chinese external market. The strengths and weaknesses will be analysed in this sub research question three, whereas the opportunities and threats will be the focus of sub research question four. The analysis will implement all four theories described in the theoretical framework. The resource-based view of the firm will, however, be in focus when analysing the internal capabilities that the DHI spin-off project needs to possess before attracting venture capital. The promotion of capabilities of the DHI spin-off project when attracting venture capital is discussed in the section 'The Need of a Strong

Profile'. This is followed by an analysis of the need for 'The Technology'. The focus on customers is discussed in 'The 'Market', whereas the potential for a sound project to develop is analysed in 'The Business'. The last section of this sub research question focuses on the importance of the people behind the innovative project, analysed in 'The Team' section. The analysis will end in the 'Sub Conclusion'

5.3.1 The Need of a Strong Profile

The innovative spin-off projects from DHI have several strengths that a new venture could benefit from to attract venture capital in the Chinese market if managed in the right way. Following the resource-based view of the firm, the importance of promoting the project with the existing capabilities is essential. The cornerstone of the resource-based view is to examine the strategic resources of a given firm that leads to a creation of a competitive advantage[31]. It is therefore important for the innovative DHI spin-off project to specify a resource-profile and thereby be able to develop a product-mix profile (Wernerfelt, 1984), which is the best fit to the external threats and opportunities in the Chinese market analysed in sub research question four (Bjørn & Worm, 2008). The product-mix profile is essential when attracting venture capital investors as it describes the unique position and strengths of the spin-off project and resources available to make the venture succeed. From this perspective, the DHI spin-off project would therefore need to outline their strengths and strategies to profit in the Chinese market if they aspire to attract venture capital (S. Houmøller, personal communication, May 19, 2009; M. A. Mathiesen, personal communication, May 12, 2009). These internal strengths are significant for a venture capital investor when investing in a new cleantech project as a defined business model within the new project limits the uncertainty of the investment (S. Houmøller, personal interview, May 19, 2009).

S. Houmøller (personal communication, May 19, 2009) outlines four essential criteria that venture capital investors consider when investing; the technology, the market, the business, and the team of the project. These criteria are described as consequences of the fact that numerous entrepreneurs seeking venture capital receive rejections from

[31] Barney, 1991; Rumelt, 1984; Wernerfelt, 1984

venture capital investors. All criteria need to be fulfilled in order to make a functioning cooperation between the DHI spin-off project and a given venture capital investor. (S. Houmøller, personal communication, May 19, 2009) The four factors will therefore be the structure for the following analysis. The investment criteria are equivalent within all four types of venture capital existing within China being; Chinese corporate, governmental, university, or foreign venture capital investors discussed in research question four (Ahlstrom et al., 2007; White et al., 2004).

5.3.2. The Technology

Technology is, according to S. Houmøller (personal communication, May 19, 2009), the prerequisite for a venture capital investor when engaging in a new venture.

The technology aspect is an essential strength and competitive advantage of the DHI spin-off projects when attracting venture capital. The reason is that the project is created in a company where technology is developed through research and development as their core expertise (DHI, 2009). The products developed within the research institute, DHI, are considered to be amongst the top of their field (Mikkelsen, 2008). Furthermore, the company DHI would under no circumstances promote a product that the company does not fully support (H. G. Enggrob, personal communication, June 17, 2009; J. Rasmussen, personal communication, May 1, 2009). In this way, the DHI parent company will endorse the quality of the new spin-off project which will have a positive effect on the ability of the project to attract venture capital investors (S. Houmøller, personal communication, May 19, 2009; Zhang & Wong, 2008). The support from the parent company creates credibility which can be considered a strength for the DHI spin-off project, as they decrease the investment risks involved by acting as an organisational referral and approver of the project (Zhang & Wong, 2008). In addition, the products born within DHI will be tested and proved functional before entering the market (H. G. Enggrob, personal communication, June 17, 2009) which performs an additional security factor for a future venture capital investor. DHI spin-off projects thereby have a strength in new technology approved by a government-backed research and development institute in Denmark.

Furthermore, the DHI spin-off project is developed in Denmark, which is considered a knowledge intensive economy where innovation and research within new technologies is in centre (Mikkelsen, 2008; Frijs-Madsen & Rasmussen, 2008). Denmark is characterised as having the useful lead in tackling environmental issues like energy efficiency and water treatment which creates a competitive advantage for Danish products. Furthermore, partnerships in technology exchange have already been initiated between the Chinese and Danish governments meaning an improved position for Danish companies operating in China[32]. In addition, Danish exports of cleantech products are increasing and the process of penetrating a new market is thereby identified and would help the exit of the DHI spin-off project from Denmark (Møller, 2008). These factors combined are considered strengths for a DHI spin-off project as the institutional environment in Denmark is favouring cleantech innovations which are acknowledged by the formal institutional environment in China.

In relation to the support from the parent company, patents are described as being essential when searching for venture capital. It is close to impossible to achieve venture capital investments without a patented project as no investor will invest time or money without the patent security (S. Houmøller, personal communication, May 19, 2009; M. A. Mathiesen, personal communication, May 12, 2009). The spin-off project will on this issue enjoy a favourable position as the parent company has great experience within the field of patents and would be able to support the project in the patent process. Acquiring patents is thereby another strength of a DHI spin-off project in regards to technology.

However, clear weaknesses likewise exist in regards to a DHI spin-off project attracting venture capital. The focus on water treatment products and technology is not the centre of attention within DHI China where software is the core competence. The DHI products are therefore not tested in the Chinese market. Since the focus lies primarily within the field of software, DHI China only possess limited knowledge about the water treatment product sector and may be less inclined to assist within areas that lie outside their core competences (K. F. Janning, personal communication, June 8, 2009). This can present a weakness in regards to attracting venture capital as the lack of information about the

[32] N. H. Christensen, personal communication, June 17, 2009; Frijs-Madsen & Rasmussen, 2008; UM, 2007

product and the specific capabilities in the Chinese market might function as a factor of reluctance.

In total, nevertheless, the spin-off projects from DHI possess several strengths within technology that can be used to attract venture capital.

5.3.3. The Market

The second criterion on Houmøller's list of criteria for venture capital investors is the customers and the market. There has to be a sound market where the products can be traded in order to persuade venture capital investors to invest in the DHI spin-off project. (U. W. Sørensen, personal communication, June 2, 2009; S. Houmøller, personal communication, May 19, 2009)

The customer focus is implemented in the AddVenture strategy as H. G. Enggrob (personal communication, June 17, 2009) explains that the product and the customer have to be in place before the project leaves DHI. A thorough presentation of the business model with already existing customers is an important advantage when searching for venture capital (S. Houmøller, personal communication, May 19, 2009). Given the research and development of the DHI parent company, spin-off projects have the strength of developing the project in house. Thereby, the projects do not need to search for venture capital before the project is ready to enter the market.

Another strength for the DHI projects in the Chinese market is that they are spin-offs from a Danish company with innovative solutions that are needed within the water treatment industry in China. The DHI parent company operates with water treatment solutions on a global level and is thereby highly experienced within that field. They work with many different solutions adjusted to different local settings making them able to focus on the specific need of China. (DHI, 2009) From the research executed within DHI around the world, useful solutions are created which are suitable candidates to become spin-offs in the Chinese market. A DHI spin-off project thereby enjoys the strength of local solutions developed in a global setting (H. G. Enggrob, personal communication, March 23, 2009).

As described in sub research question one, through the 11th Five Year Plan, the government is trying to attract sustainable solutions to improve the water treatment issues within the country. In particular, the focus on water-saving plans and strategies (Circular Economy Law, Article 20, 2009) benefit the DHI spin-off project as the government has created a demand and market for the water treatment venture (Mikkelsen, 2008). The need for the specific products is intensified by the rapid urbanisation, which similarly generates market potentials as the need is not limited to end-of-pipe products but also process-integrated solutions that are increasing at a fast rate (KPMG, 2008). These market demands are considered a strength as the DHI spin-off project could function as a solutions to assist China with their water treatment challenges. The position for applying for venture capital is thereby strengthened as the risk associated with the investment is reduced by the approval from the government and the need of water treatment projects.

In addition, DHI has been asked to participate in research cooperations with China's four big research institutes which are placed in Beijing and Nanjing, which are national institutes, and the local Yantse and Yellow River water commissions (J. Rasmussen, personal communication, May 1, 2009). This cooperation with the institutes will allow access to Chinese research and development and ease the integration into Chinese networks, which is otherwise characterised as a major obstacle for foreign enterprises (White et al., 2004). Additionally, being part of the Chinese research institutes will favour the DHI spin-off projects as the associations play a referral role to potential venture capital investors (Zhang & Wong, 2008; Batjargal, 2007). According to M. A. Mathiesen (personal communication, May 12, 2009) venture capital investors increasingly seek connections with Chinese research institutes to gain access to the pool of generated knowledge which further creates a strength for a DHI spin-off project. Another positive influence of being part of governmental and university organised events provide a number of opportunities for the spin-off projects from DHI in regards to meeting prospective venture capital investors, which further expands their possibility of involving into networks (Zhang & Wong, 2008). The cooperations will act as a strength when attracting venture capital since a DHI spin-off project would be approved by governmental institutions and have access to the research facilities. Having access to Chinese research institutes makes the DHI project more welcomed in the Chinese setting.

However, being a spin-off from a Danish company, the Chinese might be reluctant towards the project since the tendency is to support local innovation[33]. In addition, the formal institutions are focusing on creating strong national enterprises and would favour the success of Chinese companies on the market over an international corporation (N. H. Christensen, personal communication, June 17, 2009). The issue about local support is equally present in the process of attracting venture capital as the networks, described in sub research question two, play an important role and Chinese investors tend to invest in Chinese ventures as they are less trustful of foreigners[34]. This represents a strong weakness in regards to attracting venture capital for a DHI spin-off project.

However, all ells being equal, the DHI spin-off projects have a major market to enter and with the support from the parent company they possess strengths to attract venture capital investors present in China.

5.3.4. The Business

The third criterion that S. Houmøller (personal communication, May 19, 2009) outlines as important for attracting venture capital is the possibility to create a business from the given project.

The company, DHI, has been present in the Chinese market since 1992 which creates a strength for the spin-off project as it can utilise the knowledge accumulated in the department in China (K. F. Janning, personal communication, June 8, 2009). The project would therefore possess a strength by having connections through DHI China that could ease the start-up phase as it has been proven difficult to operate in the Chinese market due to the dominating normative and cultural-cognitive institutions. (U. W. Sørensen, personal communication, June 2, 2009). The DHI spin-off project would be able to take use of the already existing networks and business opportunities that DHI China holds, described as essential in sub research question two (Zhang & Wong, 2008). In relation to networks, the manager, Mr. Lu, is an important person within DHI China as he, in his years

[33] N. H. Christensen, personal communication, June 17, 2009; M. A. Mathiesen, personal communication, May 12, 2009; Batjargal, 2007; Clegg et al., 2007

[34] K. F. Janning, personal communication, June 8, 2009; M. A. Mathiesen, personal communication, May 12, 2009; Batjargal, 2007; Yinya-Li, 2005

in the Chinese market, has created strong ties to the local government in Shanghai that the new spin-off could benefit from (K. F. Janning, personal communication, June 8, 2009). These ties have an immense influence on the business development of the project as they can provide good alliances with relevant venture capital investors within China. Furthermore, Mr. Lu values local employees and incorporates them into the DHI corporation in order to use their skills in the Chinese market. The understanding of the Chinese business arena and the implementation of Chinese employees is useful in relation to applying for venture capital as the parent company is already integrated in the Chinese setting which the project can benefit from. In this sense, Mr. Lu is a strength for the DHI spin-off project.

As concluded in sub research question two, having strong ties with the government is important when doing business in the Chinese market (Granovetter, 1985). As water treatment projects are related to infrastructure, having good relations with the Chinese government as well as governmental offices around the world is a strength for the DHI spin-off project. The company can show a track record of having the experience when cooperating on a governmental level which creates a beneficial reputation for the project (J. Rasmussen, personal communication, May 1, 2009). The DHI project can benefit from previous cooperations between the Shanghai government and the parent company. The reason is that relational trust and history with contacts makes actors feel that they mitigate uncertainties surrounding their purposes and outcomes and are thereby willing to engage in further business activities (Batjargal & Lui, 2004; Granovetter, 1985). These experiences work as a business pre-approver for future governmental projects as a DHI spin-off project will stand out as a reliable infrastructure partner.

The importance of triads is essential for the spin-off project to meet venture capital investors. The DHI project has a strength in regards to triads through the business partners of the parent company. The project can benefit from organisational referral both as a tenant of a research institute in Denmark as well as of DHI China which plays the role of referrer by recommending prospective investors to the project. (Zhang & Wong, 2008) This is a way of promoting the new spin-off as the private information about the project is otherwise unavailable in the market. The DHI spin-off project will have the possibility to be recommended to venture capital investors which is the optimal form of referral in networks and therefore a strength of the new venture (Zhang & Wong, 2008).

However, Mr. Lu, who is the manager of DHI China, might be too much in control of every business area in China which can act as a weakness for a new innovative project to grow as his focus primarily is on software instead of water treatment products (K. F. Janning, personal communication, June 8, 2009). Therefore, the risk of Mr. Lu's disapproval will act as a weakness of the DHI spin-off project as much of the strength for the project lies within the support and network of DHI China. The ability to attract venture capital can thereby be increasingly challenging. As a result, if DHI wants the innovative project to grow and become a venture backed spin-off they will have to include Mr. Lu in the process. Following network theory, the Danish entrepreneurs of the spin-offs must be located in China with the assistance of Chinese employees since the project cannot be run from the Danish headquarter[35].

Another business weakness associated with being a DHI spin-off from a corporate organisation when attracting venture capital is that the parent company might intervene in the process to a high extent and thereby slow the progress of the new venture. In addition, it can be demanding for a spin-off within a new niche to exit fully from the parent corporation and create their own corporate culture if the DHI spin-off project has been too attached to the founding firm. (S. Houmøller, personal communication, May 19, 2009) As the new project is developed within DHI, the dependency on the parent company and the challenges of becoming an independent actor can act as a weakness for creating a sound business and thereby attracting venture capital investors.

The most challenging phase of the DHI spin-off project is to be able to commercialise the new products on the market to create a sound business. Having technology and experience within research and development is not a prerequisite for commercialisation. This is a weakness for a DHI spin-off project as the parent company does not possess the necessary knowledge about promoting a new product, and therefore needs venture capital expertise within the business field. Sales and marketing is secondary in regards to technology within DHI which is a weakness in regards to assisting the spin-off project to commercialise their innovative products. The limited focus on the commercialisation phase

[35] K. F. Janning, personal communication, June 8, 2009; M. A. Mathiesen, personal communication, May 12, 2009; Kadushin, 2004

of the product is a strong weakness for the spin-off project as venture capital investors require business models and indicators of market potential prior to the investment.[36]

In total, the DHI spin-off projects possess a profound business potential in China if supported by the parent company and hence the possibilities to attract venture capital.

5.3.5. The Team

The fourth and most important criterion according to S. Houmøller (personal communication, May 19, 2009) in regards to attracting venture capital is the team of the DHI spin-off project.

A general understanding within the global venture capital sphere is that an investor would rather invest in a good team with a semi-good idea than the other way around as the entrepreneurs are the ones to lead the project (S. Houmøller, personal communication, May 19, 2009). It is therefore vital to the venture capital investors to trust the people behind the innovative idea to both protect their investment as well as avoiding challenging agency problems (Eisenhardt, 1989). According to the resource-based view of the firm, a well functioning team is a competitive resource when attracting venture capital (Rumelt, 1984; Wernerfelt, 1984). The DHI spin-off project has a strength within this field with their highly educated workforce that possess knowledge about the technological products making them able to explain the strengths of the project in detail to potential investors. Furthermore, the employees are motivated by the ability to take part in the creation of a pioneering solution within the water treatment industry (J. Rasmussen, personal communication, May 1, 2009). The engagement of the team thereby improves their ability to attract a venture capital investor and acts as a strength for the DHI spin-off project.

A weakness regarding the team is, however, that the employees of DHI are engineers and might not be able to think the way venture capital investors do when promoting the new DHI spin-off project to investors. As S. Houmøller (May 19, 2009) explains; “Venture capital investors do not care for specifics in a new technological product, but are rather

[36] H. G. Enggrob, personal communication, June 17, 2009; U. W. Sørensen, personal communication, June 2, 2009; S. Houmøller, personal communication, May 19, 2009

interested in how it can be produced and for how much in order for it to lead to a profit making project." U. W. Sørensen (personal communication, June 2, 2009) adds; "Often the employees at GTS institutes are too focused on engineering and thereby do not have the competences to run a business." H. G. Enggrob (personal communication, June 17, 2009) further acknowledges this problem as he states that it is a weakness for the project that DHI consists of too many technology specific employees and could benefit greatly from more business minded people who could commercialise the project. In addition, a DHI spin-off project has not yet been through the whole venture capital cycle and no employees at DHI have experience in managing the process.

Another weakness of the team in the DHI spin-off project is that the managers within the parent company rely too much on Mr. Lu making the project depend on his preferences. Mr. Lu focuses his DHI business unit primarily on software meaning that he might not know the market of the particular DHI spin-off project, but he is given the authority to run DHI China from the head office as he possess profound knowledge about the Chinese market as well as being born Chinese[37]. Therefore an agency problem is likely to occur as different interests exist within DHI about the spin-off projects (Eisenhardt, 1989; Jensen & Meckling, 1976). It seems as though some managers tend to focus more on these spin-off projects than others which leads to a disadvantage when creating the innovative DHI project. Consequently, the managerial disagreements are likely to harm the ability of the project to attract venture capital as the team will appear weak if they do not possess the needed support.

5.3.6. Sub Conclusion

When concluding on the sub research question; ***"Which strengths and weaknesses do spin-off projects from DHI possess in regards to attracting venture capital in China?"*** the strengths outweigh the weaknesses for the DHI spin-off project to attract venture capital in the Chinese market.

[37] H. G. Enggrob, personal communication, June 17, 2009; K. F. Janning, personal communication, June 8, 2009; J. Rasmussen, personal communication, May 1, 2009

The internal capabilities of a DHI spin-off project to be presented in a product-mix include technology, the connection to the Chinese government, and suitable solutions for the water treatment industry combined with the high market demand in China. Additionally, support, accumulated knowledge in regards to formal as well as normative and cultural-cognitive institutions, and networks from DHI China is capabilities that the projects can utilise to their advantage. These factors are all strengths for creating a well-functioning business that venture capital investors can invest in, if promoted in the right way.

However, weaknesses exist that hinder the success of the DHI spin-off project. The weaknesses include limited focus on water treatment products of DHI China, being foreign of origin rather than Chinese, high dependency on the parent company for research and development, and the team focusing on engineering solutions instead of commercialising the project as well as their lack of experience with the venture capital cycle.

In this light, our overall conclusion is that strengths outweigh the weaknesses for the DHI spin-off project to attract venture capital and through the collaboration penetrate the immense Chinese market with their pioneering projects in the water treatment industry.

5.4. Opportunities and Threats in the Chinese Venture Capital Market

The fourth sub research question builds upon the internal capabilities of the DHI spin-off projects presented in the previous analysis and how these can be successfully used in the Chinese setting described in the first two sub research questions by creating alliances. The focus is therefore on how the DHI spin-off project can be transferred from the Danish parent company to the Chinese market through alliances with venture capital investors locally present in China. The analysis will investigate external conditions in terms of latent opportunities and threats of the alliances between the DHI spin-off project and the venture capital investors in the Chinese water treatment industry by the use of the 'OT' from the 'SWOT' framework by answering; ***"Which opportunities and threats exist in the Chinese venture capital market for the spin-off projects from DHI?"***

All four theories presented in the theoretical framework will be applied throughout the analysis. The overall possibilities when entering into a partnership will be discussed in 'The Importance of Alliances'. Four different types of venture capital are present within China

which the DHI spin-off project is able to attract and benefit from. The following sections are structured in regards to these four venture capital types, being 'Government and University Venture Capital', 'Chinese Corporate Venture Capital', and 'Foreign Venture Capital'. The reason for investigating a DHI spin-off project in relation to the different types of alliances is that they individually provide different opportunities and threats in the Chinese market. The discussion ends with the 'Sub Conclusion'.

5.4.1. The Importance of Alliances

As presented in 'The case of DHI', the company aspires to create alliances with venture capital investors where the DHI spin-off project will be transferred from the DHI parent company in Denmark with the use of venture capital to the immense water treatment market in China (H. G. Enggrob, personal communication, June 17, 2009). DHI has the knowledge and technology but lack the home market whereas China has a great demand for water treatment products but not the solutions. The assumption is therefore that creating a powerful incumbent collaboration in an alliance will create a win-win situation for both the DHI spin-off project and the venture capital investor, if managed successfully.

Following the theory of the resource-based view of the firm, a DHI spin-off project wish to engage into alliances to obtain access to needed resources, acquire new skills, develop competitive advantages, and gain access to resources through the alliances with venture capital investors[38]. In order to engage with a partner, the DHI spin-off project will have to present its potential advantages being its strengths in research and development, technology, and further essential capabilities that the DHI spin-off project is capable of offering to potential partners. (Haiyang & Kwaku, 2007; Granovetter, 1985) As DHI is a recognised government-backed company from Denmark, a clear opportunity is represented in the credibility of the parent company. Furthermore, DHI have alliance experience obtained from working with small and medium sized enterprises, governments, and universities around the world (DHI Group, 2009). These factors are considered an opportunity to enter into alliances as they are competitive advantages attractive for venture capital investors. (Haiyang & Kwaku, 2007)

[38] Clegg et al., 2007; Rumelt, 1984; Wernerfelt, 1984

Through these alliances, the DHI spin-off project have the opportunity to transform its internal weaknesses in the Chinese market into strengths by paring up with venture capital investors present in China that have strengths which will compensate the internal weaknesses of the DHI spin-off project. The same argument can be used for external factors in regards to opportunities and threats. The combination of strengths of the partners present an opportunity for success in the Chinese market for the parties involved. However, the opportunity depends on the ability of the DHI spin-off project to implement the strengths presented in sub research question three to attract potential venture capital partners.

As analysed in sub research question three, a major strength of a DHI spin-off project is the research and development of water treatment solutions brought to the spin-off project by the DHI parent company. However, if the project aspires to attract venture capital and thereby integrate into an alliance, the DHI spin-off project will have to share the knowledge and let outsiders take part of their technology know-how (Ernst & Young, 2008). According to U. W. Sørensen (personal communication, June 2, 2009) venture capital investors will not engage in a project if the value in terms of research and development is kept in the parent company and thereby not brought to the venture. The knowledge sharing situation can be critical to the DHI spin-off project as their knowledge intensive products might get copied which thereby represents a threat to its emergence (Ernst & Young, 2008).

In this way, exposing the opportunity of the accumulated strengths of the project is therefore a threat if presented to the wrong investors due to the weak legal environment in China presented in sub research question one. However, without exposing the idea, the investor will not recognise the potential of the DHI spin-off project. The project that builds upon the research and development from the DHI parent company attracts venture capital investors as these products are considered valuable in the Chinese water treatment market. However, as the formal institutions have not developed appropriate intellectual property rights which can protect the solution of the DHI spin-off project from potential imitators. Intellectual property rights are therefore seen as a major threat for a cleantech spin-off project engaging in partnerships in China. Hence, there is a fine line between threat and opportunity when exposing the core strengths of the DHI spin-off project to attract investors in the Chinese market.

As analysed in sub research question one, the formal institutions are weak and major opportunities therefore exist for the DHI spin-off project in an alliance as it will work as a mechanism against institutional uncertainty and risks in the market. In regards to the weak formal institutional setup, an alliance with venture capital investors who have local market understanding and social networks will enable the DHI spin-off project to successfully penetrate the market with their product-mix of capabilities, explained in sub research question three (Clegg et al., 2007). In this way, a partner with local knowledge and other contextual competencies will act as a prime risk reduction to the success of the project. The opportunity for the DHI spin-off project in engaging in an alliance lies in the reduction of uncertainty in the formal institutional setup, the access to network and connections, and opportunity to fulfil expected market growth. (Clegg et al., 2007; White et al., 2004)

According to M. A. Mathiesen (personal communication, May 12, 2009) the DHI spin-off project needs to be physically present in the Chinese market with skilled preferably Chinese employees as it would be a threat to the success of the venture to be distant from the alliance and investment. These assumptions are supported by the network theory which predicts that nodes are likely to be more connected if geographically close (Kadushin, 2004). According to the incomplete contracting theory; the only source of control of the investment is ex-post control meaning direct monitoring and active involvement in the investment. Being distant would therefore work as a threat and hinder the performance of the DHI spin-off project due to the limited management presence. (White et al., 2004; Osnabrugge, 2000)

Additionally, in order to succeed in China the need of a local partner must be in the centre as U. W. Sørensen (personal communication, June 2, 2009) explains; “The possibility to be successful without a partner is almost zero”. Finding the right partner in the Chinese market is therefore an opportunity for the DHI spin-off project in the water treatment industry in China due to the reliance of networks (Kadushin, 2004). Following U. W. Sørensen’s argument, DHI spin-off projects will have to engage in an alliance with a Chinese partner that is active on the market in order to experience the concealed opportunities in China. Following the resource-based view of the firm, an alliance is inimitable and will create a competitive advantage for the project of DHI being an opportunity that cannot be achieved if manoeuvring independently (Prahalad & Hamel, 1990).

Engaging in an alliance with a domestic investor calls for flexibility to align incentives and trust created through relationship building to explore the latent opportunities of the alliance. Engaging in an alliance with a Chinese venture capital partner represents threats to the successful emergence of the DHI spin-off project as contacts are not seen in the same absolute terms in China as in other places of the world (Ahlstrom et al., 2007). In regards to agency theory, the uses of thorough contacts are rarely implemented in Chinese enterprises and they can therefore not be used as a binding tool to minimise neither of the principal-agent problems (Osnabrugge, 2000; Eisenhardt, 1989). Relational contacting therefore acts as a viable substitute for formal legal contracts to reduce uncertainty, information asymmetry, moral hazard, and risk. However, the DHI spin-off project do not know to what extend the contact of the relationship is being fulfilled and the success depends on the ability of the DHI spin-off project to continuously develop strong personal ties[39].

Precautions should, therefore, be taken in regards to ownership structures when engaging with domestic venture capital companies as corporate governance has its own idiosyncratic characteristics in the transition economy as visible in the principal-principal theory. Concentrated ownership, business group structures, extensive family ownership combined with weak formal protection thereby presents a threat to the alliances (Young et al., 2007). A board seat in the created alliance between the domestic venture capital investor and the DHI spin-off project is thereby not a prerequisite for influence in the venture. The actual authority of the foreign cleantech project may be limited due to the possible exclusion from its strategic governance roles which are mostly reserved for trusted family associates of the venture. (Young et al., 2008; Bruton et al., 2002) In regards to agency theory, the traditional principal-agent problem thereby develops into a principal-principal problem as the partners engaged have equal rights to the venture but their actual influence on the venture differ (Young et al., 2008). The argument is that when standard corporate governance mechanisms have limited institutional support, network ties, connections, and government contacts emerge to fill the corporate governance vacuum (Peng & Heath, 1996). As formal institutional protection is weak, the normative and cultural-cognitive institutions typically favour the interest of the controlling party. That

[39] Wright, 2007; Peng & Zhou, 2005; Jensen & Meckling, 1976

party is often the Chinese partner as they possess market knowledge and connections placing them in a favourable position in regards to the foreign project (Young et al., 2008). As discussed in sub research question two, the development of trust is therefore a precondition for engaging in a cleantech venture capital relationship with Chinese venture capital in order to become a trusted partner and thereby engage fully in the strategic decisions of the venture. (Ahlstrom et al., 2007) Otherwise engaging with a domestic partner represents a major threat to the DHI spin-off project.

However, the reasons behind creating alliances between a venture capital investor and DHI spin-off projects are plenty. The venture capital investors bring local market access, business knowledge, and resources to the venture whereas the DHI spin-off project brings innovative solutions, game-changing technologies, and path-breaking know-how within the water treatment industry in China that the formal institutions wish to attract. In this way, the combination of the actors bring a cleantech solution to the market that would otherwise not have been implemented as funding and lack of knowledge about the Chinese market would hinder the DHI spin-off project access. Threats to a successful alliance include relational contracting and governance structures as exemplified in the principal-principal problem. Finding the right way to collaborate is therefore expected to create a win-win situation. Opportunities and threats related to the different types of venture capital alliance partners are analysed in the following sections.

5.4.2. Government and University Venture Capital

The government venture capital investors are defined as working in close cooperation with the local governments as they receive the capital from the formal authorities. Being financially and legally backed by the government provides access to information about new venture developments and investment opportunities. Their main aim is to promote local high-tech industries and commercialisation and invest in early stages of projects. (White et al., 2004) The government is further directly as owner and indirectly through networks linked to the domestic venture capital funds (Ernst & Young, 2005). Although the Chinese universities and corporate venture capital investors are not under direct government control, the majority still seek government support in areas related to physical space, infrastructure, and similar resources (White et al., 2004).

The university venture capital investors are closely related to the government as much of their funding is provided from governmental offices. (White et al., 2004) The advantage of engaging with university venture capital investors is their close ties to Chinese innovative research and development as well as access to the talent pool from the universities. A possible alliance between the DHI spin-off project and a university venture capital investor would provide the innovative project with access to other new ventures, China's pool of talent, and more investment opportunities. However, the weakness is that their investments are limited to projects that emerge from universities and the DHI spin-off project has, as a consequence, limited access to this funding. (White et al., 2004) As DHI is initiating collaborations with different institutes in China, a DHI spin-off project might become a future trusted partner of the university venture capital. This type will, however, not be discussed in detail as the spin-off projects from DHI currently do not have access to this funding.

Several opportunities, however, exist when engaging with government venture capital. Amongst those is intellectual property protection where an alliance with the government could be an opportunity in regards to safeguarding the technology in the venture. Although cleantech is regulatory favoured by more protection than other high-tech areas (Cleantech Group, 2008), loosing intellectual property is still a threat for the DHI spin-off project whose key performance indicators are innovation and technology (H. G. Enggrob, personal communication, March 23, 2009). In this perspective, M. A. Mathiesen (peronsal communication, May 12, 2009) advises not to bring the newest technology to China. The theft of intellectual property is increasingly holding cleantech entrepreneurs back from entering China implying that the country does not receive the most recent water treatment solutions and innovation (Ernst & Young, 2005). This aspect is increasingly becoming a concern of the Chinese government. The government is therefore likely to have an increasing incentive to both work with international standard schemes on the matter and to enforce intellectual property protection in regards to attract foreign water treatment solutions. Concerning an alliance, the argument is that as the Chinese government becomes an investor in a cleantech project, they likewise become a co-owner of new technology and innovation making it worth protecting. (Ernst & Young, 2008) From the perspective of legitimacy and intellectual property protection, engaging in a government alliance is therefore an opportunity for a DHI spin-off project.

Threats, however, likewise exist to an alliance between a DHI spin-off project and the government. They involve the conflict of goals (Peng, 2001). The reason is that the government venture capital investments are split between financial and social returns on investments (White et al., 2004). As mentioned in sub research question two, Chinese firms are encouraged by the state to maximise employment and production to avoid social instability. Chances are that the government will push for the same aspects in their own ventures, meaning that the DHI spin-off project may risk overproduction or extra workers on the payroll. (Bruton & Ahlstrom, 2003) According to the agency theory, it is therefore important to agree on essential goals from the initial stage of the cooperation (Eisenhardt, 1989) as these circumstances may restrict opportunities and weaken competition (Peng & Zhou, 2005).

Furthermore, 40% of fund managers in domestic venture capital investors are former government officials and only 4% of the total staff has prior fund management experience (Liu, 2001). It implies that the incentives to boost the cleantech project are inadequate and the expertise to provide support and value-added services are limited (White et al., 2004; Bruton et al., 2002). This represents a threat as the limited business support of the government is aligned with the weakness of DHI concerning lack of commercialising experience. From this perspective a pure DHI spin-off project and government venture capital alliance may therefore not be the most beneficial for financial success of the project.

As discussed in sub research question one, engaging with government venture capital can be a rather difficult matter. Government officials are concerned that successful private projects and firms undermine the socialist system by introducing capitalist ideas, such as venture capital (Ahlstrom et al., 2007). The threat is, in this respect, founded in the normative and cultural-cognitive mentality of Chinese officials as smaller funded and often private enterprises of today are considered the monopoly capitalists of tomorrow. The fear of the officials is therefore that the private companies could negatively brunt the socialist system. (Ahlstrom et al., 2007; White et al., 2004) For this reason, foreign cleantech companies are seen as competitors to state-owned enterprises which make the government venture capital investors invest the funds in Chinese enterprises to continue their existence, secure jobs, and control industrial assets. (Ahlstrom et al., 2007) In this way, the resistance of the normative and cultural-cognitive institutions towards investing in

foreign cleantech enterprises is a threat to the emergence of an alliance between the DHI spin-off project and the government venture capital investor.

However, the formal institutions are increasingly aware of the benefits of promoting foreign cleantech ventures where government venture capital is used as a mean to reach the goal of improving the water situation in the country (Ernst & Young, 2005). This focus of the government creates an opportunity for the DHI spin-off project. A successful partnership with a government venture capital investor could work as a prerequisite for future projects (Batjargal & Lui, 2004; Granovetter, 1985). If engaging in a partnership, DHI would get the opportunity to favourably influence the regulations for future projects in the water treatment sector as they are cooperating on a governmental level and thereby being able to influence policy-makers. Following network theory, a successful DHI spin-off project would furthermore make DHI become a future partner of the government in the water treatment industry. Previous cooperations make actors feel comfortable and decrease uncertainty surrounding a new collaboration. (Batjargal & Lui, 2004; Granovetter, 1985) The threat, however, is the risk of failure of the DHI spin-off project, which consequently leads to an exclusion of future DHI spin-off projects from government venture capital, but this threat is seen as generic in the venture capital industry (M. A. Mathiesen, personal communication, May 12, 2009).

According to U. W. Sørensen (personal communication, June 2, 2009) a good relationship with the government is the most important indicator for success in the Chinese market. This is supported by M. A. Mathiesen (personal communication, May 12, 2009) who argues that the government provides central as well as local access to decision-makers. Relations with the government thereby work as a door opener for a DHI spin-off project and their existing cooperation with the local authorities in Shanghai, national and local research institutes, as well as an official visit from the Chinese water minister to the DHI head office in Hørsholm are seen as major strengthening examples (J. Rasmussen, personal communication, May 1, 2009). Being a partner is expected to give DHI access to government venture capital which further provides a blueprint of the DHI spin-off project to other types of venture capital investors in China. The government thereby acts as a reliable referrer in a triad relationship (Zhang & Wong, 2008; Kadushin, 2004).

However, M. A. Mathiesen (personal communication, May 12, 2009) argues that government venture capital investments are rigid and bureaucratic implying that the engagement is time-consuming and inflexible. Furthermore, the central government might have preferences in relation to where the investment should be placed since they are susceptible to local government pressure making DHI accept unfavourable positions for projects to become a preferred partner in future collaborations. These factors create a threat to the emergence of a government and DHI alliance as the risk and return prospects are not attractive to the DHI spin-off project (White et al., 2004).

Several opportunities, however, exist for DHI spin-off projects when engaging directly with government venture capital investors. Enabling examples are the legitimacy to the technological entrepreneurship, protection of the venture, lower administrative structural barriers as well as facilitating the IPO in the Chinese stock market, which is completely controlled by the government[40]. Having an alliance with a government venture capital investor would thereby facilitate the venture with formal institutional assistance as well as normative and cultural-cognitive institutional support and network with top administrative levels in the Chinese society.

5.4.3. Chinese Corporate Venture Capital

The majority of the Chinese venture capital market consists of the corporate venture capital investors. The advantage of engaging in an alliance with these firms is their knowledge about the industry as their managers mostly come from securities firms, banks, and the industry which is different from the government venture capital investors where the fund managers may not be familiar with the business practices and systems. (White et al., 2004)

Finding a Chinese corporate venture capital investor presents a major opportunity for a DHI spin-off project as the type of venture capital have strong financial bases from unlisted firms with large cash flows, individual investors, banks or corporations (Ahlstrom et al, 2007; White et al., 2004). Not only do they have funds to invest, they also have the

[40] Ahlstrom et al., 2007; Kambil et al., 2006; Fung et al., 2004; Bruton & Ahlstrom, 2003

flexibility to invest as these funds are less bureaucratic than the government venture capital investors (White et al., 2004). Furthermore, given the business background of the corporate investors, they are usually involved and connected in the industries in which they invest meaning that they possess great knowledge about the market. In the case of a DHI spin-off project, an alliance represents an opportunity as the internal weakness of lacking market knowledge will be compensated by the venture capital investors industry, managerial capabilities, and connections (Wang et al., 2002). Another opportunity linked to integrating into an alliance with a Chinese corporate investor is that the venture capital investors are able to facilitate the entrance of the DHI spin-off project into new sectors through their networks (White et al., 2004).

The corporate venture capital investors are generally well connected in China and hence understand the formal, normative, and cultural-cognitive institutional aspects of the Chinese society within their field. However, they might be suffering from undeveloped strategic innovation abilities seen from the perspective of a foreign cleantech project. (Wang et al., 2008) Research, development, and technology are core competences of the DHI spin-off project and they can thereby assist to compensate for the weakness of a corporate venture capital partner. Lack of commitment to product innovation, research and development, and risk-taking capabilities are considered to be harming Chinese competitiveness (Wang et al., 2008; Kambil et al., 2006). The internal innovative weakness of the Chinese corporate venture capital investor, which is harming the competitiveness of the partner, could therefore be outweighed by engaging with a DHI spin-off project. An alliance in regards to knowledge sharing is therefore seen as an opportunity for the corporate venture capital investor as well as the DHI spin-off project as their separate weaknesses will be diminished by the strengths of the other. (Clegg et al., 2007).

However, the Chinese corporate venture capital investors are not necessarily familiar with managing high-risk investments represented by a start-up project as they generally invest in mature firms making it difficult for a DHI spin-off project to attract these investments. Although corporate venture capital investors provide funds as well as expertise to the project, the investors have a more restrained involvement in the funded firms and their value-added is limited. (White et al., 2004; Bruton et al., 2002) This implies a threat for an alliance between the corporate venture capital investors and a DHI spin-off project.

Given the weak formal institutional environment facing venture capital investments, the corporate venture capital investors are relying on networks to reduce agency risks. As discussed in sub research question two, venture capital investors in China rely on strong ties and are therefore inclined to invest in other Chinese since they are generally less trustful of those whom they do not know[41]. The normative and cultural-cognitive institutional relationship assets are likely to be the primary driver of firm performance (Peng, 2003). This aspect is therefore a threat to the DHI spin-off project as they do not have the connections with the corporate venture capital investors to be considered as a trusted alliance partner (U. W. Sørensen, personal communication, June 2, 2009, Batjargal & Lui, 2004). Engaging with a corporate venture capital partner would therefore be a time-consuming experience as they prefer to develop alliances from prior connections and identify partners from connections and networks (Clegg et al., 2007). However, the dependence on strong ties is expected to move towards weaker ties in the transition period, which implies an opportunity for a DHI spin-off project in the long run.

In regards to exiting the venture, corporate venture capital investors have been facing challenges as the government has been hesitant to open a Nasdaq-style second board (Liu et al., 2006; White et al., 2004). As the government controls which companies can enter the stock market, creating an alliance with a corporate venture capital partner has not been favourable unless the project is aimed at strategic buyers. However, the second board opened in 2004 and is aimed at high-growth start-ups enterprises to assist small, fast growing companies to create jobs and reduce the reliance on manufacturing (International Business Times, 2009; Hung-Gay et al., 2005). Having improved the abilities to exit in the Chinese stock market is an opportunity for the DHI spin-off project, as the DHI parent company needs a clear exit strategy to engage in the venture. However, this ability to exit through a new stock exchange will likewise increase the competition from Chinese companies seeking corporate venture capital in the water treatment industry, which is a threat for DHI spin-off projects as it will intensify the competition in the sector.

Becoming a trusted alliance partner with a Chinese venture capital investor will secure future funding to DHI spin-off projects. In China, pension funds and insurances cannot

[41] M. A. Mathiesen, personal communication, May 12, 2009; Batjargal, 2007; Yinya-Li, 2005

enter the venture capital industry and the corporations are therefore expected to be the primary source of funding in high-tech. Engaging with a Chinese corporate venture capital partner is therefore a major opportunity for a DHI spin-off project. However, creating the alliance is considered very difficult due to the importance of network and connections in the Chinese market. Success is therefore highly dependent on the ability of the project to adapt to the Chinese environment and create relationships with business leaders.

5.4.4. Foreign Venture Capital

As eight of the top ten venture capital investors in the Chinese venture capital market are foreign, these investors play a significant role in the water treatment industry (White et al., 2004). The companies distinguish themselves from the domestic Chinese venture capital investors operating in China in terms of their legal form, being mostly limited partnerships, their focus on high growth or high potential investment targets, and interest in cleantech. (White et al., 2004)

The advantage of engaging in an alliance with foreign venture capital investors is the experience in venture capital management which is on a higher level than the domestic corporate and government venture capital investors (White et al., 2004). The average years of relevant experience of Chinese managers is 2.1 years in comparison to 11.9 years for the foreign managers (Wright, 2007; White et al., 2004). The experience makes it easier for foreign venture capital investors in China to recruit and maintain a qualified work force, which is a major strength in regards to avoid staff turnover and keeping connections within the company (Ahlstrom et al., 2007). Furthermore, they are able to provide connections to potential customers and partners in foreign markets and prepare the venture capital receivers for the global markets (White et al., 2004). This represents an opportunity for a DHI spin-off project as the foreign venture capital investor bring international as well as Chinese experience into the alliance and will be able to assist in decision making throughout the entire venture capital process which is a weakness of the DHI spin-off project. Furthermore, the DHI parent company needs a clear exit strategy which can be provided through an IPO by the foreign investor on the international stock exchange as explained in sub research question one.

However, the focus of the foreign venture capital investors on potential high growth companies can be a threat to the ability of a DHI spin-off project to attract the foreign venture capital funds. According to U. W. Sørensen (personal communication, June 2, 2009) a DHI spin-off project is not geared to present the high growth potential that foreign investors are looking for. The foreign venture capital investors value high return on investments and the cleantech project would therefore have to present the growth prospects necessary to attract the investors (S. Houmøller, personal communication, May 19, 2009). This is a generic threat for a DHI spin-off project in regards to all types of venture capital, but the domestic Chinese might be more inclined to follow the regulations of the government to improve the water treatment market than foreign investors are. The foreign investors are more proactive in regards to financial returns than Chinese investors (Ahlstrom et al., 2007; Cleantech Group, 2007).

A weakness when entering into an alliance with foreign venture capital investors is their possible weak ties with major organisations in China. They thereby do not benefit from the preferential access to domestic sources of related resources. (White et al., 2004) Although a DHI spin-off project is connected through DHI China, the foreign investors might be inclined to look for more well connected Chinese entrepreneurs to widen their own networks which imply a threat to the project of DHI. On the other hand, the network that the DHI spin-off project can possess through the parent company to the Chinese government might prove an opportunity for an alliance with the foreign venture capital investors, as the water treatment market is related to government regulated infrastructure projects. In this sense, the relationship with the government acts as a strategic asset and opportunity for the DHI spin-off project in regards to attracting foreign venture capital (Barney, 1991; Prahalad & Hamel, 1990).

However, the new regulations of the government permitting foreign shareholders to build and operate water treatment plants in small and medium-sized cities (KPMG, 2008) presents a major opportunity for the creation of an alliance between the DHI spin-off project and a foreign venture capital investor. Substantial investments are needed to support the rapid urbanisation which is backed up by the government creating an immense market for water treatment solutions. (KPMG, 2008). These ownership conditions generate a major opportunity for a DHI spin-off project in attracting a foreign venture capital partner. Following the agency theory of the principal-principal approach, the foreign venture capital

investor will be more inclined to invest in the water treatment industry where they are able to gain a majority share instead of a minority share if investing in other sectors with a Chinese partner. (Young et al., 2008; White et al., 2004)

5.4.5. Sub Conclusion

We conclude on the sub research question; ***"Which opportunities and threats exist in the Chinese venture capital market for the spin-off projects from DHI?"*** that the opportunities outweigh the threats of DHI spin-off projects engaging in an alliance with venture capital investors in the Chinese market.

There are several opportunities for the DHI projects in the Chinese market when engaging in alliances with venture capital investors. However, the success of the spin-off depends on their ability and willingness to share their core competences with the venture capital alliance partner although it simultaneously represents a major threat to the core competences of the project. It is necessary to open up to partners in order to experience the latent opportunities in an alliance. The DHI spin-off project will otherwise reduce its opportunities if manoeuvring independently in the water treatment market. The projects will have to engage in relationship building to connect in networks and build trust to secure the spin-off venture.

In regards to government venture capital investors, we conclude that the opportunities outweigh the threats for DHI ventures as the government will provide access to water infrastructure projects, lower the administrative barriers, provide legitimacy, and access to the stock market. Threats include the inflexibility, local government pressure towards less favourable projects, goal conflicts, and lack of business experience as well as the inclination to invest in domestic enterprises to boost the economy.

Opportunities likewise exist when engaging with Chinese corporate venture capital investors. These opportunities include business experience, connections, and market knowledge. The threats, however, consist of the high dependence on networks, the proclivity to invest in Chinese, and limited exit abilities, making this type of alliance difficult to obtain for the DHI spin-off project.

Foreign venture capital alliances provide opportunities in regards to venture capital business experience, international connections, cleantech perspectives, and exit abilities. The threats, on the other hand, contain weak ties in China and their inclination to look for well connected spin-offs to widen their network. In spite of this engaging with foreign venture capital investors offer several opportunities for the DHI projects.

Finding the right partner or mix of partners represents an opportunity for DHI spin-off projects if they work towards a common goal for mutual gains, whereas the wrong partner will jeopardise the future abilities of the venture in China. Additionally, entering an alliance in China would give the DHI project the opportunity to obtain a broader network which can benefit the both the DHI spin-off projects and the parent company in the future.

Our overall conclusion is that the opportunities outweigh the threats for DHI spin-off projects in an alliance with venture capital investors present in China in the water treatment solutions market.

Part 4

6. Conclusion and Recommendation for the DHI Spin-off Projects

Our recommendations for the DHI spin-off projects on our main research question being; **"What are the possibilities for DHI spin-off projects to engage in venture capital alliances to enter the Chinese water treatment market?"** will be guided by the sub conclusions on the presented sub research questions.

We conclude in the analysis that understanding the Chinese institutional setting is a necessity of the DHI spin-off projects before entering the water treatment market through the use of venture capital alliances. As the formal institutions in China are increasingly focussing and promoting the cleantech possibilities to solve the water challenges of the country, they are creating an expanding market for venture capital potentials. The focus on water treatment solutions is implemented in the 11th Five Year Plan, the Circular Economy Law, and by allowing foreign investors to own water treatment plants in small and medium sized cities. By implementing cleantech industries into central laws and regulations, the government is actively promoting the sector and hence the venture capital investors. These formal incentives all favour the possibilities of DHI spin-off projects to attract venture capital in order to successfully implement their pioneering water treatment solutions in the Chinese market.

However, the formal institutions likewise provide several constraints for the spin-off projects from DHI. The Chinese government controls the majority of the water treatment industry and thus primarily selects domestic ventures to promote the development of the Chinese industry. Additionally, we conclude that as the legal environment for the venture capital industry is not fully developed, venture capital investors tend to invest in mature enterprises instead of start-up ventures which place DHI projects in a disadvantage position for attracting venture capital.

To compensate for the weak formal environment, venture capital investors and cleantech entrepreneurs utilise network strategies to reduce uncertainty in the Chinese market. Being part of a network is consequently necessary when operating in China as the use of

network strategies provides options and possibilities for business activities as the normative institutions acts as a controlling force within the business environment. A comprehension of this business method is essential for the spin-off projects from DHI when penetrating the Chinese market as strong personal ties and referrals dominate the decision making of the venture capital investors. Not being part of a network will exclude the projects from the involvement in business deals. We consequently recommend the spin-offs from DHI to utilise the networks and connections of DHI China when approaching venture capital investors. Engaging with venture capital investors in China subsequently provide the DHI ventures with access to new networks. Bringing Danish water treatment solutions to the immense Chinese market is for this reason facilitated through alliances with venture capital investors.

As concluded in the analysis, the spin-off projects of DHI possess several strengths for successfully attracting venture capital present in China. We recommend the spin-off projects from DHI to focus on their product-mix, which is the internal strengths suitable for the external opportunities and threats in the Chinese market. The resources the projects should focus on promoting are technology, research and development, and being a spin-off from a world leader within water treatment solutions.

Four different types of venture capital investors exist in the Chinese market that the spin-off projects from DHI can enter into an alliance with. However, the different types provide various opportunities and threats for a successful entry in the water treatment industry in China. We therefore recommend the ventures from DHI to enter into an alliance with two different types of venture capital investors in order to minimise the risk of the investors as well as present the project with the best opportunities in the Chinese market. We conclude that the most beneficial venture capital partner alliances for the spin-off projects are the government venture capital investors and the foreign venture capital investors combined.

As the water treatment industry is predominantly infrastructure the demand for solutions within this field mostly arises from the government. The government venture capital investors are therefore vital for a successful penetration of the pioneering solutions from the spin-off projects in the Chinese market. The project from DHI already possesses an advantage within the governmental arena as the parent company has direct relationships with Chinese government officials. These connections will support the new ventures in

creating a beneficial alliance that provide access to the immense water treatment market. Additionally, as the government primarily favours the growth of domestic cleantech enterprises, an alliance with the formal institutions is a necessity to be flourishing in the Chinese market.

A foreign venture capital investor is able to provide the DHI spin-offs with the compulsory capital and the managerial knowledge about commercialising the product which is a weakness of the projects. Furthermore, the foreign investors participate more actively in the venture as they rely on the limited liability partnership model, which will provide the DHI spin-off projects with more guidance. DHI is familiar with venture capital practises in Europe and will consequently have a better understanding of the foreign business practises. However, if creating an alliance with foreign venture capital investors alone, the products of the DHI spin-off projects are required to be much more sufficient than those of the local ventures that hold a favourable position with support from the government. Hence, we recommend the DHI project to engage with foreign venture capital investors in combination with government venture capital as these combined will be most beneficial for the venture.

However, we do not recommend the projects from DHI to utilise resources on attracting Chinese corporate venture capital investors as these investors mainly invest in other Chinese ventures to lower agency risks and to compensate for the weak formal institutional environment. Furthermore, a corporate venture capital investor is restricted in terms of exit possibilities, which complicates the cooperation for the projects. In addition, the corporate venture capital investors tend to invest more in mature companies in contradiction to spin-off projects from DHI. Additionally, since university venture capital is mainly provided to university related ventures, the DHI ventures should not concentrate on these investors.

In order to create the alliance with the government and foreign venture capital investors the DHI spin-off projects are required to compensate the knowledge and accesses from the investors by providing shares in their venture. However, we conclude that the sacrifice is beneficial as the alliance creates a major potential for success of the DHI project in the Chinese water treatment market. Furthermore, by engaging with both government and foreign venture capital investors provide a possibility for the DHI parent company to exit

through two IPO's as the foreign has access to an international stock market and the Chinese government provides exiting through the national stock market.

The Chinese government is in the process of enforcing laws and regulations which is further accelerated by the pressure from the coastal regions to improve the environmental conditions in the rural areas. These incentives combined with the improved ownership positions for foreign investors in the districts create a new market for the products of DHI spin-off projects. We therefore recommend that the ventures from DHI should stay updated on the development in the West as investors will potentially search for projects to invest in.

On the basis of the presented research our overall recommendation to the DHI spin-off project is to create an alliance through the connections available from DHI China that would open up to penetrate the Chinese market and hence create a successful business in the Chinese water treatment market.

Part 5

7. Table of Figures

8. Appendix

8.1. Interviewees

Hans G. Enggrob

Head of Innovation/Corporate Venture DHI

Hans is the manager of innovation at DHI and consequently also responsible for the AddVenture strategy. He focuses on venture capital as a possible finance source to the DHI spin-off projects.

Interviewed March 23, 2009 and June 17, 2009 at DHI head office.

Read more: www.dhi.dk

Jørn Rasmussen

Director, DHI Solutions

Jørn is the director of research and development at the DHI Head office. He is furthermore aiming to increase the percentage of research and development conducted in the DHI offices around the world. He is working with developing a global strategy for DHI.

Interviewed on the May 1, 2009 at the DHI head office.

Read more: www.dhi.dk

Kenneth F. Janning

Environmental Engineer at DHI

Knowledge and experience from working at the DHI office in China. He possesses information about the setup of the company in Shanghai, the structure, the focus and more.

Interviewed on June 8, 2009 at the DHI head office.

Read more: www.dhi.dk

Martin Arno Mathiesen

Partner for The Capital Gateway

Martin works with connecting investors with start-up companies and partners in Denmark and China.

Interviewed May 12, 2009 through a Skype conference

Read more: www.thecapitalgateway.com

Nis Høyrup Christensen

PhD fellow, MSc, on the PhD project: 'The emergence of a new organisational field: The dynamic construction of China's renewable energy sector'

Nis' research areas include business and politics, China's renewable energy sector, market and innovation policies in China, foreign firms in China, and China's Communist Party, ideology and policy processes.

Interviewed June 17, 2009 at the DI head office.

Read more: www.cbs.dk/research

Ulrik With Sørensen

Owner of Kildeskov Consulting

Kildeskov Consulting expands the utilisation of environmental technologies to generate energy. Kildeskov exports renewable energy and cleantech solutions to customers and partners in China. The company has two decades of experience in the Chinese market cooperating with political, administrative, and corporate decision makers.

Interviewed on June 2, 2009 at public location.

Read more: www.kildeskov.com.

Søren Houmøller

Manager & owner, 1st Mile

The company covers the first commercial distance for new concepts and technologies. The focus is first and foremost on cleantech and 1st Mile has implemented several business cases. The consultancy covers business plans and strategy, innovation and entrepreneurship, implementation and execution, business creation on research and development projects, interim management and project management.

Interviewed May 19, 2009 at the 1st Mile head office.

Read more: www.1stmile.dk

8.2. Chinese Venture Capital Market

The following is a presentation of graphs visualising the venture capital market in China. The first graph shows the distribution of newly raised funds by currency. The second graph visualises in which sectors the venture capital is invested. The distribution of investment amount by stage is showed in the third graph followed by the fourth graph which pictures the exiting strategies.

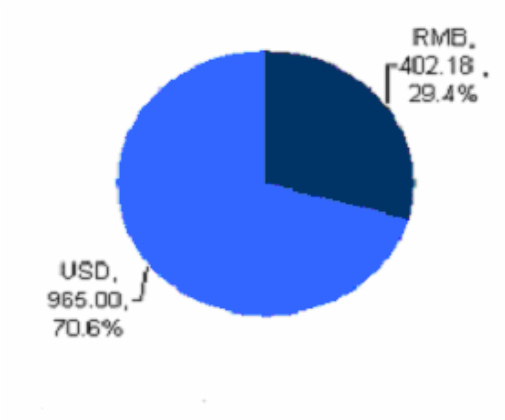


Figure 5: Distribution of newly raised funds by currency in Q2'09 (by amount raised, US$M). Source: Zero2IPO

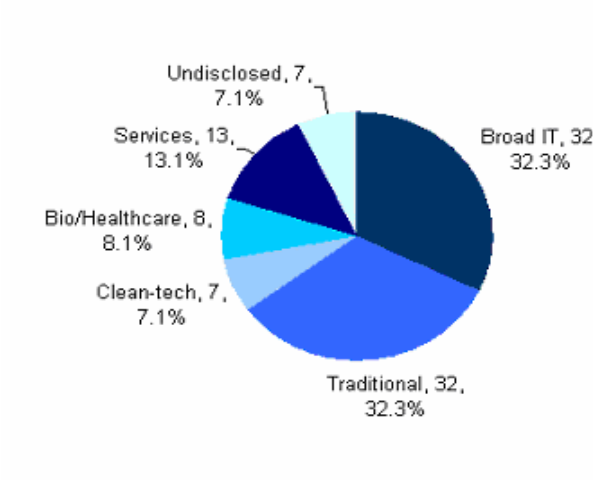


Figure 6: Industry breakdown of venture capital investment deals in Q2'09 (by no. of deals). Source: Zero2IPO

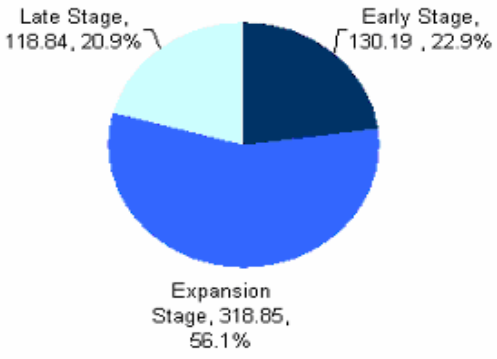


Figure 7: Distribution of investment amount in Q2'09 by stage. Source: Zero2IPO

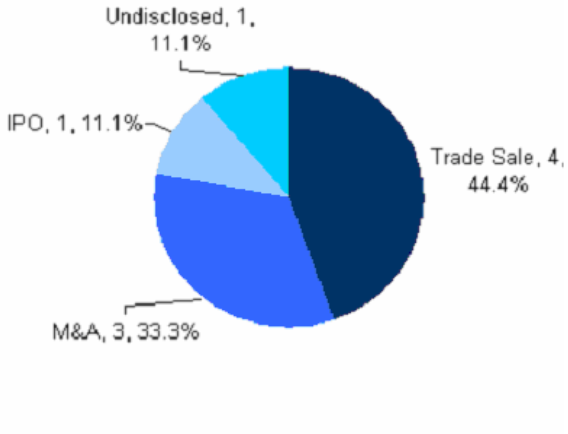


Figure 8: Distribution of exits in Q2'09 by option. Source: Zero2IPO

8.3. DHI

The following section is a company introduction to DHI and the data is acquired from the DHI Annual report 2008 and the DHI group webpage.

DHI is an independent, international consulting and research organisation established in Denmark in 1964 as a spin-off from the Danish Academy of Technical Sciences established Vandbygningsinstituttet/ Danish Institute of Applied Hydraulics and is today present in all regions of the world.

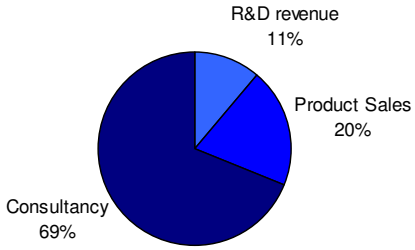


Figure 9: Revenue distribution. Source: DHI annual report 2008

The objectives of DHI are to enhance technological development, governance and competence within the fields of water, environment and health. This is done through offering a wide range of consulting and policy services and leading edge technologies, software tools, chemical/biological laboratories and physical model test facilities including field surveys and monitoring programmes.

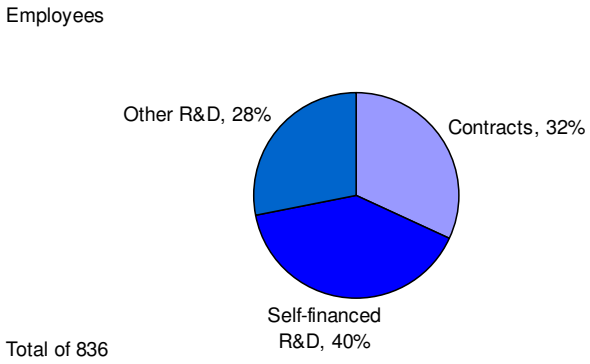


Figure 10: R&D financing. Source: DHI annual report 2008

DHI is a member of the GTS - Advanced Technology Group, a network of independent Danish research and technology organisations authorised by and collaborating closely with the Danish Ministry of Science, Technology and Innovation on technology based promotion of trade and industry.

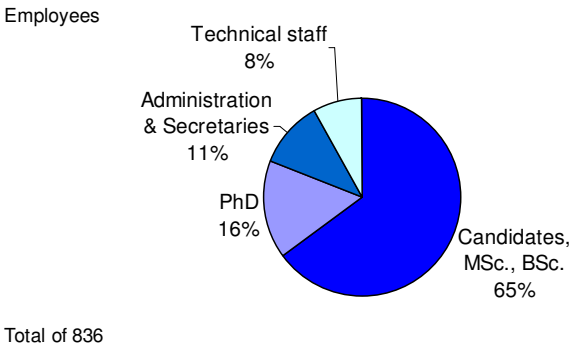


Figure 11: Education of employees. Source: DHI annual report 2008

On a global level, DHI works with governmental agencies and authorities, contractors, consulting companies and a wide range of industries. The company has more than 800 dedicated employees working worldwide.

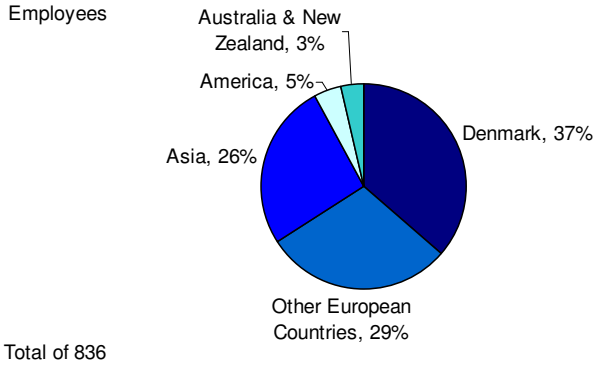


Figure 12: Nationality. Source: DHI annual report 2008

Following the group organisation below, the parent company has the overall responsibility of the business, but the different divisions, e.g. China, are run independently as a separate business. In this way, Mr. Lu is in charge of the Chinese division himself, although the overall responsibility lies with the parent company.

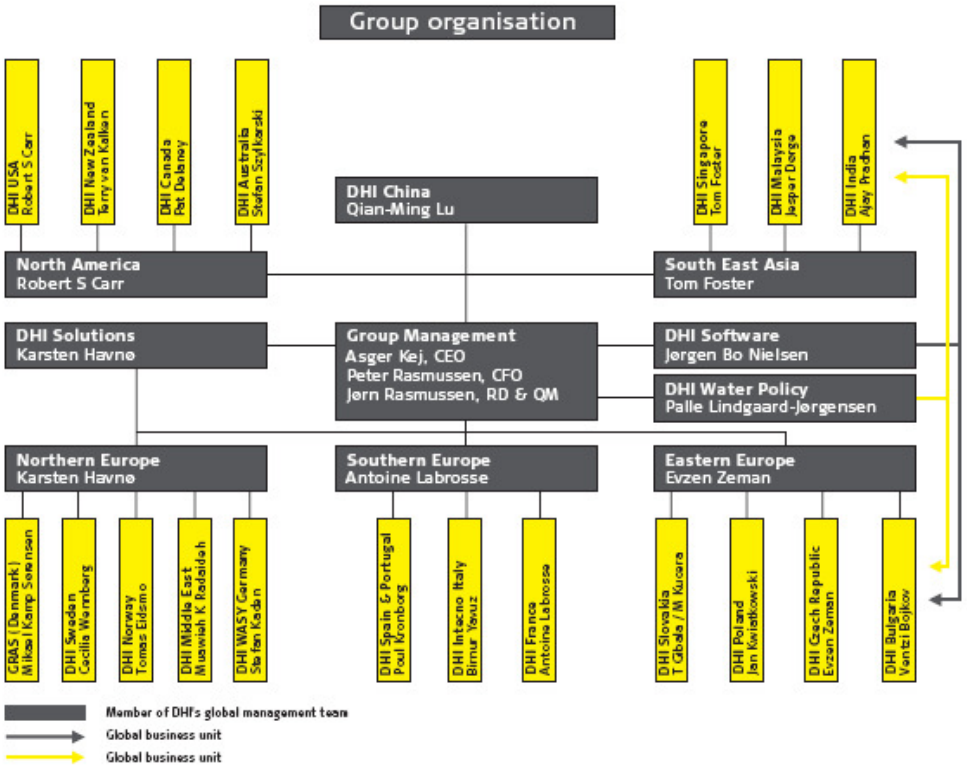


Figure 13: The DHI group organisation. Source: DHI annual report 2008.

Financially DHI did well in 2008 (Annual report 2008) as the company made a profit of DKK 25 million making gross revenues grow to almost DKK 600 million representing an underlying net growth of 10%. The development can be seen in the below figure presenting DHIs profit and loss for the group and parent company respectively.

Profit & Loss / DKK 1,000	***Group 2008***	***2007***	***Parent 2008***	***2007***
Revenue	594,107	504,033	354, 781	290,391
Sales and expenses	(576,478)	(493,906)	(346,864)	(287,292)
Result before financial income and expenses	17,629	10,127	7,917	3099
Result of investments in related companies	0	0	5,693	2,436
Financial income and expenses	(5,223)	(4,857)	(2,373)	(3,182)
Result before nonrecurrent income	12,406	5,270	11,237	2,353
Nonrecurrent income	13,825	0	13,825	0
Result for the year before tax & minority interests	26,231	5,270	25,032	2,353
Tax	(867)	(1,955)	(382)	(196)
Minority Interest	(684)	(1,158)	0	0
Result for the year	**24,680**	**2,157**	**24,680**	**2,157**
Assets				
Fixed assets	43,463	73,589	59,572	81,215
Contracted work in progess	65,682	57,964	42,534	37,827
Receivables	187,124	144,827	141,444	108,967
Cash in bank and in hand	100,547	48,993	57,758	15,304
Assets	**396,816**	**325,373**	**301,308**	**243,313**
Liabilities				
Equity	127,828	103,398	127,828	103,398
Minority interest	5,335	5,229	0	0
Provisions	387	563	387	563
Long term debt	18,686	40,700	18,686	40,695
Short term debt	244,580	175,483	154,407	98,657
Liabilities	**396,816**	**325,373**	**301,308**	**243,313**

Source: DHI annual report 2008

8.4. AddVenture Strategy

The following is a summery of the AddVenture strategy presented in the folder: "A new approach to business incubation, corporate venture and intrapreneurship" the AddVentrure homepage, and innovation slides from DHI.

The AddVenture program was launched in 2001 as a new strategic element in the innovation processes of DHI. In the first two years of the existence of the program, DKR 2 million per year was allocated as seed-capital and co-financing of AddVenture spin-offs and ideas. However, with the performance contract 2004-2006, a new strategy based on external capital was implemented, which is why DHI continuously search for venture capital. The idea of AddVenture is that the entrepreneur within the DHI organisation use the knowledge and technology combined with the resources and capital. These factors combined will go to the market and create solutions and welfare.

As well as developing innovative solutions for the customers of DHI, the company participates actively in the development of new products. This is happening either through the customers, the R&D partners, entrepreneurs, or with internal ideas from the DHI staff. These products or solutions are considered the candidates for later spin-offs and DHI spin-off projects which may seek venture capital if approved through the definition, development and commercialisation stages visualised below.

AddVenture is an innovation strategy which involves collaboration with incubation and venture capital partners who are able to assist the start-up project with seed capital, specific market experience, knowledge, and networks suitable for business start-ups.

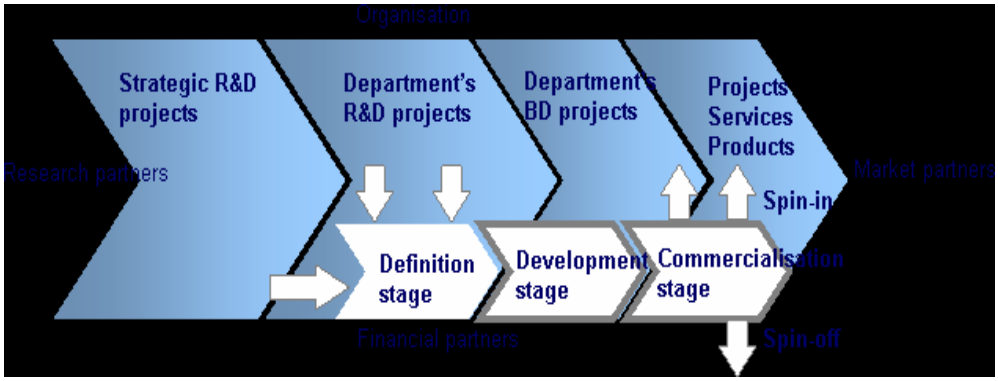


Figure 14. Business incubation based on AddVenture. Source: AddVenture homepage

The idea is that DHI contributes with its immense knowledge base, technological test facilities, pre-seed capital investments and global network from the DHI companies and

markets around the world. The technology will, however, in many cases be carried out in cooperation with the external partners.

The Innovation Processes

DHI believes that innovation is an invention if it is being commercialised in terms of the product, process, method, service, or organisation. Innovation is seen in a matrix describing existing customers and new customers in regards to the market base and technology base. In the figure below, it is explained how a given innovation is being defined within DHI before it is being developed and finally commercialised. DHI have core competences within research and development which takes place in the definition stage. The different milestones in the innovation cone are meant to reduce market uncertainty and define the collection, selection, development, and filtering of projects before the project gets to the commercialisation stage According to DHI, the commercialisation stage is their strength as they know how to make money with their existing products and services.

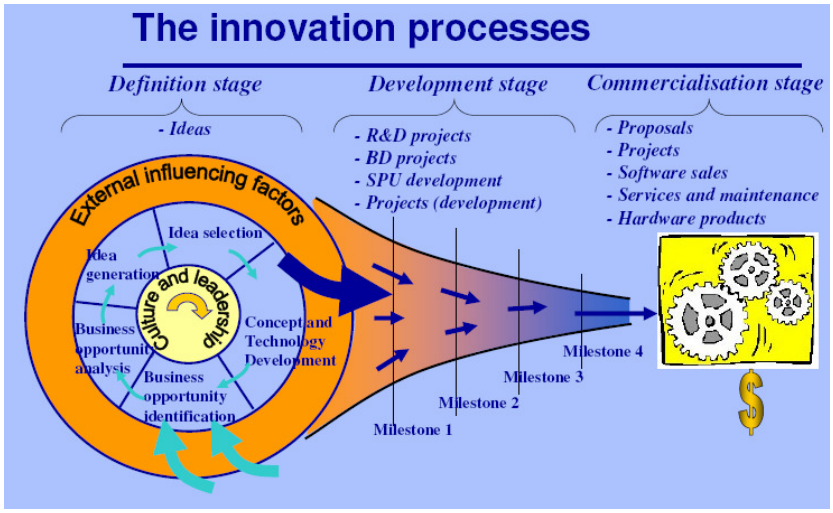


Figure 15: The innovation process. Source: AddVenture powerpoint

The Resource Gab

Venture capital is supposed to be added in the development and commercialisation stage, and where the yellow "Research resources"-line meets the blue "Business resources" line is a "Valley of death" as the long-term investment in research may fail to meet the short-term profitability goals. Investors are therefore needed to fund the process and get the project into the commercialisation stage.

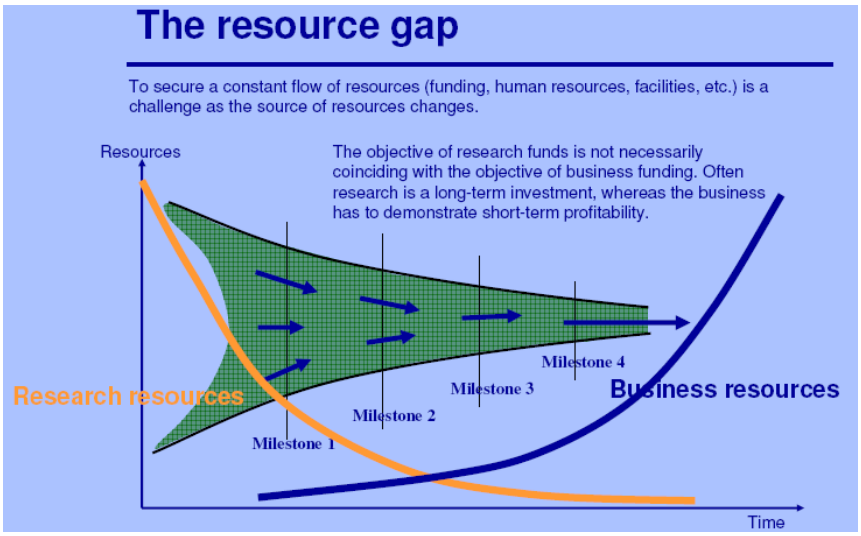


Figure 16: The resource gab. Source: AddVenture powerpoint

The 'Entrapreneurs'

The employees at DHI are continuously being encouraged through workshops, seminars etc. to develop innovative projects and products that could be suitable as new ventures as well as solutions and add-ons to existing services and customers. This is done to keep encouraging the employees, but also help entrepreneurs who have the desire to have their own business. (H. G. Enggrob, personal communication, June 17, 2009; J. Rasmussen, personal communication, May 1, 2009)

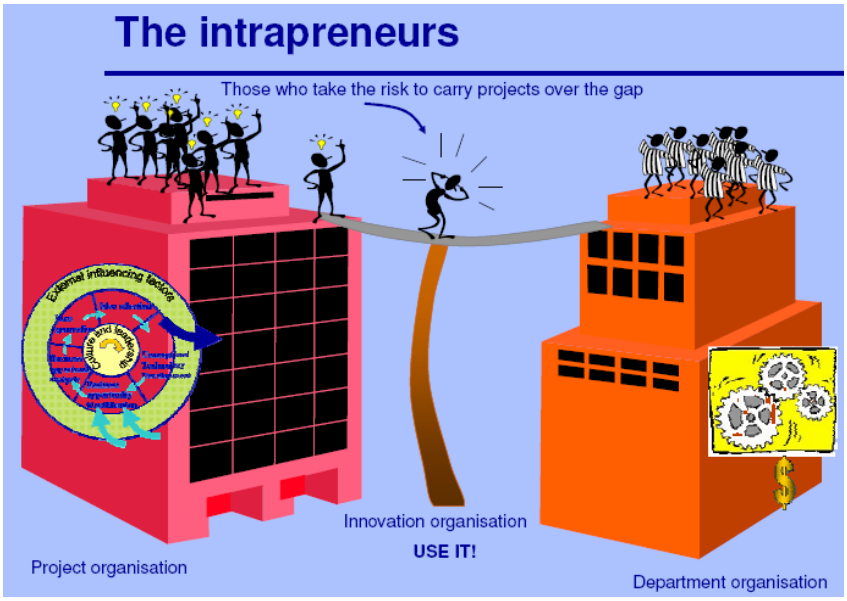


Figure 17: The entrepreneurs. Source: AddVenture powerpoint

8.5. Major Environmental Laws and Regulations in China

Laws and Regulations	Effective date
Environmental Protection Law	1989
Law on Prevention and Control of Environmental Pollution by Solid Waste	1995; amended 2005
Law on Prevention and Control of Atmospheric Pollution	1995; amended 2000
Law on Prevention and Control of Water Pollution	1996
Law on Prevention and Control of Pollution from Environmental Noise	1997
Criminal Law*	1997
Energy Conservation Law	1998; amended 2008
Regulations on Labor Protection in Workplaces Where Toxic Substances Are Used	2002
Impact Assessment Law	2003
Clean Production Law	2003
Renewable Energy Law	2006
Administrative Measures on the Control of Pollution Caused by Electronic Information Prducts (RoHS)	2007
Circular Economy Law	2009
Regulations on Waste Electrical and Electronic Equipment	Forthcoming

* The Law is special and is included in this environmental law list as it made it possible for the first time to punish infringers with fines, imprisonment and capital punishment (EIU, 2009)

Figure 18: Major environmental laws and regulations. Source: McElwee (2008); EIU (2009)

8.6. Relevant Internet Sources to be updated on the Issue

The corporate web-page of DHI Group: www.dhigroup.com

The Cleantech Group: www.cleantech.com

Zero2IPO: www.zero2ipo.com

1st Mile: www.1stmile.dk

Kildeskov Consulting: www.kildeskov.com

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