INTERNATIONALIZATION AND NETWORKING OPPORTUNITIES FOR FINNISH CLEANTECH COMPANIES

Master’s thesis
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The commissioner of this thesis is Exigo Oy, Finnish consultant company. The purpose of this thesis was to study what kind of assistance Finnish cleantech companies need when considering to enter foreign markets. The research studies only 7 most potential market areas.

The author collected information by reading books, statistics and cleantech program of Finnish government. The most important source of information was interviews. The study also includes quantitative information; the author made a research for Finnish cleantech companies, which operate with waste management cleantech business. Companies operating with renewable energy were left outside the research.

The results demonstrated that Finnish companies have plenty of know-how and technology to export, but most of the companies are small or medium sized. They require business networks as well as assistance with practical details to successfully operate abroad.

When ordering this thesis, Exigo Oy was important consultant in Arabian peninsula, but since that it has quit its operations until further notice, as the entrepreneur got an interesting assignment elsewhere. This study will serve Exigo Oy, once it returns back to consultant business.

**Keywords**  Cleantech, business networks, export, foreign markets.

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1 INTRODUCTION

1.1 Background

The commissioner of the study is Exigo Oy. It is a Finnish consulting and export management company, and its’ head office is located in Tampere. The company provides internationalisation services for Finnish customers. A big number of Exigo Oy customers are SME’s who aim to develop their international businesses. Operational branches for Exigo Oy are technology, information and communication technology, and industrial manufacturing or subcontracting. Exigo Oy, for example, offers partner and customer connection services, marker researches; it connects companies with potential cooperators; prepares market entry strategies; assists with sales contracts, license agreements and other details and arranges matchmaking events. In environmental technology business Exigo Oy strives to increase Finnish technology and innovations exporting in target markets. Major sectors in environmental business are waste collection, recycling, landfill technologies, waste-to-energy solutions, wastewater treatment and energy efficient products. It also helps with local legislation, rules and regulations etc. Exigo Oy has a comprehensive partner network abroad. The biggest markets exist in Sweden, Egypt and Persian Gulf Council countries. (Exigo.)

Exigo Oy is seeking new potential partners or networks of whom could expand their businesses abroad. Finland is one of the leading countries in environment protection and environmental business and new innovations are developed continuously.

Globally environment protection is a growing trend and legislation or waste management targets are tightening. Many countries are trying to get rid of landfills and postpone the end-of-waste situation of materials. Consumer behavior is in a key role when a product ends up in trash or finds a new life as a reusable material or energy. When the latter happens, there is room for a number of innovations both in product and material innovations, or know-how. Many countries still dump their trash in nonfunctional landfills but when the legislation and practices proceed, all alternatives are potential hit products.

These two things - Finnish know-how and global trend - could meet each other increasingly, but many Finnish companies don’t know how to enter foreign markets, should they enter by themselves or as a part of business network and which markets are optimal for their purposes.

The purpose of this survey is to research Finnish waste management products to export and the best possible market areas for them.
1.2 Objectives

Global trend is to lessen landfills. Reasons for this are rising knowledge of healthy and environmental problems, and lack of natural resources. In the same time, human kind is consuming increasingly and produces waste more than ever. China, India, Brazil and other huge countries by population are growing economies; people there have more money to spend than before and governments encourage people to spend to keep the economy wheels rolling. This causes the problem, what to do with the waste. There are two options:

1. To postpone the end-of-waste situation by re-using material, innovating new utilizations for waste usage etc.
2. To use waste as energy source (incinerating or bio fuel).

The first objective of this thesis is to clarify, do Finnish waste management cleantech companies find it easy to entry foreign markets. The chapter explains different export methods and most considerable entry methods for each of them.

Second objective is to map the most potential market areas for companies. This objective covers eight market areas; based on the Finnish government Cleantech program. Besides theoretical analysis, there are also experts of each area giving their comments of how they experience waste management issues from grass-root level. These comments are based on open interviews and expert’s own point-of-view.

Third objective is to study networking methods. For many Finnish waste management cleantech companies networking is crucial, because they are relatively small and entering foreign (and often distant) markets by themselves is too expensive or difficult.

The result after researching all these objectives to clarify for Exigo Oy, where it can find new potential business partners and what kind of assistance these companies require with their export activities.
2 THEORETICAL FRAMEWORK

2.1.1 Porter’s Diamond Model

The theoretical framework in this research is based on Michael Porter’s Diamond Model. This model presents that there are inherent reasons why some nations or local industries become more competitive than others. Diamond model clarifies 4 conditions, which offer organizations or clusters competitive advantages, depending on their home base.

**Factor conditions** are those factors, which the home country / nation can provide for the organization for exploitation. Those are advantages, which the organization can make more advanced factors in global competition. Such factors can be e.g. highly skilled workforce or raw materials. Converse factors can also make a potential competitive advantage; for example, lack of workforce can force the organization to improve its’ automation and lessen manufacturing defects this way.

**Demand conditions** compare the demand for products between local and foreign markets. If the domestic market is larger and more demanding, the local organization contributes more in that than foreign companies do. Exporting local companies can first collect evidence of how its’ product works and improve its’ features. Innovations improve the product or the whole business. Second, if the domestic market is demanding or saturated, this may boost the organization to expand its’ business in foreign markets.

**Related and supporting industries** mean subcontractors or other industries, which the organization needs to manufacture the product. When supporting industries are competitive, the organization gets cost efficiency and, at its’ best, receives innovative components. This leads to greater competitiveness.

**Firm strategy, structure and rivalry.** In different countries, the structure and way of managing a company can differ a lot, and this may affect in competitiveness. In some countries the management might be hierarchical, or power distance may be flat. Business culture with hierarchical management often produces technical solutions; ones with flat management and low power distance produces more likely design products.

If the competition in domestic market is very hard, company might build up capabilities, which lead as an advantage in foreign markets. If there is only little or not at all competition in domestic market, it does not set development or innovation needs for the company. (businessmate.org 2014.)
This diamond figure may help company leaders to analyze the factors that encourage them to enter foreign markets. Cleantech and waste management are growing businesses but already some countries have successfully entered developing markets. Germany, Austria, Denmark or Switzerland are operating in Asian countries with high volumes, but there is still room for others. Also in Europe there are small markets to enter so Finnish companies have to organize clusters at the earliest opportunity. Factor conditions in Finland offer skilled engineers, infrastructure to sample new products and innovations and so on. The distance to big markets is a challenge.

Demand conditions have and will developed Finnish cleantech. The waste management system in the country is on top class, but European Union demands sets new targets continuously. One top driver to develop products on domestic markets is that landfills will be banned.

When considering a cluster of companies entering foreign markets together, related and supporting industries have to be monitored especially closely. It is useless to collect co-operators, which have no prerequisites to operate in foreign business markets. A cluster of companies or subcontractors must all support each other, especially in such a small country than Finland is.
2.1.2 Legislative requirements

This section discusses legislative environmental requirements in global, European Union and national level in Finland. It also pores over some researches, which examine the demands and difficulties when trying to reach set targets in environment protection. The purpose is to study, how legislation pushes the environment issues accomplishment on different levels and forces countries to find alternative solutions for landfilling.

The research projects study the measures Finland has done so far to solve environmental problems and what are the findings of these studies. They indicate the problems that an environmentally advanced country has to solve and aim to raise questions about the same problems in international level.

2.1.3 The United Nations Environmental Law

These following chapters explain which global norms or requirements force countries and organizations to develop their environmental progress. There is no general environmental legislation, but most of the countries in the world are members of United Nations and involved to follow its’ conventions. The United Nations Environment Programme UNEP has a sub division DELC, Division of Environmental Law and Conventions. In practice UNEP sets the framework for DELC to develop environmental law compliance on governance level, defined international environmental norms and implements multilateral environmental agreements (MEAs). The UNEP norms, agreements and laws concern all the United Nations member countries. DELC has guideline program to implement environmental laws; the program is called Montevideo programme and it was first published in 1981 and it is updated in the beginning of each new decade. The current Montevideo Programme IV was adopted in 2010. (unep.org.)

The Montevideo Programme IV includes e.g. following environmental key activities:

- Progressive development of environmental law. This means that as understanding and technological capacity of environmental issues grows, legislation in international, national and regional levels cannot follow rapidly enough. Governances should adopt the new opportunities more flexibly. Another detail worth mentioning is that especially developing countries have difficulties to implement environmental laws. (unep.org.)

- Protection on human rights and the environment. Globally millions of people suffer diseases caused by pollution or harmfully treated waste. On the other hand, lack of information or human rights within citizens lead to indifference of environment. The result of this is a negative circle. (unep.org.) The author experienced this circle while living in Romania. The tap water was not drinkable and the author suffered from hypodermic infections a several times, caused by shower water.
As the water was not drinkable, people were forced to buy water from stores but there were no recycling possibilities for the plastic waste and the waste was dumped in, sometimes even illegal, landfills. The landfills polluted the soil and groundwater again. In Romania, there was a survey of poor people who could not afford to buy water and drank the tap water. These people suffered of e.g. cancer in a significant extent.

- DELC aims to direct nations towards green economies. Green economy is a definition for an economy, which grows by investments that reduce pollution and finds possibilities in sustainable business. The means to achieve greener economies are to set strict laws, allow funding for green investments (such as cleantech equipment) or to disincentive activities harmful for the environment. (unep.org.)

The weakness in the environmental law is that all countries cannot follow them equally, the law includes lots of good ideas but less practical advices of how to implement those, and there are no clear consequences for the countries that do not obey the agreements. Still the law pushes countries globally to increase their environmental rules and this opens continuously new doors for businesses.

2.1.4 The European Union landfill directive

In biggest part of Europe, the EU landfill directive (1999/31/EC) requires the member countries to decrease the end-of-waste amount in landfills. The purpose of the landfill directive is to reduce landfills as final waste disposal options and to increase alternatives for waste usage. As landfills cause harmful impacts for both environment and human health, the directive aims to advance the alternatives of waste treatment. All the EU member countries have a target of reducing their biodegradable waste even 65 % of the year 1995 level until the year 2016 (http://europa.eu). This number gives huge possibilities for the companies who develop alternative waste treatment for bio waste. When it comes to other solid municipal waste, the European Committee has published The Roadmap to a Resource Efficient Europe (COM 2011) 571). This roadmap has a vision until the year 2050: there the EU economy grows by taking limited resources into consideration. In the vision these resources include both, the usage of natural resources but also nature tolerance to stand waste (eur-lex.europa.eu, 5.) The roadmap sets up the interim review for the year 2020. Some of the most important details that the committee aims to implement are listed as follows:

- Consumers and authorities have incentives to choose most resource efficient products or services. These products and services have own signs to make it easier to choose them;
- The most pollutant or least resource efficient products and services are eliminated from markets;
The Committee confirms a common method for evaluation and comparison of the environmental impacts of the products and services. This helps consumers and authorities to compare the items based on the similar basis. (eur-lex.europa.eu, 6-7).

In the EU there is generated end-of-waste over 2,7 billion tons annually, and some EU member countries recycle over 80 % of the waste and this number shows how waste can be used as a resource (eur-lex.europa.eu, 8.) This shows how big export opportunities and markets exist in Europe for new innovations. In the roadmap, interim goal for the year 2020 is that recycling and waste reusing are economically desirable alternatives, and to achieve this there is a need to develop a functional renewable raw material system. To achieve these targets, the European Committee together with member states aim to impact in research and innovations (this is an on-going process). They also encourage public and private sector to companionships and common technology initiatives. (eur-lex.europa.eu, 9.) This all means competition but also opportunities to enter European markets and it is obvious that there is a need for networking with companies from different waste management sectors.

There are signals that landfills are banned totally in the future. Association of European plastic manufacturers, PlasticsEurope, tries to promote the total ban of landfills and waste usage as an energy source. The association has sent in 2012 a proposal to the European Parliament to ban the landfills in Europe. The ENVI Committee (environment, public health and food safety), which is one of the European Parliament Committees, has given green light for this target. In 2012 15 EU member countries landfilled over 60 % of their end-of-life plastics and according to PlasticsEurope this is because of the countries are not enforced enough to follow the legislation, and because landfilling is the cheapest way to treat waste. (Plasticsurope.org.) If the total ban will come true, the markets for alternative waste management solutions are huge.

2.1.5 The Finnish national waste management plan NWMP

The purpose of this chapter is to explain the challenges, which Finland has with waste management requirements. Even though Finland is one of the most developed countries with environmental issues globally, there are still many problems to solve. Finland has not met the requirements The National Waste Management Plan (NWMP) includes, and it has huge opportunities to develop new innovations and market those both in domestic and foreign markets. Domestic markets can also be used as testing fields. (Ympäristöministeriö 2008, 9 – 10.)

The first interim review of the NWMP was published in 2012, and it examines how the goals of the NWMP have come true until the year 2010. It also determines the additional measures that should be implemented for the next interim and the final goals on 2016. The first interim review shows that the
goal to stabilize the amount of municipal solid waste to the level where it was in the early 2000’s (2.3 – 2.5 million tons). This has not proceeded as was planned. The amount of municipal solid waste has increased some. Another goal was to collect 50% of all municipal solid waste, which did not actualise, because only 2/3 of the target was achieved. The interim report estimates that that this goal will not come true if there are no more effective actions. Third goal in the NWMP was to decrease the landfill usage as the waste repository. In this case Finland is far away from the target: the purpose was to decrease the amount of landfill waste for 20%, but the true number is 2.5 times bigger. One possible action could be changes in landfill taxation. This could lead to increasing usage of waste as energy source. (Finland’s environmental administration 2012.) This clashes with the waste hierarchy, because the waste should be recycled and reused rather than incinerated.

Figure 2. Repository of municipal solid waste in Finland 2002-2011 (Tilastokeskus, Statistics Finland).

The amount of landfill repository had decreased in Häme and Kainuu provinces and South East Finland. The reason for this is the active three waste incineration plants (Riihimäki, Kotka and Turku) in 2009. The report does not take a stance on e.g. the logistic emissions or other factors when comparing recycling and incinerating. According to the NWMP, for Southern and Western Finland there are intentions to build many waste incinerating plants comparing to the amount of generated municipal solid waste. The actors behind these plans plan to handle not only municipal solid, but also industrial waste. In some parts of Finland, it is expected to be hard competition of waste. (Finland’s environmental administration 2012.) If this competition leads to burn of all possible waste, it is against the waste hierarchy, which says the waste should be recycled and reused before burning it. So even though the landfills are about to decline, the first option in Finland seems to be incineration and this leads to the production of new raw material. The ash the incineration
plants produce is hazardous waste so the in this case the problem will be postponed to the next level.

2.1.6 “Biotechnology 2020 – welfare for Finns” report

The Ministry of Trade and Industry in Finland has prepared a biotechnology strategy, which sets guidelines and strengthens Finnish innovation system. The strategy aims to view all branches of biotechnology and the possibilities Finland has to market new innovations, in both domestic and international markets. Biotechnology is perceived in medical and genetic applications, but there are much more than only those. The strategy considers biotechnology in wider scope and one of the major details are environmental applications. As the name of the strategy says, Finland is testing market for the innovations and increases welfare in the same. In 2000’s, in Finland the contribution in biotechnology has not redeemed expectations. There have not been established new companies as expected and the growth of companies has been modest. There is a lot of know-how in Finland but some sectors, such as cleantech, needs more contribution to grow. The vision of the strategy is that Finland will research and develop biotechnology to solve challenges not only in healthcare, but also in environmental issues (Biotechnology 2020 report, 3-9.) As the following figure shows, there are only a limited amount of cleantech or environmental business companies in Finland.

![Bioindustrial companies in Finland in 2007](source: Biotechnology 2020 report)

Biotechnology could be one solution in current global problems. More and more countries are decreasing the amount of landfills and try to find substitution for them. For example, the European Union landfill directive requires the member countries to decrease the composting waste in landfills by a national strategy. The amount of waste in 2016 should be 75 % less than it has been in 1994 (Biotechnology 2020 report, 25.)

This means huge markets for biotechnological innovations, and it is expectable that this trend spreads in other market areas as well. Finland has all possi-
Internationalization and Networking Opportunities for Finnish Cleantech Companies

The biotechnological innovations have huge markets and it is expected that this trend spreads in other market areas as well. Finland has all possibilities to enter EU markets among the first companies, as most probably German and Austrian companies are the leaders. In this sense such consult companies as Exigo Oy have a significant role by creating contacts and networks for Finnish companies.

2.1.7 Cleantech impact in Finnish employment

The “Biotechnology 2020 – welfare for Finns” report results get support from World Wide Fund for Nature (WWF) and Global Cleantech report “Coming Clean: The Global Cleantech Innovation Index 2012.” This report says Denmark provides the best circumstances for start-up companies to develop and export cleantech products and is followed by Israel, Sweden, Finland and The USA. The top 4 countries are forced to be innovative in cleantech as they have small domestic markets and need competitive advantage of new inventions. (panda.org.) Ms Mari Pantsar-Kallio, Strategic Director of Strategic Programme for the Cleantech Business, says that one goal for this program is to create 40 000 new jobs in of Finnish cleantech business until the year 2020. Another goal is to double the turnover of these companies until the year 2018, to the number of 40 billion euros. One method to achieve these numbers is to create domestic markets for cleantech companies to get references and then entering foreign markets with samples of the know-how. Another method for increasing the numbers is that public sector would prefer domestic cleantech instead of cheaper, but old and foreign technology. According to Pantsar-Kallio, Finnish cleantech has a good reputation globally and policy-makers are aware of it. One major problem with entering foreign markets is to find financing, or the lack of ways how to seek for financing options. (Finpro 2013, 6-8.)

2.2 Key concepts

This means huge markets for biotechnological innovations, and it is expected that this trend spreads in other market areas as well. Finland has all possibilities to enter EU markets among the first companies, as most probably German and Austrian companies are the leaders. In this sense such consult companies as Exigo Oy is, have a significant role by creating contacts and networks for Finnish companies.

When comparing waste management alternatives, environmental point-of-views have to be considered alongside of employmental, political or technological ones. Green values are a megatrend and environmental business is growing fast globally. The issue is that there is no one single correct answer, which would be the best way to handle the waste. Not only to get rid of the waste, but producing new raw material has also taken into consideration. The next chapters describe shortly the terms used in environmental issues.
• Precedence order (or waste hierarchy) is a concept, where in the first instance is the avoidance of waste generation, if this is not possible the material should be reused, on the third position is material recycling, the fourth option is the utilization as energy and if any of these are not possible, the waste should be dumped in landfills (ec.europa.eu.)

Figure 4. Waste precedence order (a.k.a. waste hierarchy).

• Cleantech (clean technology) includes all such products, services, processes or other systems, which harm the environment less than the alternative for it does. Clean technologies lessen environmental impacts directly or through a value chain. (Sitra 2007.)

• Innovation is a new idea, which is replicable, meets customer expectations and satisfies a need. After a process an idea can be generated for a product or service, and it is a risk for the developer, as there are no existing markets for the innovation. (businessdictionary.com 2013.)

• Currently humankind is consuming natural resources in intolerable way. One tool to measure the use of natural resources is ecological footprint. This tool calculates how many hectares land one person needs to satisfy his material usage. The ecological footprint takes into consideration several factors: the impacts of climate change, fish population collapse, agriculture and forestry or the expansion of cities. Western countries are on the top of this list, but there are also other regions, which use natural resources over the tolerance.
The following figure shows the most extravagant countries in the world in 2009.

Figure 5. Top 10 countries by Ecological Footprint

What makes this figure interesting for Exigo, is that from their major business markets there are two countries on the top ten list: United Arab Emirates and Kuwait.

- According to European Commission, *the sustainable development* “stands for meeting the needs of present generations without jeopardizing the ability of future generations to meet their own needs – in other words, a better quality of life for everyone, now and for generations to come”. (European Commission 2013.)

Sustainable development is a large unity, which can be divided in three: ecological, economical or social and cultural sustainability. Shortly, the leading idea is for each generation to consume so that the nature can adjust it, and next generations will get at least the same or even better opportunities to satisfy their needs. (Finland’s environmental administration.)

Ecological sustainability emphasizes to protect the diversification of ecosystems and not to consume natural resources intolerable. A major principal in ecological sustainability is the cautiousness principle: before an act the risks, damages and costs should be evaluated. Other important principles are to
avoid damages in advance, and to prevent damages in the generation point. (Finland’s environmental administration.)

Economical sustainability includes stable growth of economies, where an economy does not get into intolerable debts on a long run, or either overusing of natural resources. (Finland’s environmental administration.)

In social and cultural sustainability the highlights are on people: how to guarantee the requirements of welfare for the becoming generations. Globally growing population, poverty, lack of food and clean water and other details need to be considered without overusing the natural resources (Finland’s environmental administration.) The most effective tool against poverty and its’ side effects – human traffic, exploitation of fisheries, lack of infrastructure and hygiene and so on- is education and proper jobs. More jobs i.e. in industries mean increasing use of minerals, this leads to increasing and easily to excessive digging. Also the working circumstances in cheap labour countries are not adequate.

- Environmental Business: The Finnish Ympäristöyritysten Liitto (The Association of Environmental Enterprises, later on AEE) defines the environmental business as follows: it includes services, products or technologies, which measure, prevent or repair environment damages. (The Association of Environmental Enterprises.)

This is pretty narrow definition, because on a larger scale many companies work environment friendly even though they are not directly connected to environmental issues. There are logistic companies driving only electricity or bio fuel and those can be defined as environmental businesses, as they market green business with their own actions. In this thesis the definition “environmental business” includes all companies, which operate directly with environmental issues, such as recycling, consulting, waste management, reuse or repository of waste.

- Household waste: all the waste that households generate at home. For example, car tyres left to tyre company, are not household waste.

- Municipal solid waste (MSW) is wider concept than household waste. Besides household waste, it includes all the waste that administrational organs, industry or services bring.

- REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) act. The European parliament has set this act of chemical registrations, evaluation, procedures and restrictions. REACH takes place from 40 different earlier acts and is obligatory for all the member countries. REACH is a risk management tool with industrial chemicals, and this makes it vital important factor in plastic reusing.
Many actors in plastic reusing business are worried about if the plastic is compatible with REACH demands. (Finnish Safety and Chemicals Agency Tukes.)

- Life Cycle Assessment (LCA) is a standardized scientific tool. It is used to analyze the possible environmental impacts that a product, service or process has during its’ whole life cycle. The LCA analysis calculates e.g. energy, material input, and environmental releases. (The Plastics Portal.)

- Grate incinerator is a combustion chamber, and the waste is burning above the grate. The waste moves on a belt and it dries and burns on its way forward. (VTT 2005.)

Figure 6. Grate incinerator (winderickx.pl).

- Fluidised bed incinerator is another technology used in waste combustion. Below the combustion chamber there is airflow, which makes the ash and combusted material to float. The benefit of this technology is that it combusts also moist material. The material, anyhow, has to be crushed fine so it floats. (Koivunen 2007.)

Figure 7. Fluidised bed incinerator (gesui.metro.Tokyo.jp).
3 RESEARCH METHODS

The first research problem in this thesis is to study, do Finnish cleantech companies need assistance and networks when exporting their products or services. This problem is studied by e-mail questionnaire.

Second problem is, where are the most promising markets, where Finnish companies can export. The market areas are found from Finnish government cleantech program and by asking Finnish cleantech companies in the questionnaire, which markets do they find most interesting. The results were similar with governmental program. From each market area, there is an open e-mail interview from an area expert. Experts are persons or groups, which explain everyday observations regarding waste management.

Case studies in chapters 3.3.1. and 3.3.2 concern waste incineration and there are two alternative case studies: Tammervoima Oy and TammerPower. The purpose of the case study is to present globally current incineration system, which e.g. Tammervoima Oy is using, and a new innovation TammerPower system. The latter is a new innovation and requires references from domestic markets to boost its spreading globally. Case studies are implemented by interviewing represents from both processes.

3.1 Research methods and questions

The research method selection depends on the research problem nature and the purpose of the examination. There are two major orientations: quantitative or qualitative research method. Quantitative method includes classifications, causes and effects and numeral or statistical analyses (Jyväskylä university). The concept qualitative method includes a number of different research methods. Hirsjärvi, Remes & Sajavaara (1997, 155) define the qualitative research method as a tool, which favours people as information source, the target group of interviewees is chosen by purpose, the study plan might change while the survey proceeds and the aim of the researcher is to find new, unexpected factors – not to test theories or hypotheses.

This study answers for three major questions:

1. Where are the most potential markets for waste management;
2. What kind of assistance Finnish companies need with exporting;
3. Is there need for networking with other companies from the same business branch?
The selected research method to clarify these answers is qualitative, and implemented with an inquiry. The inquiry was sent to selected companies by e-mail.

Waste management solutions are never unambiguous; each alternative has strengths and weaknesses. Because these differences cannot be explained with statistics, there are open interviews from several operators in the business. They represent different branches or governmental aspects and have equal possibility to answer criticism against their solutions.

Case studies are implemented by interviewing representatives of both systems by an open interview.

Potential target markets are examined with David A. Aaker’s five-stage method, and are so called sub-studies. They cover market size and growth, distribution channels, major market trends and key success factors. Besides this quantitative method, the market analyses are fulfilled with open interviews from experts from each area. The purpose of this qualitative method is to observe weak signals, which quantitative theory does not notice.

3.2 Questionnaire research results

In total, 12 companies out of 20 replied to the questionnaire. All the companies answered anonymously. Questions and answers for them are listed below. In parentheses, there is mentioned how many companies stand behind the question.

Purpose of these questions is to examine, what kind of services might Finnish companies require, if they ask a consult company (such as Exigo Oy) to assist them with entering foreign markets.

1. Indicate the company industry

- Machinery and process technology (1)
- Waste Management (2)
- Environment (2)
- Waste logistics (2)
- Recycling (3)
- Import & retail (1)
- Subcontractor in recycling equipment assembling (1)

Companies from most cleantech branches have answered the inquiry. This gives comprehensive picture, that the services the companies need is not depending in the branch.
2. Name the key products / services, which the company considers to export.

- Waste-to-energy material handling machinery and concepts. Biomass-to-energy material handling machinery and concepts. Services to previous. (1)
- One Collect – waste container collection optimisation system. (1)
- Energy saving solutions (1).
- Material reuse solutions. (2).
- Renewable energy or subcontractor. (2)
- Smelt-off-systems. (1)
- Automatic solid waste conveying systems AWCS. (1)
- Plastic, rubber, alternative fuels. (1)
- Process machines for waste management plants. (1)
- Wastewater treatment solutions. (1)

3. Was the company established due to new (innovative) product / service, OR did the company previously manufacture product / service which it intends to export now?

- Old products / services (7)
- New innovation (4)
- The machines we represent in Finland we could also deliver to a foreign plant, if the plant was delivered by a Finnish company. (1)

Both, new innovations and old products / services need some kind of assistance when entering new market area.

4. What is the competitive advantage / special feature of the product / service the company wants to export? What differs it from competitors?

- High efficiency technology. (1)
- A complete solution for waste collection logistics optimisation. (1)
- Technology advantage and strong unique IPR. (1)
- Knowledge, experience, practiced personnel. (3)
- Energy savings. Savings in CAPEX and OPEX. (1)
- Sourcing from customers in both ends of cycle. (1)
- We represent European products and we are very familiar with them. Many of those machines are something that is not manufactured in Finland. That’s why we could be a good supplier of single machines in Finnish waste treatment project abroad. (1)
5. Do you think your product / service has adequate legal protection (patent, trademark…) for international markets? If not, how to enhance it?

- Legal protection is strong. (2)
- Product is patented. (6)
- Some enhancement is needed. (1)
- We have a quite strong IPR portfolio already, but we intend to improve it. (1)
- If we enter foreign markets, assistance with patents is needed. (1)

Consultancy with legal issues is often required when entering foreign markets.

6. Does the company already export this particular product / service abroad? If yes, what is the market area?

- Europe, South America, China, Russia, South East Asia. (1)
- European Union countries. (6)
- Sweden.
- North West Russia. (1)

7. What is the major purpose of expanding the business abroad?

- Company development. (2)
- Increasing market share. (1)
- Increasing sales. (5)
- Establishing a new subsidiary. (1)

8. What kind of assisting would help when planning export operation?

- Real market knowledge and contacts. (1)
- When entering new markets, we usually use consultants to find us good local partnerships in each target market. (1)
- Contacts. (3)
- Help to avoid corruption. (1)
- Cooperation. (1)
- None. (1)
- Permits, notifications, transports. (1)
- For export we need some kind of consortium. (1)
9. Does the company prefer to enter foreign markets alone or with an export network?
   - Network. (6)
   - Alone. (6)

Finnish companies often seem to need a network when entering foreign markets. This makes a business opportunity for Exigo Oy.

10. Could the company consider asking assistance from a consulting company, when entering new market area?
   - Yes. (8)
   - No. (4)

11. What does the company consider as its´ biggest strengths / weaknesses when exporting? What tools does the company require to tackle the weaknesses?
   - Strengths:
     - Technological skills. References. (1)
     - The machines we represent are competitive, we know them and their service well. Our relationships with our suppliers are good and long.
   - Weaknesses: not enough human resources that have adequate experience in our market. (1)
   - We are so small company, that it is not easy to go alone. (1)
   - Small size. (1)
   - Lack of contacts. (1)
   - No experience of export. (1)
   - The only challenge is to find the local partner. This is required in any new market place. (1)
   - Nowadays you can take material out different rules if you are not a waste dealer. If you are a waste dealer, you are treated with all bans and laws. (1)
   - We are dealer in Finland, not in other countries. So the exportation is mainly limited to machines participating in some Finnish projects. (1)

As the question 10 points out, there is a need for consultancy within Finnish companies. Exigo Oy has a possibility to make companies familiar with each other, and also to lead them to foreign markets. This kind of project might take years but lead to growing cleantech export.
12. Other comments.

- Money for contacts. (1)

13. Which markets areas interest the company in the future?

- China. (3)
- Other Asian countries than China. (3)
- North America and Canada. (1)
- Russia. (2)
- South America. (1)
- Europe (not German speaking countries.) (1)
- Nordic countries, then Asia when more experience. (1)

As the inquiry shows, the need for consultancy and networking with other companies is remarkable. Finland has a lot know-how and innovations, but the companies should enter foreign markets under specialist guidance.

3.3 Waste incineration

In the NWMP, one goal to reduce harmful impacts for the climate is to incinerate the waste, which is not recyclable anymore. This can be achieved by estimating the need for incineration capacity as a part of regional waste management plan. In incineration plants the responsible connection authorities are local Finland’s Environmental Administration Center, councils of regions, energy producers (such as electricity companies) and municipal or private waste management companies. The authorities are responsible e.g. of simplifying waste management license or appeal processes and ensuring the utility function of waste incineration. (Finland’s environmental administration 2008.)

Benviroc Oy is a Finnish consulting firm in energy and environment issues business. It has made a survey for waste management company Ekokem Oy regarding the carbon footprint of solid municipal waste handling. The finding of this survey is that landfills have the biggest carbon footprint, and this is due to the rotting waste and methane it causes. The waste incineration in Ekokem Riihimäki plant lessened the carbon emission 33 kg / combusted 1000 kg of waste. This number takes heat production affects into consideration. (Benviroc Oy 5.11.2010.)
In Riihimäki town, the Ekokem waste incineration plant produces district heat for Riihimäki and Hyvinkää regions. The local waste management company Kiertokapula Oy collects waste for Ekokem use and in 2009 there was produced district heat 126 GWh and electricity 9 GWh. In 2013 these numbers are estimated 143 GWh for district heat and 33 GWh for electricity. (Benviroc Oy 5.11.2010.)

According to Pöyry Management Consulting Group, a Finnish infrastructure-consulting corporation, in Finland in 2012 there were three active waste-to-energy plants and 24 co-incineration plants, which combust waste along with other fuels. Five more were under construction and three units were under planning process. (Pöyry Management Consulting Oy.) In Sweden, the incineration plants are forced to export solid municipal waste from Norway to keep the plants running. Finland has a small population and with his amount of incinerators there are concerns whether they are also forced to bring waste from e.g. Russia or Baltic countries. If so, there are questions of who is responsible of the waste contents, is it worth it to transport the waste for long distances and what is the carbon footprint of the waste cargo. For Finnish companies, the business opportunities in incineration business is more in infrastructure
planning than in equipment business. Another question is, how to innovate the ash usage.

3.3.1 Case: Tammervoima Oy

Tammervoima Oy is a non-profitable incineration plant in Tampere. It is a joint venture company owned by Pirkkanmaan Jätehuolto Oy (49%) with a local electricity producing company, Tampereen Sähkölaitos (51%). Pirkkanmaan Jätehuolto Oy is a non-profit organisation with function of produce services and does not pay dividends for its’ owners. It is not an authority and cannot impact in waste producing, but it helps the society to get rid of waste in appropriate way. Tammervoima Oy has two functions: to manage municipal solid waste in Pirkkanmaa region and to produce energy and electricity. The incineration of waste will diversify the energy sources and also decrease the amount of landfill waste. The construction of Tammervoima plant is planned to complete in 2015. (Tammervoima 2013.)

At present, Pirkkanmaan Jätehuolto Oy already runs a waste management unit Ressu, which handles wood-based, as well as industrial energy waste. Ressu produces supplementary fuel for energy plants. According to Mr. Simo Isoaho, Research & Development Manager in Pirkkanmaan Jätehuolto Oy, emissions and the combust suitability of Tammervoima Oy plant are comparable with Ressu. Benefits with incineration plant are reduction of seagulls or rats, implementation of waste precedence order, keeping the environment healthier, the costs of waste management decrease and commodities (energy etc.) production. (Isoaho 2013.)

According to the new waste management legislation, in 2016 at least 50 % of municipal solid waste should be recycled. The waste that is not usable for recycling purpose should be incinerated. Only a small amount of waste will end up in landfills (www.ymparisto.fi). Currently in Finland there are three power plants using waste as energy source (Riihimäki, Turku and Kotka). There are also several power plants using waste as parallel energy source, but using also other material. In Tampere, Pirkkanmaan Jätehuolto Oy is responsible to collect the waste, collaborative company Tammervoima Oy produces the energy and Tampereen Sähkölaitos will sell the energy for consumers. The target in annual waste processing amount is 150 000 tons of waste. There are estimations, that one plastic bag of trash is a source of energy to warm up water for 7 minutes shower, or an oven for one hour. (Tammervoima 2013.)

The whole Tammervoima Oy project is planned to contain also a separated bio waste plant, which produces methane. This bio waste plant is important to ensure that the incineration plant has only mixed waste to combust, not moist components. Before these plants can be built, there legislation requires an evaluation of environmental impacts (YVA). In this YVA evaluation, there are researched all the significant impacts for environment, how to prevent
those impacts and to ensure that citizens have possibilities to be heard. These units - incinerator or bio waste plant – are independent, so even if another does not pass the evaluation, another is still functional (Tammervoima 2011, 7).

The transportation impacts in Tammervoima Oy plant consist of waste and transport of required chemicals, and removal of ashes or smoke cleaning products. Impacts in the air are results of flue gas emissions, but it has been calculated that these emissions are below the normative index. Waste incineration plant does not have impacts in the water. All the waste is received in an indoor hall, where negative air-pressure absorbs the air to the grate incinerator. The waste incineration impacts in the climate are born when the combusting lessens greenhouse emissions. This happens by replacing fossil fuels with waste. It is estimated that incineration plant produces 35 000 – 55 000 tons of greenhouse gas annually while a landfill produces 75 000 – 115 000 tons of it. Emissions caused by the waste transportation do not increase from current level as the trucks drive approximately the same distances than at present. (Tammervoima Oy YVA evaluation, 7-8).

Figure 9. Tammervoima incineration plant is located in Tarastenjärvi landfill area in Tampere (illustration.)

There has been criticism towards incineration plants, and in Finland World Wildlife Fund (WWF) is one of the leading directions that arise discussion regarding benefits of incineration. The Finnish WWF questions the following details:

- Material effectiveness and reusing suffer if the waste is burned, not reused
- There is no objective information for consumers enough
There are no research results of emissions, which leads to uncertainty factors regarding environmental aspects.

Lack of unambiguous statement regarding what kinds of waste Tammervoima Oy will incinerate. It has been told that Tammervoima Oy will incinerate medical products, slaughter waste or other environmentally injurious waste. These might cause health problems. There should be strict limits for the waste types that are destroyed in Tammervoima plant.

Ms. Minna Santaoja, represent of the WWF Finland in Tampere, emphasizes that WWF is not against incinerating if there are clear and neutral statements concerning waste incinerating. (Santaoja, interview 21.1.2013.)

Mr. Simo Isoaho answers to critics by emphasizing that Tammervoima Oy is not an incineration plant for slaughter waste but only for damaged food-processed animal waste, which comes from trade. Tammervoima Oy receives only so called ethical waste (pre-treated medical products from hospitals), not components with the risk of contagion. According to Isoaho, Tammervoima Oy offers simple and cheap final treatment solution for many waste types, which could cause environmental harm in landfills. (Isoaho, 2013.)

3.3.2 Case: TammerPower Oy

Known with working title “TammerPower”, this chapter studies new innovative Finnish concept in waste management solutions. This concept is a pilot project of four co-operators: BMH Technology, Metso, St1 Biofuels and German company Convaero. The concept of four co-operators is based on the following idea: recyclable waste is separated and used again as raw material.

Together with BMH Technology, Convaero in TammerPower produces Solid Recovered Fuel (SRF) and bio-dries organic waste, which is separated from Municipal Solid Waste (MSW). Organic waste goes to St Biofuels. It is interested in availing TammerPower facilities; it found possibilities to produce bio-ethanol from organic materials, which are separated from other waste particles. Metso manufactures gasification plants. The plant produces electricity and heat of SRF fuel.

TammerPower differs from traditional incinerators in sense that when traditional incineration plant burns waste and produces electricity for conurbations, TammerPower enables recycling of all valuable materials, like metals simultaneously with high efficiency energy production.

TammerPower concept was developed between these four companies, because they all had previous references of similar projects. Cleantech business in Finland is smallish, and these companies considered it useful to merge their know-how. Increasing price of electricity is a future megatrend, which fol-
lows the increasing price of oil and electricity consumption. This concept is one solution to this problem.

When comparing traditional incineration plant and TammerPower concept, the latter has following operational advantages:

- Capacity to generate electricity is higher than in incinerator system;
- Operational life-time is over 30 years. During this period, Tammer-Power can generate much more electricity with higher efficiency than incinerator;
- Lower risks than incinerators have; this is due to TammerPower capability to burn other fuel than just waste (e.g. forest based biomasses);
- Environmental issues. TammerPower reaches higher combustion temperature than an incinerator, and so the emissions are easier to control;
- Lifetime maintenance and operational costs are lower;
- Cash flow rate is much higher.

When compared to traditional incinerator, TammerPower is claimed to have the following competitive advantages:

- There is no need for waste source separation before processing. This is an advantage in countries with no culture of sorting waste materials;
- There does not exist corresponding concept. TammerPower is a Finnish innovation;
- Combines waste disposal and high efficiency electricity generation.

TammerPower concept offers great export opportunities for other Finnish waste management companies as well. This size plant employs not only in construction phase, but also maintenance, supplementary technology, professional services and other additional functions offer work. When discussing about sub contractors, Finnish companies have a benefit: Finland is a reference as a society with high-level waste management system. Supplying of one plant employs with at least 800 man-years.

TammerPower concept is valuable also in national economy point-of-view. Depending on its’ capacity, value of one plant is app. 300 million €. It is estimated that 150 – 180 million € of this will remain in Finland. TammerPower concept could lead in creation of whole new industry: utilization of waste as raw material and energy source.

The biggest possible market areas for TammerPower concept are in Brazil, China and Russia. Yet, United Kingdom is probably the first export market area as there has been a lot interest towards this system. Sweden is also one possible market area, as there does exist similar system, Mälar Energi.

The biggest obstacles to export this system at present are lack of references, as Tampere city decided to choose Tammervoima plant for its waste management. Another obstacle is lack of financing for long-term infrastructure construction. Policy-makers’ lack of knowledge regarding TammerPower
concept goes hand-in-hand with the financing barrier. When there is no reference, export opportunities are difficult to find. Domestic markets should offer first opportunities for this concept to prove the efficiency. (Hannu Lepomäki, Vice President of Technology in BMH Technology Oy, open interview 1.11.2013).
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4 INTERNATIONALIZATION ASPECTS

The commissioner of the study, Exigo Oy, has previous experience in consulting abroad, but when entering new markets or business areas, it wants to find more potential partners with whom to offer service or product entireties from planning to implementation, in foreign markets. Based on decreasing amount of landfills and increasing need for alternative waste management solutions the research questions can be divided into three parts as detailed below:

1. What innovations do Finnish companies have or they develop currently that postpone the end-of-waste treatment?
   - Which materials or products do not have too much competition abroad yet?
   - Which new materials are adequate to launch abroad and easy for foreign cultures to adapt?
   - Which used materials are adequate to launch abroad and easy for foreign cultures to adapt?
   - Which technology is adequate to export abroad?
   - Are waste sorting, recycling and reusing methods possible to adapt abroad (e.g. plastic collecting pilot results)?
   - Can Finland export incineration plant technology abroad?
   - Can Finland export infrastructure planning abroad?

2. What are the best possible market areas for Finnish companies in environmental business currently?
   - Where are the biggest markets, where Finnish companies should entry?
   - What are the best possible market entry strategies?

3. Do companies require domestic networks to achieve competitive advantages or to offer more wide product / service variety?

4.1 Export methods

The following section discusses different existing market entry strategies. The four most common – indirect, direct and straight export or joint venture – are dealt in the first chapter and the more rear ones – project export, licensing, franchising and contract manufacturing – are in the second chapter.
When entering foreign markets, a company have to consider a few factors, such as:

- What makes our product or service unique enough to export it?
- How to evaluate the market area we should enter to?
- How to enter there; e.g. alone, in a joint venture, or by franchising?
- How to minimize the risks when operating abroad?

This section clarifies the outlines of each method.

4.1.1 Indirect, direct and straight export

This section opens up the concepts indirect, direct and straight export and joint venture. Indirect export happens when the manufacturer is using a domestic intermediary. In this case, the manufacturer does not necessarily even know who are the end users of the product, in which market the product is for sale and the impact in marketing is almost nonexistent. Indirect export is the best method for bulk or standard products. (Karhu 2002, 79). Small companies take the advantage of this method as they minimize the costs and risks. When using the indirect export method, a company can use its’ resources in the core business.

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Lack of export formalities</td>
<td>-No touch with end users and markets</td>
</tr>
<tr>
<td>-Communication with own language</td>
<td>-Dependant on intermediary</td>
</tr>
<tr>
<td>-Trading is easy</td>
<td>-Experience of exporting does not improve</td>
</tr>
<tr>
<td>-Small costs</td>
<td>-Limited connection and feedback with end users</td>
</tr>
<tr>
<td>-Small risks</td>
<td>-After using intermediate, no contact with end users</td>
</tr>
<tr>
<td>-Intermediary has resources and experience</td>
<td>-Difficult to follow market situation</td>
</tr>
<tr>
<td>-Short payback term</td>
<td>-Difficult to increase sales with own actions</td>
</tr>
<tr>
<td>-Possibility to reach big markets</td>
<td>-Intermediate is an extra cost</td>
</tr>
</tbody>
</table>

Table 1 Advantages and disadvantages of indirect export. (Source Karhu 2002, 82.)

Direct export means that a manufacturer operates exporting via foreign intermediary. Often the intermediary is retailer or an agent. The difference between these two intermediaries is that the retailer re-sells the product with its’ own conditions but an agent represents the manufacturer and obeys manufacturer conditions and prices. In between the manufacturer and end user there might be several intermediaries. (Karhu 2002, 88.) This export method is suitable for e.g. grocery products, which in environmental product business could mean biodegradable waste bags.
<table>
<thead>
<tr>
<th><strong>ADVANTAGES</strong></th>
<th><strong>DISADVANTAGES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-Short delivery channel -&gt; lower costs</td>
<td>-End user might remain unknown</td>
</tr>
<tr>
<td>-Easy to control the pricing</td>
<td>-Market information is screened through the intermediate</td>
</tr>
<tr>
<td>-Easy to follow the target market behaviour</td>
<td>-Need for language skills and export know-how</td>
</tr>
<tr>
<td>-Effective access to information -&gt; Good basis for future strategies</td>
<td>-Need for financial resources</td>
</tr>
<tr>
<td>-Practical export lesson for company personnel</td>
<td>-Need for market with own trademark -&gt; otherwise the brand is unknown for end users after cooperation with intermediate</td>
</tr>
</tbody>
</table>

Table 2  Advantages and disadvantages of direct export. (Source Karhu 2002, 90.)

Straight export is a method where the manufacturer delivers product straight to the end-customer with no intermediaries. The personnel of the manufacturer take care of sales and marketing. This is suitable export method when the product is extremely expensive or massive, such as machinery or other technical equipment. In this case the representative of the manufacturer knows the product and its features in details. (Karhu 2002, 110.)

<table>
<thead>
<tr>
<th><strong>ADVANTAGES</strong></th>
<th><strong>DISADVANTAGES</strong></th>
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<tbody>
<tr>
<td>-Easy to control the whole export chain</td>
<td>-High marketing costs</td>
</tr>
<tr>
<td>-Flexible marketing and services</td>
<td>-Lack of local market experts</td>
</tr>
<tr>
<td>-Easy to follow the market development</td>
<td>-High salary and travel costs of sales personnel</td>
</tr>
<tr>
<td>-Direct contact with existing and potential customers</td>
<td></td>
</tr>
<tr>
<td>-Experience of new market areas</td>
<td></td>
</tr>
<tr>
<td>-No intermediate costs</td>
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</tbody>
</table>

Table 3  Advantages and disadvantages of straight export. (Source Karhu 2002, 113.)

Joint venture is defined as cooperation in between at least two organisations. At least one of the parties is located in different country than other ones, so a group of Finnish companies cannot establish a joint venture. Instead, they can cooperate with a company from the target market and take the advantage of the local market knowledge. Joint ventures have several sub definitions, but this chapter regards joint venture in general level.

According to Karhu (2002, 245 - 249) there are several reasons to establish a joint venture. These reasons include such factors as e.g. lack of own resources, difficult legislation or customer company requirements. To make a joint venture successful, it is relevant to find suitable business partner. All parties recognize their common interests and what strengths each one can bring to the cooperation.
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<table>
<thead>
<tr>
<th><strong>ADVANTAGES</strong></th>
<th><strong>DISADVANTAGES</strong></th>
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</thead>
<tbody>
<tr>
<td>- More experts to share their know-how</td>
<td>- Discussion of responsibilities and decision-making</td>
</tr>
<tr>
<td>- Business partner’s knowledge in use</td>
<td>- How to divide the share capital (50 / 50 % might cause problems if need to vote)</td>
</tr>
<tr>
<td>- No need to tie all own resources</td>
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</tbody>
</table>

Table 4  Advantages and disadvantages of joint ventures. (Source Karhu 2002, 247.)

4.1.2 Project export, licensing, franchising and contract manufacturing

The definition for an export project is that it is a one-time venture. To implement the export project abroad there has been established an organisation, which has all the required resources to run the venture. In this organisation there are involved one or several participants. Typical characteristics for an export project are that it is unique (not standard) subject, and it is common export method in construction or production industries. (Karhu 2002, 139 – 140.) In cleantech business the best business opportunities for Finns in exporting projects could be e.g. when building new incineration or especially biomass plants abroad. France and Germany are the market leaders in incineration constructing, but Finnish companies are extremely active to promote biomass plants. For example, cleantech companies Metso, BMH Technology and St1 Biofuels are planning a pilot project TammerPower, which is a bio gasification plant (Uusiouutiset.fi). These kinds of plants are a good example of export projects.

<table>
<thead>
<tr>
<th><strong>ADVANTAGES</strong></th>
<th><strong>DISADVANTAGES</strong></th>
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</thead>
<tbody>
<tr>
<td>- Usually massive targets</td>
<td>- Sensitive to currency fluctuations</td>
</tr>
<tr>
<td>- Big profits</td>
<td>- Long-term exporter responsibility</td>
</tr>
<tr>
<td>- Long-term use for resources (labour, machinery etc.)</td>
<td>- Need for active search of future projects</td>
</tr>
</tbody>
</table>

Table 5  Advantages and disadvantages of project exports. (Source Karhu 2002, 152.)

Licensing stands for a procedure, where a manufacturer owns a proprietorship for a product or trademark. The proprietor rents the right for a foreign manufacturer to produce and market the product and this latter pays royalties for the proprietor. Licensing is not the best way to enter foreign market, as there is a risk of misuse of confidential information. (Karhu 2002, 172 – 180.)
Internationalization and Networking Opportunities for Finnish Cleantech Companies

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Rapid enter to market</td>
<td>-Risk of confidential information misuse</td>
</tr>
<tr>
<td>-Small start-up costs</td>
<td>-No flexibility if need for change manufacturing</td>
</tr>
<tr>
<td>process</td>
<td></td>
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<tr>
<td>-Feedback from markets</td>
<td>-Often low long-term profit</td>
</tr>
</tbody>
</table>

Table 6   Advantages and disadvantages of licensing. (Source Karhu 2002, 188.)

Contract manufacturing happens, when a proprietor owns trademark or has develop a product, and buys manufacturing or assembling services from a foreign producer for it. The difference for licensing is that in contract manufacturing the proprietor alone is responsible for marketing actions. This is a usual strategy when domestic production costs grow too high. When there is a small need for capital or human resources, this strategy is good for small or new companies. (Karhu 2002, 212-214.)

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
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</thead>
<tbody>
<tr>
<td>-Low need for capital</td>
<td>-Risk of manufacturer unethical behavior</td>
</tr>
<tr>
<td>-Flexible, if need for changes</td>
<td>-Need for control in local level</td>
</tr>
<tr>
<td>-Improves competitiveness in international markets</td>
<td>-Risk of industrial espionage</td>
</tr>
<tr>
<td>-Quick reacting for changes in demand</td>
<td>-Dependant on manufacturer deliverability</td>
</tr>
<tr>
<td></td>
<td>-Risk of currency fluctuation</td>
</tr>
</tbody>
</table>

Table 7   Advantages and disadvantages of contract manufacturing. (Source Karhu 2002, 216.)

Franchising is a business mode, where company assigns its brand or product for a business partner (franchisee), often for a limited time. Franchisee pays compensation for the user right, but is not allowed to make its own modifications in marketing, logo or other details. Franchising is often called “system leasing” because products / services, and external signs are identical amongst each franchisee. For the brand owner (franchisor), franchising is a separated business branch from its original business idea; the system demands support for the new entrepreneur. Support includes e.g. personnel training, organising identical marketing, accounting and quality processes and so on. Franchising and licensing have several notable differences: in licensing, there is no business supporting acts for the business partner. Franchising is most often concentrated on service production and marketing, when licensing is used in manufacturing. (Karhu 2002, 192 – 199.)

Franchising is more useful export method for a single company than for an export network. The networks are born in the target country and local subsidiaries’ origin can be in Finland, but in the end they operate for the franchisee in the target country.
<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Cheap entry to foreign markets</td>
<td>-The brand has to be well-known</td>
</tr>
<tr>
<td>-Ties capital only a little</td>
<td>-Business partner risks</td>
</tr>
<tr>
<td>-Local market knowledge from franchisee</td>
<td>-Difficult to control and supervise from a distance</td>
</tr>
<tr>
<td>-Low risk for franchisor</td>
<td>-Franchisor needs to have special franchising knowledge</td>
</tr>
<tr>
<td></td>
<td>-Brand is vulnerable due to dependence on franchisee’s acts</td>
</tr>
</tbody>
</table>

Table 8. Advantages and disadvantages of franchising. (Source Karhu 2002, 202.)

If a Finnish company does not know, which would be best strategy to enter foreign markets there are several experts to ask assistance from. Finpro, the Finnish association for foreign trade, offers export consultant services. Another national association is Cleantech Finland, which is specialised in environmental business and cleantech export services. Exigo Oy offers these services as well and has contact networks with experience. As a small private company it can familiarize itself with one single customer’s needs very deeply.

4.2 Market-specific export method selection

Based on Karhu (2002, 27-28), the first factor when choosing export method is demand. If the forecast shows that demand is about to stay on low level, it is not expedient to invest abroad. Exporting from country of origin is wiser. If it seems that markets will grow, or an unit abroad could create new markets, investing in manufacturing unit is considerable. Also, foreign unit enables the company to collect information from markets. The more information, the easier it is to make decisions concerning future.

Big population is not the only thing that ensures demand. Purchasing power is a requirement for demand, and e.g. India is attracting target market at present because of growing middle class with more money to use. One thing that impacts in demand is attitudes or image towards the product. Globally there’s a vogue for green values and recycling is perceived as a good thing to do.

Another market-specific export method is competition. Competitive situation is based on the amount of competitors and their competition methods. In the target market there must be demand for export products / services, because profit must cover bigger costs than in domestic markets. One option to de-
crease costs is to establish a manufacturing unit or subsidiary in the foreign market. (Karhu 2002, 28–29.)

If a network of companies decides to establish a joint manufacturing unit, the partners have to complement each other and offer different components to collaboration. Often this is difficult for small companies, as they cannot afford to operate both in domestic and foreign markets.

Third notable aspect is societal factors. Taxation and financial environment are remarkable when choosing export method. If target country offers tax relief for foreign investors, or it has stable currency, it attracts companies. Infrastructure is one major factor; if man-made environment is on a weak level or natural environment sets challenges (e.g. earthquakes) it is easier to export from domestic country. Other societal factors are e.g. political and juridical systems. (Karhu 2002, 30–31.) A country with old technology often does not attract foreign investors with new high-tech, because there are no skilled human resources to use the new technology. On the other hand, such country can attract investors to update its equipment in up-to-date level at a stroke. This is probable e.g. in Balkan area, where EU projects and also private sector try to respond in growing waste management demands.

The more the target market differs from domestic market, the harder it is to establish local unit in there. Also, there is bigger need for local knowledge. At the end of each market analysis, there is a recommendation of 2–3 export methods.

4.3 Competition strategies in international markets

According to Kurkilahti & Äijö (2007, 135), the most important activity level for a company is business level, where the company meets customers and competitors. Two other levels—corporation and function levels—play a minor role, even though they are important as well. The business level is called competition strategy, and the first crucial task for the company management is to clarify, what is the real business level in the company. The business level means one clear business definition, which can be either a product line, a single unit in a corporation, or other one detailed business part. This means, one company cannot export successfully all their products in foreign markets with one competition strategy. After a thorough competition strategy statement, the company can continue to prepare their SWOT analysis. The figure below shows one possible way to elaborate the competition strategy step by step.
Table 9. Strategy process step by step (Source Kurkilahti & Aijö 2007, 136)

<table>
<thead>
<tr>
<th>1. Required information for the basis of the strategy</th>
<th>2. Conclusions of the basic information</th>
<th>3. Strategy compilation</th>
<th>4. Operative planning and implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal and external information and analysis</td>
<td>Overview and strategic summary</td>
<td>The selection and development of the strategy</td>
<td>Functional strategies</td>
</tr>
<tr>
<td>- Trend analysis</td>
<td>- SWOT analysis</td>
<td>- Vision</td>
<td>- Budget, resources</td>
</tr>
<tr>
<td>- Marketing and customer analysis</td>
<td>- Strategic challenges</td>
<td>- Mission</td>
<td>- Annual plans</td>
</tr>
<tr>
<td>- Competitor analysis</td>
<td>- Strategic alternatives</td>
<td>- Objectives</td>
<td>- Strategy management, company culture, communication</td>
</tr>
<tr>
<td>- Company analysis</td>
<td></td>
<td>- Values</td>
<td></td>
</tr>
<tr>
<td>- Other required analyses</td>
<td></td>
<td>- Definition of the strategy (= unique position): business concept, principles and strategic measures</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Organization structure</td>
</tr>
</tbody>
</table>

In the step 1, the required information includes such details as trust worth, preferably own, experience of the competition environment, trends, market progress, customers and what is the relationship between own company and these factors (Kurkilahti et al., 2007, 137). This thesis surveys Finnish cleantech innovations, and in this point it is notable to see the future trends in environmental business and to forget the already existing, saturated markets. For example, waste bags made of paper are not a good option to export as there are many competitors offering this product. Other biodegradable waste bags, like Bioska products, are innovative and new product in many market areas. Still the exporting company has to study if there is further use for the product – there is no need for biodegradable bag if it still ends up in a landfill.

Other critical questions in step 1 are e.g. company resources and competences in comparison with competitors; technology, energy or raw material trends; social and cultural trends; growth and demand expectation in target market; who and where are most potential customers; structure and development of competition; most important competitors and reasons for their success; pricing or customer behaviour analyses. (Kurkilahti et al., 2007, 138-140.)

Step 2 discusses SWOT analysis, which should always consider the strengths, weaknesses and other factors compared with something. It is not enough to list good things in a company but must analyse the things where the company has a competitive advantage and is better than competitors. The same idea concerns each quarter of the SWOT analysis. Strategic challenges include all the details that company needs to success in new market, but are difficult to implement. (Kurkilahti et al., 2007, 141.) Such details are e.g. creating brand knowledge, especially if the company has limited resources to do this. The brand should be extremely well considered to separate from others and it should stay easily in customers’ minds.
Step 3 is strategy compilation (=unique position), which means the way in which the company aims to achieve the targets. Description for the unique position is defined with the following questions:

- Business concept. What is the target market and what does the company offer there?
- The foundation of success. Where the company is better than competitors? How is it going to success in the chosen market?
- Strategic principles and measures. How to act to success in the chosen market? What measures does it take?

Kurkilahti & Äijö (2007, 144)

When a company has described the position and competitive advantages in the target market, it should once more take a look that there are no too similar products in the markets. Local knowledge is a big benefit in this, especially with small consumer products. In business-to-business cases the products are often big (e.g. machinery) and the companies are more aware of the situation in markets, while they often have to give an offer and quotation for the customer. Business-to-customer products are more often grocery items and they might be more difficult to observe from a foreign country, with no local contacts.

The 4th step is to implement the operative strategy. In practice this means that a company has to choose and define the precise market it will enter. If the company tries to take over many segments with the same strategy, pricing and advertising, it cannot succeed. It also has to know the reason why it is better than the competitors – none of customers will purchase a product, if it doesn’t know exactly what is the benefit for it. According to Kurkilahti et al. (2007, 171) the company needs strategic flexibility, which in practice means that it needs a plan B in case of low sales numbers. Especially in business-to-business cases the export company has to be an expert in customer’s business and know exactly, what are customer needs and how to satisfy them. That is the factor why customer chooses the cooperation partner.

### 4.4 Market analyses of the most potential target markets

This section analyses the most potential market areas for Finnish cleantech operators. The analyses are based on David A. Aaker’s Market Analysis, which researches the following dimensions:

1. Based on David A. Aaker’s market analysis, the market size includes present or potential sales estimations. These numbers can be found from government data, trade associations or major operator financial reports.
2. Market growth forecasts the potential customer number in chosen market area. The best ways to forecast this number is to study demographic data or sales growth of comparable products.
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3. Distribution channel answers the question, how directly the product/service can be delivered to the customer. In business-to-business field it regards more infrastructure issues than delivery.

4. Market trends are industry-dependent, but there also varying details, such as demand for product variety. Regional trends are more than likely and impact in many trends.

5. Key success factors may change over time and market area, but one important is technological improvement. Also access to unique resources – such as labour, political stability and legal issues – is a key factor. (slideshare.net.)

To make the analyses more comprehensive and to find possible weak signals of future trends, they are complemented with comments of each area experts.

<table>
<thead>
<tr>
<th>Market size</th>
<th>Market growth</th>
<th>Distribution channels</th>
<th>Major market trends</th>
<th>Key success factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number of potential customers</td>
<td>• Demography factors</td>
<td>• Infrastructure, logistics • How the product reaches customers?</td>
<td>• Identify the threats and opportunities in the market</td>
<td>• Unique resources • Technological improvement</td>
</tr>
</tbody>
</table>

Table 10. Market potential analysis. (Source: David A. Aaker, slideshare.net.)

The most potential target markets for Finnish cleantech exporting are covered by The Ministry of Employment And The Economy, which has created “Strategic Program for the Cleantech Business.” In this program the most potential markets are described by their commercial growth visions, and they are China, India, Brazil, Russia and Africa. (tem.fi.) Africa continent is divided in two parts, as the North Africa conditions differ from the Sub-Saharan region. The Gulf Council Countries in the Middle East and the European Union are not mentioned in the government program, but the first is one of the richest markets in the world and the latter is the nearest foreign market for Finnish companies, and for this reason they are researched in this thesis.

4.4.1 Market analysis of Europe

*Market size.* Europe is heterogeneous market area as there are extremely developed economies (e.g. Germany or Austria), which are leading countries in environmental business themselves. On the other side there are emerging economies, like former Yugoslavian countries, which have need to improve their infrastructures. In Europe there are lots of companies that offer waste
management solutions and have domestic field advantage, so Finnish companies should enter small but developing markets and find a niche in there. As The European Union is expanding, there are new candidate countries, which should achieve EU standards in waste management and some old EU members also have to improve their performances. There are needs and opportunities but competition is hard. This analysis concentrates in the emerging market areas.

*Market growth.* The population in Europe is projected to decrease during the next few decades, but when the standard of living is good the consumption keeps the need for cleantech solutions running.

![Europe population projection until 2050](image)

Figure 10. European population number until 2050. (Source: United Nations.)

The labour force is starts aging after 2020, but the pensions in many countries are in a good level and do not decrease purchasing power tremendously. One factor, which cannot be forecasted, is the immigration effect in European population and labour force. (World Bank, 3/2011, 6.)

*Distribution channels.* In most European countries the infrastructure is in a good level and there is no need for construction, except maintenance measures. The author has lived in Romania and witnessed the condition of Balkan countries transport network level. The highways are often in poor condition, trains might be rusty and railways do not allow the maximum speed for trains, and ports suffer lack of proper equipment to receive big ships. In the countryside it is not extraordinary to see horse-drawn carriages in the midst of vehicles. In 2013, in Romania there was 547 kilometers of motorways, and 146 kilometers were under construction. This is a small motorway network for a big country by landmass, when The Netherlands has 2600 kilometers or Austria 1700 kilometers of motorways. (cnadnr.ro 2013.) The war in the 90’s has damaged former Yugoslavian countries transport networks further. There is progress going on, for example in Kosovo there opened a new highway through the country to Albania, and it was built with green con-
struction principles (reducing, reusing and recycling waste, which is unprecedented in the area.) Now the highway links landlock countries to Albanian ports. (Worldhighways.co.) As road networks, also the condition of railways and airports vary inside Europe. EU requires its member countries to maintain the transportation networks in a certain level, and this makes most of the continent convenient in distribution purposes.

Ports are extremely important factor in European distribution. In Europe there are over 1200 seaports, and over 90% of all cargo passes the ports. The ports are of different sizes and conditions, but some of them are among the globally busiest ones (Rotterdam, Hamburg, Antwerp etc.) Inland ports and river transportation play vital role in Central Europe. (European Commission 2013.)

**Major market trends.** Aging is one threat for European market development, but the labour force is mainly educated. The price of labour force varies by country, and the following figure shows an average cost for one working hour in European countries. It indicates where it is cost effective to manufacture cleantech solutions, if manpower costs are the determinative factor.

![Figure 11. Cost of working hour in Europe. (Source: Eurostat data 4/2013.)](image)

Long-running economic crisis has slowed trading in Europe for years. In EU countries the growth does not seem to brace up notably in the coming years, and moderate growth concerns also emerging countries. IMF forecasts the growth for emerging markets to pick up 2.75% in 2014, which is consequence of gradual recovery of euro currency and political decisions. Most positive forecasts IMF gives to Turkey and Serbia. (IMF, World Economic Outlook. Hopes, Realities, Risks. 49-50.)

**Key success factors.** In Europe, the euro currency is one key success factor as it concerns most European countries and is globally second strongest currency after US dollar. It makes trading easier, but is also a weakness due to weak
economy euro countries, which pull the value of the currency down. Other EU linked success factors are free movement of labour and products.

For Finnish companies Europe is easy to reach logistically. Corruption is on low level and easy to prevent by using official ways in trading. English is business language in almost each country cultural differences are smallish, so the risk of misunderstandings is small. Finns have good reputation in Europe and Finland has an image of clean and technologically improved country, so with the right niche there is a market share for cleantech products.

4.4.2 Expert analysis of Balkan Peninsula market area

The former Yugoslavian countries represent one of the most potential market areas for cleantech in the near future in Europe. Economies are growing and need to improve the infrastructure is enormous. The Embassy of Finland in Serbia has collected information and answers to open interview from specialists in different branches.

Illegal landfills make a huge problem in all Balkan countries. The problem is particularly pronounced in Serbia, which was declared the most polluted country in Europe in 2010. There are big illegal landfills as well as many smaller ones. Unfortunately not only the illegal landfills are a problem, but also the legal ones for they often don't meet the necessary standards. Serbia started building sanitary landfills, which meet the European standards, as recently as in 2009.

Citizens in Serbia don’t consider waste sorting, recycling, and environmental problems to be issues that are of vital importance, but the general atmosphere is changing although very slowly. People have more knowledge about environmental problems than they used to and recycling for example is taught in some schools. Still majority of the people aren't interested in recycling and environment because they have bigger, more urgent problems to deal with that directly relate to their well-being. The same problem can be seen with for example human rights issues and almost every problem that isn't directly related to increasing people's income. People in Serbia also often expect someone else to solve their problems, for the solutions to come from outside rather than seek solutions themselves. The environmental problems have to get so bad that they actually harm or threaten people's health before they start demanding a change and improvement.

Environmental issues aren't a priority in Serbia at the moment although politicians use "green values" for promotional purposes. There are some projects that are often badly planned and executed. Sometimes they create a false sense of action in the field of green values. The trend in Serbia seems to be more towards consumerism than green thinking. It's not that long ago that people actually had to recycle and reuse everything possible, because they
didn't have money to buy anything new. That's why recycling in Serbia is still associated very much with poverty and backwardness. People take more pride in being able to throw things away without thinking it twice or not having to take your own canvas bag to the grocery store.

Government in Serbia does not contribute much in recycling, but it is made very difficult. The projects involve the use of effective technologies that are expensive and the government has limited funds for investing in infrastructure. There aren't generally containers on close proximity to households so if one wants to recycle, he has to put a huge amount of effort into it. Usually recycling infrastructures are handled on local level and there doesn't seem to be any countrywide plan on how to do it. So in some towns you might find a centralized recycling center and in others a few recycling stations spread around town. Often private companies run recycling projects but mostly Roma people still take care of recycling in Serbia. They dig through the waste containers and take everything they can sell. Serbian government has to start contributing more in the future, though, because EU directives and legislation. There is a good will to develop environmentally friendly infrastructure projects if there is a clear funding framework.

The expert comments recommend Finnish companies to enter Balkan district markets by exporting cleantech products, although depending on the volume of the project and the kind of technologies that companies want to sell. Export of products is the easiest way to enter and exploit the foreign demand. In exports there is minimum initial investment and risk as well. Exporting is the easiest way to enter the foreign market, after holding the clench on the market, companies can think of long-term investment programs like licensing, franchising, joint venture or establishing a fully owned subsidiary.

One of the biggest challenges is corruption. It is necessary to make corruption visible in all areas of society; also it is necessary to confront decision makers with these facts, in order to incorporate mechanisms to be respected in order to prevent corruption. At the moment this is one of the primary goals of Serbian (and other former Yugoslavian) governments. Still corruption is at the very high level in all government structures.

4.4.3 Market analysis of Russia

*Market size.* Russia is a huge market area and the 9th biggest country in the world with the population of 142.5 million people and the 77th biggest by purchasing power parity per capita. After the Soviet Union collapsed in 1991, the country has moved to market economy with global trading. World bank calculates 7% average growth for Russian economy during the last decade, and the middle class has emerged. Even though the global crisis in 2008 hit Russia hard because of oil price plunged, the Russian government measures caused that the economy turned up in 2009. (CIA World Factbook. Russia 2014.)
Business consultancy company PriceWaterhouseCoopers forecasts Russian GDP to triple until 2050, and it will be the largest European economy in that year, passing Germany by (PriceWaterhouseCoopers 1/2013, 23.)

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<tr>
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<tr>
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<td>1.848</td>
<td>Mexico</td>
<td>2.830</td>
<td>France</td>
<td>5.714</td>
</tr>
</tbody>
</table>

Figure 12. Russian GDP growth projection until 2050. (Source: PriceWaterhouseCoopers “World in 2050. The BRICs and beyond: prospects, challenges and opportunities.)

**Market growth.** Even though the population of Russia is estimated to decrease until 2050, there are still great needs and markets for cleantech business. One crucial factor in market growth is reduced number of unemployment; according to CIA World Factbook in 2012 some 5% of manpower was unemployed. The Ministry of Natural Resources of the Russian Federation has created a portal “Green Evolution” for interest groups to use it as a tool to learn Russian green strategies, and to assist them by promoting their know-how in growing markets (greenevolution.ru.)

![Population trend in Russia until 2050](image)

Figure 13. Estimated population number in Russia (Source: World Bank.)
**Distribution channels.** The US Chamber of Commerce assesses Russian infrastructure to progress tremendously in the near future, as it has already done a couple of years so far. In 2011 the investments in infrastructure building were almost 163 billion euros, which is app. 7 % of Russian GDP. The US Chamber of Commerce estimates the annual investments still grow at least 7 % until 2018. The transportation network in Russia includes common and industrial railways, public roads, internal water routes, offshore transportation and air routes. The costs of transportation are currently app. 25 % of total product costs, which is 2,5 times higher than in developed countries and should decrease when transportation options improve. (Investmenteurope.net.) This means, if Finnish companies decide to establish a production unit in Russia, the logistical capacity is improving. Also, increasing transportation facilities ask for more waste management equipment in terms of moving people and goods. When the prices reduce, it is a competitive advantage for Finnish cleantech operators.

In many Russian cities there already run environmental projects; Finnish operators might be interested in the results of “Project W.A.S.T.E. 2011-2013” or “Cities by the Water: New Opportunities for Business Development” as Petrozavodsk is near the Finnish border (Petrozavodsk-mo.ru.), not even to mention bigger metropolitans St. Petersburg or Moscow, which offer enormous business opportunities for Finnish cleantech innovators.

**Major market trends.** One of the biggest challenges in Russian labour markets is high number of mortality and morbidity within work force. The level of science has stuck in inadequate level compared to international level, partly because of deficient governmental boosting. Networking skills and language barriers are another challenge in the market area. On the other hand, Russia joined the World Trade Organization in 2012, which reduces trade barriers. (Finpro.fi, Russia.) It is possible that when Russia orders cleantech products or services abroad and meanwhile trading with former Soviet Union countries increase their economies, such countries as Ukraine will also become timely.

**Key success factors.** The Russian government has set the improvement of environmental issues as one of its top priorities. The Ministry of Natural Resources has developed the legislation towards to monitoring ecologic values. In practice, companies can get financial incentives if they adopt new and environmental friendly technology. The government has increased the fines with environment offence. In this sense, Finnish companies have a great opportunity to sell new equipment to Russia. In 2009 the Russian government contributed 8,3 billion euros in environment protection, and the required finance is not decreasing. In 2010 the Russian government announced plans to recycle 20 % solid waste until 2016. Such cities as Moscow and St. Petersburg are involved in projects to build waste sorting and processing plants. Russian industry has no expertise to implement all phases in the construction, and it needs foreign assistance with such branches as waste-to-energy technology and ash
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utilization. (Globaltrade.net.) In Russia, there are huge markets for Finnish waste management cleantech innovations.

4.4.4 Expert analysis of Russia

Ms. Ksenia Naletova is a Russian citizen living in St. Petersburg, Russia. She studied her MBA degree in Häme University of Applied Sciences and visits Finland regularly, so she has an excellent perspective to compare waste management condition between these two countries, both in environmental and business point-of-views.

Waste management problems are everyday life in Russia. For households, there is no waste sorting systems almost at all. Even harmful waste types, such as batteries, medicines or chemical products, are thrown in the same container. The government should contribute in improving waste sorting by offering points-of-recycling for consumers, and also to inform people why and how to recycle. Some Russian citizens are aware of some organization, which are specialized in harmful waste treatment, but it is rare to see anyone using these services.

Generally, the level of ecologically friendly behavior in Russia is very low. During recent years, in bigger cities there have happened some improvements with attitudes towards green values. People with higher standard of income can afford to travel more, and they adopt behavior from foreign cultures. In bigger cities there visit more tourists, and this forces authorities to clean the streets, offer trash containers in public areas and empty those at regular intervals.

In remote areas the waste management situation is critical. Finnish companies could find business opportunities quite close to the border; Russian part of Karelia has a big number of illegal landfills even in such tourist attractions as Lake Ladoga. This problem could be solved with effective cooperation with Russian authorities and an influential network of cleantech business cooperators. Even if highly placed officials are involved in illegal or legal waste management business, a network of foreign operators could enter the market successfully.

From a citizen perspective, recycling and waste management in Russia are at the first steps of development. Majority of people would be ready to change their behavior and recycle, and government has established several programs to promote to transition. In this huge country the change will happen slowly, but with effective actions it occurs.
4.4.5 Market analysis of The Gulf Council Countries

The Cooperation Council of the Gulf countries in the Middle East are prosperous countries and rich by natural resources, mostly oil and gas. The GCC countries are United Arab Emirates (The UAE), The Kingdom of Bahrain, The Kingdom of Saudi Arabia, The Sultanate of Oman, Qatar and Kuwait.

Market size. The amount of population varies. All the GCC countries except Saudi Arabia have relatively small populations from Bahrain with 1.3 million to United Arab Emirates 7.8 million inhabitants. In Saudi Arabia there are 26 million people. (Finpro.fi). The amount of population is growing rapidly, but main reason for this is immigration. Even 42% of population is expatriates. All GCC countries are Islamic, and the religion dictates the rules of behaviour. Saudi Arabia is probably one of the most devout societies in the whole world, and women's position and rights are often weak. Other GCC countries are not as strict, but foreigner has to be sensitive when defining market segments and potential customers. (Human Rights Watch.) The welfare in these countries is on a high level and people have enormous amount of money to spend. Saudi Arabia is the biggest economy when considered the population, and the locomotive of the economy in Arabian Peninsula. The UAE on the other hand is most international and open economy. (The Ulkopolitist.)

The original population is young, even if in the whole area the population under the age of 15 years will drop from 29% to 24% until 2020. The biggest challenge in the near future is to manage immigration issues. The big amount of youngsters means that behaviour and habits will change, some of them even fast. The estimated growth of population in 2010 – 2020 is over 8 million people in the whole area. Due to geography (deserts), the population is largely urbanised. (The Ulkopolitist.) When in urban areas live more people, they generate waste increasingly and this offers growing markets for cleantech and waste management products.

Market growth. Consumer behavior in GCC countries has to be taken into consideration when entering that market area, as the behavior differs from western style. Since ancient times have Arabs felt that they are all brothers, no matter which country they come from or which tribe they represent. This ancient Islamic habit inherits from tribal traditions, which say, “a man can not be rich if his brother suffers poverty.” Due to this, the countries have donated money for each other when one economy has had a better welfare. This happens also inside the states – there are no poor people (Brown et al., 1984, p. 138).

The World Bank forecasts the population in the GCC countries to grow until the year 2050 as the following figure shows.
**Distribution channels.** Logistics set demand in Gulf Council Countries; they are not at the same landmass. Only Saudi Arabia is a big country, all the five others are relatively small. Roads are not the major transportation system in these countries, even though they have road networks. Export freight leaves the countries mainly by sea. According to CIA World Factbook the GCC countries have excellent harbours; by landmass the smallest Bahrain, which is an island with 760 km² and 8 merchant marines. Kuwait has 17 800 km² and 34 merchant marines. As a comparison, Finland has a landmass of 338 000 km² and 97 merchant marines. These marines are at top technological and built to avoid oil disasters by the Gulf. (CIA World Factbook. Middle East 2013.)

**Major market trends.** Politically the Gulf Council Countries are quite stabile market area. These countries have had an aim to establish their own monetary union since 1970’s. The monetary union crashed in 2009 when The UAE denied of accepting Riyadh to be the location of the central bank. The purpose of this union is to stablize political situation, which nowadays sometimes gets unstable. The latest example of this happened in spring 2012 in Bahrain, when Bahraini students began riots, inspired by Tunis and Egypt revolutions (so called “Arab spring”). After one month the troops from Saudi Arabia, UAE and Qatar intervened the riots. The message was clear: the situation has to get stabile again (crisisgroup.org 2011).

Even though all GCC countries are Islamic and have similarities in their legislation, they have different political systems. In Qatar the constitution gives all the power for the emir. The emir is keen to modernize the political system in the country and has established a committee to renew the constitution in more democratic way. Oman has no political parties or legislators, but only the sultan and 30 ministers. Political parties are forbidden also in constitutional...
monarchy Bahrain. The government breaks the freedom of speech or press regularly, even if it is getting better. After Iraq occupation ended in 1991 in Kuwait there has been demands for political freedom and democracy. Due to these demands Kuwait had parliament elections in 1992, and since then the political freedom has improved. The ruler of Kuwait is the emir. The United Arab Emirates have been one of the world’s leading oil exporters. With the income of oil the country has developed health care, education and infrastructure. Even though this little country is one of the most open and free countries in GCC, politically it is still very authoritarian. Presently there is a president who leads the country in 5 years period. In UAE the company law regulates the activities and registration of foreign companies intending to establish a presence in the UAE in a way, which gives the government almost total control over which foreign companies may enter or do business with the country. Saudi Arabia is an Islamic monarchy, where political parties and labour unions are strictly forbidden. The king nominates the government. The Islamic law “sharia” forces all citizens to be Muslims. (globalis.fi). If a Finnish company considers of expanding actions to GCC countries, it should pay a lot of attention to union labour and other issues.

In spite of all differences the GCC countries have in their political system, they have similarities as well. Such things as weak human rights, lack of freedom of speech or religion or other strict rules may cause that people are not able to move their everyday routines towards environmental thinking. They have bigger problems, and when the political system increases the welfare, people stifle their dissatisfaction in something they can afford – shopping. None of the states have taxation, as they are rich due to the oil exporting. That’s why they cannot drive their citizens towards environmental behaviour e.g. by setting extra taxes for plastic bags.

The GCC members are highly welfare countries. In global competitiveness rate of altogether 142 countries their places are as follows: Qatar 14th, Saudi Arabia 17th, United Arab Emirates 27th, Oman 32nd, Kuwait 34th and Bahrain 37th. (Finpro.fi.) The economy in GCC countries tripled in 2002 – 2008. Due to global economic depression the growth stopped but not tremendously. The regional GDP grew to a new historical rate, 28.9 %. (gulfbase.com.) Especially in Bahrain the growth of economy is boosting again, and it increased appr. 4-5 % in 2012. Economic Development Board EDB estimates the growth reached new historic levels (Arabian Business 2012.)

In countries where there is shortage of clean water and landmass for landfills, recycling and environment protection should be a top priority. Unfortunately things are differently. According to EcoMena (Qatari online information organization) report from 10/2012, Kuwait is one the highest waste generators per capita in the world. The waste is often not recycled and a country with a landmass of 17800km² has landfills more than 18 km². 14 sites are closed and 4 are active. The sites are dumps rather than engineered landfills. This uncontrolled waste dumping causes severe public health and environment issues (EcoMena 2012.) The situation is not better in Bahrain. A newspaper trade
Arabia writes a report of consumer waste production. The newspaper says, that total amount of household waste in Bahrain has increased from 287 tonnes in 2007 to 402 tonnes in 2009. The increase just in two years is 29 % and the growth seems to continue this steep. If compared a private persons daily waste amount, in Bahrain it is 1.5 kg, in Oman 0.6 kg and in Germany 1.1 kg. (Trade Arabia.)

In Saudi Arabia there has been attempts to improve the condition of landfills but these attempts have faced such problems as need for bigger intervene of private companies or illegal and unskilled workforce. In Jeddah city there is a pilot project waste separation plant. This plant earns its income by separating reusable material (glass, metal, cardboard…) and by selling it as raw material. The problem in this plant has been that illegal workforce with low salary has stolen this business from the plant (Saudi Gazette.) The government of Oman has set the waste management policy among their top priorities. The sultanate plans to establish 16 engineered landfills, 65 waste transfer stations and 4 waste treatment plants by 2015. (EcoMena.) In all GCC countries governments are slowly developing environmental issues, but to be effective, there should be recycling bins everywhere for the households recycling needs too.

Advisable export methods in GCC countries are direct or indirect export, because the cultural differences are huge and it might take several visits before the trust between business partners is born. Arabs do business friends with friends, not with business partners, and becoming that familiar takes time and effort.

Not only behavioural, but there are also practical things to know about GCC countries: for example, working days are Saturday to Wednesday; Ramadan has to be taken into consideration etc. If export method is project export, which might happen when GCC countries can afford to order whole processes from abroad, it is advisable to collect components outside GCC countries, as they do not manufacture much and prices get high.

4.4.6 Expert analysis of Gulf Council Countries

Mrs Päivi Käri-Zein is a lecturer in Haaga-Helia University of Applied Sciences and her special field is doing business in Arab countries. She has lived in the UAE and Lebanon and runs her own company Trade Network Käri-Zein, which produces e.g. strategic and risk analysis of Arab countries.

According to Käri-Zein, one important notification of GCC countries is, that there is no traditional middle class. When middle class people in Europe have a clue of earning money for their consumption goods, people in GCC countries don’t necessarily have the same touch with everyday living. This might cause that the idea of waste management is distant for their thoughts. In GCC countries there is class allocation, and it can be described roughly as follows:
The kitchen is the servants’ place and the house owner does not visit there. The kitchen is concerned as a dirty place, and no one is interested in educating servants. When the immigrant employees are not familiar with the idea of recycling, all the waste is dumped into landfills without sorting. It seems that there is no change coming for this behaviour, and the change needs massive campaigns from the state to increase knowledge towards recycling. (Päivi Käri-Zein, phone interview 23.11.2012.)

Infrastructure is on mediocre level in each country. In Saudi Arabia the state restricts the access for certain Internet sites; otherwise there is no limitation in its usage (Päivi Käri-Zein, 23.11.2012). When mirroring the infrastructure in GCC countries towards their waste management system, there is a good basis to develop landfills and recycling points. Lack of technology is not a barrier for it, but e.g. railways are rare and make a challenge for transportation.

4.4.7 Market Analysis of China

Market size. China is the biggest market area in the world with the number of 1, 4 billion inhabitants and the 124th with purchasing power parity per capita. In 2010 China was the world’s exporter nr 1. Reforms towards market-oriented economy have progressed the rapid growth of private sector and foreign trade investments. Inside the Chinese borders, the biggest market areas are in cities –people move to urban areas to find jobs- and the coastal side is the most populated region. Enormous cities with old technology cause huge environmental problems: air pollution, lack of clean water, waste management issues and so on. (CIA World Factbook. China 2014.) According to PriceWaterhouseCooper greentech report (2013, 55), in 2012 China invested 67 billion US dollars in greentech, which is the biggest amount in the world. This together with waste management offers Finnish companies great oppor-
tunities to trade with alternative waste management solutions and for example bio fuel plants.

**Market growth.** The population of China is estimated to decrease during the next decades, and major reason for this is probably the one-child-policy, which has prevailed since 1970’s. Often girls are not as wanted children as boys are, and especially in the rural areas where the control is not effective, there has been abortions, neglects or even homicides of girl infants. This has caused a disproportion between genders, and there are 105 males for every 100 females. (Geography.com.) Despite the decreasing number of inhabitants, China is almost endless market area in cleantech business.

![Population trend in China until 2050](image)

Figure 15. Estimated population number development in China. (Source: World Bank.)

Consulting company PriceWaterhouseCooper estimates Chinese GDP to grow evenly for the next decades. This decade will remain as the decade of strong growth but the rate will steady at the 2020’s when the markets mature and economy has emerged. China is expected to move from export-oriented economy to a consuming economy, and even if the population is decreasing will people have better standard of living than presently. (PriceWaterhouseCooper, 2013, 8.) This will drive the waste management cleantech markets on, as there will be increasing need for handling all the marks of consumption.
Distribution channels. Since the beginning of 2000’s, China has constructed an enormous net of expressways, especially in the eastern part. The current 5-years-plan has goal to expand the network to reach at least 90 % of the cities with minimum 200 thousand inhabitants. The need for continuous road network construction still exists, as the increasing consumption requires more transportation routes and fluent logistic reduces transportation costs. Railways are in the focus of the current 5-years-plan. Until 2015 there is plan to increase the high-speed train railways capacity to 40 000 kilometers in addition to 80 000 kilometers other railways. Shanghai is the busiest container port in the world, and in the global top 20 there are 9 Chinese ports. Seaside freight is crucial factor in Chinese infrastructure, and many major ports are expanding their berthing capacities. Inland ports are also increasing their capacities, as the huge rivers offer watercourses for logistics. In airports, the government has created and still continues to build hub-and-spoke-style airport network, which enables speed freight transportation. China will open 50 new airports 2011 – 2015, which makes the total amount of 230 airports. (KPMG 2013, 10, 15, 20, 27.)

Waste management in China needs many alternatives due to different circumstances in urban and rural areas. The target is to handle 400 000 tons of waste a day, and most of it by incineration. At the end of current 5-years-plan China will have 300 incineration plants, which can handle 30 % of the waste. Inhabitants are protesting against this, as they are afraid of pollution. Waste-to-energy values are not as high in China as in Europe, because of moist contents of the waste. (KPMG 2013, 33.) When people are urbanizing quickly in China, one alternative for this problem could be more effective recycling products and systems –such as biodegradable organic waste bags, which differ foodstuff from burnable waste- and then bio fuel plants for moist waste.
Other business opportunities in Chinese waste management can be found in landfill leachate systems, which now pollute the water, and recycling equipment. China is looking for alternatives for incineration, and aims to expand recycling. The latter would also benefit social issues, as it would offer job for local people. Chinese waste management infrastructure is developing branch.

**Major market trends.** According to International Monetary Fund, the Chinese work force is aging strongly during the next three decades. In 2012 the number of workers decreased with 3.5 million and the forecast says that the aging comes earlier and more steeply than forecasted so far. This, together with increasing number of foreign employers and more educated young generations, increases the wages. Most obviously China will not remain as the major global target country for manufacturers, but Africa will take the place. (IMF Working Paper 13/26, 6.)

![Growth of Working Age Population](image)

Figure 17. Working force aging forecast in China.

The current 5-years-plan (until 2015) contributes in lessening environmental consequences of economic growth. Not only energy consumption, but also the plan concentrates in several other strategic industries as well, most of them being closely linked in cleantech; e.g. energy-saving and environmental protection technology, new energy, high-end equipment manufacturing or new materials. (Finpro, China.) This opens great views for foreign companies to export several cleantech solutions to China, and Finnish cleantech companies should export all available products, processes or services and try to find new markets inside China. Different parts of country have different problems and in major cities private consumers might have different cleantech solution needs than people in rural areas.

**Key success factors.** China has established an organization “China Greentech Initiative”, which is the only collaborative platform between China and international cooperative partners. The purpose of this platform is to assist China
to invest in greentech solutions and to achieve its sustainability targets. This platform creates strategic market researches for customers with assistance of over 1000 specialists from various industries. China Greentech Initiative offers potential co-operators and other relations, and education to enter Chinese greentech or cleantech markets. (china-greentech.com.)

As China has a growing demand for capable work force and expert level professionals, the government has improved its educational system. Four Chinese universities have wedged in the 50 best technological universities in global level. (Finpro, China.) This means also the technological improvement in the country.

4.4.8 Expert analysis of China.

Ms. Jun Xing is a Chinese engineer lived in Finland for several years. She has an excellent point-of-view for environmental issues both in China and in Finland.

In general, Chinese people do not sort waste out, but collect all the waste in one plastic bag. In urban areas, there are big trash bins nearby apartments, and often private people act as trash collectors and collect recyclable materials for reuse. This is not organized by governmental waste management. When it comes to governmental waste management, in waste collection centers workers separate recyclable materials often with hands, not always mechanically. The material, which is not suitable for recycling, is fuel for incinerators.

Chinese government has encouraged urban area inhabitants to sort their waste out, but in lower class recycling and waste sorting is not habitual.

4.4.9 Market Analysis of Brazil.

Market size. In Brazil the estimated population number is 201 million people, which makes it 5th biggest market in the world and 8th biggest compared with purchasing power parity. The employment rate is 94%, which increases purchasing power. Some 87% of inhabitants live in urban areas. (CIA World Factbook. Brazil 2014.) Brazil is improving its importance in global market and macroeconomic stability with several measures. For example, since 2003 it has built up its foreign reserves and reducing debts. Brazil was among the first emerging markets to recover the recession in 2008. In 2010 the GDP grew 7.5%, which was the highest rate for 25 years and the unequal level of income has declined evenly. (CIA World Factbook. Brazil 2014.) Brazil economy has a stabile basis to grow continuously and to become one of the
leading market areas globally, and with the stable basis it can tackle hardships.

*Market growth.* PriceWaterhouseCooper estimates the GDP (based on Market Exchange Rate) of the country also to increase, with the projection of Brazil being globally nr 5 in 2030 and nr 4 in 2050. The figure of this projection is shown in the Russia analysis in the page 41.

The population in Brazil estimated to increase evenly until 2050, so there are markets for cleantech solutions, especially when foreign companies will invest in this low cost production location and have need for improved infrastructure. The non-Atlantic border areas might be a good gateway for other South American countries, which means expanding business opportunities.

![Population trend in Brazil until 2050](image)

Figure 18. Estimated population growth in Brazil. (Source: World Bank.)

Distribution channels. Infrastructure level in Brazil is not on an acceptable level yet, and The World Economic Forum ranks it to 107th of total 142 countries in the world. (WEF Global Competitiveness Report 2012-2013, 116.) There is need for improvement in each sector, but the government has taken this into account and after 3 decades with almost non-investments in this, which has eroded logistical and other channels. The challenge is still huge, with a country with enormous landmass and increasing middle-class. The governmental authorities in Brazil have started “Growth Acceleration Program”, and the government contributes app. 1 % of annual GDP in this program 2011 – 2014. The program has a purpose of boost the effectiveness of both public and private sector investments in infrastructure improvement, and it does not only start new projects but also upgrades existing objects. The government grants special tax incentives to encourage infrastructure development. Brazil hosts Olympic Games in 2016 and this is one reason why the country contributes strongly in airports and urban rails. As the exporting is booming currently, there are also heavy investments in ports and railways. After all current investments, Brazil is supposed to have 10 000 kilometers of
new railways, 96 % of inhabitants living within 100 kilometers from an airport and so on. (PriceWaterhouseCoopers 2013, 2.)

Municipal solid waste management in Brazil is not in the best possible level. The growing waste generation increases the amount of landfill gas, and it is estimated that 60 % of collected MSW in Brazil does not have regular destination. When in Brazil there are over 5500 municipalities, only 451 of them have waste collection services. (iswa.org, 2.) This lack opens doors for e.g. consulting and recycling container manufacturing businesses, as well as for bio fuel-gasification plant business.

**Major market trends.** One threat for economical development in Brazil is its inability to take full advantage of work force. It should improve the human resources it has in the working-aged people, and the social regulations. Currently the age structure is efficient, but will change near 2025 when the population starts to retire and work force decreases. (CIA World Factbook. Brazil 2014.)

According to World Bank projection in 2010, Brazil has a lot to do with its economical progressing. The figure below shows some details, which are not easy to tackle when entering Brazilian markets.

<table>
<thead>
<tr>
<th>Lots of room for improvement</th>
<th>Brazil</th>
<th>China</th>
<th>India</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Doing Business</td>
<td>129</td>
<td>89</td>
<td>133</td>
<td>120</td>
</tr>
<tr>
<td>Starting a business</td>
<td>125</td>
<td>151</td>
<td>169</td>
<td>106</td>
</tr>
<tr>
<td>Dealing with construction permits</td>
<td>113</td>
<td>180</td>
<td>175</td>
<td>183</td>
</tr>
<tr>
<td>Employing workers</td>
<td>138</td>
<td>140</td>
<td>104</td>
<td>109</td>
</tr>
<tr>
<td>Registering property</td>
<td>120</td>
<td>32</td>
<td>93</td>
<td>45</td>
</tr>
<tr>
<td>Getting credit</td>
<td>87</td>
<td>61</td>
<td>30</td>
<td>87</td>
</tr>
<tr>
<td>Protecting investors</td>
<td>73</td>
<td>93</td>
<td>41</td>
<td>93</td>
</tr>
<tr>
<td>Paying taxes</td>
<td>150</td>
<td>130</td>
<td>109</td>
<td>103</td>
</tr>
<tr>
<td>Trading across borders</td>
<td>100</td>
<td>44</td>
<td>94</td>
<td>162</td>
</tr>
<tr>
<td>Enforcing contracts</td>
<td>100</td>
<td>18</td>
<td>182</td>
<td>19</td>
</tr>
<tr>
<td>Closing a business</td>
<td>131</td>
<td>65</td>
<td>138</td>
<td>92</td>
</tr>
<tr>
<td>Unweighted average</td>
<td>115</td>
<td>91</td>
<td>121</td>
<td>102</td>
</tr>
</tbody>
</table>

*Source: World Bank, Doing Business 2010*

Figure 19. Doing Business-ranking 2010. (Source: World Bank, 2010.)

Number of some certain raw materials have very high recycling rate in Brazil. Collection of these materials is organized by industries and includes such materials as aluminum, glass, metal and paper. (iswa.org.) This activity harms public and non-profitable recycling, and causes that in some places recyclable and reusable material will end up in landfills.
Key success factors. Brazil is world’s largest ethanol fuel producer and nr two in exporting it. The country has a sight to be world’s first sustainable bio fuel economy. So far the sight lies on Brazil sugarcane farming (un-energy.org), but there could be demand for gasification plants as well. Waste-to-energy solution would make a functional parallel energy production system, save land for other farming and channel bio fuel for vehicle use. Brazil is also otherwise sophisticated country when it comes to technical resources: according to Finpro, the country has competitive advantage due to its capability to absorb and adopt new technologies, innovation skills and advanced business sector. (Finpro.fi, Brazil.)

Advisable export methods in Brazil are contract manufacturing, as the country is in a distance from Finland, it owns labour force and capability to adopt new technologies. In contract manufacturing, the confidential information of the products is probably more in security than when licensing. Straight export is one option, because business culture is relatively close to Finnish one and the highest top usually makes decisions. It saves costs, which direct or indirect export cause, but these are usable methods as well if exporter wants to utilize existing contacts in the country.

4.4.10 Expert analysis of Brazil.

Mr. Pasi Loman is a Finnish entrepreneur living in Brazil. He is planning to expand his business in other Latin American countries, and he has excellent experience of everyday living and governmental acts in Brazil.

Illegal landfills make a problem in Brazil. The mayor of Rio de Janeiro admitted that the city will not be able to clean the Guanabara Bay before the 2016 Olympic games; sailing events are meant to take place there.

There are massive differences between the upper and the lower classes. Middle class is only now beginning to emerge. Majority are Brazilians are poor – minimum wage is about USD 350 per month and many people actually earn less than that. A small percentage (app. 3-5%) are either comfortable or rich. Most people don’t recycle or even think about it at all. One has to take recycling personally to some recycling centers, often at supermarkets, but since most people don’t have cars, that would be difficult (not that they are even thinking about it). A friend of Mr. Pasi Loman once saw from his kitchen different rubbish bins for different materials for recycling purposes, and he commented “Oh, you must be rich, as only rich people recycle”. In the four Brazilian companies that Mr. Loman has worked for, small to medium size businesses, none of them did any recycling at all. Yet, paradoxically, many Brazilians sincerely believe that they are world leaders in recycling; as proof they point out to extremely poor, often homeless, people, who pull carts on foot and collect cardboard and other recyclable materials from the streets (but
ask the same person “Do you recycle at home?” and the answer will probably be no). Lots of people don’t understand why batteries etc. should not be thrown to rubbish bins with general waste.

Green values are becoming a trend, but often it seems to be a marketing gimmick and nothing substantial; for example, there exists a company that was developing a beauty product that was to be called **** Bioclean even though there was nothing “bio” about it. As of the government, they like to think that they are thinking green, but some of their policies have proved controversial (big dams etc.). Recycling centers, for example, are private initiatives. The São Paulo state government did organize recycling collections once a week, but in many districts that has ended.

When it comes to entering Brazilian markets, it is recommendable to establish joint ventures or at least having a local agent, because personal contacts are very important in Brazil. Coming direct from Finland might be very challenging.

4.4.11 Market Analysis of Sub Saharan Africa

Market size. Ministry of Employment and Economy describes Africa as one potential target region in “The Strategic Program for the Cleantech Business”. The whole continent has strong population growth, democracies are developing and productivity is improving. All these factors together forecast economic growth in Africa. (tem.fi.) The United Nations regional definition includes all the African continent countries below Sahara desert (The United Nations Data). The region is huge and diverse, so this analysis pays attention only to the biggest or best developing economies, which make them potential target markets for Finnish companies. The International Monetary Fund IMF has decomposed the region in four subcategories depending on their economical development. The categories are oil exporters, middle-income countries, fragile countries and non-fragile low-economy countries. The oil exporter countries (Chad, Cameroon etc.) are politically unstable or there is a lot of poverty. For example, in Cameroon the population below poverty line is app. 48 %. Nigeria is the second biggest economy in the continent after South Africa and is involved in this research. (IMF 2012, 6. CIA World Factbook.) Many countries are classified to be fragile, so the growth of the economy is depending on civil conflicts or other non-economic events. Such countries are e.g. Central African Republic or Democratic Republic of the Congo. The fourth IMF sub-group is non-fragile low-income countries, which have shown weak signals or developing economical situations. (IMF 2012, 6.) The most potential markets for Finnish cleantech companies of these countries are Kenya, Nigeria, Mozambique, South Africa and Tanzania.
Figure 20. Sub-Saharan Africa.

*Market growth.* The market size in each country is huge. The population varies from 24 million inhabitants in Mozambique to 44 – 48 million in South Africa, Kenya and Tanzania. The biggest population is in Nigeria, 170 million inhabitants.

Figure 21. Estimated population growth in Sub-Saharan African countries (Source: World Bank.)
As the figure 23 in the page 62 (North Africa, section GDP forecast) shows, not only the population but also GDP is about to grow. Based on the Africa Development Bank prognosis, in East Africa the GDP will grow almost 10% until the year 2030, when the average percent in the whole continent will be app. 5.9%. Southern and Western Africa will stay barely below the average. One reason for the economic growth has been significant increase in middle class. Africa Development Bank estimates the increase on middle class to grow from the 2010 level 34% to 42% (1.1 billion people) in 2060. These people and their governments will impact in health care, education and environmental products. (African Development Bank 2011, 13.)

**Distribution channels.** Africa suffers of weak infrastructure, and this has been one of the major reasons for the economies not to integrate in global business as well as e.g. human resources could enable. Poor infrastructure increases transport prices, and especially landlock countries suffer with only little opportunities to compete with prices against e.g. Asian countries. In Sub-Saharan Africa the roads are in worse condition than in Northern part, partly because of foreign invests in North, and this slows economical development down. Fewer than 20% of roads are paved, and in general the roads suffer of the lack of maintenance. In Africa there is app. 84 000 km of railways, but often they it does not interconnect regions or countries one to another. The railway network has potential for expansion and this could develop both intracontinental and domestic trading. In Sub-Saharan Africa there are lots of ports but only a few are suitable for large vessels. African economies are mostly based on domestic trade and the governments would need foreign currency to develop infrastructure. The exception for this is South Africa with excellent infrastructure; the problem South Africa faces is that the core infrastructure is built around mining industry in the central part of the country, and coastal infrastructure is not in that good level yet. (African Development Bank 2011, 27-28.)

One important infrastructure factor is energy. There are often blackouts, and for example the whole Kenya suffered blackout in 28.5.2013, and Uganda supplied electricity to Kenya. Local blackouts are common, but a whole nation without electricity is rare. (Dailytelegraph.com 2013.) Sub-Saharan Africa has a lot to improve with its infrastructure and distribution channels, but it shows slow progress when Chinese and Indian operators are already significant players in the region (Finpro 2013).

**Major market trends.** In spite of its reputation as a violent country, Nigeria offers business opportunities for foreign investors. It is the biggest country when counting the population, and 2nd biggest economy in Sub-Saharan Africa. The problem in Nigeria is that the government should use the income from oil sector in infrastructure improvements. The capital Lagos over has over 10 million inhabitants and the city has a need for tremendous improvement. The capital of Kenya, Nairobi, has over 3 million inhabitants and faces the infrastructure problem. (African Development Bank 2011, 35.) This offers great
opportunities for waste management solutions; this amount of people generates waste, which can be reused as bio fuel, raw material or energy when the correct equipment is available.

Tanzania is one example of poor but yet currency-safe economy. The country is doing trade with many near-by countries, but none of the partners alone make over 10 % of Tanzania’s trade partnership. This is why the economic crisis affected a little or almost at all in Tanzanian economy, and the current is stable. Economy is progressing favourable, despite of inflation, and banking sector is in good condition. (Finpro 2013.) In Tanzania, tourism is a growing business and this sets challenges for the country when green tourism is a global trend.

**Key success factors.** Despite of all the lacks in infrastructure, Sub-Saharan Africa has similar potential to grow as a target market as Northern part has. Even if it is further away from other markets than North Africa is, it has developed in unprecedented rate. The key success factors for this are firstly human resources: when other continents face problems with aging, Africa in whole is the youngest continent globally. When investing in education, the young generations are one of the pillars that raise Sub-Saharan Africa for a potential region both in manufacturing and generating points-of-view. Foreign investors have access to skilled work force and consumers with awareness of cleantech products. (African Development Bank 2011, 9.) The growth of human resources and product manufacturing offers a new business opportunity: in a continent with a shortage of water, there is need for water-skimpy innovations.

AIDS and other diseases are a plague in Sub-Saharan Africa. This part of continent accounts 67 % of HIV infections globally, and other dangerous diseases in the Sub-Saharan part are e.g. Ebola, SARS and aviation flu. (African Development Bank 2011, 31.) When the vaccine programs are increasing in Africa as well, there is a huge amount of medical equipment to dispose of safely. In this sense, incineration plants offer a reliable solution for this problem. Finnish companies have know-how to build e.g. grates or to design infrastructure for the plants.

Sub-Saharan Africa is the worst degraded region in the world. The estimations of degraded landmass vary between 20 – 75 %. (African Development Bank 2011, 26.) There obviously is need for cleantech products, not only to mend the degraded soil but also to prevent spoilage more areas.
4.4.12 Expert analysis of Sub-Saharan Africa

The expert comments are collected from a Finnish and Tanzanian citizen, who prefers to appear anonymously. He is involved in cleantech business by his own company, which markets renewable energy systems and solar energy applications between Tanzania and Finland.

In Sub-Saharan Africa, there are few municipal landfills. For instance in case of Tanzania, most of landfills are located outside of the city, and often the services of collect garbage are expensive. There is low class (poor people), middle class and upper class in Sub-Saharan African countries. For example, Tanzania is rich country in resources but majority of people are poor because of the corruption, mismanagement or bad policies decision made by policy makers. Especially in big cities, there is big gap among low, middle and upper class. Everyone cannot afford to pay waste collection, so some areas are filled with unsorted garbage. The capital of Tanzania, Dar es Salaam has experience problems of waste management for years. Instead of dumping garbage to landfill, most people tend to burn rubbish in their yards in the city. Very often this problem cause respiratory disease. Alternatively, in Dar es Salaam waste are dump in local storm drains or to Msimbzai River.

On governmental level, e.g. Tanzania has ratified several international and regional conventions with regard to environment regulations. However, like many developing markets, Tanzania and other countries face fundamental environmental and energy challenges, which have a big impact in the growth of the economy. Water pollution in coastal and inland waterways, industrial pollution in urban areas and deforestations are the main environmental tyrannies in Sub-Saharan Africa. The countries have not been able to take advantage of the available technologies to create a sustainable environmentally friendly situation. Governments contribute very little in environmental friendly infrastructure. For instance in Tanzania, Dar es Salaam City Council was responsible to provide environment services for free (from 1961 when Tanzania got independency) until 2000. In 2000 these services were outsourced to company called Multinet, the first private company to provide waste management services in Dar es Salaam. The transition to Multinet services has been ineffective and confusing due to poor information about the waste management scheme. Both private people and businesses have not benefited of Multinet services.

Compared to Finland, in Sub-Saharan Africa there is a need to encourage people to “think green” so the expert believes there is potential for waste management business in Sub-Sahara Africa. Africa represents a market of about 900 million consumers and only few companies are operating there, although huge business opportunities await Finnish businesses in various sectors. Establishing business in Africa demands knowing the local needs, creating deep partnership with various actors and tailoring products & services to match with local environment. The best circumstance knowledge comes from
African people who have lived or studied in Finland. There are a lot of companies in Sub-Saharan Africa who search for joint venture companies or want import from Finland, but e.g. some Finnish waste management cleantech companies have web site only in Finnish language. Finnish companies should also take the advantage of “Finnpartnership Matchmaking Services”, a service where companies and organizations in Finland and in developing countries can seek out new cooperation opportunities and business partners.

4.4.13 Market Analysis of North Africa

According to United Nations definition, the North Africa region includes the African continent countries with the borderline of the Mediterranean Sea coast and Western Sahara region. This region covers Algeria, Egypt, Libya, Morocco, Sudan, Tunis and the Western Sahara, and the countries are also known as Maghreb countries. The latest area is controversial; Morocco has occupied part of it in the 1970’s and liberation corps “Polisario” has declared Western Sahara independent country. (The United Nations Data.)

![Map of North Africa](image)

**Figure 22. North Africa.**

*Market size.* Africa as whole is very populated continent, according to World Bank estimation there live app. one billion people. Many countries are developing and poverty is a problem, but many western companies have started to operate in Africa, mostly because of cheap labour and other resources, and many economies are growing.

*Market growth.* African Development Bank has estimated gross domestic product (GDP) to grow in North Africa evenly for next decades. This means increasing purchasing power in both, domestic and industrial sectors.
The population growth is strong in Africa. This means, that in the long run there will be huge demand for waste management innovations, and in the long run the new generations probably will take environmental issues more into consideration when the knowledge and access to innovations grow. Most probably at the first step more developed economies adopt the equipment. The need of equipment will then spread to less developed countries afterwards when their economies and infrastructure improve. For this reason, it is important for Finnish companies to choose carefully the markets where to enter in the first wave.
needs massive changes in transportation in next three decades. When economies grow, it leads to increasing transport both overseas and inside the continent. PIDA seeks to attain improvements in physical transportation networks and cooperation between governances. (pidafrica.org.) When economies and welfare grow, the awareness of environmental issues grows as well. Africa has huge energy resources but there is a lack of utilization of them. Solar energy is a solution for electricity production, but economies with a big number of inhabitants generate lot of waste to utilize. According to EcoMena, the MENA region (Middle East and North Africa) is the most water scarce region of the world. There live some 6.3 percent of world’s population but has access to hardly 1.4 percent of the world’s renewable fresh water. Lack of proper landfills deepens the problem as inappropriate waste management fouls water resources. (EcoMena.) Here are business opportunities for both major tendencies: waste incineration and innovations to postpone the end-of-waste situation. The existing landfills are tremendous or illegal, and incineration plants could generate energy of the dump waste. On the other hand, such innovations as solar power compactors (by Ecomp Oy) or waste collection pipelines (by MariMatic Oy) would success in urban areas. Recycling and waste sorting should be easy for private consumers so such Finnish products as Bioska bags for organic waste are one opportunity to make successful business within upper middle class consumers.

**Major market trends.** A common political characteristic for North African countries is that they have been independent relatively small time, since 1950’s – 1960’s, with the exception Egypt, which has been independent since 1922. Countries suffer periodic unrests; latest was in 2010 – 2011 when there was so called Arab Spring uprising. It began in Tunis and spread over the region and partly also to Middle East. In some countries the Uprising lead to toppling of dictatorial regimes. This paved the way for moderate Islamists and conservative factions to governance, but outside of these groups there are Salafists who are eager to use violence to achieve their goals. The fourth factor is uncoordinated terrorist groups with purpose to damage governments or international interest groups. Generally the political situation is stabile but still students; union labors and right organizations are willing for new reforms. Not only unrests, but also corruption is a huge problem in each country. (north-africa.com.) North Africa needs foreign invests and in the long run this feeds also political stability. Finnish companies need to operate carefully in the region and use local knowledge to forecast becoming unrest movements and experts to help them entering the markets with no extra payments.

In grass-roots level the economies are separated in two parts: formal and informal economies. Formally people or organizations buy and sell stuff, but informal economy is also very common: people barter consumer goods. In the formal economy level the most employing sector in North African countries is agriculture, and they are rich in minerals and oil. Sustainable development is a growing trend and at present solar energy and other environmental businesses have a magnificent growth in the region. Due to proximity with Europe, North
Africa is economically in strong position. A major problem is unequal distribution of income between citizens. For this reason, North African countries are defined as “developing economies”. (Exploring Africa.) Despite of global recession, the North African economies are growing over the global average. The Uprising slowed economic growth down in 2010 – 2011, but foreign investments have returned to the region and boost the growth. (The Africa Report 2013.) North African economies are in a moderate distance from Finnish companies and they should be in the front line to share the part of the cleantech business growth. Probably during the next 10 – 20 years the market area is saturated with competitors from China and other big investor countries.

**Key success factors.** One key success factor for a Finnish company in North Africa is in a reliable distance; it is not too far away from domestic markets. It makes logistics easy to arrange. Finpro has trade center in Egypt and Finnish companies can buy export services there (Finpro.fi); also Exigo Oy operates in Egypt and has experience of North African markets. In Africa there is need for clean water and controlled waste management to save the nature to increasing need for food production. These factors create the demand for cleantech products. North Africa is near European borders and is already a strong trade partner in the region, e.g. in Morocco over 20 % of trade is involved with European countries (France is the major player in North Africa), and Finnish companies could unite with them (Mäkipää J., 2011, p. 62.)

**Advisable export methods** in North African countries are indirect, direct or straight export. Religion and hierarchy set challenges; for example working days may differ from Finnish ones. If a Finnish operator knows local behavioral rules, straight export is a good method, but to avoid mistakes in sensitive issues it is a good idea to use a middleman. Establishing an own manufacturing unit is insecure after Arab spring and other unrests.

4.4.14 Expert analysis of North Africa

*Mr. Yasser Shawky is the Commercial Advisor in the Embassy of Finland in Egypt.*

Northern Africa is divided on two parts: Eastern, which includes Egypt and Libya and Western with Tunis, Algeria and Morocco. The latter market area is saturated by Spanish, Italian or French cleantech companies, so Finnish
companies should focus in Eastern part. Especially Egypt is potential target country due to its’ massive inhabitant amount – 90 million people living in only some 10 % of the whole landmass. Waste management operations can be centralized in densely populated areas.

According to Mr. Shawky, in Egypt there is no waste sorting or recycling at all yet. The government should impact in the whole process and enable recycling all the way from domestic households to material reuse. This offers business opportunities to all Finnish cleantech companies; from sorting container producers to incineration plants.

As the whole waste management infrastructure in Egypt needs development, there are big markets for Finnish companies. There already are operators from other countries, so competition is hard as well. In Egypt there has been two revolutions and four presidents 2011; the current government aims to lessen corruption and improve the situation. People who have been involved in corruption during past years have now had their sentences.

Mr. Shawky recommends Finnish companies to enter Egyptian markets either by jointing local companies, own agent or other representative in the country, or otherwise by being in the site. Operating from a distance does not work. To avoid corruption or other problems when entering Egyptian markets, it is also advisable to involve embassy in the negotiations during the whole process.

4.4.15 Market Analysis of India

*Market size.* India is world’s 2nd most populated country in the world, with current amount of app. 1.22 billion people. When viewing the GDP, the country is nr 4 globally, but GDP per capita with purchasing power parity gives India only the rate 168. The country is in a crossroad towards open-market economy, and services make the major of economic growth. Domestic markets and demand increased the economy in 2010 to a growth of 8 % in a year, but there are distrusts for the governments’ commitment for developing the economic reforms. Yet, the near future in Indian economy looks bright mostly because of young population and investment rate. (CIA World Factbook, India 2014.) According to PriceWaterhouseCooper projection, the GDP in India will grow notably during the next decades, despite all the challenges it will face.
Figure 25. India GDP projection until 2050. Source: PriceWaterhouseCooper “World in 2050. The BRICs and beyond: prospects, challenges and opportunities”.

Market growth. Education in India has improved a lot during a few past decades. Now even 90% of children enter school, even if the education is unequal depending on the region or social factors. There are both public and private schools, and in the latter the fees cuts students off. At the top-level education, English language and computing skills are required. (Desai et al., 2010, 22.) The increasing amount of young, aware and educated people make purchasing capable class with a need for improved infrastructure and more hygienic environment.
Federation of Indian Chambers of Commerce and Industry (FICCI) is launching a new channel to increase the knowledge and contacts in cleantech markets. The first India International Cleantech Summit is established in 2013 to provide a platform for stakeholders in cleantech business together. It aims to encourage global start-ups, SMEs and big companies to invest in clean technology in diverse sectors, and to network with other operators in the business. There are three pillars that the Summit leans on: policy, financing and markets. (Federation of Indian Chambers of Commerce and Industry.) This summit is a strong signal of that the authorities want to boost market growth in cleantech business and are searching for international businesses to invest in it. For Finnish companies, this is an outstanding channel to find best solutions and partners to enter Indian markets.

**Distribution channels.** The road networks in India are congested and the jams are increasing. Projection for annual cargo traffic growth is 15 %. The National Highway Development Program (NHDP) is planning over 200 projects with over 13 000 kilometers to improve the transportation circumstances. Some states are having their own road construction programs, with smaller scale than the national program is. Railways are deficient and the transportation capacity is constrained, and the government has recently executed large-scale investments to progress railroad condition. Some 40 % of the financial support came from private sector. There are also plans to construct cargo railroads between the million cities Delhi – Mumbai and Delhi – Calcutta. Indian Railways is searching private partners to modernize railway stations and there are also plans to build logistic parks for new industries, and manufacturing plants for rolling stocks near the railways. (PriceWaterhouseCooper India, 2008, 10.)

Ports in India are facing challenges with their capacity to handle increasing amount of cargo. Traffic was estimated to reach 900 million tons in 2012, and the annual growth in cargo is 15 %. The ports are insufficient to handle this, even if they are recently modernized. The National Maritime Development Programme includes 276 projects, and there is invested over 15 billion US
dollars in this program until 2020. Airports (PriceWaterhouseCooper India, 2008. 10.)

**Major market trends.** India has a lot to do when improving its competitiveness in manufacturing. Many Asian countries have achieved better benefit of their capability and passed India in terms of manufacturing sector share of GDP. Many Asian countries have successfully transformed agricultural workers to work in production, but in India this has not been a major trend. Labour remains unskilled and is not used with full force, and lack of taxpayers prevents the development of the society and infrastructure. Rules and regulations to start a new business are complicated and there are national and state-level procedures to obey, which are a notable burden for companies. (PriceWaterhouseCooper India, 2012. 5, 7.)

**Key success factors.** India is about to have the largest and youngest labour force the world has ever seen. This leads to a massive urbanization, and India is facing a globally unique crossroad situation. If the country succeeds to utilize the huge human potential effectively but still ethically, foreign investors will contribute a lot in the economy. The human resource development seems to be in a good condition, as only in 2005 – 2010 over 53 million workers have raised up from poverty. The World Bank is guiding Indian economy to an ascension with a “Country Partnership Strategy 2013-2017” program, which is the first strategy for the bank to reduce poverty and to increase shared prosperity. One of the goals is to improve infrastructure, which helps both: people moving to cities to work, and foreign companies to find suitable manufacturing properties more easily. Another goal is to improve girl education, and to support the Indian government to develop the social protection. These details assist foreign companies to find more skilled and motivated labour force. (World Bank.)

Currently industrial manufacturing is one fundamental pillar in the Indian economy. To raise the country’s competitiveness in global business environment, the government has created “National Manufacturing Policy” (NMP) to improve the production circumstances. The aim of this policy is to increase the role of manufacturing in the GDP 9 % unit until 2022 and to create 100 million new jobs. Some key factors in this policy are to establish manufacturing zones, to encourage the establishment of SMEs and promotion of green manufacturing. (PriceWaterhouseCooper, India 2012, 4.)

Together with changing policy towards investments and industrial zones the growing amount of skilled labour will lift India up for a potential market area for foreign companies. Not only the growing demand of waste management systems, but also the possibilities to manufacture equipment in the country and deliver them locally offer Finnish companies almost endless markets.

**Advisable export methods** in India differ from the ordinary selection list. In India, a foreign company can establish a branch, project agency, representative agency, joint venture or subsidiary. Ownerships and legislation are com-
complicated in different business types, so the best option is to establish a representative agency. This agency is not allowed to make profit itself, but the parent company is.

4.4.16 Expert analysis of India.

*The expert comments are collected from Mr. Chandrashekar Challagonda, Indian engineer who has lived in Finland for several years. His relatives are involved in waste management business in India, and Mr. Challagonda has good personal view of waste management condition in both countries.*

In India, the waste management does not concern only domestic waste, but one big issue are retired US navy ships. Those are brought to India for dismantling and drowning in Indian waters. Working conditions or environmental views are not on proper level, but recently there has been bans for making business with this sort of waste management.

In India, waste management is a multibillion-dollar business. The government is concentrating in biggest cities, which generate most waste. In these cities, waste management companies are involved in this business but there is a still lot of need for foreign contribution as well. Waste sorting and management process in India goes as follows:

Consumers and companies throw all waste in one trash bin; there are no sorting possibilities for organic waste, metal, glass or plastic.

Public administration (governmental or local) is responsible to arrange waste transportation to companies.

Companies separate different waste types. Most often this phase is done manually, even though presently machines separate plastics.

Metal, glass and plastic are recycled. Organic waste is decomposed and fertilizer companies reuse it as their raw material.

The rest of waste is sent to landfills.

Mr. Challagonda considers lack of proper landfill sites as one major problem in Indian waste management. Other challenge is to find appropriate labour to do manual waste sorting and develop their working conditions more safe.
4.5 Networks in Finnish cleantech business

This chapter studies the purpose of business networks and answers, do Finnish cleantech companies have a need to cooperate in foreign markets.

Many Finnish waste management cleantech companies are small or medium sized, and for them it is difficult to enter foreign markets by themselves. When finding one or several business partners, they have more opportunities to offer waste management solutions for clients. If a network of companies can offer the whole product/service chain e.g. from biodegradable organic waste bags to waste containers and yet all the way to bio fuel production, the network has know-how and relations from several sections. This lessens the risk of failure and eases trading in distant market areas.

4.6 How to create a functional network

According to Hakanen, Heinonen and Sipilä (2007, 28-30) to create a long-term a successful business network, is a multi-phase project. It requires a deep consideration of common benefits, partner’s business fields, business idea and special competences (e.g. knowledge of a certain market area.) The desirable achievements have to be determined in the beginning, and the end of the network project should be clear for each party. App. 30-70 % of business networks fail, due to e.g. lack of communication, different visions of the final advantages, and unclear rules or expectations.

The strategy is vitally important and should be clear for each network participant. In the first step of creating network, all partners should evaluate their common and separate goals and analyse if they aim in the same result. It is important to understand that each partner in the network is different with own history, situation, resources, operating policy and so on. To ensure that each partner fits in the network, they should offer supplements for the network and get suitable goals. Company strategy has to be the basis for network plans, because it determines what are the resources and competences the company needs in the future and how it is going to get those. Networking strategy determines what types of networks and assist it needs to achieve long-term goals. (Hakanen et al. 2007, 30-31, 93.)

Some points to determine the goals of a network could be as follows:
1. Economical aspect:
   - Desired turnover
   - Desired profit
   - Invests, cash flow and financing
   - Spreading economical risks
2. Customer aspect:
   - Retailer relationships
   - Distribution relationship condition
   - Customer partnerships (amount, condition, development)
   - Service entity to satisfy customer needs
   - Customer loyalty
   - Reputation and visibility amongst customers

3. Process aspect:
   - Control over networks, partnerships and co-operations
   - Delivery time minimization
   - Stock volume
   - Possible new innovations
   - Ability to purchase acquisitions

4. Human capital aspect:
   - Inner co-operation
   - Improvement of core competences
   - Learning inside the network

(Hakanen et al., 2007, 153-154.)

In Finland there are several forums to find potential cleantech business partners, such as national Cleantech Finland and their expert service Solved. On provincial level there could be more forums, because at least small companies might appreciate local partners, easy and cheap ways to get familiar with them and also recruiting new talents. One solution to improve networking on local level, is to create districational activities. For example, the author of the thesis is planning to create a local department for Finnish Waste Management Association. These actions are based on voluntary work, but the advantage is that people and companies involved in this are truly interested in spreading cleantech know-how and networking.

4.7 Different types of business networks

Business networks can be divided in four different types, based on how they operate and what are their purposes. These types are:
   - Vertical networks
   - Horizontal networks
   - Business reforming networks
   - Innovation networks

Vertical and horizontal networks are so called basic business networks. They don’t create new innovations, but try to improve existing businesses. Vertical networks aim to increase their sales, improve customer satisfaction or product
quality or decrease stocks. In *vertical network* there is a leader company, such as car manufacturer. Because manufacturing all components and parts would be expensive and difficult to control, the manufacturer creates a net of companies to cooperate with it. All companies aim to deliver required parts to car manufacturer just in time and to the right place, and in different countries the network partners may vary, if local company can deliver the same parts. Partner companies get the advantage of often long-term partnerships and big manufacturing volumes. (Valkokari, Hyötyläinen, Kulmala, Malinen, Möller and Vesalainen 2008, 70.)

*Horizontal network* forms, when companies in same business branch find the advantage of uniting. Often the branch has tough competition and there is need to decrease costs. One example of this is alliances between flight companies. When companies unite, their target is cost-effectiveness and improved customer service. In Finland, many big retailer chains (S-Group, K-Group etc.) have horizontal networks with e.g. hotels, furniture sellers or mobile phone operators. Partners offer services, which the core business does not produce, and customer gets benefits when focusing most of purchases under one loyalty card. Partners get advantage of cooperation with a strong brand and loyal customers. Horizontal network requires common system to customer rewards and common marketing communication. (Valkokari et al., 2008, 71-72.)

*Business-reforming networks* are multilateral project networks, or networks to create tailor-made solutions for customers. These networks often are short-term, and have purpose and schedule. There is one leading partner, which gathers partners with special skills to solve a problem. The target is to reform business standards, like improvement of manufacturing process, logistical process or service-/ product package for customers. The leading company is not able to reform the existing business standard by itself, and needs expertise from partners to reform its own practices. Partners get the advantage of learning new practices amongst the first ones and by getting credits. The leading company has to trust all partners, their innovativeness and capability to create new solutions; if the control is too strict, it chokes innovative thinking. (Valkokari et al., 2008, 73-74.)

*Innovation business networks* are based on research results. Innovation business networks are crucial for the competitiveness of the society, and closely linked with universities or other research centers. Their purpose is to create new businesses, which might have demand in the future, or totally up-dating existing business practices. Business potential is strongly insecure, and involved companies or individuals market their visions for potential stakeholders. Innovation business networks are often based on a small group of partners who know each other from the past. If the innovation seems to have business potential, there is a need to search new partners to develop technologies, do marketing, or otherwise to improve market entry. (Valkokari et al., 2008, 75-78.)
Finnish cleantech companies might consider any of networking models, regarding on their product / service and the type of the company. For example, a company manufacturing waste containers might produce the products in the target country if it is in a distance. From Finland it needs suppliers to deliver high quality components and to supervise assembling; one supplier delivers bags inside the container and so on. This is an example of vertical network operating abroad.

4.8 Need for networking

In the research (page 19), some particular questions aims to study the need of networking. Some results point out that companies do not want to enter foreign markets by themselves. The reasons for this may vary.

Half (6) of those companies, which replied the questionnaire, think that they want to network with other for new markets. When asking, what kind of assistance companies need, one replied that it needs some kind of consortium. In the same question, one company told it needs “cooperation”, which can mean both – assistance from Exigo Oy or networking company.

When studying weaknesses, one company mentioned it has not enough human resources with adequate experience. Other company on the side could fill in the missing experiences. There were also mentioned small size, and again the same with other words “We are so small company, that it is not easy to go alone.” A big percent of companies truly feel that their small size requires other to enter foreign markets together, with a big volume that makes them more competitive.
5 DISCUSSION

The major purpose of this research was to identify the needs that Finnish cleantech companies have when entering foreign markets. Exigo Oy needs data from variable points-of-view, so this research studies the most potential market areas and need for networking with other Finnish operators.

There are many factors, which impact in export. In The European Union, the legislation is tightening up and landfills will be banned. Incineration alone does not solve the problem, as some waste types produce toxic emissions. Incineration does not encourage inhabitants to recycle raw materials. There is need for alternative waste management solutions and also need for exporting know-how, spare parts, maintenance services, equipment and so on. As the words of Egyptian Embassy indicate (page 65), “the whole waste management infrastructure in Egypt needs development.” The same concerns many other market areas as well.

Based on Porter’s Diamond Model theory, Finnish companies have several factors, which give them advantages in global markets. Education and know-how are on a top level. Industry structure has changed; previously the country was profiled as heavy industry producer, but especially Nokia and its subcontractors have created a new basis for high tech industry. This has improved the development of cleantech industries. The latter also impacts in related and supporting industries. Previous workers have established subcontracting companies and become entrepreneurs with their know-how. To improve export, Finland should strongly contribute in new innovations, such as TammerPower is, to create domestic markets for them and to give them opportunity to collect references. This would also impact in domestic employment rate. The worst scenario is, that competitors from other countries develop their own innovations, get references from their domestic markets and pass Finnish companies by.

Based on demand factor in Porter’s theory, Finnish domestic markets are not full saturated, but in a small country growing is hard. There are well-known operators with big market shares, and when a small company gets some evidence of the features of its products, it should network with others to expand the business abroad. In Finland waste management already is on high level, and new innovations (such as pipe waste management system) take time to replace old and functional systems. In Finland, pipe management systems are now built in new built-up areas, but must be aggressively marketed in foreign markets. It will take probably 20 – 30 years in domestic markets, before pipe management systems will replace current waste management systems. This affects also in firm strategy, structure and rivalry. In small domestic mar-
kets the product has no chances to evolve, when there is only a little end-use experiences. Competition and variable circumstances (climate, infrastructure etc.) also force companies to develop the product. All the factors in Porter’s theory point out, that Finnish cleantech companies must enter foreign markets to achieve growth and new innovations.

5.1 Differences between small / medium size and big companies

In Biowelfare 2020 report (page 9), the target for Finland is to create 40 000 new work places in cleantech industry. This big amount of new jobs need innovations and foundations for operations from the government, not only companies. As this thesis concerns business, not political view-points, the inquiry was made for 12 Finnish cleantech companies (page 16).

It can be concluded that the companies do have experience in their own special field; the need for assistance comes up when considering business abroad. Many companies are small / medium sized and do not have resources to enter alone. There is need for consultancy, local contacts or co-operators. Consulting companies have a big role to lower the threshold. Exigo Oy can assist companies with various details: from licences to contacts and so on. It is needed as an outsourced extra resource.

Big companies aim to enter big markets further away; China and other Asian countries were mentioned most. One big company is considering South America. One small company wants to collect experience first in familiar Nordic markets and then Asia, when is has more experience. Europe, outside of German speaking countries, was target for one company. German speaking countries are saturated with own companies; former Yugoslavia is a good market, as Finnish embassy in Serbia points out in their interview.

The open interviews of market area expert point out, how various details must be handled in each area. Avoiding corruption or finding local contacts to even start the business are some examples; the level of waste management differs vastly and local legislation dictates terms. In grass-root level many inhabitants have never recycled and there is a huge demand simply for recycling bins. Charts show that number of population is growing on most of the continents, more and more people get education and consumption increases. In this sense, a big company should be a leader in the “V of cranes” and smaller ones act as subcontractors or offer e.g. maintenance services. This “V of cranes” should be carefully planned and responsibilities shared before entering the foreign markets.

Advantages and disadvantages of different export methods and their selections, as well as competition strategies are explained on pages 28 - 35. Market area analyses are explained on pages 36 - 69. The best combination of each export operation must be planned individually, and consulting company Exigo
Oy has the required expertise to assist with them. The most important thing is to act immediately, as the competition and markets are quickly saturated with strong competitors.

5.2 Reliability of research results

No matter how carefully a research has been done, there is always a possibility of mistakes or research questions, which does not concern all interest groups. To minimize the mistakes and to define proper questions, the author first drafted research questions based on Exigo Oy wishes. After drafting the first questionnaire, the author polished it with thesis advisor assistance.

The informal research part is written in the beginning of each market area analysis. Persons with strong knowledge of local waste management situation explain how things are there, and what they think should happen to make it work properly. There were no exact questions, so they were free to tell what they found most important. The purpose was to maybe find weak signals from consumer-point-of-view, and on the other hand to explain the difficulties what waste management or cleantech might face. If this part would have been executed with strict questionnaire, there could have been a possibility of something that something the local expert think is important, would have been missing in the answers.

The research was implemented by e-mail, and it was sent to altogether 20 cleantech companies. 12 companies replied, which makes 60 % response rate. This is not adequate rate to make the research totally reliable, but it shows the tendencies, which Finnish companies want to point out when looking for networks or assistance. In this sense the objective of the research was reached, considering it from Exigo point-of-view.

It seems that small or medium size companies were more interested in answering the questionnaire. The reason for this is that they have a bigger need for networking than big companies do. Big companies already often have required contacts, or as it is with TammerPower concept, there already is a network of big companies with one innovative product. Yet, big companies mainly did not answer the questionnaire. Only 2 out of 12 responses came from big companies.

The combination of questionnaires, open interviews and area analyses gives the research diverse approaches in the research problem. They are all the best methods in a certain chapter. There might be some critique towards using various research methods, but they all have an own purpose when studying cleantech export opportunities and export methods.
5.3 Further research possibilities

In the future, as big and current research topic as cleantech can generate several new researches. There is need for corporate social responsibility and how companies world-wide organize their waste management. This cleantech research does not include renewable energy possibilities, which obviously is a growing business. One topic to update this research after a few years is next generation cleantech equipment – what is innovation today, is old tomorrow. Finnish cleantech innovations and how to market those abroad needs an own research. Future megatrends need networks and market researches to find their buyers. This research was made to serve consultant company Exigo Oy needs, but future researches can deal with also exporters, consumer behaviour or innovation developments.

5.4 Own reflections of the research

At the beginning of writing the thesis, the research problems were defined as follows:
Where are the most potential markets for waste management;
What kind of assistance Finnish companies need with exporting;
Is there need for networking with other companies from the same business branch?

The questions are defined concerning Exigo Oy’s needs when trying to find new customer companies for its consulting services. The purpose of the questions in the research form was to find out whether the companies need assistance and cooperation when entering foreign markets, and what kind of assistance they mainly are looking for.

The current situation is, that green values are a growing trend globally and have huge markets. Finland has a lot of know-how and innovative technology, but yet exporting is not on required level. The government of Finland has set cleantech business in governmental program and aims to get it to become a locomotive of Finnish economy. Theoretical programs are not enough to solve all the problems that cleantech exporters meet; now there is obvious need for concrete acts to assist companies with practical issues. The current situation was risen up with EU legislative demands, Biotechnology 2020 report and The Finnish National Waste Management Plan. The author became familiar with huge amount of standards, tightening laws, consumer behaviour, cultural differences and infrastructure problems.

The company representatives, consultants or other people reading the results of this research, should note that to get the full advantage of results, one should follow continuously global economical situation and remember that technology develops all the time. These results are not valid after ten years.
anymore, as new technology takes over the markets and alternative end using methods for waste will born.

After establishing coalitions and getting market shares abroad, there should be a new research after a few years to study future market opportunities.
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