

# Green Business Case “Individual Waste Water Package Plant Business in Areas of Outside Sewer Networks: A SME Approach”

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## Abstract

This study investigates the green business development case in Finland, which was born as a result of the Onsite Wastewater System Decree (OWSD) entered into force in 2004, changed in 2010 and totally renovated in 2011. The study concentrates on the SME companies producing and selling equipment and services related to the individual waste water package plants. The business development is observed as a SME based business opportunity with great potential, but heavily influenced by the external factors like the legislation, the political climate and the recent economic recession. The business development is measured by new product performance indicators. The results show the real business volume of this niche green business field, the overall business development trend and SME managers' experiences and understanding about the external factors during the operational years of the decree in 2004 -2010.

**Keywords:** Green Business, SME, Water Waste.

## 1. Introduction

Companies play an essential role in greening the economy, as they offer for clients products and services that help conserve the environment. The key word is green business. Green business is not a separate technology, preferably a combination of various technologies and innovations that together produce the processes, products and services that reduce the negative environmental impact. Every technology field is a potential engine of the green economy and innovations.

As known, green business is very dependent on the European Union and national level environmental legislation, makes green business quite steadily developing. The strong legal impact gives for this green business solid basement and good opportunities to forecast the future by following up directives and legislation initiatives in the EU and national level.

In Finland a decree “Treating Domestic Wastewater in Areas Outside Sewer Networks (542/2003)”, which is also called the Onsite Wastewater System Decree (OWSD), entered into force in 2004. The aim of the Finnish Government behind the decree was to reduce remarkably the environmental load of domestic wastewaters by the year 2017 and to improve the condition of the Baltic Sea. All the new buildings should have to fulfill the requirements of the Decree immediately and old wastewater systems should have to fulfill the requirements before 2014. Later, the Decree was changed in 2010 and totally renovated 2011 (Government 2003, 2009, 2010).

Markets and demand are the drivers of all business, including green business. The purpose of this study is to analyze the business case in Finland concerning individual waste water package plant business in areas of outside sewer networks during 2004 - 2010.

From the originality point of view the study contributes to empirical research which shows by a case study the complexity of the green business issue from the micro and small companies' and entrepreneurs' point of view.. The study indicates the meaning of the changes in the external business environment and political climate. So far the research and discussion of the topic has been

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concentrated in to the functionality-non-functionality of the technologies and the possibilities and limitations of the different technological solutions.

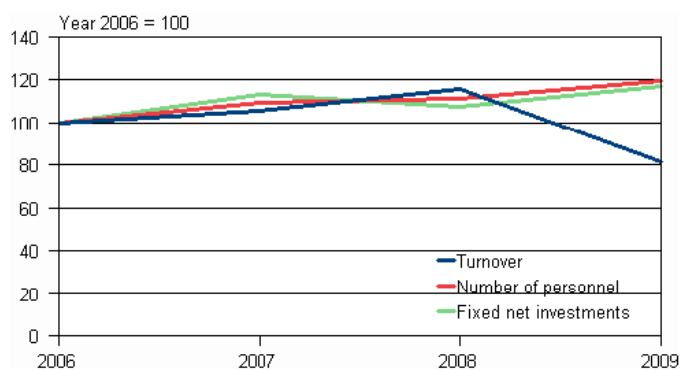
The Case Framework and Literature Review chapter provides an overview of the business framework related to the case in Finland and the aspects of innovation management, which is applicable to the case. The subsequent chapter introduces the methodology and hypothesis setting. In the final chapter results, outcome and implications for practicing managers are highlighted.

## 2. Case Framework and Literature Review

### 2.1 Business Volume – Early Forecasts and Current Situation

In 2009 the total turnover of all companies in Finland operating in the environmental goods and services sector was 1.61 billion euro. The turnover fell by 30 percent from the previous year while the number of personnel as well as investments continued to show growth. These data derive from the new statistics on environmental goods and services sector compiled by Statistics Finland (Statistics 2010). The statistics comprise data on enterprises operating in the environmental and services sector as their principal activity. Environmental business activity refers to activity related to production that is based on environmental pollution prevention or the saving of natural resources. From this group of companies we will identify those SMEs, which operate in the individual waste water package plant business in the rural areas and we

**Figure 1** Change in the turnover, number of personnel and investments of industries in the environmental goods and services sector in 2006–2009 (Statistics, 2010)



will introduce the volume and performance and highlight companies' opinions about the business development in the chapter Results and Outcome.

Finnish citizens, 5,4 million people, and companies pay currently some five million euro daily for freshwater and wastewater treatment (Poutiainen 2010). In 2005 it was estimated that there is a need for improvement or establishment of 250 000 household specific wastewater systems in rural areas with average construction costs of around 3 000 euro / system (varies between 1 400 - 10 000 euro). This means that the implementation of these policies equals with 750 million euro business in Finland during 14 years having about 20 million euro annual growth. The share of the planning business in this field would be about eight per cent (Kaarikivi-Laine 2003). Moreover, the operating and monitoring costs will be around 100 - 1000 euro / system / year (Etelämäki , and Kujala-Räty 2005). At the same time, according to the report of Santala, Etelämäki, and Santala (2003), Finland has about 450 municipal waste water treatment plants (WWTPs) of varying sizes. Within the years in the beginning of 21<sup>st</sup> century 110 WWTPs i.e. about 20 percent were closed down and they were merged to larger units. This has resulted in a marked with 2.1 percent yearly increase meaning to be a competing solution for the individual waste water package plant technologies.

But, in the beginning of the decree implementation the huge new business opportunity was foreseen in Finland: for 250 000 wastewater systems were notified meaning about 750 million euro technology investment and 100 million annual maintenance and service business. Business start-up activity developed throughout the Finland in the fields of planning, developing new technologies etc. New companies, departments and knowledge within existing companies were developed and new innovative technology and start-up companies were established. There were plans to establish regional clusters for this business field. First wave in the markets were waste water system planning companies and after that the technology providers with the standard waste water system plants and they operated mainly through big hardware stores.

In 2010 Ministry of Employment and Economy published in the report (Jääskeläinen 2010) that there are 24 companies working in the waste water treatment and purification field having all together 176 million € annual turnover and 476 employees. Average R & D investment

rate is 0,5 percent (high tech fields equal with an average of four percent) and annual growth rate was 10 - 15 per cent before the economic downturn. It should be pointed out, that all of these companies do not, anyhow, work in the rural area waste water business.

In spite of the promising business potential forecast before and in the early stage of the decree implementation, the business volume overview indicates that there has not been available clear data about the individual waste water package plant business as such or its success in Finland.

## 2.2 Innovation and Company Performance

Innovations and their commercial success have emerged as one of the critical strategic concerns of companies. Jaworski, and Kohli found out (1993) that market orientation has a positive influence on company overall performance, but Menguc, and Auh (2006) argue, that the market orientation might not be enough to generate superior performance; there is also needed complementary resources like high innovativeness. Innovation has been linked to cross sectoral performance in many studies (Hull 2004; Pauwels, Silva-Risso, Srinivasan, and Hanssens 2004; Sorescu, and Spanjol 2008).

To measure innovation performance, one must consider the financial and non-financial performance of a firm (Avlonitis, Papastathopoulou, and Spiros 2001; Gounaris, Papastathopoulou, and Avlonitis 2003). *Financial performance* refers to a measure of how well a firm uses assets from its primary mode of business to generate revenues. *Non-financial performance* is a long-term operational objective that emphasizes the importance of increasing customer loyalty, attracting new customers, and enhancing the image and reputation of a firm (Blazevic, and Lievens 2004). In this study we apply Moorman's (1995) *new product performance*, which is a degree to which organizational goals involving new product profits, sales and share have been reached. Briefly, it is a rate the extent to which the product has achieved the following outcomes: market share relative to its stated objective, sales relative to its stated objective, return on assets relative to its stated objective, profit margin relative to its stated objective and return on investment relative to its stated objective. We agree with Eisingerich, Rubera, Gaia, and Seifert (2009) that companies with focus on service innovation or service related processes have the potential for greater performance. We also share the opinion of

Cooper, and Kleinschmidt (2007) about the ten different performance gauges which were later reduced to two key performance dimensions - profitability and impact - which defined the "performance map", but regard it too wide in the micro and small business context.

## 2.3 Innovation and Other Success Challenges

We raise three overall challenges, which we regard important for this business field.

First, in general, the commercialization of the innovations in this field has succeeded relatively well in Finland, but the concentration on big variety of different technologies has also caused some confusion among buyers. There are dozens of onsite wastewater treatment methods and applications (Ruokojärvi 2007) but the problem is to find sufficiently impartial and concise informative material to compare systems in order to identify the best available solution for each individual customer. Individual waste water package plants, for example, are a relatively newly developed innovation in waste handling. Most units available today have been on the market less than 10 years. All sewage treatment systems require some degree of management and maintenance.

Second, like stated (Fane, Willetts, Abeysuriya, Mitchell, Etnier, and Johnstone 2004) the disaggregated nature of decentralized systems presents challenges because many different parties are involved in their use and operation: homeowners, installers, managers, inspectors, and regulators all play a role. Santala (2003) underlines that in Finland a prerequisite for the selection of an effective and site-specific treatment method is that the client hires a qualified designer who knows enough about the performance of different onsite treatment methods, both soil adsorption systems and prefabricated treatment plants. The customer or user must be an integral part of the entire development process of the productive innovation - from scoping, through product definition, development and right on to validation and beyond (Cooper, and Edgett 2008).

Third, operating in this business requires well operating high-tech equipment, and, as these kinds of products are relatively new in the markets, it can be expected that R & D plays important role in the business and R & D investments are essential. The products should pass the efficiency, durability and functionality tests conducted by authorities and official testing laboratory.

## 2.4 Waste Water Business – Forecast for Near Future

Most analysts in the USA predict that, just like last year, 2011 will offer a mixed bag of opportunities. Demand for new health care and educational facilities, transportation options, traditional and alternative forms of power, and water and wastewater treatment systems all seem to justify a relative degree of optimism in the markets (Shuster 2011).

In Finland the field in general has positive future scenarios, but there is nowadays and optimism and pessimism in this specific niche waste water business field. A business journal Kauppalehti (Trade Journal 2010) published company interviews, where the latest political development has seen as a reason for a total collapse even for earlier successfully performing companies where as journal Talouselämä (Economic Life 2011) reported about the top business man Heikki Salmela, business creator of fast-food business Hesburger, which is performing better than McDonalds in Finland. Salmela has sold and bought new waste water management companies and predicts that “something big is going to happen in Finland”.

## 3. Methodology and Hypothesis Setting

Case study is an empirical study that is applicable especially when the boundaries between phenomenon and context are not clearly evident (Yin 2003). Traditionally case study research includes qualitative evidence like data collected by interviews or participant observations. This case study can be regarded as a multi-strategy case study, because it combines quantitative and qualitative evidence (Eisenhardt 1989, Gummesson 1991). Gummesson (1993) also states that case study is for the better understanding complex phenomena like change processes and activities of individuals. The selected multi-strategy case study is also favorable for the triangulation; the comparison of the quantitative and qualitative data was carried out.

The purpose of the case study is to be close real life situations. Context-dependent knowledge and experience are at the very heart of case study. The case study is useful for both generating and testing of hypotheses but is not limited to these research activities alone (Flyvbjerg 2006).

The case has been selected on the basis of expectations about its information content. More precisely, the study

can be categorized as a deviant case, because it attempts to obtain information on the unusual case, which can be especially problematic or especially good in a more closely defined sense. For the sample selection the information oriented selection was used to maximize the utility of information from the case.

First, in this two-phase study project, we focused on the comparison of the databases and statistics to find out the total volume of the business case in Finland and will filter the companies, which exactly work in the individual waste water package plant business.

Second, in-depth-telephone semi-structured interviews were carried out among SME companies of this business field to examine the company new product performance and the impact of the decree and other external factors on their business during the years 2004 and 2010 and to shed light for the future perspectives.

The interview part of the study followed standard social science protocols, including creation and testing of the survey instrument (questionnaire), identification of the study population and sampling frame, development of the contact database and implementation of interview protocols. The questionnaire was built after the literature review and it was divided into question groups, each one dealing with different aspects of the topic. Relevant data, received from the interviewed companies through a questionnaire were to get sound and deeper conclusions confirming - or not - the literature based information. The interviews took place on March – April 2011.

### 3.1 Hypothesis Setting

As the case study entails the proximity of reality (Flyvbjerg 2006) the case framework and the literature review led to the testing of the following hypothesis:

H1: new product performance indicators enable to follow-up the realization of SMEs financial goals related to the Decree implementation

## 4. Results and Outcome

The reader should view the results in lights of the limitations of the study. Specifically, the amount of the used performance indicators is limited. Anyhow, the problem with a bigger number of measurements is that the perfor-

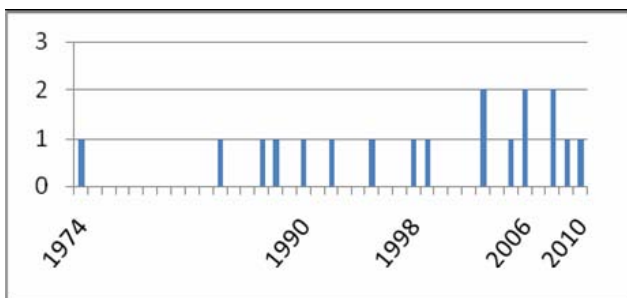
mance issue might become clouded—it is more complex and more confusing especially for the SME context.

The first phase of the study was carried out by comparison of statistical data and other databases and the second phase was to collect data by interviews. The results are presented in two groups as follows:

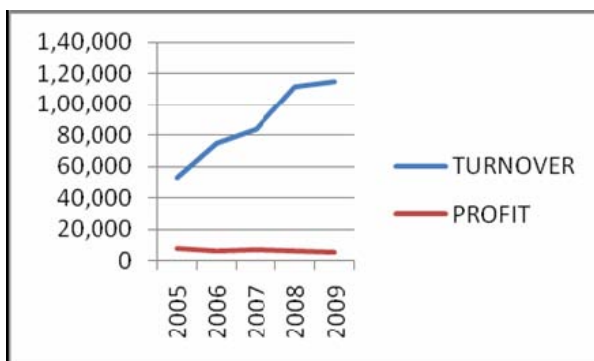
#### 4.1 Total Volume of Individual Waste Water Package Plant Business in Finland

The search by databases and statistics resulted to the following total volume: there are 18 companies operating in the individual waste water package plant business. Their establishment years are presented in the Figure 2. Among these companies are three big companies, which do not belong to the SME category according to the European Union's SME definition. Two of these companies have later gone bankrupt; both of them are SME companies. The total annual business volume in 2009, which was achieved by the individual waste water package plant business in 18 companies, including equipment and services, was 99 million euro. This figure, anyhow, must be regarded as an estimation, as some of the companies

**Figure 2** Company Establishment Year (n = 18)



**Figure 3** Turnover and Profit Development 2005 - 2009



work also in other business sectors and some of them has in the study conducting time stopped their operations and all details have not been available.

Companies established long before the decree became into force operated originally in other fields like construction, fertilizers production and plastics industry. These older companies still today have in their operations remarkably share of “old business” and the individual waste water management package plants still are a side activity or one of the side activities. The golden era of new start-ups was in 2000 - 2010.

In average 84 percent of the total turnover of the companies resulted from waste water package plants varying between 35 – 100 percent. The turnover was mainly collected by equipment sales and only four percent was of the services.

The business in turnover was developing rapidly like was expected, but profitability has not achieved the goals. But, it should be pointed out, that for the early years the profit goal was not the main goal, preferably the ultimate goals was getting market share and volume and develop technology further. Still the declined trend for coming years was not the expected situation. The next chapter, which introduces the results of the second phase of the study, financial data by the new product performance and collected qualitative data bring additional information behind this development.

#### 4.2 New Product Performance

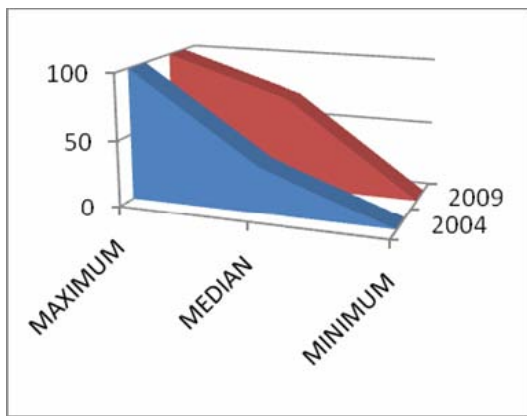
The presented results in the following chapters New Product Performance and SMEs' Managerial Experience about decree implementation are based on the interviews carried out among eight SME managers in March - April 2011 and are used as a primary data source for this deviant case. Like stated above, the total amount of the companies between 2004 – 2010 was 18. Of these three are bigger than SME category companies, two of them have gone bankrupt and five were not either available during the interview period or denied to participate the interview. All in all, eight SME managers were interviewed by telephone.

Each figure presents the situation in 2004 and 2009 as well as the company of best performance and of the lowest performance. Median describes the situation of a SME company “in between” the best and the lowest. The companies are not presented by their names because of

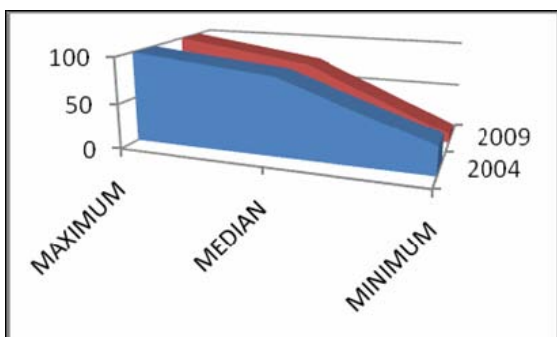
the confidentiality. Generally, the newer companies are keeping the lowest performance position.

In 2004 the original goal was not achieved. In 2009 the old companies achieved the goals well where as newer companies are lagging remarkably behind the goal.

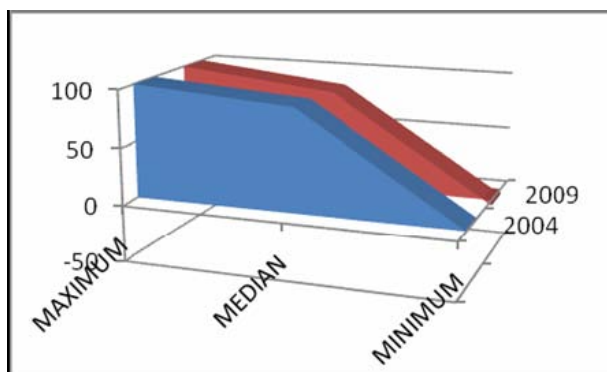
**Figure 4 Market Share Relative to Stated Objective 2004 and 2009**



**Figure 5 Sales Revenue Relative to Stated Objective 2004 and 2009**



**Figure 6 Profit Margin Relative to the Stated Objective 2004 and 2009**



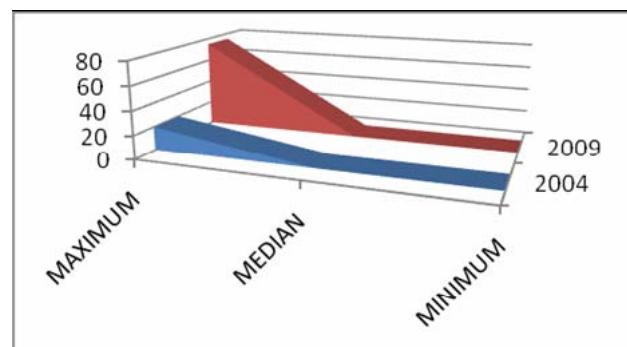
In 2004 in average 30 percent of the sales revenue was gained being a quite a disappointment. In 2009 the lowest performer gained only five percent of the sales revenue relative to stated objective.

In the first years the strategy of “ Zero Profit Margin” seemed reasonable for SMEs and they assumed that the profitability will certainly increase in coming years, in 2009 at the latest. But, like figure indicates, this was not the result. From the interviews we noticed, that this follow-up has been quite lagging behind in SMEs.

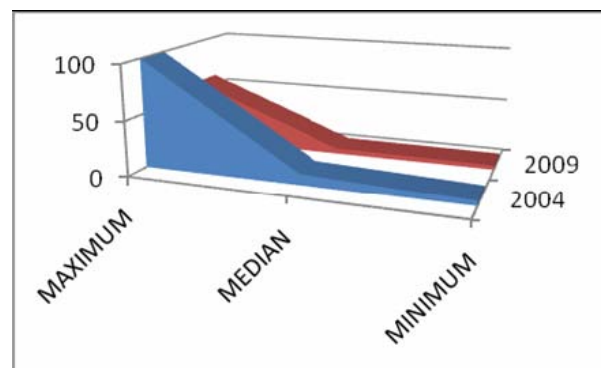
This result has some uncertainties because of the lack of use of ROI in the couple of the interviewed SMEs, but it can be regarded indicative.

All companies made long-term R & D collecting ambitious product families for different conditions and households in size. This, naturally, means heavy R & D investments and especially in the companies, which concentrated to

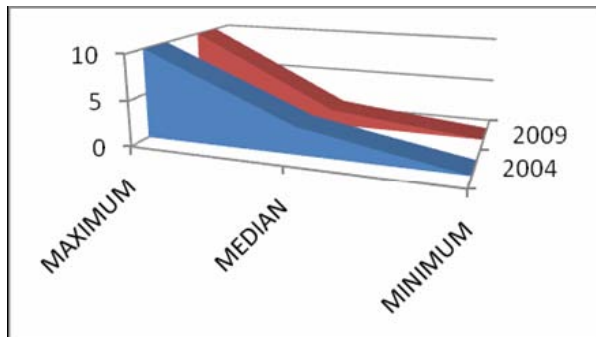
**Figure 7 Return on Investment (ROI) Relative to the Stated Objective 2004 and 2009**



**Figure 8 An Acceptable Level of Sales Revenue Given the Amount of R & D Financial Resources Invested in New Product Development**



**Figure 9** An Acceptable Level of Sales Revenue Given the Amount of R & D Human Resources Invested in New Product Development



work mostly in the individual waste water management package plant business. The ROI was planned “to be handled” during the forthcoming years and the remarkable amount of the profit was invested back in the R & D.

The results show the relatively big financial investments in new product development, in average 10 percent even among companies investing the less. The trend is declining between years 2004 and 2009. The bigger R & D investors were newcomers in the markets, some of them started from the zero having no earlier technologies in markets.

On the contrary, investments on R & D human resources can be estimated to be modest. Managers told that the work was mainly done as a parallel job of existing staff. The use of external expertise is obligatory in some extent: for testing the durability of the equipment (by VTT Technical Research Center of Finland) and for testing the purification efficiency (by Finnish Environment Institute). Still, the other use of external expertise is rather occasional than systematic.

Thus, the study was to test the hypothesis that new product performance indicators enable to follow-up the realization of SMEs financial goals related to the decree implementation. The only difficulties were in indicators ‘Profit Margin Relative to the Stated Objective’ and ‘Return on Investment (ROI) Relative to the Stated Objective’. The first was followed so retrospectively, that it might be seen useless in their daily business operations, and, the second is not familiar as every day tool among interviewed managers. To conclude, the data gathering concerning the new product performance indicators succeeded well. Taking for the testing new indicators for

the cases with similarities requires further investigations simply because of the characteristics of the SME management including much tacit knowledge.

The next chapter raises some key points from the SME managers, which appropriately support the collected quantitative data.

### 4.3 SMEs’ Managerial Experience about Decree Implementation

SME managers were aware that in a root level local inhabitants, customers, understood that the new decree means some unpleasant new constructions and costs and there have still been a lot of uncertainty about the suitable methods and technologies and when will be the right time to act. Many people are still today waiting for the clear information from the authorities, development of the systems and for lower prices. Furthermore, inhabitants living in sparsely populated areas wish to receive more financial aid (even if loans, grants and taxation cut-backs have been available) and informative support in planning and constructing their wastewater treatment systems. According to the answers of company managers they trusted on their own ability to manage with the customer uncertainty, at least until the change of the decree in the late 2009, when the implementation of the decree got more action time and caused postponement and backlog of orders – more wavering from the customer side. For some more companies the total renovation of the decree since 2011 may cause more trouble and they may have to shut down their business.

Managers considered the content of the original decree reasonable and it passed one parliament election and one municipal election without any political interest. But, among rural inhabitants and real estate owners was, anyhow, enough potential to win more of their sympathy and this was picked up as one of the themes especially in the True Finns Party for the 2011 election. Managers were of the opinion that this political persecution caused the change of the decree 2009 and later total renovation in 2011. One of the SME interviewees asked:...” if you know to which address I can send the invoice of this, I would be grateful...”

When the decree change came into force in 2009 there was already information available about coming renovation of the decree in 2011. This caused the situation where two

SMEs went bankrupt, three were sold to the big Finnish and foreign companies and two phased the situation that they should make a turnaround or other comprehensive changes. The one decided to change product assortment thoroughly and the second decided to shut down the business.

#### 4.4 Outcome

The outcome allows to learn about the green business in micro level – in this case in SME level – to have a look on their reality in the individual waste water package plant business, and at the same time, the outcome considers the bigger picture of this niche business in Finland and its takeoff and landing to the new and more challenging situation – at least from the SME point of view.

*The results of this study suggest that* the last years' changes in the business environment has hit harder to this special green business field than to the other green business fields in general. The reasons behind the failure were mostly because of 1) the ultimate trust of companies towards political and authority decision makers safeguarding stable enough business environment and 2) political actions with lack of responsibility and interest towards small business players.

It can be stated, that the decree has been widely faulted in Finland and has caused loss of entrepreneurs and new business. But, on the contrary, big players have made benefit of all of this. They have not taken such relatively big risks in R & D investments like SMEs and they have been able to compensate the possible miscalculations by the better performance of their other business operations.

Finally, green business in individual waste water package plant field is business just like any other and involves the same prerequisites for success as business in general.

#### 5. Acknowledgement

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The conference was hosted under the theme "Back to the Future: Changes in Perspectives of Global Entrepreneurship and Innovation".

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