

MARKETING STRATEGIES TO SUPPLY
WASTEWATER TREATMENT EQUIPMENT
FOR PULP AND PAPER PLANTS IN VIETNAM

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Equipment For Pulp And Paper Plants in Vietnam

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ABSTRACT

In this research, Vietnam wastewater treatment equipment used in the pulp and paper industry in Vietnam was analyzed. The primary objective of the research is to establish the feasibility analysis of the market of wastewater treatment equipment for pulp and paper plants. Then market strategies were recommended for the foreign firm to enter the market.

The Vietnam wastewater treatment equipment market was analyzed under the qualitative analysis. Through qualitative analysis the secondary data, the primary data which was collected the field research's interview are analyzed. Moreover, marketing tools and marketing strategy are used to make a theoretical structure for the thesis.

After analyzing the market situation the research recommended are given to give the business opportunities and how the foreign firm can do business in the Vietnam market.

Key words:

The Vietnamese pulp and paper industry, Wastewater Treatment, Pulp and Paper Industry;

LIST OF FIGURES AND TABLES

Figure 3-1: The pulp and paper manufacture process.....	13
Figure 3-2 Overview of Dissolved Air Flotation process.....	15
Figure 3-3 Biological treatment process	15
Figure 3-4: The PESTLE analysis	16
Figure 3-5: Porters' Five forces model	17
Figure 3-6: Developing the region centre concept in Asia-Pacific.....	18
Figure 4-1: Estimation of the pulp and paper industry in Vietnam from 2006- 2010	26
Figure 4-2: Vietnamese pulp and paper plants in 2009	27
Figure 4-3: The Five forces in the Vietnamese pulp and paper industry.....	35
Figure 4-4: Buying process of the small project.....	43
Figure 4-5: Tendering model of projects funded by ODA.....	44
Figure 4-6: Tendering model of projects funded by the Government	44
Figure 4-7: Tendering model in the ODA funded project	45
Figure 4-8: Tendering model of the BOT project.....	46
Figure 5-1: Strategy to approach the market.....	51
Table 2-1: Summary of Quantitative versus qualitative research (Svend Hollensen, 2004, p.144).....	6
Table 4-1: Strengths and Weakness of Big players	28
Table 4-2: Strengths and weakness of foreign medium size environmental companies	30
Table 4-3: Strengths and Weakness of local companies.....	31
Table 4-4: Ownerships of the pulp and paper plants in Vietnam in 2009	42
Table 5-1: Stakeholder analysis and management.....	58
Table 0-1: Vietnamese paper production and pulp production in 2007	74
Table 0-2: SWOT analysis two main WWT technologies used in the Vietnamese pulp and paper industry.....	75
Table 0-3: List of Vietnamese pulp and paper plants used Krofta WWT equipment	76

Table 0-4: Long list of medium size potential partners	77
Table 0-5: Questionnaires	78
Table 0-6: The wastewater analysis of 10 Pulp and paper firms in Hanoi areas (Based on average).....	80
Table 0-7: National technical regulation on the effluent of pulp and paper mills – QCVN 12: 2008/BTNMT	81
Table 0-8: Laws affect the WWT equipment applied in the pulp and paper industry.	82

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CONTENT

LIST OF FIGURES AND TABLES	II
ACKNOWLEDGMENTS	IV
1 INTRODUCTION	1
1.1 Background	1
1.2 Research objective, scope, questions and limitation	2
1.3 Theoretical framework	3
1.4 Research approach, methodologies and empirical study	3
1.5 Structure of the research	4
2 RESEARCH APPROACH AND METHODS	5
2.1 Evaluating the different research methods	6
2.2 Reason for choosing analysis method and ways of collecting the data	7
2.3 Ways to analyze and present the qualitative data	11
2.4 Summary of the research approach and method	12
3 LITERATURE REVIEW	13
3.1 Overview of the technologies and WWT equipment applied in the Vietnamese pulp and paper industry	13
3.2 Market analysis tools	16
3.2.1 Situation analysis	16
3.2.2 Market segmentation and segment selection	17
3.2.3 Market entry approach	18
3.2.4 Marketing strategy	18
4 MARKET ANALYSIS FOR SUPPLYING THE WASTEWATER TREATMENT EQUIPMENT TO THE VIETNAM MARKET	20
4.1 Vietnamese situation analysis	20
4.1.1 Vietnamese macro environment analysis	20
4.1.2 Micro environment analysis on the Vietnamese WWT equipment market for pulp and paper industry	26
4.2 Market segmentation and segment selection after the field research	35
4.2.1 Understand of the WWT market for pulp and paper industry in vietnam after field research and empirical study	36

	VI	
4.2.2	Market segmentation and segment selection	41
4.3	The risk and challenge in the market	48
5	RECOMMENDATION STRATEGY TO SUPPLY THE WASTEWATER TREATMENT EQUIPMENT INTO THE VIETNAM MARKET	50
5.1	Business opportunities in the Vietnam market	50
5.2	Stategy to approach the market	51
5.3	Marketing strategy	55
5.3.1	Building competitive advantages	55
5.3.2	Stakeholder analysis and managements	57
5.4	Risk management	64
6	CONCLUSIONS	68
	REFERENCE LIST	70
	APPENDICES	74

1 INTRODUCTION

1.1 Background

Vietnam locates in the eastern margin of the Indochinese peninsula, with China, Cambodia, and Laos. Vietnam is the world's 13th largest country with population of 90 million people. The average growth rate of Vietnamese real gross domestic product was 7.1% between 1990 and 2009. (ADB, 2009a, p.1) The development of Vietnamese economy has resulted from the development of an industry. In Vietnam, the industry bases on manufacturing industries which account for 83.8% of the total value of industrial output. (Chi K. Ngo, 2008, p5) However, manufacturing industries in Vietnam use out of date machines and technologies. About 60 -70% of Vietnamese manufacturing industry products is produced by the out of date technologies. (Chi K. Ngo, 2008, p5) Backward technologies in the manufacturing industry have caused high consumption of material, energy thus higher price and serious pollution in Vietnam.

Among these polluting industries, a pulp and paper industry is one of the most polluting industries in Vietnam. Vietnam has 500 pulp and paper plants and only 10% of the plants meet environmental standards. The Vietnamese pulp and paper industry uses a large amount of input and output material compared to other industries. Besides, technologies applied in paper plants in Vietnam are out of date, 98% of the production equipment is old and needs upgrade. The low technology applied in the pulp and paper industry wastes a large amount of clean water. About 200-600m³ is used when producing one ton of paper. Moreover, the pulp and paper industry has the typical feature that the amount of draingane water is the same as that of the input water. (Innovation Norway, 2009, p206)

Most pulp and paper plants in Vietnam do not have WWT systems or the WWT systems are not efficiency and cause pollution. (Habubank Security, 2009, p.6).

So that a market of wastewater treatment equipment (WWT) used in the Vietnamese pulp and paper industry is huge and potential.

In recent years, Vietnam has aimed to increase the capacity of the pulp and paper industry to meet domestic demands on papers. In 2010, the pulp and paper industry in Vietnam supplied 70% of domestic requirement and 74% of cover paper. (vppa.vn, 2011) In order to produce 1.4 million tons of paper and 600,000 tons of pulp, each year Vietnam will need 400 million m³ of water and 640,000 ha of forest materials. (Chi K. Ngo, 2008, P19) The more pulp and paper produces, the more WWT equipment is needed.

Moreover, the demand of the WWT equipment will increase along with the development of Vietnamese environmental laws. The environmental law requires more investment from pulp and paper plants in the WWT equipment to meet the environmental requirements. Hence, the pulp and paper plant should upgrade their WWT systems to meet the new conditions.

1.2 Research objective, scope, questions and limitation

The primary objective of the research is to establish the feasibility analysis the market of the WWT equipment for the pulp and paper industry. And then create the market strategies for the foreign firm to enter the market of the WWT equipment for pulp and paper plants in Vietnam.

The main research questions:

- Which business opportunities are there in the market of WWT equipment for the Vietnamese pulp and paper industry?
- Which WWT technologies can offer to pulp and paper plants in Vietnam?
- How to enter the market and supply the WWT equipment for the pulp and paper industry in Vietnam?
- Which marketing strategies can be applied to enter the Vietnam market?

Limitations:

This research was carefully prepared, the researcher aware of its limitation and short comings.

First of all the research was conduct on the market that information is not up-to-date and some information is hidden. As a lack of data from large number of variables information, the researcher uses the qualitative research to analyze the market. Since the research was done by a qualitative research and most of data will be collected by analyzing the market data from other sources and personal interviews.

Secondly, the research was conducted by the researcher herself, it is unavoidable that in this study, certain degree of subjectivity can be found. In fact it would have been sort of objective.

1.3 Theoretical framework

To enable understandings of the market for the WWT equipment used in the pulp and paper industry, in this research a theoretical discussion of the market opportunity will be presented in three stages:

- A market's situation was analysed by using PESTLE framework, Porter's Five Forces of competition
- A market segmentation and segment selection was used to find the best segment for a foreign firm to enter the Vietnamese market.
- Recommendations to enter the market were given through market entry approach and marketing strategies.

1.4 Research approach, methodologies and empirical study

In the research, the researcher uses the qualitative analysis to analyze the market.

The qualitative analysis was conducted under three main stages:

- The first stage of the research was spent on collecting secondary data about the Vietnamese WWT market for pulp and paper plants. The market's data were collected from reports, articles, newspapers and internet sources.
- The second stage of the research was implemented in May and middle of June of 2011 in a field research trip.
- The last stage was an analysis data and recommended the business opportunities and marketing strategies to enter the market.

1.5 Structure of the research

Main contents of the research were included 6 chapters as follow:

Chapter 1 introduces the background of the research, a brief introduction about Vietnam pulp and paper industry. The aim, the scope of the research and the structure of the whole paper are represented. In this chapter, theoretical frameworks applied in this research are introduced.

In Chapter 2, a research approach and a research method are introduced. The qualitative method is also evaluated and analyzed in this chapter.

Chapter 3 is a literature review part. In this chapter, an overview of the technologies applied in the Vietnamese pulp and paper industry is introduced. After that, the market analysis tools are represented such as PESTLE framework, Porter Five Forces of competition, Segmentation analysis.

Chapter 4 provides a market analysis for supplying the WWT equipment. The macro environment analysis, micro environment analysis, market segmentation, and risk analysis were introduced in this chapter.

Chapter 5 gives recommendation market entry approach and market strategy for the firm when they enter the market

Chapter 6: Conclusion

2 RESEARCH APPROACH AND METHODS

The term 'research' refers to "A systematic process that includes defining, designing, doing and describing an investigation into a research problem" (Maylor, H. and Blackmon, K. 2005, p.4)

Two major types of information in marketing research are primary data and secondary data.

- Secondary data: these can be defined as readily available information that has already been collected for other purpose. The major disadvantage is that the data are often more general in nature. The advantages of secondary data are the low cost and amount of time associated with its collection. (Myers, M. 2009, p.8)

If the market research questions are not answered by the secondary research. It may need to be searched for additional information in primary data.

- Primary data: can be defined as information that is collected first-hand, generated by original research to answer specific current research questions. The major advantage of primary data is that the information is specific, relevant and up to date. The disadvantages of primary data are the costs and amount of time associated with its collection. Primary data can be collected by qualitative and quantitative research.(Myers, M. 2009, p.8)

The quantitative research methods were originally developed in the natural sciences to study natural phenomena. Quantitative methods now's well accepted in the social sciences include survey methods, laboratory, experiments, and formal methods. Most quantitative researchers use statics tools and packages to analyse their data.

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural. Qualitative data resources include observations and participant observations, interviews and questionnaires, documents, texts, the researcher impressions and reactions. Qualitative research is the best methods to apply when the researcher wants to study a particular subject in depth. A major disadvantage of qualitative research is that it is often difficult to generalize to a larger population. (Myers, M. 2009, p.8)

2.1 Evaluating the different research methods

Quantitative and qualitative techniques can be distinguished by the fact that quantitative techniques involve getting data from large, representative group of respondents. The objective of qualitative research techniques is to give a holistic view of the research problem, and therefore these techniques must have a large number of variables and few respondents. Qualitative methods are important because research in business and management deals not only with organizations but also with the people in them. (Maylor, H. and Blackmon, K. 2005, p.345)

Table 2-1: Summary of Quantitative versus qualitative research (Svend Hollensen, 2004, p.144)

<i>Comparison dimension</i>	<i>Quantitative research</i>	<i>Qualitative research</i>
<i>Objective</i>	To quantify the data and generalize the results from the sample to the population of interest	To gain an initial and qualitative understanding of the underlying reasons and motives
<i>Type of research</i>	Descriptive and or casual	Exploratory
<i>Flexibility in research design</i>	Low (as a result of standardized and structured questionnaire: one-way communication)	High (as a result of the personal interview, where the interviewer can change the questions during the interview: two-way)

		communications)
<i>Sample size</i>	Large	Small
<i>Choice of respondents</i>	Low	High
<i>Data analysis</i>	Statistical summary	Subjective, interpretative
<i>Ability to replicate with same result</i>	High	Low
<i>Interviewer requirement</i>	No special skills required	Special skills required (an understanding of the interaction between interviewer and respondent)
<i>Time consumption during the research</i>	Design phase: high (formulation of questions must be correct) Analysis phase: low (the answers to the questions can be coded)	Design phase: low (no 'exact' questions are required before the interview) Analysis phase: high (as a result of many 'soft' data)

(Hollensen, S. 2005, p.144)

2.2 Reason for choosing analysis method and ways of collecting the data

In this research, the researcher used the qualitative analysis to analyze the market environment. The reason for using the qualitative data is the information about the Vietnamese pulp and paper industry is not enough and normally out-of-date. Therefore, the researcher applied the qualitative method to analyze the market. In this research, the qualitative analysis was conducted through three main stages:

- Collecting secondary data
- Field research trip
- Analysis stage and recommendations

In the first stage of the research was spent on collecting secondary data about the Vietnamese WWT market for pulp and paper plants. The market information was collected from reports, articles, newspapers and internet sources. One main goal of this research is giving an up-to-date overview of the current WWT market for pulp and paper industry in Vietnam. So that the information used in this research should be required as much up-to-date as possible. Some articles found are out-of-date and invalid because they are introduced from the early of 2000's while Vietnam market conditions are changing very fast. Local newspapers were also used to gather up-to-date information. However, Vietnamese newspapers are not the most reliable sources because wastewater pollution is a hot topic in Vietnam. The information about wastewater in the pulp and paper industry is always hidden and not easy to collect the true information. Therefore the researcher had to be careful with the information which was provided by newspaper and double check the information. The articles, reports, newspapers and internet sites did not supply all the needed information used.

The secondly stage was implemented in a field research trip conducted from the end of May and middle of June in 2011. The data collected by interviews was therefore done for two purposes.

- To verify whether the collected information was valid and up-to-date.
- To gather missing information or information from secondary data that was not found in any of the three sources listed above.

In the field research trip the personal interviews were used to collect information about the WWT market for pulp and paper industry in Vietnam. Individual interviews involved talking with people in their homes or offices. The personal interview was quite flexible and the researcher could collect a large amount of information. The interviewer should hold a respondent's attention for a long time and can explain difficult questions. The selected interviewee was a person with considerable knowledge of the problem.

In the field research, the timetable for the interview was planned beforehand and the goal to contact and discussion with people who work in a pulp and paper field

in Vietnam. This research method might have challenge with the business people having lack of time or changing schedules so that the interviews might be cancelled. There is also possibility that the pollution matter related to pulp and paper as one of the most pollution industries in Vietnam might cause some limitation in the interviewing phase and the information supplied is not in written form.

The interviewees in the field research were people who directly work and have experience of Vietnam pulp and paper industry. Interviewees can be group into three main groups:

- The first group is a group of officials and authority people who have considerable knowledge of the pulp and paper market for example the specialist works in environmental field or institution.
- The second group is customers who come from pulp and paper companies. This group including people who work in pulp and paper plants in Vietnam.
- The third interview group is a group of people who work in companies' supply the WWT equipment. This group includes some foreign company and two local companies who do business in Vietnam wastewater market and supply WWT equipment for pulp and paper plants.

The first observation and interview with the pulp and paper company took place in Vietnam during the field research in May – June 2011. The field research's objective was to have 10 – 15 interviews with managers of pulp and paper plants in the North and the South of Vietnam. One interview was estimated at half an hour and was recorded. The topic of the interview was sent to the interviewee in advance.

The second interview took place in Finland with the support of Finpro and through the Cleantech's Expo from 12 to 13 of October 2011 in Lahti, Finland. By interviewing and discussing with Finnish companies, the researcher had another

view of the Vietnamese WWT market from the foreign company's point of view when they do business in Vietnam.

The questionnaires for the interviews are listed in appendices table 0-5 of this research. The choice of potential customers for the interviewing was done after the first segmentation of the market explanation. The questionnaires were planned so that they seek the answers to the research questions. The interview with the officials and authority in Vietnam would answer the question such as:

- What regulations and laws are concerning WWT technology in Vietnamese pulp and paper industry?
- What policies are there to support the investment in WWT equipments in pulp and paper plants?

The interview with Vietnamese potential customers would answer these questions:

- What are the main products and the WWT system of company?
- What buying criteria of the WWT equipment that the customer might require?
- What is the decision making process of customers when buying new WWT equipment?

The interview with specialists and companies who work in WWT market might answer some main questions?

- What current WWT technologies are applied in the Vietnamese pulp and paper industry?
- How potential the market is? And the strategic of companies when do business in Vietnam? What kind of competition is there in the market?
- How did the company build up their relationship in Vietnam market?
- What are the criteria of companies when choosing the potential agent in Vietnam market?

- What challenges companies have to deal with when doing business in Vietnam?

The third stage analyzed the data by applying structured analysis of the qualitative data. Once the data was collected the qualitative analysis is taken place at the same time. Many researchers consider that it is a mistake to go on accumulating data without examining it from time to time to see if any major themes or patterns are emerging. For that reason the data should be gathered in the process known as ‘progressive focusing’. If this process is not done, the researcher risks becoming swamped in data and it become increasingly more difficult to analyze. Another main problem in qualitative work is having too much data rather than not enough. After progressive focusing stage, most qualitative researchers can arrive at a point where their data has to be organized in some kind of systematic way, if only for analytic purposes. In this point, researcher should manage collected qualitative data carefully. (Maylor, H. and Blackmon, K. 2005,)

2.3 Ways to analyze and present the qualitative data

In a structured analysis of the qualitative data, the researcher compared the findings to a conceptual framework that the researcher developed or found in the literature part. This structure helped and guided the researcher’s analysis and the interpretation. However, this structures still allowed the researcher to identify those aspect of the research evidence that differ from what other researchers have previous found. (Maylor, H. and Blackmon, K. 2005, p.351)

Researcher should make sure that data is traceable, reliable and competence.

- Traceable: Researcher must be able to demonstrate where a particular piece of data came from.
- Reliable: The researcher’s transcripts or other records must faithfully record researcher discussions or observations.

- Complete: The researcher should keep all their field notes, tapes and transcripts.

(Maylor, H. and Blackmon, K. 2005, p.345)

One main difficulty of the research was time limitation. For this reason, the researcher considered to taking a more structured approach to analyzing the qualitative data. Instead of trying to induce everything from the researcher's data, the researcher used the concepts or conceptual frameworks from the literature part to structure the data analysis and the interpretation of the data.

2.4 Summary of the research approach and method

The research was conducted with the qualitative approach through three stages.

- A collection secondary data stage: data was collected through internet sources, articles and reports that related to the Vietnamese WWT equipment market.
- A field research stage was took place in the end of May to June 20011. The primary data was collected by observing market, visiting pulp and paper companies, interviewing people work in pulp and paper industry in Vietnam and interviewed some companies in Finland.
- The third stage analyzed the data by applying the structure analysis of the qualitative data.

3 LITERATURE REVIEW

In this chapter, an overview of the technology applied in the Vietnamese pulp and paper industry are represented. Then marketing tools are presented to give the reader's view of marketing tools that the researcher used to analyze the market.

3.1 Overview of the technologies and WWT equipment applied in the Vietnamese pulp and paper industry

Pulp and papers are manufactured from raw materials containing cellulose fibers, generally wood; recycle paper, and agricultural residues. The manufacturing process of the pulp and paper are including these main steps:

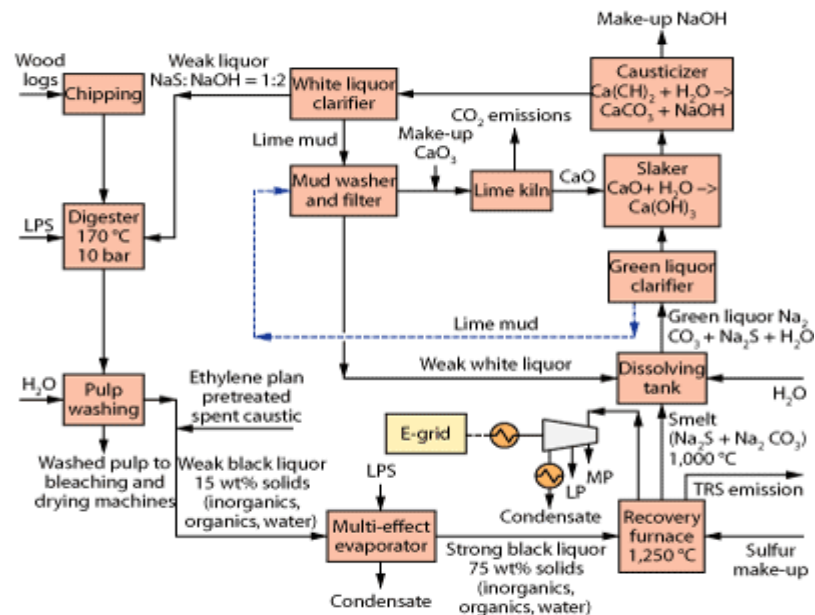


Figure 3-1: The pulp and paper manufacture process

(hydrocarbonprocessing, 2011)

In the pulp and paper industry, there are various points where the wastewater is generated. The wastewater can result from leaks and spills of digesters. A pulp washing and a bleaching gives the wastewater of various characteristics depending on the bleaching sequence. The bleaching section results in the wastewater and a chlorolignin. The wastewater is also generated from a paper machine section, a caustic chlorine manufacture and a black liquor recovery. There are variations in the COD, inhibitors and the degradability depending upon the source of the

wastewater. Some main characteristics of the wastewater generated from the pulp and paper industry can be referenced in the following chart:

Table 2 Main characteristics of the wastewater generated from the pulp and paper industry

Wastewater	COD (mg/l)	Degradation (%)	Inhibitors
Wet debarking	1300-4100	44-78	Tannins, resin acids
Pulping	1000-5600	60-87	Resin acids
Thermomechanical			
Chemithermomechanical	2500-13,000	40-60	Resin acids, fatty acids, sulfur
Chemical pulping	7000	~	Sulfur, ammonia
Sulfite condensate			
Chlorine bleaching	900-2000	30-50	Chlorinated phenols, resin acids
Sulfite spent liquor	120,000-220,000	~	
Kraft condensate	1000-33,600	83-92	Sulfur, resin acids, fatty acids, terpenes
Sulfite condensate	7500-50,000	50-90	Sulfur, organic sulfur

(water-observatory.net, 2011)

Chlorine bleaching effluents are not suitable for anaerobic treatment due to their low biodegradability and presence of toxic substances that affect the methanogens.

Phosphorus and nitrogen are also released into wastewaters. The main source of nutrients, nitrogen, and phosphorus compounds is raw material such as wood. The use of peroxide, ozone and other chemicals in bleaching makes it necessary to use completing agent for heavy metals such as manganese. (IFC, 1998) With high component of pollution ingredient inside, the wastewater from pulp and paper plants needs some special treatment methods.

In the Vietnamese pulp and paper industry, three main technologies applied in producing pulp and paper are Kraft (sulphate) pulping, Sulphite pulping and Mechanical pulping. (Habubank Security, 2009, p.6). Majority of pulp and paper companies in Vietnam use the mechanical pulping. In these companies Bai Bang Paper Company and some new paper companies have the technology to reclaim chemicals but these technologies are not complete. Tan Mai paper is a only company that uses the thermo-mechanic technology in Vietnam.

The wastewater from pulp and paper industry in Vietnam is treated by many technologies, but in this document, the researcher mentions two main technologies are Dissolved air flotation (DAF) and Biological aerobic treatment process.

Dissolved air flotation is a well - known method of particle separation. In this method micro bubbles are created by dissolving air into water under pressure. Air is then released to atmospheric pressure in the floatation cell. When the air saturated pressurized water is released, micro bubbles are formed. Suspended solids and colloids attach to one another, or to air bubbles due to chemical, physical and electrical forces. These particle flocks then float to the water surface and are scalped off. The removed sludge will be pours into the stationary centre section from where it is discharged by gravity for either recycling or disposal. (Krofta Engineering, 2011)

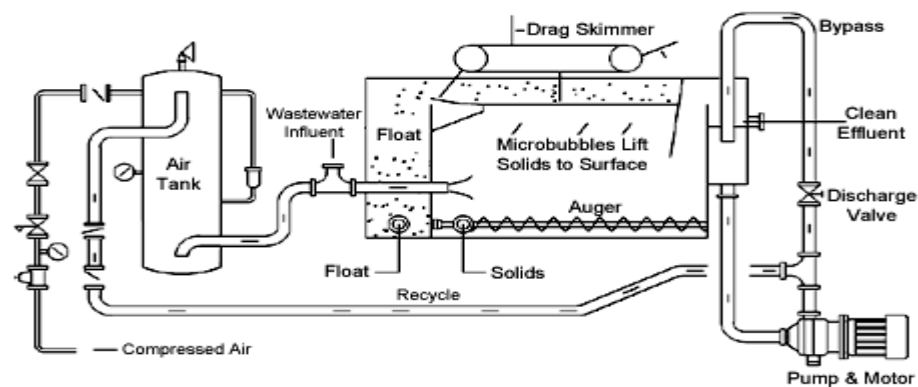


Figure 3-2 Overview of Dissolved Air Flotation process

(DAF, 2011)

Biological treatment is including Anaerobic and Aerobic processes. Biological WWT is an extremely cost effective and energy efficient system for the removal of BOD (Biological Oxygen Demand), since only micro-organisms are used. These feed on the complex materials present in the wastewater and convert them into simpler substances, preparing the water for further treatment. (oviowater.com, 2011)

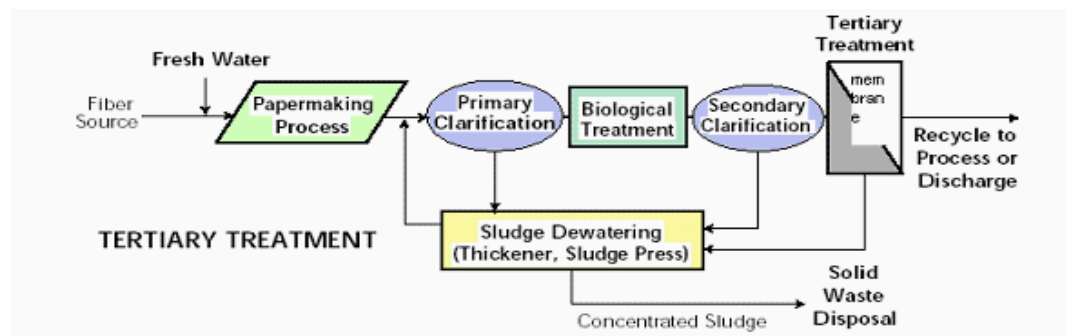


Figure 3-3 Biological treatment process

(Water Treatment Plant, 2011)

3.2 Market analysis tools

Before entering the market of WWT applied in the Vietnamese pulp and paper industry market, the foreign company should carefully research the market conditions. By using market analysis tools the company can have the market content and the strategy to approach the market.

3.2.1 Situation analysis

Macro environment analysis: Macro-economic environment including all factors that influence the market. To analyse the market factors, a PESTLE framework analysis is used to find out the context market where the company or product works on. In PESTLE analysis, six elements including Political, Economic, Social cultural, Technology, Legal and Environment.



Figure 3-4: The PESTLE analysis

PESTLE is used to review a strategy or position, direction of a company. Besides PESTLE gives a tool to company to see what is happening in the market (outside) that can affect what is happening inside an organization.

Micro environment analysis:

The Company can analyse the competition in the Vietnamese pulp and paper industry by using Porter five forces analysis.

“The Five forces model suggests that competition in an industry is rooted in its underlying economic structure and goes beyond the behaviour of current competitors. The state of competition depends upon five basic competitive forces.”

(Gary Armstrong, Philip Kotler, 2011,)

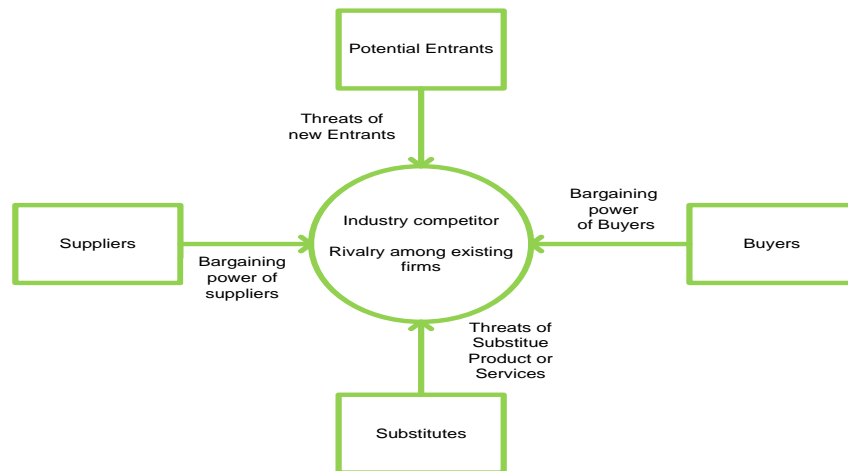


Figure 3-5: Porters' Five forces model

(Armstrong, G. and Kotler, P. 2011,)

Each of the five forces in the Porter's model in turn comprises a number of elements that combine to determine the strength of each force, and its effect on the degree of competition.

3.2.2 Market segmentation and segment selection

Market segmentation identifies similarities and differences between groups of customers. “Market segmentation divides a market into distinct groups of buyers who have different needs, characteristics, or behaviors, and who might require separate products or marketing programs.”

(Armstrong, G. and Kotler, P. 2011, p. 78)

In order to choose the suitable market segment the firm who want to enter the market should estimate the market segment opportunity. This process requires the firm or the company compares potential segments in which it may serve under

estimating the future attractiveness of each market segment, is that segment large enough and profitable enough to serve.

3.2.3 Market entry approach

When the firm got enough information about how the market works the firm can decide the market entry approach. How the firm can enter the market and how to utilize the business opportunity in the market.

Choosing the suitable entry mode is an important initial step when the firm enters the market. In this research, the research used a country-by-country approach together with developing a regional view (Lasserre, 1995) as a recommend entry mode strategy.

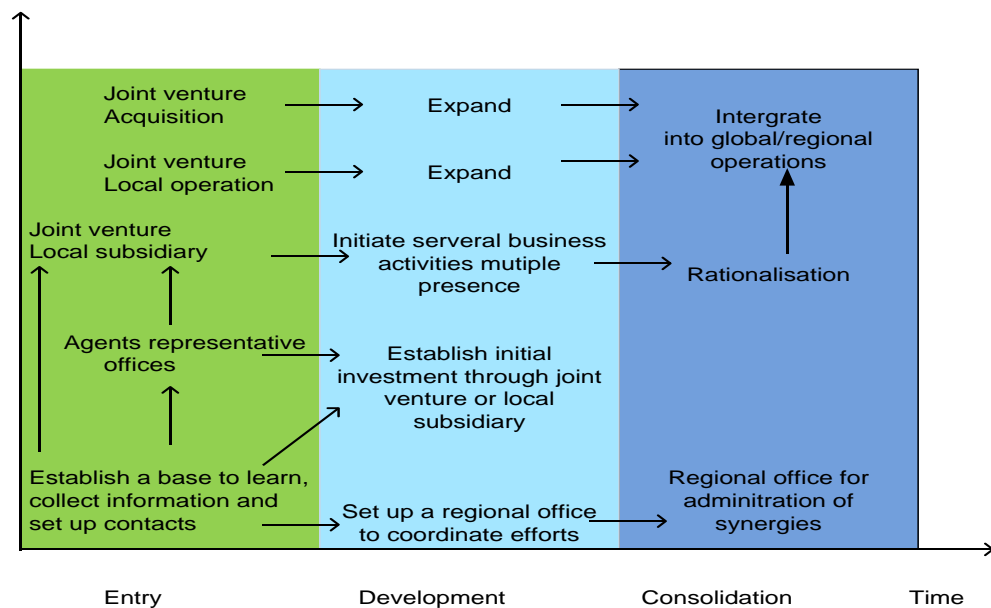


Figure 3-6: Developing the region centre concept in Asia-Pacific

(Hollensen, S. 2004, p.341)

The particular entry and pathway to development will depend upon the company's prior experience, capabilities, and on the particular strategic attractiveness of industrial sector in a country.

3.2.4 Marketing strategy

The researcher uses the group of marketing strategies as a marketing strategy for the foreign firm when entering the market. The marketing strategy includes three strategies:

- Building competitive advantages
- Stakeholders analysis and management
- Risks management

4 MARKET ANALYSIS FOR SUPPLYING THE WASTEWATER TREATMENT EQUIPMENT TO THE VIETNAM MARKET

Before entering the market, the foreign firm should make deep market analysis the targeted market. The market's data should include the current market's situation such as the macro environment analysis, the micro environment analysis and a market segment.

4.1 Vietnamese situation analysis

Vietnamese situation analysis is conducted through the Vietnamese macro environment analysis and Vietnamese micro environment analysis. When looking the market at macro and micro views, the firm can have the true story about the market condition.

4.1.1 Vietnamese macro environment analysis

Once a company enter the market they should understand the macro-economic environment including all factors that influence the market. To analyse the market factors, a PESTLE framework analysis is used to find out the context market where the company or product works on. In PESTLE analysis, six elements including Political, Economic, Social, Technology, Legal and Environment are used to review a strategy or position, direction of a company. Besides PESTLE gives a tool to company to see what is happening in the market (outside) that can affect what is happening inside an organization.

Political:

Vietnam officially is Socialist Republic of Vietnam, locates in the south-eastern Asia. The Communist Party of Vietnam is the only official party. The central role of the Vietnam government was reasserted in all organs of government, politics and society. The stability of the Vietnamese political system depends on its single party strength. In the WWT equipment market, the Government plays a critical role in the success of foreign firms due to its unique social and political systems.

The WWT equipment field always requires a relative long investment and the long presence of a firm in the market. For this reason the stability of the Government and the consecutive policy is important to the investment. Vietnam government is encouraging the foreign investment in environmental protection sectors through tax reduction and other incentives. Investment incentives are available for projects that focus on the following activities: production of new materials or new energy; production of high-tech, bio-tech, in-tech; use of, or R&D on high technology or modern technology etc.

Economic:

Vietnam is a true emerging market with the economic growth of 7-8.5 percent in period 1997 to 2007. In recent years, Vietnam has developed industry field with average growth at 14 to 15 percent per year. (U.S Commercial Service – Vietnam, 2009, p4).

Since 2008, Vietnam government has to deal now are the economy crisis and a high inflation rate. From 2008 to 2011, Vietnam economy has difficult time with the recession in the economy development rate. Besides, high inflation rate made the situation more and more difficult for Vietnam. The inflation in Vietnam in 2011 was estimated will reach to 22% in 2011. (tradingeconomics.com, 2011) The high inflation rate and the low economic growth rate which was estimated around 6% in 2011, make the business opportunities in Vietnam less attractive.

Reference exchange rate on Sep 5, 2011 VND/EUR=29,232.84

(vietcombank.com.vn, 2011)

In Vietnam, the state owned sector still contributes approximately 37% of Vietnamese GDP. (U.S Commercial Service – Vietnam, 2009, p2). In recent year, there is also a steady shift of the Government roles, responsibilities and functions away from being an owner of the economy. This shift will have important implications for environmental management in the industrial sector and create many business opportunities.

Social

Vietnamese population is about 90 million and is the 13th largest population in the world. Most of the population lives in rural area and just 28% of total population live in urban area in 2008. The annual rate of urbanization in Vietnam is quite high at 3.1% in the period 2005-2010. (CIA World Factbook, 2010)

People's attitudes towards wastewater problem have changed in recent years. There is enormous increase in the Government and public investment on industrial WWT over last two years, particularly after a number of high profile prosecutions such as the Vedan case.

Technology

There is a need for technology and technological competency throughout all sectors in Vietnam economy. Industries in Vietnam use machines and technologies which are 2-3 out-of-date generations in compared with other countries. Up to 60-70% of industrial products have been produced from averaged and backward technologies. (Innovation Norway, 2009, p. 206) Old technologies have caused serious pollution to the Vietnam environment. Besides, Vietnam lacks of skilled personnel and universities to do significant research and development contribution to the development of Vietnam. The research being carried out tends to be theoretical and not connected to the needs of economy. As mentioned before, the Vietnamese pulp and paper industry uses the out-of-date equipment. The pulp and paper industry uses a large amount of clean water about 200-600m³ per tons of paper. 98% of the production equipment in the Vietnamese pulp and paper industry is required to innovate. Besides, 90% of the pulp and paper plants in Vietnam does not have the WWT equipment. For these reasons, the pulp and paper industry needs to up grade their production equipment and the WWT equipment.

Legal

When doing business in supplying the WWT equipment in the Vietnamese market, the foreign firm has to obey four main systems of laws:

- Laws applied in the environment
- Laws applied in the WWT equipment
- Laws applied in the pulp and paper industry
- General laws applied for foreign investments.

In Vietnam, the wastewater has become the biggest environmental issue. For that reason, the wastewater is controlled by strict legal systems. There are three main decisions directly control the development of the pulp and paper industry in Vietnam.

- Decision 64/2003/QD-TTg issued in 2003 approving the plan for thoroughly handing establishments which cause serious environmental pollution. According to this decision from 2007 to 2012, pulp and paper plants which are listed in this decision have to completely solve their own pollution problems by upgrading production lines or WWT systems.
- Decision 07/2007/QD-BCN of January, 30, 2007, approving the adjusted planning on development of Vietnam's pulp and paper industry up to 2010 with a vision toward 2020. According to this decision Vietnam planned to invest VND 95.569 billion in the Vietnamese pulp and paper industry. In which 87,664 billion will be invested in importing equipment and 7,905 billion will be invested in planting trees.
- The main law that controls the WWT equipment in Vietnam is the standard TCVN 12: 2008/BTNMT, the National regulation on the effluent of pulp and paper mills. When the foreign enter the market, the firm's products should be able to deal with wastewater and the treated water should meet the standard TCVN 12:2008/BTNMT.

Environment

An environmental analysis can give company the overview of the conditions that directly related to the WWT equipment market.

Geography: Vietnam has the shape looks like an S-form. The distance between the North and the South covers 1650 km; the narrowest width is 50 km. The total

area of the country is about 330,000 km². The country has several highlands and a remarkable number of rivers which are important for water transportation and societies.

Water resources: Vietnam has 2,360 perennial rivers over 10 km and 15 major river basins. At a first glance, Vietnam has abundant water resources with the total surface water discharge per person a year in Vietnam is 9,856 m³ compares with the international standard of 1,700 m³ per person a year. However, the water supply in each river basin is significant different and there is also the big different in water supply between the dry and wet seasons. Besides, Vietnamese water resource heavily depends on the international rivers. Only 40% of Vietnamese surface water is generated inside the country. 60% of the surface water discharge through rivers origin from international such as the Cuu Long river basin which is generated from Mekong river countries, Red- Thai Binh basin original from China. At the present, 82% of the water in Vietnam is used for irrigation, 11% is for aquaculture, 5% for industry and 3% for urban use. By 2020, the water use is expected to increase by 48% in which, irrigation water by 30%, industry by all most 190%, urban 150% and aquaculture by 90%. These changes will place heavy burden on Vietnamese water resources. (ADB, 2009b, p. 3)

Forest: Forest covers 39.1% of Vietnam total area. In 2009, the Vietnamese forest was 10,399 million ha of natural forest and 2,919 ha of plantation forest. (Vietnam General Statistic Office, 2010, p.137). In which, the pulp wood plantation areas was between 2 million ha and above 243,000 ha (Johda, J. and Rathi, S. 2006, p.8). In 2009, Vietnam had 850,000 ha of acacia and eucalyptus plantations. These plantations are main materials for the Vietnamese pulp and paper industry (Wirefabrik.com, 2009). However, the forest plantations are scattered all over the country and material sources are more available in the South and the Middle of Vietnam. These conditions lead to many difficulties for pulp and paper plants in logistics and increase the cost of materials.

Climate: Whatever technology applied in the WWT equipment is the firm should notice a temperature in which the WWT equipment will be installed. For that reason the climate conditions of Vietnam should be noticed. There are three

different types of climates in the Northern, the Central and the Southern region of Vietnam.

- The North: In the North there are four seasons along the year. The rainy months are August, September and November.
- The Central: Here, the weather tends to be at high temperature all along the year.
- The South: Dry seasons, from November until April, and wet seasons, from May to October.

(Vietnam Embassy, 2007)

Summary of the Vietnam macro environment analysis

As the summary, when entering the Vietnam market, the firm should pay attention in the economic issue with the crisis situation in the Vietnam market.

	Market drivers	Market restraints
P	<ul style="list-style-type: none"> • Political stability • Strong invests in cleantech and WWT equipment 	<ul style="list-style-type: none"> • Corruption and lack of transparency, accountability
E	<ul style="list-style-type: none"> • High economic growth of 7-8.5 percent (1997 to 2007) 	<ul style="list-style-type: none"> • Recession in the economy development • High inflation
S	<ul style="list-style-type: none"> • Attitudes toward wastewater problem have changed 	
T	<ul style="list-style-type: none"> • 90% of plants lack of WWT • Current technologies consume lots of water in production (200- 600m³ per ton of paper) 	<ul style="list-style-type: none"> • Low investment and out of date technologies
L	<ul style="list-style-type: none"> • Important laws in the market: <ul style="list-style-type: none"> ➤ <i>Decision 64/2003/QD-TTg</i> ➤ <i>Decision 07/2007/QD-BCN</i> 	<ul style="list-style-type: none"> • Weak environmental policies • Uncertainty over the legal enforcement or future direction.

<p>➤ <i>Standard TCVN 12: 2008/BTNMT</i></p>	
<p>E</p> <ul style="list-style-type: none"> • Vietnamese forest accounted for 39% total area • Abundant water resources 	<ul style="list-style-type: none"> • Forest scattered all over the country • Water resource depends on the international rivers. In future Vietnam needs more water

4.1.2 Micro environment analysis on the Vietnamese WWT equipment market for pulp and paper industry

The Vietnamese pulp and paper industry has low production capacity and does not meet a demand on papers of the Vietnamese market. In Vietnam, the pulp and paper industry can supply only 70% of paper domestic requirement and 74% of cover paper. In 2010, Vietnam produced 1,843,890 tons of paper meanwhile the demand in Vietnam market was 2,568,333 tons of paper. As an estimation of the Vietnam pulp and paper association, in 2015 the total demand on papers of Vietnam market will reach to 6 million tons. (vaap, 2007)

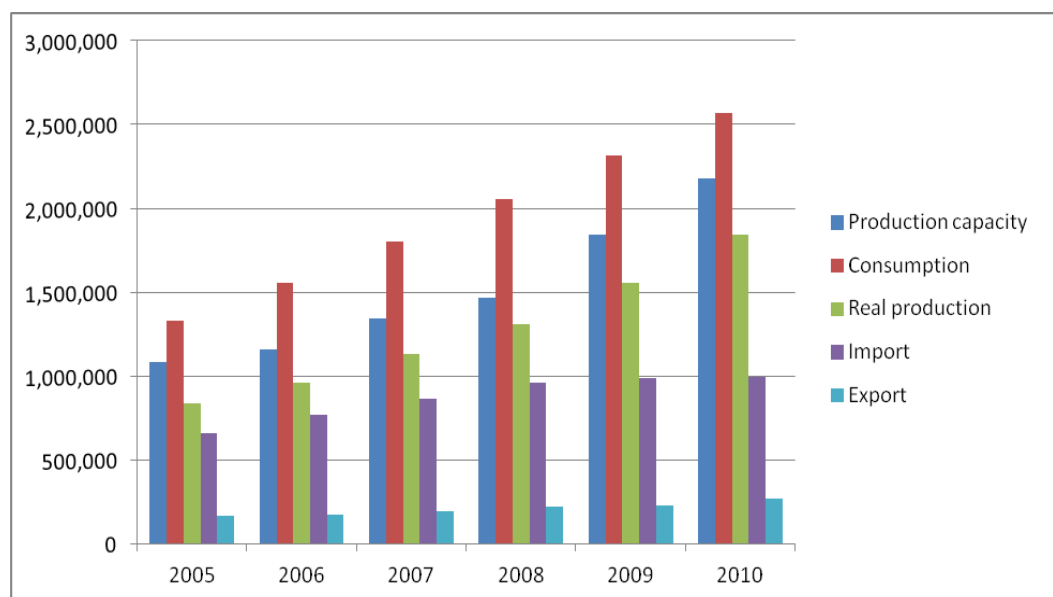


Figure 4-1: Estimation of the pulp and paper industry in Vietnam from 2006- 2010

(vaap, 2007)

The low capacity of the pulp and paper industry in Vietnam due to a large number of the small and medium pulp and paper plants in the industry. Based on the ownership and the number of pulp and paper plants in the Vietnam market can be divided into 5 main segments.

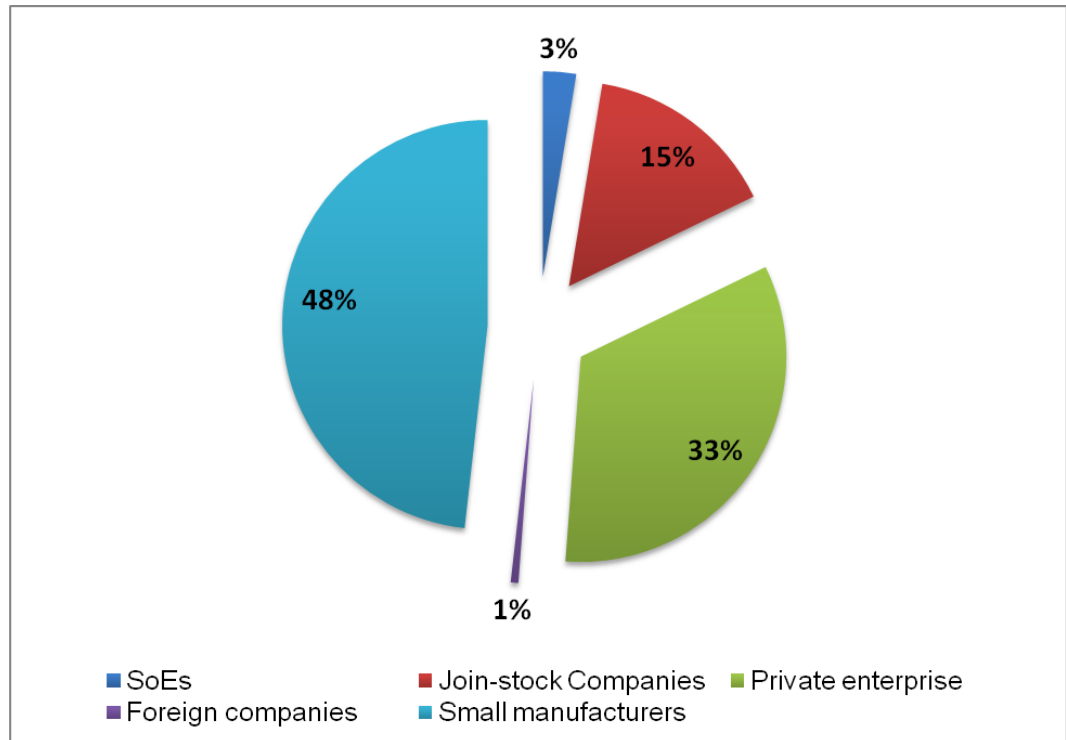


Figure 4-2: Vietnamese pulp and paper plants in 2009

When the firm decides to enter into the WWT equipment market for pulp and paper industry, the firm should understand the nature of the WWT industry in Vietnam. In this research, the researcher applied the five forces model developed by Michael E. Porter to analyse the micro environment of the Vietnamese WWT market.

Intensity of rivalry- High

The first forces the firm need pay attention when they attend the market is the intensity of rivalry of the industry. One fact in the Vietnam market is that nearly all the WWT equipment is imported. As an estimation of the U.S. Commercial Service, the Vietnam WWT equipment market can reach to USD 790 million in 2011 in which USD 355 millions of equipment will be imported. (U.S.

Commercial Service – Vietnam, 2011, p.1) At the present, many different WWT products and technologies are present in the Vietnamese WWT market.

The concentration of the industry: The Vietnam WWT market consists of more than a hundred players all over the world. The most active players come from countries such as Denmark, Finland, India, Japan, France, American and Sweden. Competitors in the Vietnam market can be divided into three main groups: Big players, medium environment companies and local companies

Big players

The first group is a group of big players, including many big corporations and big companies who supply pulp and paper production equipments and WWT equipment for pulp and paper plants. This group of competitors includes many big companies and corporations such as Jackko Pöyry, Grundfos Vietnam co.Ltd, Siemens, Krofta, Ovivo and many firms come from Japan, Germany and India etc. Strengths and weakness of this group is analyzed in the followed table.

Table 4-1: Strengths and Weakness of Big players

Strengths	Weakness
<ul style="list-style-type: none"> • Well-known brand name • Modern technology, strong capabilities • International experience and good relationships with customers in the Vietnam market • Strong financial resources and human resources 	<ul style="list-style-type: none"> • Board offering and hinder concentration of expertise and specialization. • Expensive technology

This group of competitors can set up their representative offices in Vietnam or direct export product through BOT projects. The strength of this group is a market experience and good relationships with customers in the market.

In this research, the researcher used Krofta as an example of this group of competitors. Krofta Engineering Limited is a successful example of an Indian company who supplies the WWT equipment in the Vietnam market. The strongest selling points for Krofta products are a suitably priced technology, and the ability to provide “American” technology with an “Asian” price. (Kroftaengineering, 2011)

The succeed of Krofta in the Vietnam market is strongly supported by their agent Hanoi’s Company for Technology and Development (CFTD) This local company has strong relationship with Government and supplies many products from high-tech equipment to Vietnam military and security service, and the WWT equipment. CFTD has proven to be an efficient agent with the most current project of Krofta in Binh An paper mill of Tan Mai Group JSC. (Cftd-green.vn, 2011)

The list of Krofta’s projects in the Vietnam market can be referenced in table 03 in the appendices.

Foreign medium size environmental companies

A second group of competitors in the market is a group of foreign medium size environmental companies. This group of competitors sells their product directly to the Government or through projects funded by ODA or foreign countries such as Netherland, Finland or Sweden. Strengths and weakness of this group of competitors are:

Table 4-2: Strengths and weakness of foreign medium size environmental companies

Strengths	Weakness
<ul style="list-style-type: none"> • Have experience and relationships in the market. • Flexible management systems • Focus on medium projects from consulting services, supplying the WWT equipment for pulp and paper plants 	<ul style="list-style-type: none"> • Do not have relationship with customers as good as local company and big players • Establish a base to learn the market and set up relationship on the market.

This group of competitors can supply equipment and technology for all fields of water supply and the WWT equipment. In the Vietnam market, these companies supply sewage treatment technology, water supply equipment, or consulting Vietnam government or provinces in designing WWT projects. With many experiences and projects in Vietnam, these competitors have many advantages when they compete with the new firm who just starts to enter the market.

When the new foreign company enters the Vietnam market, they should have good strategy to compete with these companies. The firm should have better marketing strategies, better after sale services. Besides, using the company's existing relationship in the home country to enter the ODA funded projects in the Vietnam market is the best ways to enter the market.

Local companies

This group of competitors includes many Vietnamese big and small size companies. These companies have limited financial resources and narrow products lines. Most companies in this group focus on supplying the WWT equipment for small pulp and paper plants in Vietnam.

Table 4-3: Strengths and Weakness of local companies

Strengths	Weakness
<ul style="list-style-type: none"> • Low prices products • Good relationships with customers and organization in Vietnam • Flexible and deeply understand the market 	<ul style="list-style-type: none"> • Limited resources and finances, technology • Can't not attend in international projects funded by ODA • Imported product and install in Vietnam

These local companies can become the customer of the foreign firm in the Vietnam market. These local companies have to import equipment from overseas market to supply their domestic projects. The company in this group of competitors can also become a local agent of the foreign firm. The foreign firm can utilize these companies' market knowledge, relationships with customers, authorities and suppliers in Vietnam market to expand their business. Moreover, in some big project the foreign firm can use the local company as a subcontracting. The list of these companies was listed in the table 0-4 in appendices

Fixed costs of the WWT equipment are **high**. In a modern pulp and paper plant, the investment for the WWT system might account for almost one-fifth of total investment. For example in the new plant of Saigon paper, My Xuan II, the investment in the WWT systems was USD 20 million meanwhile the total investment was USD 110 millions (Saigon paper, 2011). This condition encourages the innovation in the technology to reduce the WWT equipment price to meet the customer requirements.

Switching costs in the WWT equipment for the pulp and paper industry are **high** because the product is specialised. The customer has to invest lot of resources in initial investment, operation and maintenance costs.

In conclusion, the **Intensity of rivalry** in the WWT equipment market is **high** with high competition between competitors and the low exit barrier.

Suppliers- Low

The power of suppliers in the Vietnam market is low because local supplier's products are not unique or differentiated. When the firm enter the Vietnam market, they can use the local supplier to supply accessory or subcontract their projects to reduce the cost of project. Furthermore, there are numerous of local companies who are ready to co-operate with foreigner and switching cost are low. In appendices 3 the list of local suppliers the foreign firm can cooperate with when doing business in the Vietnam market is listed.

Buyers- Medium

The buyer in the WWT market is a pulp and paper company. The WWT system is differentiated with other products and should be accompanied with the infrastructure and the technologies applied in the pulp and paper plant. The bargaining power of buyers in the WWT equipment market for pulp and paper plants is different between the different market segments.

The powers of buyers in the group of *State-owned enterprises* and the *Joint stock enterprise* having stated-owned capital are *high*. These enterprises can use the financial resources from many sources to invest in the WWT equipment. The main reason for buying and upgrading WWT systems of this group is that they are forced to treat their wastewater as the legal requirement. Hence, the state-owned enterprise and the joint-stock enterprise having state-owned capital require the WWT equipment solve their pollution problem and meet the Vietnamese environmental requirements.

The power of buyers in the group of *private enterprises* which have capacity more than 1,000 tons/year in Vietnam is *medium*. This group of customers has been limited of financial resources and they tend to focus on the price of equipment more than the technology. The quality of the wastewater output should meet the Vietnamese environment requirements. For that reason, the power of this group of customers is medium.

The group of foreign enterprises has a *low power* of buyer. The financial resources of these companies come from investors, banks and their own companies. The required standard of WWT of these companies is higher than those of most Vietnamese companies and even higher than the required standard of Vietnam government. But most of the foreign enterprises had invested in the WWT equipment when they started to invest in the Vietnam market.

The group of paper plants in Vietnam with *small manufacturers* is low. This group of segment includes pulp and paper manufacturers which have capacity less than 300 tons a day does not have financial resources to invest in the WWT.

Substitutes- Low

All companies have direct competitors who can pose a threat if these direct competitors can persuade customers to switch products as opposed to switching brands. Typically the emergence of a new technology creates a substitute for an existing product. The WWT equipment in the pulp and paper plant is the specialized product and switching cost is high. So that, *the substitution* in the WWT equipment for pulp and paper plants is *low*.

New entrants- Low

In Vietnam green technologies are being imported from other countries such as Germany, USA, India, and China.

Capital requirement when the foreign firm enter the Vietnam market is *low*. There is no registered capital requirement when the foreign firm work in the Vietnam WWT market. The firm doesn't have to invest much money when they do business in the market. The scale of Vietnam plants is small for example in the pulp and paper industry, the average capacity of pulp and paper plants are from 1000 tons to 10,000 tons. And in Vietnam just only 4 plants have capacity more than 50,000 tons of paper per year including: Bai Bang, Tan Mai paper, Sai Gon paper and Chanh Duong paper.

Absolute cost advantages: The cost advantage of the foreign firm is **low** in compared with local Vietnamese companies. These local companies can supply low price waste water treatment for small and medium size pulp and paper plants.

Product differentiation: in the WWT equipment market for the pulp and paper industry is **high** due to the differentiation of the product. Different technologies, processes, sizes, customized designs, and services are few dimensions of this differentiation. In an industry where products are differentiated, the established firm possess the advantage of brand recognition and customers loyalty. So that, the new entrant should more focus on additional advertising and promotions costs.

Experience: The ***biggest challenge*** for new entrants in Vietnam wastewater market is the experience. Early entrants gain experience sooner than the later entrants. Moreover, in Vietnam market there are many big players from multinational corporation, Japan, USA, France, Finland and India. These players are advantaged by experience, low cost or suitable cost, and the relationships with local authorities, customers, and suppliers. It is difficult for the new entrant when competes with established firms who have good knowledge of the market and good relationships with customers and suppliers. In order to break into Vietnam market, the new entrant should build up their own business relationships with local authorities, customers and suppliers. The key element to gain business contracts in Vietnam is opening and enhancing the business relationship deeper and wider.

For these reason, the **new entrants enter** into the Vietnamese WWT market is **low**.

Summary of the Vietnamese micro environment analysis

In summary, in the WWT market, the new entrant will have to compete with ***medium power of the customer*** and ***High- intensity of rivalry high, Low-substitutes*** and ***Low supplier*** and ***Low-entrant***.

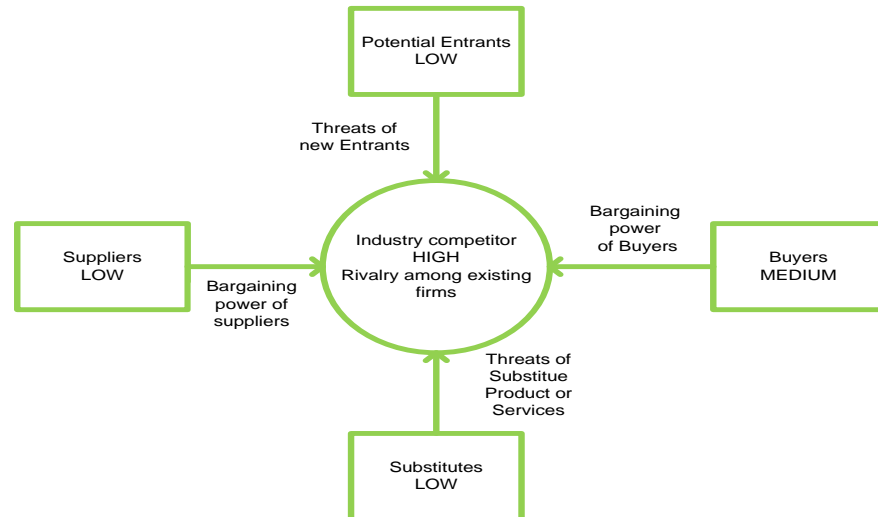


Figure 4-3: The Five forces in the Vietnamese pulp and paper industry

Hence, when the new foreign firm enters the Vietnam WWT equipment market should focus on these issues:

- Having good strategy to compete with the existed firm by having better marketing sensitivity, supplying better product and after sale services.
- Having product differentiation and focus on gaining the experience in the market.
- Cooperating with the local company in the market to reduce the cost and utilize the experience of the local companies.
- Building up business relationships with local authorities, customers and suppliers. The key element to gain business contracts in Vietnam is opening and enhancing the business relationship.

4.2 Market segmentation and segment selection after the field research

Market segmentation and segment selection is an important analysis that the foreign firm should pay attention when they enters the Vietnamese market. The success or failure of the firm might depend on the right selected market segment.

4.2.1 Understand of the WWT market for pulp and paper industry in vietnam after field research and empirical study

From end of May to June of 2011, the researcher had a chance to discuss with people who work in the Vietnamese pulp and paper industry. The researcher learnt from the trip that the pulp and paper industry has high demand on the WWT equipment. This industry is extremely polluted and needs to be firmly controlled by pulp and paper plants and also Vietnamese authorities.

High demanding on developing the Vietnamese pulp and paper industry

The pulp and paper industry in Vietnam needs to upgrade their production equipment. In Vietnam most of equipment in pulp and paper plant in Vietnam are from the 60's of a 20th century. In many private enterprises, the equipment of the paper plant is old and mainly imported from China or was bought from big paper plant then reinstall in their company with smaller capacity. As the research's No. 01C-09/04-2008-2 of Hanoi's Department of Science Technology's research, 6 out of the 10 small and medium size pulp and paper enterprises in Hanoi area did not meet the wastewater standard. The wastewater from these plants contained the COD, BOD, TSS parameters which are 6 or 9 times higher than the Vietnamese standard. (HDST, 2008, p.13) The list of the companies were analysis in the research No. 01C-09/04-2008-2 was listed in the appendices

With the old equipment, the products of the Vietnam paper company always has low quality and at a high price. The price of the product often is 10% higher than the imported products while the quality is lower. Moreover, since 2012, the pulp and paper in Vietnam will have more challenge when the imported taxes on imported paper are reduced. As the agreement signed between Vietnam government and WTO, since 2012 taxes levied on imported papers will be average reduced 50% in the whole type of imported papers in 2012. The imported tax on printing paper will be reduced from 50% to 25% in 2012. (trungtamwto.vn, 2011)

To enhance the capacity and competitiveness of the Vietnamese pulp and paper industry, the Government had issued many policies to invest strongly in the pulp and paper industry. In the decision 07/2007/QD-BCN of January 30, 2007,

Vietnam planned to build seven news pulp and paper plants to expand capacity of the industry. New pulp and paper plants were expanded and invested by this decision include Hai Phong, Bac Kan (50,000 tones of pulp/year), Thanh Hoa (50,000 tons of pulp/year and 60,000 tons of paper/year), Lam Dong (200,000 tons of pulp/year), Hoa Binh, Kon Tum 1 (130,000 tons of pulp/year). (Nguyen Quang Vinh, 2008, p.5)

Besides, the Government also had a policy to support foreign investors to invest in paper manufacturing and plantation such as reduce the tax or support the land to grow paper materials. Much co-operation between Vietnam pulp and paper plants with foreign investors was initiated with the support of State-owned Vietnam Paper Corporation to attract private investment via joint ventures with local and foreign companies.

The Vietnam market condition brings more opportunities for the foreign company to supply the WWT equipment into the Vietnam market. The more pulp and paper plant the more WWT equipment is required.

Financial resources are invested in the Vietnamese pulp and paper industry

As an estimated of specialists in the pulp and paper industry in Vietnam, there are about 500 to 550 pulp and paper companies in the Vietnam market in 2011. These companies have different owners and different ways to approach the capital investment when buying the new WWT equipment. There are some main financial resources are invested in the Vietnamese pulp and paper industry:

- ***State-funded finance:*** Vietnam government funded finance is one of the largest financial resources to invest in the Vietnamese pulp and paper industry. According to the decision 07/2007/QD-BCN, from 2006 to 2012, Vietnam government planned to invest VND 95,569 billion (EUR 3,269,328,133) in which VND 87,664 billion (EUR 2,998,905,309) will be invest in equipment. But state-funded financial resources mainly spend on the state-owned and the joint-stock enterprises having state-owned capital. And as a result, companies such as Bai Bang paper and Tan Mai paper had many advantages when they can use this finance resource to invest in their

new plants and new projects. In the Vietnam market, a Light Industry Department in Ministry of Industry and Trade (MOIT) is responsible for the development of the pulp and paper industry. The Light Industry Department is responsible of the appraisal of investment projects. This department's authority (including ODA-funded projects but excluding projects subject to appraisal by the Planning Department) and submit those to the Minister for approval. Moreover, the Light Industry Department can give opinions about investment projects within its authority and which are subject to approval by local authorities. Therefore, when the firm wants to enter the state-funded project, they should pay attention to the authorities and roles of Light industry department in that project. Besides, the information of state-funded projects can be collected through the Vietnamese newspapers such as Dau Thau, Nhan Dan, Lao Dong and Saigon Giai Phong, Vietnam News and Vietnam Investment Review. The foreign firm may also be able to register to obtain a consolidated listing of government or private tenders in Vietnam at <http://www.intellasia.com> or may check the public procurement website of the MPI at <http://dauthau.mpi.gov.vn>.

- ***Financial resources funded by multilateral organizations*** such as the World Bank or regional development banks. This source of finance is priority invest in water supply and irrigation or WWT for urban or industrial zone. The pulp and paper plant do not have chance to use this resource. But in some case, Vietnam government can be a guarantor for the big and targeted company to borrow money from this financial source.
- ***ODA funded financial resources:*** Projects where bilateral organizations are a primary or essential source of finance. These project's financial resources can come from the ODA fund, or the organization. This financial resource is mostly invested in state owned enterprises and Joint stock enterprises having state-owned capital.
- ***The financial resources from enterprises capital:*** This financial resource is used in the project where a private person of firm acts as buyer, as the

project My Xuan II of Sai Gon's paper. This type of project required the WWT equipment to have high quality equipment and suitably priced. Based on the amount of project's investment and the small and medium size firm's financial resources, the firm can decide to enter this type of project or not.

Customer's buying criteria

In the field research trip, the researcher had worked with many interviewees from pulp and paper plants. The aim of customer's interviews was finding the customer's buying criteria.

As the interviews with the customer's result, the most important criteria are an *efficiency* of the WWT equipment. The treated-water after treatment should meet the customer requirement and the Government requirements. The efficiency is an economic performance with a lowest consumption of chemicals, energy used per m^3 of WWT. As the interview's information, the consumption cost in big paper plants used the modern Biological treatment is lower than VND 2,000/ m^3 WWT (about EUR 7cent). And the consumption cost in small and medium size paper plants applied DAF combined with simple biological treatment was VND 2,000/ m^3 WWT.

The second requirement from customers is the *low space requirement*. Most companies in Vietnam don't have large production area. For this reason, the low space requirement of WWT becomes an important factor when customer buying WWTs.

The third important criteria that concerned the customers when they buy the new equipment is the *suitably priced of the equipment*. The price plays an important role in customer's buying decision. There is a big different price of WWT between different equipment. As researcher interviews and collected data from customers and local competitors, the price of DAF technologies for large plants might be arranged from VND 75 billion (EUR 2,955,593) in My Xuan I plant to VND 1 billion (EUR 34,200) in paper plant with 2500 m^3 /day. The price of the equipment

depends mostly on the customer's financial resources and their technical requirements.

Success factor in the Vietnam market

One important part of the field research is the interviews with competitors come from both Vietnam and some companies from Finland which have done business in the Vietnamese WWT market.

As the discussion with firms working in the WWT market, the WWT market for Vietnam pulp and paper plants has a huge potential. Now Vietnam economy is affected by the crisis. But in the near future, the WWT equipment market's condition can be improved. When the Vietnam economy is brighter the pulp and paper industry can receive more investment from the Government and from the pulp and paper company to upgrade their equipment.

According to these interviewed firms, to be success in the Vietnam market the firm should build up *good relationships with the customers and the environmental authorities*. Vietnam is a developing country and the market works under the control of Government and the Ministry of Trade and Industry. In the project funded by the Government, the authority may have strong influence in the buying decision of the paper plants. For that reason, building a strong relationship in the market can lead to the success of the firm. In fact, it is not easy to set up business relationships when the firm just start to enter the market. The experience of the successful firms in the Vietnam market is a *good local agent in the market*. The local agent has deep understanding about the market and their own business network. The local agent can support the company to step by step to do business in the Vietnam market.

Summary of the understanding of the market after the field research trip

- The pulp and paper industry in Vietnam has high demand on innovation and improving the WWT equipment.

- The financial investment in the WWT equipment for pulp and paper industry can come from various sources such as: state- funded sources, multilateral organizations, ODA funds and from enterprises capital.
- The customer in Vietnam requires the WWT equipment should be efficiency, low space requirement and have suitably priced.
- The Vietnam WWT equipment for pulp and paper industry is high potential in the near future and it requires the long term investment in the market. To succeed in the Vietnam market, the foreign firm should have good relationships with the customers and the environmental authorities. In the pulp and paper industry the firm should pay attention to the Light industry department in Ministry of Industry and Trade (MOIT) is responsible for the development and investment of the pulp and paper industry. Besides good local agent in the market is a key success factor in the Vietnam market.

4.2.2 Market segmentation and segment selection

As an estimation of specialists in the Vietnamese pulp and paper industry, the number of pulp and paper plants in 2011 in Vietnam is around 550 plants. But there are no formal statistics number of the pulp and paper plants in the Vietnam market. The researcher used the statistics number in 2009 about the market share of each group of customers to analysis the market.

Table 4-4: Ownerships of the pulp and paper plants in Vietnam in 2009

No	Owners	Number of enterprises	Pulp		Paper	
			Capacity	Percent	Capacity	Percent
1	State-owned enterprises	13	111000	26.47	133,070	8.75
2	Join-stock companies having state-owned capital	76	237,550	56.65	694,420	45,68
3	Private enterprise	167	70,770	16,88	632,460	41,61
4	Foreign companies	3			60000	3.96
5	Small manufacture with capacity less than 300 tons	241				

(Habubank securities, 2009, p.3)

The Vietnamese pulp and paper industry was segmented by the size, the segment structural attractiveness, resources, buying process. Based on the analyzing data and the field research trip's result, the researcher divided the market into four main segments as follow:

Segment 1 includes ***state-owned enterprises*** and ***joint-stock enterprises having state-owned capital***. This segment accounts for 80% of Vietnamese pulp production and 55% of paper production in Vietnam in 2009. In 2009, this segment includes 90 enterprises including two biggest companies in the Vietnam market, Bai Bang (160,000 tons/year), Tan Mai companies (110,000 tons/year) and other pulp and paper plants which have capacity from 1,000 to 10,000 tones.(Habubank securities, 2009, p.3)

Technology: Most of companies in this segment apply sodium boiling technology without recovering wastewater. The main products of these companies are the pulp, the Kraft, printing paper and paper with medium quality. The equipment of these companies are old and inefficiency with high relative cost. The relative cost in the pulp plants is 57%, paper production was 77%, printing paper was 81% and Kraft was 91%. (Habubank securities, 2009, p.6)

Customers from Segment 1 need to upgrade their production line equipment and the WWT equipment. These customers do not have efficient WWT equipment. This fact leads to the pollution in the area where the company is located. Many companies in this segment such as Hoang Van Thu paper, Lua Viet paper, Hoa Binh paper etc are listed in the list of the seriously pollution facilities in decision 64/2003/QD-TTg. According to this decision from 2007 to 2012, these companies should completely solve their own pollution problems by upgrading production lines or WWT systems.

Financial resources to invest in the WWT equipment: Companies in Segment 1 can receive or borrow money from the Government, ODA or other financial organizations, or their own capital to invest in the new WWT equipment.

The first financial resource is from company's capital. In the small projects, the company in Segment 1 can use the finance from their capital to buy the new WWT equipment. Normally, the size of this project is small and the buyer can find their supplier through trade directories, internet or through their business network's information. The buying process of this project is as followed:

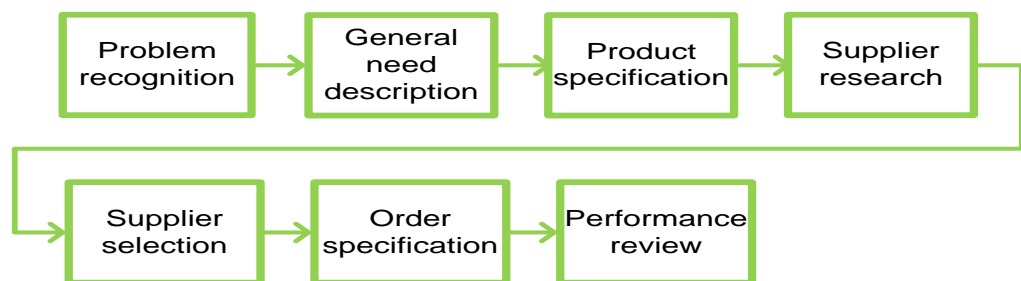


Figure 4-4: Buying process of the small project

The chosen WWT equipment in the small project is often has low price and not high quality of treated water. The WWT equipment often is supplied by the local company. As the interview with the companies from this segment, the price of WWT used the DAF technology for 2500m³ wastewater per day can be around VND 4.5 billion (EUR153,935) The treated wastewater by these equipment can meet the B standard of the standard TCVN 12:2008/BTNMT.

A second financial resource of Segment 1 is come from the Vietnamese government or the Government will support the company to borrow money from the international donor. In this funded project, Vietnam government and International donors will set the characteristics of the project. The funded project can be implemented under an EPC (Engineering, Procurement and Construction) contract.



Bidding is used to select the suitable supplier to implement the project. The bidding process in the Vietnam market is regulated by the Law on Tendering and Decree 111/2006/ND-CP dated September 29, 2006, providing guidelines for the implementation of the Law on Tendering and the selection of construction contractors. The tendering model of the project is:

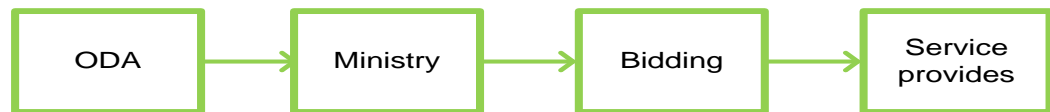


Figure 4-5: Tendering model of projects funded by ODA

In the project funded by the Government the tendering model is:

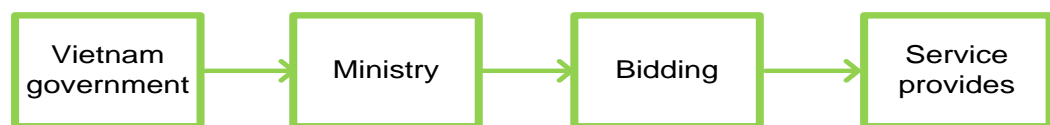


Figure 4-6: Tendering model of projects funded by the Government

In the Vietnam WWT market, the winner in large contracts always firms with strong financial resources and good relationships with customers and the Government such as Pöyry. In 2006, Pöyry was chosen to plan Bai Bang project on expanding their production capacity up to 250,000 tons/year during the period 2006-2012 (Vietbao.vn, 2006).

The third financial resource of the Segment 1 is the financial resources funded by the ODA. The major donor of ODA in Vietnam are the World Bank, the Asia

Development Bank and bilateral contribution such as Japan, France, Denmark, Netherland, Finland, Germany and Australia.(US commercial Service –Vietnam, 2011, p.5) In this project, the sale often goes to the firm that provides the most complete system which meets the customer needs and solving the problems. The tendering model of the big project is as follow:

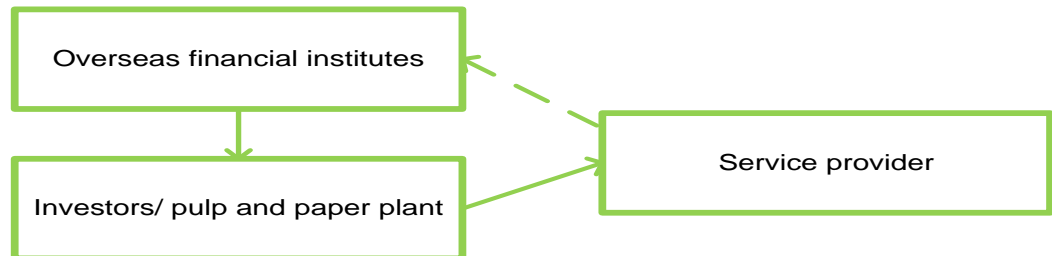


Figure 4-7: Tendering model in the ODA funded project

Segment 2 includes many *privates companies*. In 2009, there are 167 private enterprises in the market. Companies in this segment have variety of capacity. In 20011, the big and successful companies such as Sai Gon paper (100,000 tons/year), Diana paper (20,000 tons/year) strongly invested in the WWT systems. Other enterprises in this segment have small capacity from 1,000 tons to 10,000 tons of paper. These companies do not have strong finance to invest in the new WWT equipment.

Technology: The equipment applied in this segment is different based on the financial resources of the companies.

In the big and model private plant, the production equipment and the WWT equipment is new and efficiency. These companies strongly invested in the WWT equipment and the treated water from this group meet the A of the standard TCVN 12:2008/BTNMT.

In small private companies which have production capacity smaller than 1000 tons/year, the production equipment is old and inefficiency.

The financial resources of the enterprises in Segment 2 to invest in new equipment often be taken from the company's capital resources or borrowing from banks especially with the small private enterprises.

The buying process of enterprises in the segment 2 is influenced by a company's mission or target, investors and company owners. In the small projects these companies use the simple buying as the Segment 1.

In a big project the private enterprises usually use the BOT bidding process to choose the best supplier. The buying process of this segment in the big project is as follows:

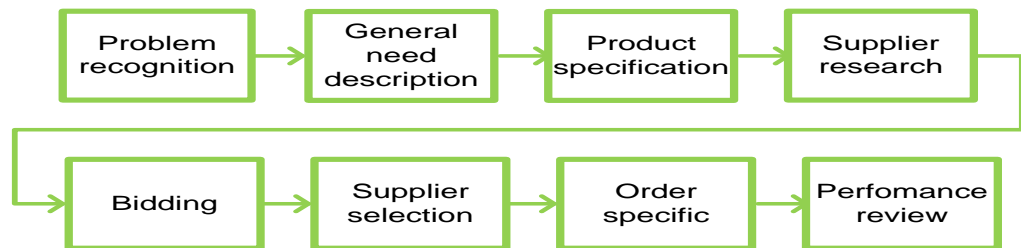


Figure 4-8: Tendering model of the BOT project

Segment 3 includes *foreign paper enterprises*. This segment includes companies who directly invested by the foreigner such as New Toyo, Joss Paper Mill, Kimberly-Clark etc.

Technology: These companies have strong financial resources and strong investment in WWT systems. Most of these companies have already invested strongly in the new production equipment and WWT systems.

Financial resources: the money investment in WWT can take from company capital or borrowing from bank. In Segment 3, the customer's buying process is influenced by company's mission or target, investor and company owners.

Buying process: The foreign enterprise in this Segment often buys the WWT equipment when the initial step when they invest in the Vietnam market. The foreign company can use the bidding method to choose the best supplier for their WWT equipment.

Segment 4 is a group of *small manufacturers* which produce paper from imported pulp and recycled paper. This group including small enterprises have capacity under 300 tons/year.

The equipment of these companies is out of date. The production line in these companies is old and these small manufacturers don't have the WWT equipment. The production line of this segment is often made from the old equipment they bought from big companies. After buying, the equipment will be reinstalled into smaller capacity equipment as these companies' demands. (Hanoi's Department of Science Technology, 2008, p.13) small manufacturers in Segment 4 always locate in the village or community such as Phong Khe village, Bac Ninh province.

Financial resources: The customer in Segment 4 does not have financial resources to invest in the WWT system. This segment market is neglected and cannot receive any financial resource to invest in the WWT systems. These paper plants cause significant environmental pollution and affect the wildlife and health of community living near plant's location.

Segment selection

As the analysis of four main groups in Vietnam market, the researcher chose the *segment 1*, the segment of the state-owned enterprises and joint-stock enterprises have state-owned capital is *the first target segmentation* in the Vietnam market. In this segment, the researcher will focus on the joint Stock enterprises who accounts for 55% of Vietnam paper production.

Firstly, this segment accounts a big market share in the Vietnam market. More than that these enterprises need and are required to upgrade their old WWT systems according to the decision 64/2003/QD-TTg.

Secondly, this group can receive the funding from the international institution or foreign government when changing their WWT equipment through ODA projects.

When the foreign firm decides to enter the Vietnam market through the ODA projects they can minimal levels of resource commitment and minimal risks. This is the fastest and the safest method to enter the Vietnam market. In the funded projects by ODA or bilateral contributor, the foreign firm will have more opportunities in these projects. In ODA funded-projects, equipment packages over USD 500,000 are typically procured through international competitive bidding and

Vietnamese local company cannot attend this bidding. (US commerce service – Vietnam, 2011, p.)

However, this entry mode is not foster the development of international operations and may result in significant loss of opportunities.

To expand the business opportunities, the foreign firm can open their market into the *Segment 2*, the *private enterprises segment*. This segment, accounts for 41% of the Vietnam paper production and includes many companies with the fast development rate. These companies also have to improve their equipment and the WWT equipment to improve the products quality and reduce the cost to enhance their competitive advantages in the domestic market.

4.3 The risk and challenge in the market

When the firm decides to do business in the Vietnam market, the firm should pay attention to the risk that the company might have in the market.

First challenge in the market is the financial crisis which can reduce the investment opportunities in the market. The financial crisis has caused delays or postpones on the investment plan in the pulp and paper industry. In the earlier plan Vietnam planned to invest in 22 main pulp and paper plants but due to the financial crisis 12 plants were cancelled, three are postponed until further information and 7 projects were adapted. (Johda, S. and Rathi, S. 2006, p.8) The planned investments were cancelled or postponed until the economic situation become clearer. This challenge has negative effect to the foreign firm's investment decision into the Vietnam market.

The second challenge is the bureaucracy in implementing the projects in Vietnam. In the Government funded project, the procurement practices can be characterized as a multi-layered decision-making process, which, despite some recent improvements, often lacks transparency and efficiency. The project in Vietnam often relates to many people inside and outside the project and can take long time to make decision. Decision of purchase, apart from local business interests, often involves decision processes in national and international development organizations. This implies the participation of a large number of people and a

heavily bureaucracy system. It often takes years from the disclosure of needs to the purchase decision being taken. There total marketing costs are very large.

The third challenge the firm in Vietnam is the corruption. The corruption in Vietnam is caused by the lack of transparency, accountability and media freedom. In Vietnam market, bribery is the normal way of doing business.

The fourth challenge in the Vietnam market is the complicated of the Vietnamese legal systems. The impractical of the legal system make the uncertainty over the legal enforcement or future direction. Environmental policies in Vietnam is either too weak to motivate improvement. These conditions lead to a lack of certainty and investment in the WWT equipment among companies in the pulp and paper industry.

These challenges can make the decision to enter the market is more and more difficult to implement. To solve these challenges the foreign firm should have carefully strategies to deal with each challenge.

5 RECOMMENDATION STRATEGY TO SUPPLY THE WASTEWATER TREATMENT EQUIPMENT INTO THE VIETNAM MARKET

In this chapter, recommendations for the foreign firm when they do business in the Vietnam market will be deeply discussed. Recommendations are based on the researcher's understanding of the market opportunity, the field research trip's results and the research analysis.

5.1 Business opportunities in the Vietnam market

As the data collection and the researcher's analyses, the researcher recommends two business opportunities in the Vietnam market:

Firstly, the firm can supply the wastewater treatment and technical consultant service for pulp and paper plants at suitable price into Vietnam market. The technology that the researcher recommended is DAF technology or the biology technology. The foreign firm can come into the market through ODA projects. This is the fastest and the safest method that the small and medium size firm can use to enter the Vietnam market.

Secondly, the researcher recommends a business opportunity in supplying used equipment for pulp and paper plants in Vietnam market. The pulp and paper plant in Vietnam is needed to upgrade and improve their production line to meet the Vietnam's pulp and paper demand. As the estimated of Vietnam pulp and paper association now in Vietnam there are about 550 paper plants, and 98% of these plants need to upgrade the equipment. It is clearly that the market for used equipment in Vietnam market is huge and potential for small and medium size company. Besides, the limited of financial resources urged small and medium size pulp and paper plants buy used equipment.

In Vietnam, the used equipment for pulp and paper plants is imported from the United States, Korea and Japan by small and medium local company. These companies mostly supply used equipment. The company can gain their advantage by supplying the service and equipment for this segment of the market.

One main important thing is that there is no law system controlling the used equipment imported in the Vietnam market. But this condition brings both the

opportunities and challenges to the foreign firm. As Vietnamese legal systems is complicated and there are many conflicted between the Government laws, the local regulation, laws of a Ministry of Industry and Trade and even sometime conflicts with the imported condition from Vietnamese customs.

When the firm decides to supply the used equipment into the market the firm should carefully set up a strategy to enter the market. The equipment of the company should be in good quality and not conflict with Vietnam's legal system and improve the capacity and the quality of customer's product. The customer of used equipment can be a customer from Segment 1, Segment 2 and especially customer from Segment 4, small manufacturers which have production capacity less than 300 tons of paper per year.

5.2 Strategy to approach the market

In this research, the research uses a country-by-country approach together with developing a regional view (Lasserre, 1995) as a recommended strategy to approach the market. (Hollensen, S. 2004, p.341)

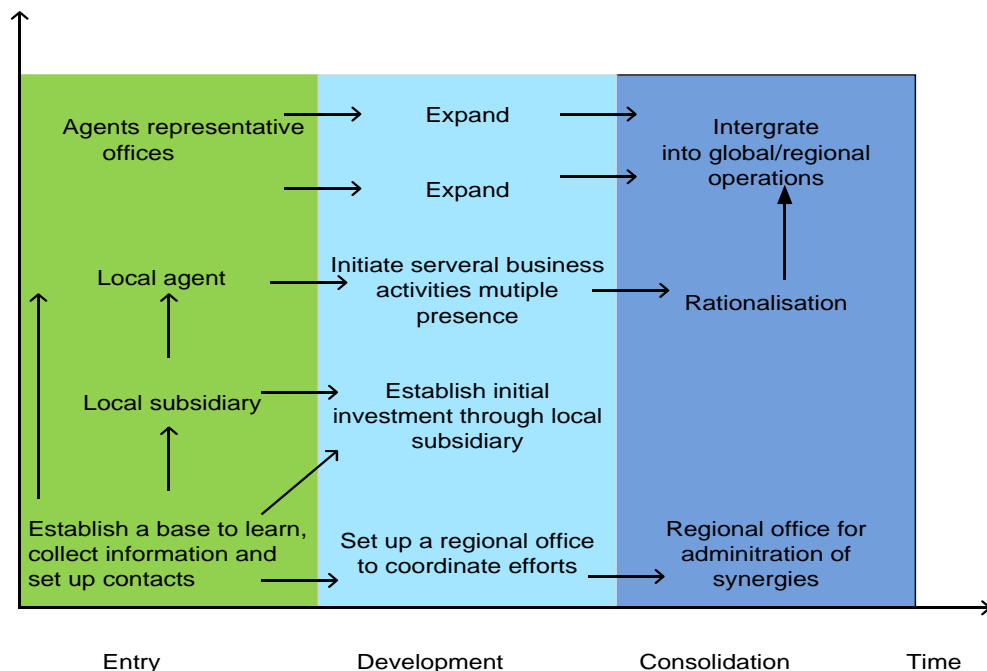


Figure 5-1: Strategy to approach the market

(Hollensen, S. 2004, p.341)

In the entry stage: The foreign firm can approach the Joint Stock enterprises and the State-owned enterprises by supplying the WWT and technical consultant service through the ODA projects. The technology supplied might be suitable with the requirement of the market such as the DAF technology or biological treatment technology. By implementing the funded ODA projects, the foreign firm can set up their initial market entry and step by step builds up new relationships in the Vietnam market.

When the foreign firm has some success in the Vietnam market, they can attend the State - funded project in Vietnam such as BOT projects or EPC contracts. In the EPC bidding, the foreign firm can have some advantages. As the law of Vietnam bidding, in the EPC project the technical criteria will be marked 70% of total mark. In some sophisticated project the technical criteria might be marked up to 80% of the project's total mark.

In the Vietnam government funded projects, the foreign firm should notice:

- In the Vietnam market, winning contracts are commonly awarded to those who can offer "appropriate" price, "decent" quality and have “strongest connections” with project developers, and are more frequently awarded as direct contracts rather than open competitive bidding. (U.S Commercial Service, 2010, p. 14)
- To be successful in the Vietnam market the firm should have good relationships with the customers and the environmental authorities. Vietnam is a developing country and the market works under the control of Government and the Ministry of Trade and Industry. In the project funded by the Government, the authority may have strong influence in the buying decision of the paper plants. The foreign firm should have a high degree of involvement and communication between the foreign supplier, the local distributor or representative, and relevant government authorities. Interaction should begin during the project planning stage.
- Moreover, the firm should connect with the Vietnam pulp and paper association (VPPA). VPPA has many members who are pulp and paper plants in the Vietnam market. The VPPA's members are potential

customers of foreign firm. And VPPA can support the foreign firm to find and connect potential customers.

- In competitive bidding, the foreign firm should have strong connection with support the project's development from the planning stage of project. The foreign firm should establish rapport and credibility. Besides, the firm also should hire local staffs who how the product or service can support project needs well before the bid is publicly announced.

In the development stage when the firm has some experience and reference projects in Vietnam market, they can decide to open their representative or choose a local agent to distribute their products and expand their market by approaching the private enterprises in the market.

Selecting a local agent: once way to locate Vietnamese partners is to contact and network through local chambers of commerce and industry associations such as Vietnam Chamber of Commerce and Industry (VCCI), Investment & Trade Promotion Center in Ho Chi Minh City, Vietnam Trade Promotion Agency. In Vietnam there are many private consulting companies have also developed services to support foreign firm to find a suitable local agent. And one of the most efficient ways to find local agent is basing on the foreign firm business network.

Open their representative office (RO). The foreign firm can also open their representative offices (RO) in Vietnam. When setting up the RO the firm should have a license which is issued by the relevant Department of Trade (DoT) in the city or province where the representative office is to be set up. A representative office should follow the stipulated in Decree 72/2006/ND-CP, dated July 25, 2006, detailing the Trade Law's regulations on representative offices, branches of foreign businesses in Vietnam, and in Circular 11/2006/TT- BTM, dated September 28, 2006, providing guidance on the implementation of Decree 72/2006/ND-CP.

Expand the foreign firm market to the Segment 2, the private enterprises. When doing business in this segment, the firm can expand their market by supplying the new WWT for the Segment 2 which includes private enterprises. To be successful

in this segment, the foreign firm should have solution to solve difficulties especially of the small private enterprises in this segment which have limited capital and lack of management skill, low product quality and high relative cost.

Financial solution: The customer in segment 2 has to use their own capital borrowed from the bank to invest in new equipment. Vietnam government doesn't have much policy to support the development of this segment. The private enterprise cannot access the state-funded and ODA fund. As the analysis of the researcher, the funded financial resource that the small private enterprises can access is the Green Credit Trust Fund. The fund is targeted to reduce the pollution caused by the small private enterprises. According to the fund, small or medium-sized businesses which lack sufficient collateral can still get up to 50 percent of the credit. Companies which reduce their impact on the environment by "certain amounts" will receive a 25 percent reimbursement for their investment in new equipment or technology. (gctf.vn, 2011) However, most private enterprises in the Vietnam market have a lack of the management skills and know how to approach the funded resources. The foreign firm can become a bridge to connect the small enterprises with the Green Credit Trust Fund. By supporting the customer accessing this fund, the firm can increase the sale through the project funded by Green Credit Trust Fund. The funded finance is from 10,000 euro and up to 1,500,000 euro. (Gctf.vn, 2011) In order to do this, the foreign firm should understand the operating system of this fund and how the private enterprises can access it.

The researcher believes that pulp and paper industry can become an initial step when company start to do business in Vietnam. The more projects they do in Vietnam the more experience and reference gaining.

Based on the firm relationship and business network, the firm can consider expanding their business by supplying the wastewater treatment equipment for other industries in Vietnam. Many companies in the Vietnam market often supply wastewater treatment solutions for some industry in the market such as wastewater treatment for industrial zones or water supply equipment besides the treatment equipment for pulp and paper plants.

5.3 Marketing strategy

In this research, the group of marketing strategies is used to be marketing strategy for the foreign firm enters the market. The marketing strategy includes three strategies:

- Building competitive advantages
- Stakeholders analysis and management
- Risks management

5.3.1 Building competitive advantages

A first action the firm should do when they enter the market is deciding what competitive advantages of the firm can have in the Vietnam WWT market. Then the firm should have strategy to strengthen their existed competitive advantages or build up new competitive advantages with series of tactics such as

Products: The firm should supply the product which can solve the environmental pollution and reduce the high relative cost of the customers in the market. In case the firm supplies the used equipment into the market, the firm's product should be economical, efficient and environmentally friendly solutions. And the quality of treated water from the used equipment systems or new WWT equipment should meet the standard QCVN 12: 2008.

Besides the supplied product should help the pulp and paper plant reduces the relative cost. In Vietnam, the consumption cost in the plant applied Biological treatment is lower than VND 2,000/m³ WWT (about EUR/7cent). And the consumption cost in small and medium size paper plants applied DAF combined with simple biological treatment was VND 2,000/ m³ WWT.

The WWT equipment and the used production equipment have to recycle and reduce the consumption water used in the production. Now the water used in the pulp and paper production is high from 200 to 600 m³/tons of paper. The

customers can have more benefit if the WWT equipment and used equipment of the firm can save the clean water.

Moreover, lacking energy is big problem with the Vietnamese pulp and paper industry. If the WWT equipment consumes low energy the customer can save more money and reduce their production cost.

The product supplied in the Vietnam market should have a suitably priced. The price of DAF technologies for large plants might be arranged from VND 75 billion (EUR 2,955,593) in My Xuan I plant to VND 1 billion (EUR 34,200) in paper plant with 2500m³/day.

Providing services: When selling the wastewater treatment or used equipment for pulp and paper plant, the firm should have services to support customer in reinstalling the used equipment into required capacity, supporting customer in operating, maintaining the equipment. Besides, the foreign firm should have after-sales service or warranties services to support their customers.

After-sales service and customer support are important components of a sale, as they can distinguish the foreign firm from competitors. The customer in the Vietnamese pulp and paper industry will expect access to a supplier in Vietnam, rather than from a regional base. This will be especially true for state-owned enterprises. The foreign firm may need to emphasize customer service training for the front-line local staff, as well as technical training for technicians.

Warranties are also an effective marketing tool to assure customers that they are buying a genuine, high quality product. In the Vietnam market, foreign suppliers are not permitted to provide direct sales service and customer support unless they have a licensed foreign investment project in Vietnam. To solve this issues the foreign firm can use the local agent or their supplier in the market to provide warranties services.

Building strong brand: Brand name of the product is the key element in the company's relationships with consumer. In the initial stage of entering the market, the firm should pay attention and start to build up the firm's brand name in the market. With the firm who just start to enter the market, spend much money on

advertising and building image in the new market is quite risk to the company. However, for the long term development in the market, the firm should start to build their brand and their image in the Vietnam WWT market. The foreign firm can attend exhibitions or trade fairs in Vietnam to advertise the company's image and products. In Vietnam, a Vietwater exhibition is the biggest exhibition in the wastewater treatment market. The exhibition has the attendance of many foreign, local and multinational firms who do or intend to do business in Vietnam wastewater market. When the new foreign firm enters the Vietnam market, the Vietwater exhibition will be a good place for introducing the firm. According to the holder of the Vietwater exhibition, 98% of exhibitors indicated they have achieved or exceeded expectations on their participation in the previous event. (vietwater.com, 20011)

Personnel differentiation: The firm can have big competitive advantages when the firm has a good strong management team, qualified and trained staff. In fact, having a strong management team acts like a multiplier of sorts. Company's business will end up moving faster, more efficiently, and be more motivated than otherwise have business of the same size, but with only one leader or a weak team. The firm can hire experience staffs have deeply understands of the buying process of the customers or have some relationship with the Vietnamese authorities.

5.3.2 Stakeholder analysis and managements

In this research, the research chose the Segment 1 and Segment 2 in the Vietnamese pulp and paper industry as targeted segments. Each group of stakeholders is different from other groups in term of the stakeholder's interest in the business activities and the stakeholder's power to influence business decisions. There is a summary about some key stakeholders who directly or indirectly influence the firm when they do business in the Vietnamese WWT market for pulp and paper industry.

Table 5-1: Stakeholder analysis and management

Stakeholder	Stake in the business	Potential impact on the business	What does the business expect the stakeholder to provide	Perceived attitudes and or risks	Stakeholder management strategy
Direct stakeholders					
Customers	The user of the WWT equipment, a target of the business	High	Purchasing the product, long term relationship Revenue / repeat business Word of mouth recommendation	Highly appreciate the firm's product or not	Closely manage, put enough effort to satisfy the customers. Provide good quality product at suitably priced
Agent	Support the firm when they enter the market	High	Utilizing the supplier's or agent's market knowledge, relationships with customers, and authorities in the market of suppliers or agent.	Inefficiency	Find the best and suitable agent in the market. Manage closely, support technologies, management skills and training technical staff to improve the agent efficiency

Supplier	Supply spare part or accessories for the firm when they enter the market	Medium	Becoming customers Subcontracting the project to reduce the cost of project	Can cooperate with competitors in their own projects	Manage closely and diversify the supplier to find the best and suitable suppliers
<i>Funded organizations to segment 1</i>					
Bilateral ODA or multilateral ODA	Funded organization of the projects in pulp and paper industry	High	Funded the projects and set up the Setting up the project's criteria Selecting suppliers	Choose the company products/ service or another supplier	Keep satisfy and keep engage in the foreign firm's projects.
Ministry of Industry and Trade (MOIT)	- Direct control the pulp and paper industry in Vietnam. - Preside over the appraisal of investment projects within its authority (including ODA-funded projects but excluding projects subject to appraisal by the Planning Department) and submit those to the Minister for approval	High	Give opinions about investment projects within its authority and which are subject to approval by local authorities. Preside over the formulation of legal documents Assist the MOIT in appraising the preliminary design of specialized construction works under group-A projects	The stakeholder can have the policy support the use of local production in WWT or increase the number of projects using of local tender.	Keep satisfy and keep engage in the firm's projects. The firm should follow up the activities of the Ministry of industry and Trade to find the opportunities to cooperate with potential customers in segment 1

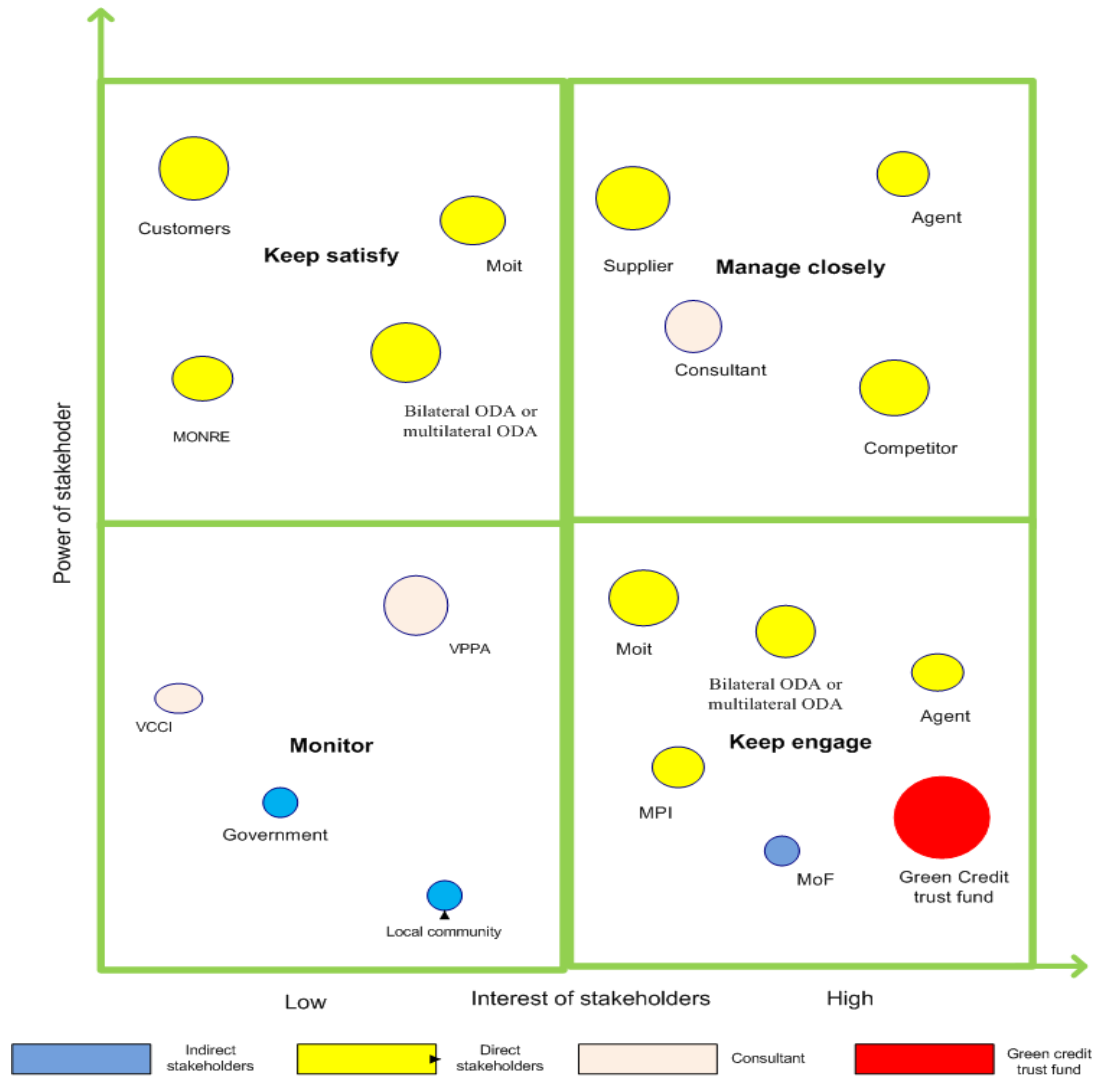
<i>Funded organization for segment 2</i>					
Green Credit Trust Fund	Support the small and medium size enterprises to invest in cleaner technologies.	High	Support financial for potential customers through buying the firm's products	Potential fund to invest in the private enterprises in the pulp and paper industry Potential customers might cannot approach the fund	Keep engage in the firm's project. Contact closely and cooperate. Understand the fund's operating process Advice the potential customer to use this fund as the financial resources for buying the firm's products
Indirect stakeholder					
Competitors	To compete with the firm by supplying pulp and paper production equipments and waste water treatment - To have the same target customers	High	Fair compete in the market Supported and sometime cooperation in the big project	To direct compete with the company To prevent or make the difficulty for the firm market entrant	Closely management, build up a better marketing sensitivity, quicker and deeper actions, better after sale services.
<i>Supporting stakeholders</i>					
Consultant	Advice services, supply legal consultant and market information.	Low	Cooperate with company and supply advice services, supply legal	Not efficiency	Closely manage, keep informed and make use the information and the

			consultant and market information.		knowledge of the advisers
Vietnam pulp and paper association (VPPA)	Have board connection with VPPA's members pulp and paper plants in Vietnam	Medium	Cooperate with the company to do business or support the market information	Support and connect the firm to the customers	Monitor contact and inform.
Chamber of commerce VCCI	Promote business development and protect the legal rights.	Medium	Support and connect the foreign firm with the local partners or customers in the Vietnam market.	Do not support the foreign companies or the recommended partners are not suitable with the foreign firm	Monitor
Authorities stakeholders					
Government	Specifically support and invest in the pulp and paper industry as part of the economic growth rate package. Pass the law affecting the way business operates.	Medium	The government invest more money in pulp and paper industry as well as improve the environment condition in existed pulp and paper plants	The Government can launch the law that effect the business of the firm	Do business under the Vietnamese law systems Support the Government in improving the environmental condition in Vietnam.
MONRE	Guide and supervise the evaluation and approval of reports on strategic assessment on environmental impact assessment and registration	High	Organize the evaluation report strategic environmental assessment; approval of reports on environmental impact Issue	To define the organization of the damage and pollution, degradation and improvement environmental quality	Keep satisfy by supplying the product that meet the MONRE requirements. Closely contact and follow the MONRE in guide lines.

	of environmental commitment in the country. Direct and coordinate with the investigation organization to identify areas of environmental contamination in the inter-province		environmental permit under the provisions of law specified route, national technical regulations on waste in the regions and sectors in accordance with the load capacity of the environment		
MPI	Sum up and submit list of ODA-funded programs and projects for approval Guide concerned units and organizations to prepare ODA-funded programs and projects Prime responsibility and coordinate with the Ministry of Finance in determining forms of using ODA capital which shall be allocated or sub-lent by the State budget Monitor the organization of bidding projects already approved by the Government	High	Responsibility for elaborating strategies and planning on ODA attraction and use To guide managing agencies in formulating lists and contents of programs and projects prioritized for ODA mobilization Prepare contents of, and conduct negotiations, on international framework treaties on ODA To represent the Government in signing international framework treaties on ODA with	Evaluate and submit to the Prime Minister for approval documents of ODA-funded programs and projects falling under the Prime Minister's approving competence;	Keep satisfy and keep engage in the foreign firm's projects in the Vietnam market. MPI is responsible for guiding, examining, inspecting, supervise and synthesizing the implementation of law provisions on bidding; to manage the system of information on bidding.

			donors; To submit to the Government and/or the Prime Minister bidding plans and bidding results of projects falling under the competence of the Government or the Prime Minister		
MOF	Manage financial customs; accounting; independent auditing; insurance; prices; securities; conducting the ownership rights to the State's investment capital in enterprises according to regulations of the Law.	Medium	Implement the State management in accounting and auditing.	Fund the project Cooperate with the Ministry of Planning and Investment in the ODA project	Keep engage, because MOF manages the assigned capital and assets and the distributed budget plan under the provisions of the Law
Local community	Group of interact people who sharing an environment where the products is used.	Low	Strong support from the local community with products and activities of the firm	Support if the firm's product protects the environment and vice verse	Monitor contact and inform

After analyzing the stakeholder in the market, the research maps in the stakeholder into stakeholders grid. Stakeholder's position on the grid showed the actions that the firm should take with them



5.4 Risk management

Risk management is attempting to identify and then manage threats that could severely impact or bring down the organization. Generally, this involves reviewing operations of the organization, identifying potential threats to the organization and the likelihood of their occurrence, and then taking appropriate actions to address the most likely threats.

Meet the legal requirement: The most difficulty the firm might have in the Vietnam market is the bureaucracy of the Vietnamese laws systems. As the WWT

equipment is directly relate to the environmental issues, the foreign firm should have a strategy for coping with the change laws systems or economic situation. The foreign firm can use the consultant system such as foreign law firms, the services of local law firm, consulting services to support the firm in works related to the Vietnamese legal systems.

Foreign Law Firms: As Vietnamese law firms still generally lack expertise in commercial and international law, foreign investors should consider using the services of a foreign law firm in Vietnam.

The services of local law firms can supply services range from preparing applications for representative offices, trademark registration, and feasibility studies to conducting market research and identifying investment opportunities. As many of these firms have ties to a particular ministry or Government agency, they may be well connected with key decision-makers and can facilitate access to officials, provide insight regarding Government policy, and advise on negotiation techniques.

Consulting Services: In the Vietnam market, both internationally recognized and local consulting and advising services are available. A number of the large international accounting/professional services firms now have well-established offices here. Such entities can provide invaluable assistance in doing business in Vietnam.

Manage the partner's risk: When the foreign firm decides to establish a new business in Vietnam market, the firm should develop business relationship in positive, but cautious manner.

The foreign firm should check the quality of a prospective partner's business before deciding cooperation. The foreign firm can request a list of customers and suppliers that are currently transacting business with that entity. The firm should make the effort to contact a number of references in order to verify the validity and integrity of the business. Confirming that the firm has actually completed successful transactions on behalf of foreign clients can decrease risk of problems later.

One of the most challenging aspects of examining the prospective partner's is the commercial credit information services. The information about commercial credit in Vietnam is limited. In Vietnam, the foreign firm can use two source of the commercial credit to check partners: Credit Information Center (www.creditinfo.org.vn), operating under the State Bank of Vietnam (SBV) had been the only credit information resource in Vietnam and Vietnam WorldVest Base (WVB) Financial Intelligence Services Co. Ltd. (www.vietcr.com), allowing it to provide credit rating services on Vietnamese companies.

The weakness of the local firm is a lack of new technology knowledge, management skills. When set up an alliance with the local agent the firm should support local agent in transferring technology or improve management skills and vice versa the firm could have a benefit from their partners. The Vietnamese local agent knows the market and they are often able to anticipate the needs of their customers and advise the firm to make firm's product more suitable with the market.

In the relationship with the agent, the firm should notice the possibility that the agent might choose the cheaper component to supply in the agent's project rather than using the firm's equipment. In Vietnam, the agent not only is the agent for one foreign company but also the agent for many companies. Meanwhile, the agent is often able to advise the agent's customers on the availability of components, or research availability from among the manufacture they act for. This condition urges the firm should have good and practical strategy to open the representative office and build up their business relationship with the customers in the market.

Patenting technologies and processes is one of the best ways to create a barrier-to-entry in industrial field or any business field. Especially in waste water treatment market, if firm's new process or technology is significantly better than the old ones that it replaces. When the firm enters the market, the firm should focus on some main issues of intellectual property rights (IPR) in Vietnam.

Firstly, it is important to have an overall strategy to protect IPR. The IPR must be registered and enforced in Vietnam, under local laws. Companies can seek advice from local attorneys or consultants.

Secondly, the foreign firm is responsible for the rights' holders to register, protect, and enforce their rights where relevant, retaining their own counsel and advisors. The firm the firm should notice two key issues to contend with, enforcement and time.

Thirdly, it is also recommended that the foreign firm should understand the importance of working together with trade associations and organizations to support efforts to protect IPR and stop counterfeiting.

- International Intellectual Property Alliance (IIPA)
- International Trademark Association (INTA)
- The Coalition against Counterfeiting and Piracy
- International Anti-Counterfeiting Coalition (IACC)

6 CONCLUSIONS

This research is aiming to find the business opportunities to supply the wastewater treatment equipment for pulp and paper plants in Vietnam.

Along with the high growth rate of the economy, the Vietnamese demand of paper products is increasing. The more paper is required, the more new plants and more business opportunities in the WWT equipment market.

With the aim of finding the business opportunity in the Vietnam market, the research was implemented to establish the feasibility analysis of the WWT equipment market for pulp and paper industry. After that, the market strategies for entering the market of WWT application for pulp and paper plants in Vietnam were recommended.

The qualitative analysis was used to analyze the business opportunity in the Vietnamese market. The market was analyzed under the macro environment and micro environment analysis. The panorama of the market was looked at through the PESTLE tools. At the micro environment, the Five Forces analysis is a powerful tool to analyze the competition in the market. Then, market segmentation and segment selection help the researcher choose the best market segments for the foreign firm to enter the market.

One important part of the research is the field research trip in the Vietnam market. By working and interviewing people and specialists in the market, the researcher has the practical understanding about the market of WWT equipment for the pulp and paper industry.

As the research results, the Vietnamese market is a potential market but pulp and paper plants in Vietnam do not have much money to invest in wastewater treatment. The finance of most of the wastewater treatment and environmental projects in general come from government funds or are ODA funded. The need of changing technology and environmental protection in Vietnam is increasing.

There are two main requirements from the Vietnam pulp and paper industry that are needed to be met:

- Improving the product quality and remain the domestic market share
- Reducing the bad effect of producing pulp and paper to the environment and obey the Vietnamese law systems.

In the content of this research, the researcher recommends two business opportunities in the Vietnam market:

- Firstly, the firm can supply the wastewater treatment and technical consultant service for pulp and paper plants at suitable price into Vietnam market. The foreign firm can come into the market through ODA projects. This is the fastest and the safest method that the small and medium size firm can use to enter the Vietnam market.
- Secondly, the researcher recommends a business opportunity in supplying used equipment for pulp and paper plants in Vietnam market. In Vietnam there are about 550 paper plants, and 98% of these plants need to upgrade the equipment. It is clearly that the market for used

In order to succeed in the Vietnam market, the new foreign firm's WWT equipment and the used production equipment have to solve the wastewater problem and reduce the production cost such as reducing energy consumption, chemical cost, the water used to produce pulp and paper etc.

From the researcher's point of view, bringing the efficient WWT equipment and used production equipment to the Vietnam market can both bring the prosperity to the foreign firm and the Vietnamese pulp and paper industry. In the long term, the Vietnamese pulp and paper industry is developing and requires good quality WWT equipment and used production equipment to develop sustainability.

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APPENDICES

Table 0-1: Vietnamese paper production and pulp production in 2007

No	Owners	Number of enterprises	Pulp		Paper	
			Capacity	Percent	Capacity	Percent
1	State-owned enterprises	13	111000	26.47	133,070	8.75
2	Join-stock companies	76	237,550	56.65	694,420	45,68
3	Private enterprise	167	70,770	16,88	632,460	41,61
4	Foreign companies	3			60000	3.96

Table 0-2: SWOT analysis two main WWT technologies used in the Vietnamese pulp and paper industry.

SWOT the DAF technology which supplied by Krofta:

<p>Strengths</p> <ul style="list-style-type: none"> • Lower purchase cost. • Low installation cost. • Easily relocated and easily accomplished • Small space requirement. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Used a lot of energy during the treatment process • Secondary treatment wastewater • Adding investment is needed when customers want to improve quality of treated water
<p>Opportunities</p> <ul style="list-style-type: none"> • The buyer in Vietnam has limited financial resources 	<p>Threats</p> <ul style="list-style-type: none"> • Can be replaced by the chemical treatment or biological treatment

SWOT the Biological technology which supplied by OVIVO:

<p>Strengths</p> <ul style="list-style-type: none"> • Tertiary treatment • Low space requirements, easy to operate. • Stable for water quality and quantity fluctuations • High treatment efficiency, high consistence excess sludge and no backwashing needed. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Expensive and most of customers in Vietnam market cannot afford such expensive technology.
<p>Opportunities</p> <ul style="list-style-type: none"> • The new trend in foreign investment in pulp and paper industry • The requirement from legal systems that all wastewater from pulp and paper plant should be tertiary treated. 	<p>Threat</p> <ul style="list-style-type: none"> • Customer can choose the cheaper technology to treat wastewater • The slow improvement and impracticality of the Vietnamese legal systems

Table 0-3: List of Vietnamese pulp and paper plants used Krofta WWT equipment

Number	Pulp and paper plants	Products
1	Effluent Tan Man Mai Joint Stock Treatment plant- Binh An paper co.	Krofta system, 4000m ³ /day in 2008, tertiary WWT after treatment water meet the Vietnam law requirement. SPC24, 6000m ³ /day, collect pulp
2	Song Lam Nghe An paper	DAF SPC18, 3500m ³ /day, collect pulp and secondary treatment wastewater
3	Thanh Dung paper	DAF SPC18, 3500m ³ /day, collect pulp and secondary treatment wastewater
4	Phuong Dong paper	DAF SPC18, 3500 m ³ /day, secondary treatment wastewater
5	Phong Khe paper	DAF SPC15, 2000m ³ /day, secondary treatment wastewater
6	Hai Phong paper	DAF SPC18, 3500m ³ /day, secondary treatment wastewater
7	Song Duong paper	DAF SPC12, SPC36 used in DIP systems and SPC10 1000m ³ /day, secondary treatment wastewater
8	Bao Yen paper	DAF SPC12, 2000 m ³ /day, secondary treatment wastewater
9	Dong Nai paper	DAF SPC18 6000 m ³ /day combined with biological aerobic treatment process, tertiary WWT meets the Vietnam standard. Finished 19/5/2011
10	Sai Gon paper	ADT 2000, tertiary WWT, capacity 10,000m ³ /day, 2009
11	Hai Ha hapaco	DAF SPC12, 2000m ³ /day, collect pulp and secondary WWT

(kroftaengineering, 2011)

Table 0-4: Long list of medium size potential partners

Name	Source/ Website	Services/ Products	Notes
Asenco Co., Ltd.	asen-co.com.vn	Supplier of waste water equipment & engineering services	Small portfolio, EPC of Long Giang pulp and paper factory (10.000 tons/yr)
Asiatech Co., Ltd.	www.asiatech.com.vn	Waste water treatment services	Appendix 1. Example of Asiatech's WWT quotation
Cam Tam Co., Ltd.	www.cawatech.com.vn	Waste water treatment services	Small portfolio consists of mostly industrial parks & industrial zones
Duc Phat JSC	xu-lynuoc.net	Engineering, chemicals & equipment supply, consulting	Subcontractors of many projects, supplier of chemical & sediment tanks
Hai Thu Ltd.	www.haithu.com.vn	WWT equipment supply	Equipment supplier for many pulp & paper projects in Vietnam
Vietfilter JSC.	www.vietfilter.vn	Water treatment equipment supplier	NI
Dong Vinh Co., Ltd.	www.dongvinh-group.com	Water treatment equipment and chemical supplier	NI
Hung Phuong Ltd.	www.hungphuong.com.vn	Complete waste water treatment systems	EPC, portfolio consists of mostly chemical companies, schools & residential areas
Van Lang Co., Ltd.	www.vlc.vn	WWT equipment supply	Subcontractors: food processing plants, medical production plants & garment plants.
Viet Nhat Co., Ltd.	www.vietnhat.net	Supplier of waste water equipment	NI

Source: (Do Thanh Ha, 2009, p.56)

Table 0-5: Questionnaires



LAHDEN AMMATTIKORKEAKOULU
Lahti University of Applied Sciences

QUESTIONNAIRS FOR POTENTIAL CUSTOMERS

Your evaluations are important with us

Company: _____

Name: _____ **Title:** _____

Place: _____ **Date/Time:** _____

1.	Please state what is your position (Job description) in your company?
2.	How long have you worked in this company? _____ (Months/ Years) How long have you worked in this industry? _____ (Months/ Years) Company's scale: _____ Numbers of employees: _____ - Small (10-200 employees , Capital less than VND20 billions) - Medium (200-300 employees, Capital less than VND 20-100 billions) - Large (More than 300 employees, Capital more than VND 100 Billions)
3.	How would you describe your role in decision making in buying WWT equipment in your company? <input type="checkbox"/> I make decisions myself/ Are there limitations of the purchase that can be done by individual? <input type="checkbox"/> I am part of decision making process/ Team- Who are in your team? <input type="checkbox"/> I know the process well and sometimes participate in it 'What kind of decisions have you been participating in lately? <input type="checkbox"/> I am not part of the process but I am familiar with the process/ is it clear process?
4.	What are your company main products? What is your company technology in producing papers? _____
5.	What are the WWT systems your company is using at this moment? Could you let me know the total investment of your company in waste water treatment systems? Your company satisfaction with current waste water treatment systems?

6.	Does your company plan for new waste water treatment systems? How much money could your company invest for the new waste water treatment?				
7.	Has your company ever been offered new waste water treatment systems from suppliers? Yes, by what company? What happened? Why? Was it a good or bad idea?				
	Please state the importance of following criteria when your company decisions to buy new WWT systems.	Most important	Important	Less important	No important
	Investment cost	1	2	3	4
	After sales Service/ Maintenances	1	2	3	4
	Meeting Vietnamese standards applied for paper wastewater.	1	2	3	4
	Efficiency in WWT	1	2	3	4
	WWT process is friendly with environment?	1	2	3	4
	Stability and safety in paper WWT process	1	2	3	4
	Product's brand names and supplier's experiences	1	2	3	4
	Open questions issues: To understand how your company makes decisions about buying WWT systems, could you explain the purchase process?				
	<ul style="list-style-type: none"> - Does your company direct imported WWT of buy from main suppliers? - What is your company process for choosing suppliers? (Bidding, Offers, Relationships...) - What is the process for deciding new investment? - What is your advice for new supplier entering this field? - Would your company be interest in cooperate with foreign company who supplies paper WWT systems? 				

Others:

Table 0-6: The wastewater analysis of 10 Pulp and paper firms in Hanoi areas (Based on average)

Number	Places to take wastewater	Criterias				
		pH	COD (mg/l)	BOD 5 (mg/l)	TSS (mg/l)	DO (mg/l)
1	Song Duong tissue paper Co.	7.58	53	31.9	56.05	2.11
2	Xuan Son private paper enterprise	6.60	557.8	287.7	383.7	1.39
3	Phuc Dat paper company	8.45	683.1	413.1	372.8	1.25
4	Tay Do paper Joint Stock Co.	8.17	791.7	442.2	306.4	0.94
5	Truc Bach paper Joint Stock Co.	7.33	88	58.4	81.5	2.25
6	Minh Chau paper Joint Stock co.	7.71	138.7	87.5	139.1	1.29
7	Duc Ngan Private company	7.69	881.4	544.5	485.9	0.78
8	Hai Tien paper Joint Stock Co.	7.38	59	38.6	67	2.27
9	Viet Thang Private enterprise	7.46	69	46.4	75.4	2.64
10	Hung Ha Private enterprise	7.44	744	489.3	390.9	0.99

Table 0-7: National technical regulation on the effluent of pulp and paper mills – QCVN 12: 2008/BTNMT

TT	Thông số		Đơn vị	Giá trị C		
				A	B	
					Cơ sở chỉ sản xuất giấy (B1)	Cơ sở có sản xuất bột giấy (B2)
1	pH		-	6 – 9	5,5 - 9	5,5 - 9
2	BOD ₅ ở 20 ⁰ C		mg/l	30	50	100
3	COD	Cơ sở mới	mg/l	50	150	200
		Cơ sở đang hoạt động	mg/l	80	200	300
4	Tổng chất rắn lơ lửng (TSS)		mg/l	50	100	100
5	Độ màu	Cơ sở mới	Pt-Co	20	50	100
		Cơ sở đang hoạt động	Pt-Co	50	100	150
6	Halogen hữu cơ dễ bị hấp thụ (AOX)		mg/l	7,5	15	15

Table 0-8: Laws affect the WWT equipment applied in the pulp and paper industry.

Law	Law applied
<i>General law applied for Foreign investment</i>	
Investment legislation law in Vietnam	Law on Enterprises No 60/2005/QH11 by the National Assembly of The Socialist Republic of Vietnam
Intellectual property law and technology transfer	<i>Law on Intellectual Property No. 50/2005/QH11 passed by the National Assembly on November 29, 2005, as amended on June 19, 2009.</i>
The law on Competition	<i>Law on Competition No. 27/2004/QH11 passed by the National Assembly on December 03, 2004</i>
Taxation	<ul style="list-style-type: none"> - <i>Corporate income tax</i> - <i>Value added tax (VAT)</i> - <i>Foreign contractor tax</i> - <i>Import-Export duty</i>
<i>Law applied in Environmental Protection</i>	
Law on environment Protection	Law on Environmental Protection No 52/2005/QH11 by the National Assembly of The Socialist Republic of Vietnam
<i>Law applied in the WWT</i>	
Law on Drainage and Sewerage	Decree 88/2007/ND-CP by the Government of the Socialist Republic of Vietnam dated May 28, 2007 on Drainage and Sewerage for Urban Areas and Industrial Zones
Law on Protection charges for wastewater	Decree 67/2003/ND-CP by the Government of the Socialist Republic of Vietnam dated June 13, 2003 on Environmental Protection Charges for Wastewater
	Decree 04/2007/ND-CP by the Government of the Socialist Republic of Vietnam dated January 8, 2007 on the Revision and Supplementation of some Articles of Decree 67/2003/ND-CP.
Guidelines to build Drainage and Sewerage in Urban areas and Industrial	Circular 09/2009/TT-BXD by the Ministry of Construction on defining detailed guidelines to implement some contents of Decree 88/2007/ND-CP on Drainage and Sewerage in Urban Areas and

Zones	Industrial Zones
Local requirement	Local requirements (e.g. existing local water resource management plans, master plans, urban development plans, etc.)
<i>Law applied for wastewater from pulp and paper plants</i>	
Effluent Standard for waste water discharge into receiving water body	<ul style="list-style-type: none"> - QCVN 12:2008/BTNMT National technical regulation on WW from paper and pulp industry - QCVN 24:2009/BTNMT published in 16th November 2009
Policy support the pulp and paper development in 2010 to 2020	<ul style="list-style-type: none"> - 07/2007/QD-BCN of January 30, 2007 approving the adjusted planning on development of Vietnamese paper industry up to 2010 with a vision toward 2020