

Convolant Ltd.

A case study into a footloose born global classic entrepreneurial company

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Abstract

Newly founded location-unconstrained entrepreneurial companies are characterized by a unique problem set due to being inexperienced and resource constrained yet conducting business in the international market. I have found that the current state of literature targets these companies, which I term 'footloose (i.e. location-unconstrained) born global classic entrepreneurial' only to a limited extent. In line with the rise of the global market, a growing number of these types of companies, however, enter the international marketplace, and hence the need of support to increase the odds of survival and success is increasing.

By means of carrying out a case study, I explore the first business activities of a representative footloose born global classic entrepreneurial company called Convolant Ltd. I explore the firm's target market and analyze its first location decision, facility configuration and business plan. I assess the extent to which theories of international business strategy, location theory and entrepreneurship are of assistance for the firm's first market activities. I further assess the extent to which crossover research amongst these three academic fields can be of assistance.

I show that an industry assessment, as proposed by international business strategy theory, is applicable to define general target markets. I further demonstrate that general location theory lacks an emphasis on international factors to be of full applicability. While traditional theory prioritizes cost factors, I find that footloose startup companies' primary emphasis is on market availability for their entrepreneurial product. I further demonstrate that one of the leading perspectives of international business strategy, the institution-based view, is highly influential of the location decision. Regarding first time business plan formulation and facility configuration decisions for a foreign market I show, that literature is essentially of no assistance. In order start closing the identified research gap I propose a crossover of the three currently mainly independent theoretical fields of location theory, international business and entrepreneurship under the requirement of placing a high emphasis on the international factor.

Preface

Writing the master thesis represents the final part of my Master of Science in Economics and Business Administration studies at Norges Handelshøyskole, Bergen, Norway.

Writing this thesis has been a rewarding process in terms of learning and developing my analytical and research skills.

I would like to express my gratitude to my supervisor Ove Rein Hetland for his guidance and constructive feedback throughout the whole process of defining the topic, developing the content, and writing the thesis.

I would also like to particularly thank Frank Schirling and Franz Josef Phillip who have provided me with detailed information and insights into the case study subject including its innovative process and facility configuration. Without their cooperation, I would have been unable to conduct my research.

Norges Handelshøyskole, June 11, 2009

A handwritten signature in black ink, appearing to read 'Ulrike Mendler', with a long horizontal stroke extending to the right.

Ulrike Mendler

Table of Content

| | | |
|--------|---|----|
| 1. | INTRODUCTION | 1 |
| 2. | REVIEW OF LITERATURE | 4 |
| 2.1. | Location Theory | 4 |
| 2.2. | International Business Strategy | 9 |
| 2.3. | Challenges of doing business in developing countries | 11 |
| 2.4. | Classic Entrepreneurship | 12 |
| 2.5. | International Entrepreneurship | 13 |
| 2.6. | Critical assessment of presented literature | 14 |
| 3. | METHODOLOGY | 17 |
| 3.1. | The proposed study | 17 |
| 3.2. | The research method | 19 |
| 3.2.1. | The case study research method | 19 |
| 3.2.2. | Exploratory embedded single-case study | 20 |
| 3.2.3. | Criticism of case studies | 21 |
| 3.3. | The research design | 22 |
| 3.3.1. | Multiple sources of evidence | 22 |
| 3.3.2. | Principles to ensure quality of research | 27 |
| 3.3.3. | Analytical strategy | 28 |
| 3.3.4. | Structure | 29 |
| 4. | PRESENTATION DATA: THE CASE STUDY SUBJECT | 30 |
| 4.1. | Company Profile Convolant Ltd. | 30 |
| 4.2. | The CeMin28 Waste Product Cycle | 30 |
| 4.2.1. | Process | 31 |
| 4.2.2. | Process inputs | 32 |
| 4.2.3. | Environmental friendliness | 33 |
| 4.2.4. | Possible end products | 34 |
| 4.3. | The Building- and Raw Materials Center Abobo | 34 |
| 4.3.1. | Introduction Abidjan and local relevant characteristics | 35 |
| 4.3.2. | Objectives | 37 |
| 4.3.3. | Facility configuration | 38 |
| 4.3.4. | Investment costs | 38 |
| 4.3.5. | Input, output and estimated revenues | 39 |
| 4.3.6. | Operating costs | 41 |

| | | |
|--------|--|-----|
| 5. | ANALYSIS DATA: ASSESSMENT AND EVALUATION | 44 |
| 5.1. | Definition of target market requirements | 44 |
| 5.1.1. | Industry assessment of German market | 45 |
| 5.1.2. | Required industry characteristics and market definition | 47 |
| 5.1.3. | Industry assessment Abidjan according to developed market characteristics | 51 |
| 5.2. | Factors of Location Analysis | 53 |
| 5.2.1. | Transportation systems and cost minimization | 54 |
| 5.2.2. | Climatic influences | 58 |
| 5.2.3. | Labor climate | 59 |
| 5.2.4. | Market availability | 61 |
| 5.2.5. | Resource proximity and long-term availability | 61 |
| 5.2.6. | Official support and political risk | 64 |
| 5.2.7. | Utilities | 66 |
| 5.2.8. | Summary applicability location theory | 67 |
| 5.3. | Assessment of project development plan and facility configuration | 72 |
| 5.3.1. | Supply chain logistics considerations | 73 |
| 5.3.2. | Potential revenues of selling by-products | 75 |
| 5.3.3. | Characteristics and production site of additives | 79 |
| 5.3.4. | Utilities | 81 |
| 5.3.5. | Lack of planning for institutional constraints | 84 |
| 5.3.6. | Revenues from waste reception | 84 |
| 5.3.7. | Summary of assessment | 85 |
| 6. | CONCLUSION AND RECOMMENDATION | 90 |
| 6.1. | Summary Research Questions | 90 |
| 6.1.1. | Research Question 1 | 90 |
| 6.1.2. | Research Question 2 | 91 |
| 6.1.3. | Research Question 3 | 92 |
| 6.2. | Recommendations for project development plan | 93 |
| 6.2.1. | Extension of investment costs | 93 |
| 6.2.2. | Modifications of input, output and estimated revenues | 94 |
| 6.2.3. | Modifications of operating costs | 98 |
| 6.2.4. | Summary benefits modified project development plan | 99 |
| 7. | REFERENCES | 101 |
| | APPENDICES | 111 |
| | Appendix 1: Abobo. Location of planned Building- and Raw Materials Center | 111 |
| | Appendix 2: Abobo. Location of planned Building- and Raw Materials Center II | 112 |
| | Appendix 3: Letter | 113 |
| | Appendix 4: Bulk Density of waste | 115 |
| | Appendix 5: Invoice Compagnie Ivoirienne d'Electricite | 116 |
| | Appendix 6: Invoice Societe de Distribution D'Eau de la Cote-d'Ivoire | 117 |

List of Figures

| | |
|--|----|
| Figure 1: Composition of Waste in Abidjan | 37 |
| Figure 2: Investment Costs | 39 |
| Figure 3: Processed In- and Outputs per day | 40 |
| Figure 4: Revenues | 41 |
| Figure 5: Operating Costs | 42 |
| Figure 6: Annual Labor Costs Building- and Raw Materials Center Abobo | 43 |
| Figure 7: Potential Revenues from By-Products | 78 |
| Figure 8: Comparison alternatives additive production sites | 80 |
| Figure 9: Utilities | 83 |
| Figure 10: Extension of Investment Costs | 94 |
| Figure 11: Extracted Components and Remaining Waste | 95 |
| Figure 12: Production of CeMin28 | 95 |
| Figure 13: Recommended Daily Facility Output | 96 |
| Figure 14: Adjusted Revenues | 97 |
| Figure 15: Operating costs: raw materials, utilities, labor costs | 99 |
| Figure 16: Comparison current and recommended project development plan | 99 |

1. Introduction

Traditionally, internationalization activities have been carried out by established companies in an attempt to expand their businesses by entering new markets. A vast amount of academic literature has been aiding these companies in their internationalization efforts. In line with the rising globalization, cross-border operations have been steadily increasing and international activities are no longer limited to mature companies taking their established products abroad. An increasing number of non-mature and non-established companies are entering foreign markets many of which immediately after their foundation. While some companies face constraints by having to be located in specific areas or within proximity of given market requirements, other companies are relatively unconstrained with regards to their location decision. These types of companies are referred to as footloose, a concept first defined by Edgar M. Hoover in 1948.

Traditional location theory has developed with a shift in focus from predominantly cost minimization considerations to including an emphasis on factors such as market demand. Furthermore, owing to the rise of the computers, the focus has evolved to developing decision modeling tools. What has largely remained unconsidered, though, is a modification of traditional location theory to include the target group of newly founded companies, which offer innovative products or processes and which internationalize immediately after their foundation. These footloose born global classic entrepreneurial companies are characterized by a very own problem set: Firstly, they are mainly inexperienced in carrying out their business activities such as deciding on their target markets, making location decisions, or writing business plans. Secondly, by launching an innovative product which has typically not been applied on a large-scale in the real world, not all facets of possible product characteristics are known yet and unforeseen issues arising unexpectedly can typically not be prevented. Thirdly, by internationalizing immediately after foundation, the startup company carries out all activities in foreign markets which pose very own, often unexpected challenges. While mature established companies are typically able to compensate for inexperience regarding products or foreign markets by doing extensive market

research, the young startup company is restrained with regards to resources in general and capital in particular.

Due to this unique problem set, several problems are encountered with regards to first activities on the market. Within this thesis I explore the issues that footloose born global classic entrepreneurial companies face with general market definition, business location decision and business plan development. I consider these activities under the viewpoint of applicability of three relevant theories, location theory, international business strategy, and entrepreneurship, and I explore the extent to which these general theories are of aid to footloose born global classic entrepreneurial companies.

My exploration is carried out by means of a case study in which I analyze a representative footloose born global classic entrepreneurial company, Convolant Ltd. The newly founded German company has developed a new process in which domestic and commercial solid wastes are, under the addition of additives and aggregates, processed into neutralized intermediate products to be converted into various end products such as building materials. The process output is flexible and dependent upon output requirements, composition of input waste and type and quantity of additives and aggregates. Convolant Ltd. is currently in the process of obtaining the necessary funding to set up its first waste conversion facility, a so-called 'Building- and Raw Materials Center', in Abidjan, Côte d'Ivoire, Western Africa. Being newly founded, having a truly innovative product, and internationalizing immediately after its foundation, makes the case study subject a representative case of a footloose born global classic entrepreneurial company. Convolant's first location choice and business plan form the foundation for the exploration of this study.

My results of assessing the applicability of general theories show the following: The first leading perspective on international strategy, the industry-based view is applicable to footloose born global classic entrepreneurial companies in terms of defining the requirements of market entry points. My results further show that location theory is generally of assistance to footloose born global classic entrepreneurial companies which are making business locations decisions. I do, however, find that several extensions need to be made, particularly concerning a strong focus on international factors and integrating the third leading perspective on international strategy, the institutional based view. Regarding

business plan preparation I find that general theory is only of limited help. All issues are encountered due to the company being constrained by the problem set described above. Many issues are company specific and can hence not be included within general theories. Nevertheless, I find that particularly concerning the constraint of operating in an unknown market, an emphasis on international factors can be of assistance. I therefore find that with regards to assistance in business planning, a crossover of location theory, international business and entrepreneurship emphasizing particularly the international issue can be of great assistance to resource constrained startup companies. My contribution with this thesis can be summarized as exploring improvement potential within the current state of research to optimally support first business activities carried out by footloose born global classic entrepreneurial companies.

The thesis is structured as follows: After I present the three academic fields of international business strategy, location theory and entrepreneurship I demonstrate the lack of crossover thereof from a theoretical point of view. Based on the literature gap I define the research objective and research question in chapter three and show how I intend to explore the research objective and questions by means of carrying out a case study. In chapter four I present general data on the case study subject, the innovative process and the case study subject's first business plan. This data serves as prerequisite input for the analysis which follows in chapter five within which I explore the put forth research questions. Chapter six, conclusion and recommendation, summarizes the research questions within the wider framework of the research objective. Since the lack of relevant academic support is found to be most prominent in business plan preparation, I give specific recommendations which are based on extracted information from the analysis section.

2. Review of Literature

Since the purpose of this thesis is to explore the extent to which the lack of crossover specific theories has an effect on footloose born global classic entrepreneurial companies, this review of literature is a central part of this thesis. Within this chapter I charter the body of knowledge in the fields of location theory, international business strategy, and entrepreneurship which is needed to explain the lack of applicability to the case of footloose born global classic entrepreneurial companies. The literature is also central to the analysis chapter, in which the research questions are considered by applying the existing theories. In this chapter I present the existing theories followed by a present of a lack thereof of crossover thereof to assist footloose born global classic entrepreneurial companies.

2.1. Location Theory

Location theory involves studying how businesses make location decisions. Facility location decisions represent long-term investments which fix the point from which all activities such as raw material procurement, output shipment, and energy supply have to take place. Location decisions further define available labor conditions and establish the available market. Because of involved costs for site construction and acquisitions, the decision, once made, is not easily reversible. Considering the implications of business location decisions, a thorough selection process is crucial (Söderman, 1975). Due to the long-term planning horizons, location decisions must be made under the assumption of a dynamic environment, which means that environments might change over time. The chosen location must hence satisfy current demand and conditions, as well as future system states with changes in its environment, populations and technology. Worded differently, what is needed are “robust facility locations” (Owen and Daskin, 1998, p. 423).

Traditional location theory uses a factor approach, which means that the reasons for business location are explained by the influence of various factors (ibid). An assessment of the most important studies in location theory has identified several factors influencing business location decisions. The most

predominant focus, especially in traditional location theory, is on cost minimization, which refers to firms choosing a location at which costs are minimized. Of all costs that are incurred, “transport costs [...] are the principal concern of industrial location theory” (Chapman and Walker, 1992, p. 41). The first useful approach with regards to cost minimization and location theory in general dates back to Johann Heinrich von Thünen in 1826¹. Under the assumption that each enterprise is pursuing maximum profit, von Thünen (1966, p. 8) explains the use of land by identifying “sharply differentiated concentric rings” surrounding a centrally located town in which economic activities are defined by transportation costs and cost of land.

In contrast to von Thünen’s approach, which essentially explains agricultural distribution by considering the location as given and the type of production to be determined, Alfred Weber’s theory seventy years later took the type of industry as given and the location to be determined². His study is generally credited to be the very first location model of significance which that would radically influence all later works in this field (Hansen et al., 1987). Just like von Thünen, Alfred Weber’s considerations essentially focus on cost minimization. Besides labor costs and agglomerating forces, it is mainly transportation costs, determined by weight and distance, which are to be minimized and, thus, are decisive of the optimal location. Differing material costs at different locations are incorporated by assigning greater distances; hence, higher material costs at one location are treated as if this location was further away (Greenhut, 1956).

Weber categorizes materials used in the production process into ubiquitous appearing everywhere (in general or regional) and localized materials, which can not be found in the vicinity of the specific location. Regarding the transformation process, localized materials are further grouped into pure materials and weight-losing materials, the first one entering into a product without residue, the latter imparting only parts and hence leaving residues³ (Weber, 1959). Considering that all material weight must be moved to the location and all end product weight must be moved away to its place of consumption, Weber concludes that “these weights represent the force with which the corners of the locational figures draw the

1 Johann Heinrich von Thünen. (1826). *Der Isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie*. (The Isolated State in its Relation to Agriculture and National Economy)

2 Alfred Weber. (1909) *Über den Standort der Industrien* (Theory of the Location of Industries).

3 Distinction of ubiquitous in pure and gross material can be ignored since it has no influence on location decision

location toward themselves" (ibid., p. 54). In order to develop models, calculations, and industry generalization, Weber introduces two more definitions. Firstly, material index is "the proportion of weight of localized material to weight of product" with ubiquities being only of significance as to increasing the end product's weight. Secondly, locational weight is defined as "total weight to be moved in a locational figure per unit of product" (ibid., p. 60). According to Weber's specifications, a process which uses localized pure materials has a material index of maximum one since the sum of their weights is at most equal to the weight of the end product. A process using localized pure materials and ubiquities, therefore, has a material index of less than one and a relatively low locational weight which results in its optimal location being pulled toward the point of consumption.

"The work of Weber [...] is generally taken as the point of departure in studies of industrial location" (Chapman and Walker, 1992, p. 36), and over the years modifications and extensions have been made. One criticism regarding Alfred Weber's work, for instance, refers to the assumption of product demand always being greater than the combined output of all suppliers (Greenhut, 1956)⁴. However, other scholars have stressed the significance of thoroughly analyzing market demand when choosing a location since cost minimization may not necessarily lead to profit maximization. In response to Weber's criticism for a concentration on transportation costs, August Lösch proposed a location theory focusing on competition for available markets in 1940⁵. Coupled with basic economic principles, Lösch proposed a framework for estimating the size and limitations of a company's market area (Cooper, 1975). According to this demand school of thought, a company's market size is determined by the output level of the typical firm in this industry, per capita demand and population density (O'Sullivan, 1993).

Several following locational theories and numerous empirical studies on industrial location patterns have found a variety of factors of influences on a company's location decision. Hence, "a location theory concentrating on least transport cost or market orientation locations is unrealistic. Instead, a picture emerges of locational inertia." (Cooper, 1975, p. 47). As shown above, early approaches on traditional location theories have predominantly focused on costs,

4 Other criticism of Alfred Weber's least cost model refer to his assumptions of fixed production costs, fixed market conditions and the assumption of perfect competition (Palander in Cooper, 1975).

5 August Lösch. (1940). Die räumliche Ordnung der Wirtschaft. (The Economics of Location)

in particular transport cost minimization. While quantitative analysis of key cost drivers is certainly important, Schmenner (1979, p. 132) points out that “they seldom tell the complete story”. Adding to the complexity is the fact that entities usually have more than one objective (Cook, 1998). Being already a highly complex undertaking with only a single objective in mind, multi-criteria facility location requires the consideration of many more factors, some of them may even be conflicting in nature (Tabari, Kaboli, Aryanezhad, Shahanaghi, & Siadat, 2008). Besides cost factors, many qualitative and often intangible factors need to be considered for which quantification is often rather difficult, if not impossible. Nevertheless, “companies should resist the temptation of letting hard numbers drive out reasoned but qualitative analysis” (Schmenner, 1979, p. 132). Some of the factors, besides transportation cost minimization and market demand considerations, which are stated to have an impact on site selection, include: proximity to suppliers and resources, accessibility to multiple modes of transportation, favorable labor climate (wage rates, training requirements, attitudes, productivity), community attitudes, official support, nontariff barriers, political risks, exchange rates (Krajewski and Ritzman, 2005), availability and cost of utilities (Reed, 1969), risks and uncertainty regarding costs, estimates and forecasts, cooperation of the responsible government (Schmenner, 1979), and environmental factors primarily climatic conditions (Toyne, 1974).

Hoover (1948, p. 71) points out that many production factors such as labor or equipment are “never required in absolutely inflexible proportions”. Many production factors can be employed with different intensity levels and depending on relative price levels or local conditions, intensive or extensive use might be the result. Due to price differences, a generalized most efficient and most economical process configuration does not exist, since the appropriate configuration is a function of many considerations, one of them being the relative prices of production factors (Hoover, 1948). A location’s low labor costs, for instance, might lend itself to less mechanization to save investment costs for technology etc., whereas the substitution of capital for labor might be a viable solution to compensate for an unfavorable labor climate.

Another point to be mentioned is that most location theories focus on desirable facilities and the factors listed above refer to factors of consideration when searching for a location. Some facilities, however, are “undesirable” or

“semi-desirable” (Erkut and Neuman, 1989, p. 275) and residents do not want these type of facilities to be located close by. For these facilities additional social and political criteria must be taken into account besides the presented quantitative and qualitative factors (Bolton and Curtis, 1990). Socio-political site selection criteria are “usually generic and apply equally to most types of waste facilities of most types of waste facilities” (Eduljee, 1999, p. 309). Regarding site selection for hazardous waste facilities, William M. Sloan (1993, p. 9) lists “equity” to be a required principle, which means that everyone who will be affected by the new facility, will have the opportunity to comment and will be heard. Furthermore, the facilities should benefit the environment and quality of life and be in line with the planning goals set by the government and the community and receive full acceptance and support (Sloan, 1993). “The long term goal is the selection of a site which is environmentally sound, socially acceptable and economically feasible” (Bolton and Curtis, 1990, p. 288).

A last point of particular concern for smaller firms is the fact that business location decisions pose practical problems since these type of decisions are typically not made on a frequent basis and hence, “the lack of relevant experience greatly affects the type and quality of the decision made” (Söderman, 1975 p. 12). Söderman further points out a validation issue regarding the determination whether a location decision was made optimal: A validation of a made location decision is difficult since “a location decision which afterwards seems to be a “good” decision might have been preceded by a “bad” procedure though which the worst alternative from a set of very “good” alternatives was chosen” (ibid., p. 13).

2.2. International Business Strategy

In order to be able to set up a business, be able to grow and potentially be successful, Mike W. Peng (2006) recommends determining a strategy which is optimally adjusted to the three leading perspectives on strategy.

The first perspective involves considering industry-based factors, which means that the company should position itself with regards to Michael Porter's (1980) five forces: rivalry among competitors, bargaining power of buyers, bargaining power of suppliers, threat of new entrants, and threat of substitutes. These external forces vary among industries and markets and determine the likeliness for the company to be successful. Signs that are indicative of a high degree of rivalry among competitors include a saturated industry with many competing firms, slow market growth or market decline, new capacities are added in large increments and high costs involved with market exit (Peng, 2006).

The second perspective, the resource-based view, refers to firm-specific resources and capabilities meaning that internal strengths and weaknesses drive the company's strategy and performance (Barney, 1991).

The third perspective, the institution-based view, involves the company's strategy being influenced by external sources such as the state and society. This institutional influence on strategy consists of formal and informal institutions, the first one being, for instance, laws, regulations and rules, the latter one referring to normative and cognitive issues such as norms, cultures, values and beliefs (Peng, 2006). These institutional-based influences are particularly substantial in an international context, when a company entering a foreign market finds itself exposed to unknown, unfamiliar institutional constraints. As opposed to foreign firms entering the market, national firms enjoy the advantage of better knowledge and information regarding their own country's economy, language, law, and politics. While this information can usually be obtained at a one-time (more or less substantial) fixed cost by the foreign firm, more permanent costs of entering foreign markets involve discrimination by the host country's government, consumers and / or suppliers. Host government discrimination, for instance, might involve activity restrictions, prohibitions and expropriation (Hymer, 1976). The sum of the various formal and informal institutional constraints and formal and informal

types of discrimination is called the “liability of foreignness” and is defined as “the inherent disadvantage foreign firms experience in host countries because of their nonnative status” (Peng, 2006, p. 214)

According to Petersen and Pedersen (2002), the different factors contributing to the liability of foreignness disadvantage can be influenced by management to differing degrees. Some of the most significant formal institutional constraints to be dealt with when entering foreign markets include taxes, regulatory requirements, regional trading blocs, non-tariff barriers, different legal systems, and political and currency exchange risks (Krajewski and Ritzmann, 2005; Peng, 2006). These constraints may be influenced only to a limited extent by the entering firm, and hence, they need to be assessed during the initial business location decision stage. One of the major informal institutional differences to be confronted with in foreign markets is culture. As opposed to the formal institutions being primarily beyond the company’s control, cultural differences including norms and customs (e.g. business values, goals, attitudes toward work, customer expectations, desire for risk taking, and other business values) can be studied, understood and adjusted to. Therefore, studying theories by leading scholars in the field of cultural understanding such as Geerte Hofstede⁶ or Fons Trompenaars⁷ might offer tremendous insight into the matter and might help reduce costs encountered due to adjusting to the different culture (Barkema, Bell, & Pennings, 1996).

Despite the risk of substantial liability of foreignness issues to be dealt with in foreign markets, many companies engage in international operations and theorists have been investigating the reasons why companies compete internationally rather than solely in their home countries. According to Steven Hymer (1976), a leading scholar in the field of international operations theory, a company’s relative advantage compared to other companies may be quite different from the relative advantage experienced in other countries. Some of the advantages which are stated to possibly be “more potent abroad than at home” (Hymer, 1976, p. 43) include locational advantages by moving closer to the market or resources (Dana, 2004), know-how, patented technology or having a differentiated product. According to Hymer’s Monopolistic Advantage Theory, it is

6 Hofstede, G. & Hofstede G. J. (1997). *Cultures and Organizations: Software of the Mind*.

7 Trompenaars, F. & Hampden-Turner, C. (1998). *Riding the Waves of Culture: Understanding Diversity in Global Business*.

due to these advantages over foreign firms in their own markets that international operations exist. If these advantages outweigh liability of foreignness costs, international business in foreign countries can be profitable.

2.3. Challenges of doing business in developing countries

Besides the various challenges that companies have to deal with when entering foreign markets, less developed markets pose additional constraints: "Some distinctive features of the business environment become increasingly evident as one moves down the per capita income scale" (Tybout, 2000, p. 13). Admittedly at the risk of over-simplification, James R. Tybout (2000) states the following most striking differences: Based on the World Bank's World Development Indicators, the size of the new markets tends to be much more limited than in their developed counterparts. Human capital has been found to be another restricting factor with regards to levels of secondary education and, hence, availability of technical staff. Limitations regarding infrastructure represent a further striking difference between developed and less developed countries. Undeveloped transport systems have been identified to be a significant locational factor in developing countries (Rushton, 1979), and communication facilities, electrical and safe water supply have been found to be rather restrictive as well. Other challenges, which are faced in developing countries, are price volatility and less developed governance systems which refer to less developed or even poor legal systems and establishments for crime prevention (Tybout, 2000).

2.4. Classic Entrepreneurship

A vast amount of literature exists in the field of entrepreneurship including various definitions, such as “Entrepreneurship is a way of thinking, reasoning, and acting that is opportunity obsessed, holistic in approach, and leadership balanced” (Timmons and Spinelli, 2007, p. 79). While entrepreneurship can occur in all types of companies and at all maturity levels, the classic notion of entrepreneurship refers to a newly founded startup company with an innovative idea or concept. Classic entrepreneurial startup companies run a high risk of failure. According to the BizMiner 2002 Startup Business Risk Index, 46.6 per cent of all business startups in the United States fail. It has been found that most of the classic entrepreneurial failures can be attributed to not meeting the definition of entrepreneurship as presented above. Reasons for classic entrepreneurship failure are found to be the product not to be creating value and instead simply offering substitutes for existing processes. Failure startups are further cited to typically be “undercapitalized, undermanaged, and often poorly located” (Timmons and Spinelli, 2007, p. 85).

In order to increase the odds of survival for the startup, thorough planning of all aspects of the newly founded company and its environment is required. A new venture’s success is further stated to not only depend on a single but on a combination of internal and external factors forming a “complex web” (Duchesneau and Gartner, 1990, p. 298). It has further been found that firms, which are engaged in extensive and thorough planning, are indeed more successful than companies putting less effort in planning. Of particular importance in the process of planning and setting up a business is the formulation of a business plan, which is the means to allow the transformation of the raw idea into an opportunity: “The plan will carefully articulate the merits, requirements, risks and potential rewards of the opportunity and how it will be seized” (Timmons and Spinelli, 2007, p. 223). The business plan is intended to guide the firm’s actions for several years to come and, hence, requires thorough planning, especially with regards to strategic statements which will subsequently have to be supported by the company.

2.5. International Entrepreneurship

As presented in subchapter 2.2, many scholars have researched the topic of international business by investigating the reasons why companies go abroad and if they do, the problems they will likely be dealing with. McDougall and Oviatt (2000) criticize these theories for predominantly examining large mature firms under the assumption that internationalization activities take place long after foundation. The two scholars further criticize entrepreneurship theories for predominantly focusing on business startups in a domestic context.

Despite classic entrepreneurs frequently conducting business internationally, the two research topics are stated to have only recently begun to intersect in the literature. International Entrepreneurship is defined as “a combination of innovative, proactive, and risk-seeking behavior that crosses national borders and is intended to create value in organizations” (McDougal and Oviatt, 2000, p. 903).

Cross-border entrepreneurship can be separated into two categories, firstly into established mature companies which internationalize long after their foundation, and secondly into born global organization which internationalize immediately or shortly after their formation. Motivations for born global entrepreneurs are listed to include global market know-how as presented for international business motivations (Zahra & George, 2002), industry conditions or external environmental circumstances (Oviatt & McDougall, 2005).

While domestic entrepreneurship is already a difficult and complex undertaking, a whole new dimension of difficulty and complexity is added in an international context. Classic international entrepreneurship involves facing all challenges of classic entrepreneurship presented above coupled with the presented issues of doing business internationally, such as dealing with liability of foreignness problems.

In order to engage in thorough and reliable planning and proper business plan preparation, which will ultimately allow the entrepreneur to stake out a successful position in the international marketplace, competitive intelligence is absolutely crucial. While large organizations have large resources at their disposal and often employ whole departments whose sole responsibility is to gather competitive intelligence, small and start-up businesses are typically resource and

capital constrained and, hence, market research and analysis is carried out on a much smaller scale. Owing to the limited financial and labor resources in startup enterprises, job responsibilities are not clearly defined, resulting in “cross-pollination” (Brandau and Young, 2000, p. 75) with people carrying out tasks regardless whether he or she is the most qualified doing this particular job. While this approach can have advantages, such as a high commitment by all members of the entrepreneurial team (ibid.), the downside involves a lack of planning and / or wrong data that might be gathered, which can consequently lead to flaws in the business plan.

2.6. Critical assessment of presented literature

Traditional location theory essentially puts forth a list of factors that influence locational decisions. These factors are mostly generic, and, despite an early recognition of various degrees of footlooseness, they predominantly target established mature companies trying to relocate or expand their current business. Most traditional location theories presume full information access and that the companies are able to process this full information effectively (Richardson, 1979). Further, within traditional theory a tendency of providing a ‘one-type-fits-all’ approach has been observed. Generic listings of factors to consider by mature companies when making location choices are however found to pose applicability restrictions to companies which are characterized by the following problem set: i) being inexperienced with regards to setting up a business ii) having an innovative product whose large-scale application for the first time is likely to result in unexpected issues iii) entering international unknown markets iv) being resource constrained. Companies characterized by this problem set are in need of a special type of assistance which traditional location theory does not provide beyond the issues whose applicability is the same as for their more mature counterparts. Due to the defines problem set, full information access can also not be presumed.

Furthermore, general location theory has been found to predominantly focus on the factual site selection, which means that the country or region to be located in is predetermined and what remains to be selected is the final location site. Within this approach a strong focus is placed on cost minimization and the

actual site selection is essentially “an engineering problem” (Reed, 1967, p. 13) largely based on geometrical calculations. Hardly any approaches deal with the higher, more abstract level of regional location decision targeted towards aiding through the decision process of which market to enter which is less of an “engineering” and more of an “economic problem” (ibid). In addition to the largely unconsidered role of regional location factors, the role of international factors within the context of location choice does not play a significant role. While a large amount of research is done in the field of international business, international factors within traditional location theory have been assigned a less significant role. While some of the influencing factors certainly apply to site selection and regional selection considerations, many site selection criteria are too narrow and, hence, not applicable to the wider focus of regional and / or international selection, and many aspects which are crucial for regional / international assessment are not included within location specific models.

One major shortcoming of location theory, which is targeting mainly established companies selecting a site within a predetermined market, can hence be summarized as lacking applicability to footloose born global classic entrepreneurial companies. Despite not implying that footloose companies can locate anywhere, having only few constraints results in a wide range of possible location choices (Decker and Crompton, 1993). Footloose born global entrepreneurs having no experience and basic data to rely on and only few constraints regarding which country to enter are primarily in need of strategic aid regarding the selection of an appropriate market entry point as opposed to choosing the factual plot of land. Furthermore, with the lists of locational decision factors being mainly targeted towards mature established companies, issues within the location decision process, which are specifically dealt with by startup companies, remain unconsidered especially so in an international context.

In line with the rise of computers, the focus of location theory has shifted from initially predominantly theoretical approaches to the development of software-supported models. Today, a large variety of business location models is available, supported by various decision modeling tools. Most of these decision models involve some type of hierarchical ranking of a list of pre-selected locations. However, the requirement of generating a pre-selected location list also lacks applicability to footloose born global entrepreneurial companies. Without

experience and preset location requirements, footloose startup companies are in need of assistance in choosing a location from a potentially global set of options. Therefore, a tool that requires a list of, for instance, five sites to determine the best scoring site is found to be impractical and inopportune.

To conclude, McDougall and Oviatt's (2000) criticism that the topics of entrepreneurship and international business intersect too infrequently can be extended by criticizing that the topic of classic entrepreneurship and international business and location theory too infrequently intersect.

Due to the presented shortcoming of a lack of theory applicability, the question arises how footloose born global entrepreneurial companies make location decision and carry out their first international business activities. Of further interest is the question whether a crossover of the three academic fields would be of assistance. I consider the following areas of particular interest:

1. To what extent is market requirement determination by footloose entrepreneurial startup companies assisted by traditional theory?
2. To what extent is traditional location theory applicable to footloose born global classic entrepreneurial companies and what modifications and additions are needed to increase traditional theory's applicability?
3. What problems are encountered with regards to entrepreneurial activities such as business plan formulation due to the lack of theory applicability?

3. Methodology

3.1. The proposed study

As presented within the literature review, the current state of research concerning location theory, international business and entrepreneurship exist within their respective domains while having little to no crossover. In line with the rise of the global market, a growing number of footloose born global classic entrepreneurial companies exist which are in need of a crossover of the three fields in order to set up their business and determine their market entry strategies.

In the field of location theory, much emphasis is placed on the prospect of market relocation or expansion, predominantly targeting mature, established companies. The market to relocate or expand into is typically pre-determined and assistance is needed with finding the optimal site for the new facility. The expansion into foreign markets poses substantial strategic issues. Extensive academic work within the field of international business strategy is available on these issues by the three leading perspectives on strategy, industry-based, resource-based and institutional-based views. In line with McDougall's and Oviatt's (2002) criticism that the research paths of international business and theoretical work on entrepreneurship too infrequently intersect, there is a recent shift of theoretical work towards international entrepreneurship.

What has remained unconsidered, though, is the extension of this emerging trend to include location theory. A merge of the three mainly independent, separately co-existing research fields of location theory, international business strategy and entrepreneurship is, however, specifically what would be needed by footloose startup companies in search of the optimal location for market entry.

The lack of crossover specific theories amongst the three research fields leads to a need of empirical exploration regarding the extent to which general theories in each respective field are applicable to footloose born global classic entrepreneurial companies. The research objective of this study further includes an assessment as to what extent crossover research amongst the three fields, location theory, international business, and entrepreneurship could be of assistance to footloose born global classic entrepreneurial companies.

The attempt to fill the identified gap in literature of the crossover of the three research fields is approached by this study by investigating how a real-life footloose startup company deals with general market selection, location decision, strategic choices and business plan formulation. A representative study subject, a truly footloose born global classic entrepreneurial company is analyzed and the extracted results are attempted to be generalized to ultimately start working on filling the literature gap.

The study starts with separately examining the applicability of the presented theories of the three academic fields. Firstly, the study empirically explores the establishment of appropriate market entry requirements for the case study subject by applying international business strategy theory. Secondly, the study explores to what extent traditionally cited locational factors have had an influence on the study subject's first location decision by applying location theory. Finally, the case study subject's first business plan and facility configuration is analyzed to assess critical points whose results are cross-referenced with existing theories or a lack thereof.

Based on the questions of interest presented in subchapter 2.6., the research questions targeted specifically to the footloose born global classic entrepreneurial case study subject summarize as follows:

1. What are the required market characteristics for a potential successful market entry by the case study subject and to what extent is theory of assistance in the determination thereof?
2. What influence do locational factors have on the case study subject's location choice? What difference in applicability is found compared to literature's generalized findings and what modifications and additions would be of assistance?
3. What critical points are found regarding the case study subject's first business plan and facility configuration, to what extent are these uncovered problems typical of a footloose born global classic entrepreneurial company and what can be improved?

The exploration of the three research questions is based on the presented theories of International Business Strategy, Location Theory, and Entrepreneurship

respectively. After separately exploring the three research questions including the three research fields, it is explored whether crossover research amongst the three academic fields would be of assistance to footloose born global classic entrepreneurial companies.

3.2. The research method

In the following, the case study research method is defined from a theoretical point of view followed by an explanation of why this type of research method was chosen to answer the research questions put forth.

3.2.1. The case study research method

Case study research is defined as “the detailed examination of an aspect of a historical episode to develop or test historical explanations that may be generalizable to other events” (George and Bennett, 2005, p. 5) Like other methods of research, case study research works empirically and is thus concerned with firstly evidence, i.e. data, and secondly theory, i.e. explanations. Theory in this context does not only refer to existing theories, but also to theories which develop during the analysis of evidence. However, while the utilized data within case study research is specific to a particular case, the extracted theories may be the basis for explanations and generalizations and be applicable to other scenarios (Gillham, 2000). Therefore, despite the research questions focusing on one specific company, the findings may be the basis for generalizations that are applicable to other footloose born global classic entrepreneurial company.

Robert K. Ying (2009) considers and compares the application areas of five overlapping research methods: case study, experiment, survey, archival analysis, and history. In his opinion, research questions focusing mainly on “what” questions are indicative of exploratory studies aiming towards the development of “pertinent hypotheses and propositions for further inquiry” (Ying, 2009, p. 9). While each of the five research methods can generally be used for exploratory studies, examining contemporary events, while having no control over the actual behavioral events, is indicative of conducting a case study. Similar techniques

tend to be used by case study and history; what sets the two research methods apart, though, is that case studies tend to make use of all types of evidence as is shown later.

3.2.2. Exploratory embedded single-case study

As presented above, the research questions are all 'what'-types, which is indicative of conducting an exploratory study and, thus, suggests carrying out case studies, experiments, surveys, archival analysis, and history. The present study intends to be of aid to current and future startup companies and therefore a focus will be on contemporary issues. Furthermore, to assess the extent to which traditional theories are applicable to entrepreneurial startups, the study subject's business behavior is analyzed, which is beyond the researcher's influence. Assessing data of contemporary as opposed to historical events and further exploring qualitative data beyond the researcher's control has led to the choice of carrying out a case study. Hence, I choose the method of exploratory case study research to answer the presented research questions which I intend to use to ultimately start filling the identified lack of theory's applicability to footloose born global entrepreneurial companies.

This research is carried out by means of single-case study. Yin (2009, p. 48) recommend a single case design if the subject is a "representative case". Convolant Ltd. is considered to fulfill this criteria based on the following grounds: Firstly, Convolant Ltd. was founded in 2008 in Germany with the objective of launching an in-house developed innovative process. Being newly founded and offering an unprecedented process, that adds value to the markets it will be introduced to, makes the company fall within the definition of a classic entrepreneurial company. Secondly, in an attempt to launch its process and create value, the company has decided to locate its first facility in Côte d'Ivoire. Being unconstrained with regards to market entry points, and crossing national borders immediately after its formation, makes the case study subject a truly footloose, born global enterprise. Since Convolant Ltd. fulfills the definition of a footloose born global entrepreneurial company on all grounds, it represents a typical case among other cases fulfilling the criteria to the same extent. The lessons learned from a representative single case are stated to be informative of the experiences

by other cases in the same situation Yin, 2009). Findings from Convolant Ltd. are ,hence, intended to be generalizable, i.e. applicable to other footloose born global entrepreneurial companies and may be tested within subsequent studies.

The single-case study follows an embedded approach by exploring the study subject's first business activities as a whole which involves an assessment of several subunits. As defined earlier, the overall research objective is to find an answer to the issue to what extent currently mostly non-intersecting traditional theories of location theory, international strategy and entrepreneurship are in a combined form applicable and of assistance to footloose born global entrepreneurial companies. In order to be able to answer this question, several sub-units of the case study's first business activities need to be considered: required market characteristics, significance of locational factors, facility configuration and business plan characteristics. Separately assessing these subunits to ultimately find an answer to the overall research objective fulfills the definition of carrying out an embedded case study.

3.2.3. Criticism of case studies

According to Yin (2009) the case study research method has been dealing with the following traditional prejudices and criticisms: One of the most predominant frequent criticisms of case studies refers to a lack of rigor of research designs, due to the case study researcher being unsystematic and or letting biased views have an influence on inferences and conclusions. The second major criticism of case study research refers to a questioning of the degree of applicability of one case's finding to others. However, this concern of a case study providing only little potential for generalization is refuted by Yin on grounds of case studies being

generalizable to theoretical propositions and not to populations or universes.

In this sense, the case study, like the experiment, does not represent a 'sample,' and in doing a case study, your goal will be to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization) (Yin, 2009, p. 15).

In order to refute the first concern of case studies, lack of rigor, determination, strictness and thoroughness of the researcher is of utmost importance. In order to reach the ultimate goal of providing reliable, valid and valuable output, sloppy

research is avoided by adhering to the guidelines presented in the following section, Research Design.

3.3. The research design

The five overlapping research methods introduced above are characterized by utilizing different sources of evidence. Experiments, for instance, largely rely on measuring and recording factual behavior without utilizing other types of written or oral information, while surveys focus exactly on what experiments are leaving unconsidered, namely verbal information while not considering individual behaviors.

In order to explore and find answers to the present research questions by means of the defined case study, various sources of evidence are utilized – a method that is stated to be one of the key strengths of the case study research method (Yin, 2009, p. 114).

In the following sections the sources of evidence utilized within this case study are presented followed by an explanation of how these sources help build convincing chains of evidence characterized by a high degree of reliability and validity. The subchapter is concluded by an outline of the employed analytical strategy employed including structure description.

3.3.1. Multiple sources of evidence

Six sources of evidence are listed, namely documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts. None of these multiple data types is stated to be fully advantageous in all respects over another type; on the contrary, the data types are stated to be highly complementary (Yin, 2009). Within this thesis I make extensive use of the first four listed evidence sources. Within the set research framework it is not possible to collect evidence from the last two sources since no opportunity is given for active as opposed to passive observation or the utilization of physical artifacts.

3.3.1.1. Documentation

The first source of evidence, documentation, is obtained from the case study subject and includes the company's project development plan and documents describing and illustrating the technology and process flow. Since the case study subject's documentation is not publicly available, the provided documentation is presented in detail in the fourth chapter of this study.

The main document, which the majority of considerations and assessments are based on, is the case study subject's business plan. The company's German title "Bau- und Rohstoffcenter Projektentwicklungsplan" translates into "Building and Raw Materials Center project development plan" and is, in the course of this study, referred to as project development plan or business plan. The original version of the project development plan was prepared on November 19, 2008 and incorporated an investment sum of 625 million Euros. After a presentation to investors and on-site visits, the plan was revised and the updated document entailing an investment sum of 100 million Euros was prepared and made available on February 10, 2009. The project development plan consists of six sections: General Overview, Income/Profit, Technical Specifications, Investment Costs, Operating Costs, and Labor. A detailed description and summary of all six sections is provided in subchapter 4.3, Overview Building- and Raw Materials Center Abobo of this study.

A second piece of documentation which has been provided by the case study subject is "CeMin28 Innovativer Abfall Product Zyklus" (*CeMin28 Innovative Waste Product Cycle*), a detailed flow chart illustrating the process steps including all possible in- and outputs. The provided document "Prozess" (*Process*) defines and describes the project phases of establishing a waste processing facility starting with market assessment followed by preparation phase, initial phase and second phase. The last supplied document "Ecocycling" gives an overview of the process from a technological point of view. These three documents form the basis of subchapter 4.2., in which the innovative process is described in sufficient detail to allow for a subsequent assessment thereof within subchapter 5.3.

Since all the documentation is prepared and supplied by the case study subject directly, reporting bias and biased selectivity must be assumed. In chapter four, I present all information as provided by the case study subject. However, to prevent bias and subjectivity to influence the study's analysis section and, in consequence,

the answer to the research questions, I corroborate the documentation's data with other types of evidence, and, seek and use documentation from alternative sources wherever possible. Examples of alternative documentation include obtaining invoices from independent companies to be able to assess the accuracy of estimates made within the business plan.

3.3.1.2. Archival Records

The second source of evidence, Archival Records, refers to records, statistical data such as census data, as well as studies by consultancy agencies. Being supplied by official sources and authorities, this type of evidence is characterized by a high degree of reliability and accuracy.

General data regarding Côte d'Ivoire and Abidjan utilized within subchapter 4.3.1, Introduction Abidjan and local relevant characteristics, is obtained from The World Factbook provided by the Central Intelligence Agency, the Human Development Report by the United Nations Development Programme, and encyclopedias such as the World Book Encyclopedia. For the analysis of the case study subject's location choice within subchapter 5.2., Factors of Location Analysis, I also draw heavily upon archival records from the sources stated above.

Within subchapter 5.1.1., the industry assessment of the German market, I utilize Archival Records provided by Germany's Federal Office for Building and Regional Planning, the Federal Statistical Office Destatis, the German Society for Nature Conservation, a study by Roland Berger Strategy Consultants, a newspaper article by CBS News and also data from The World Factbook provided by the Central Intelligence Agency.

For subchapter 5.1.3., Industry assessment of Abidjan according to developed market characteristics, I found considerably less amounts of official information than for the German market. However, the market of Abidjan is analyzed according to an assessment of Abidjan in a widely acknowledged publication on waste management in Africa⁸, an article in the International Reference Centre for Waste Disposal News, an article published in the African Journal of Environmental Assessment and Management, a newspaper article published in New York Amsterdam News, and the Central Intelligence Agency's World Factbook. Due to unavailability and inaccessibility of other data, I categorize

8 Adepoju, G. Onibokun (1999) Managing the Monster. Urban Waste and Governance in Africa

all above listed data sources as archival records which means that I assume that they are free of bias and can hence be utilized at face value.

3.3.1.3. Interviews

The third source of evidence, that I make use of, is interviews which are stated to be one of the most important sources of case study evidence: “Key informants are often critical to the success of a case study. Such persons provide the case study investigator with insights into a matter and also can initiate access to corroboratory or contrary sources of evidence” (Yin, 2009, p. 107).

Interviews are stated to be inherently “subject to the common problems of bias, poor recall, and poor or inaccurate articulation” (ibid, p. 109). I employ a number of approaches to prevent these biases and inaccuracies from influencing the case study result: Firstly, I interview a number of people as opposed to relying on input from one interviewee only. Secondly, the interviewees are company internal as well as company external persons to allow for inside as well as outside views. Thirdly, I corroborate the obtained data with data from other evidence sources, and finally, I ask questions in an as unbiased manner as possible. To achieve the goal of asking unbiased questions, I attempt to minimize the influence on the interviewee by allowing room for personal thoughts and own commentary and, in line with Becker’s suggestion, I rephrase why-questions into how-questions to prevent defensiveness by the interviewee (as cited in Yin, 2009).

I conduct the interviews face-to face, by phone, and by email. While interviews within the research method survey are typically highly structured, within this case study I carry out the face-to-face interviews as guided conversations in which the respondents answer a set of key questions while I allow them room for sharing personal views and adding information considered of value. The interviews by phone and email are conducted in a more focused way. During these interviews, I follow a more rigid approach by asking explicit questions. The phone and email interviews mainly serve the purpose of obtaining answers to some uncertain issues and to corroborate specific issues. As with the face-to-face interviews, I follow the guidelines specified above by formulate all questions in an as unbiased manner as possible.

As presented, the first source of evidence supplied by the company is static documentation which is primarily prepared for official use. These documents have

been prepared based on detailed information input. Within the delivered documentation, a lot of this information input is presented in a compressed form or it is not presented at all and manifests itself only in an underlying manner by influencing the prepared documentation. However, this information is essential for answering the research question, and, in order to obtain all this information, I carry out interviews of company representatives. By interviewing company internal informants, my understanding of relevant technological aspects is increased as well as my understanding of underlying factors which had an impact on location decision and development of the project development plan. A particularly important key informant is Franz Josef Phillip, patent holder and co-founder of Convolant Ltd. Several face-to-face as well as phone interviews are conducted with Franz Josef Phillip over an extended period of time.

In addition to interviewing company internal persons, several guided conversations are carried out with company external informants. Of particular importance is Frank Schirling, a well-informed external process engineer with much insight, especially into the company's technological process. Due to his external position, this key informant offers a less biased view on the case study subject's activities than company internal persons. Despite being external, Frank Schirling is nevertheless affiliated with Convolant Ltd by providing consultation advice. Therefore, I do not assume his input to be completely free of bias and hence, wherever possible I corroborate the received data with other sources of evidence. As with the company internal persons, several interviews of the type of guided conversations are carried out in which critical information and personal opinions on the process itself and facility configuration are provided. In particular the work on the third research question, the critical assessment of the project development plan and facility configuration, benefits from Frank Schirling's input.

3.3.1.4. *Direct Observation*

Additional data about the case study subject is acquired through direct observation of relevant activities. Direct observation represents the means to corroborate the generated picture and image of the case study subject and deepen the knowledge about the subject's technological processes and strategy.

The understanding of the innovativeness of the entrepreneurial product is deepened by a field visit to the testing facility in which the process has been

developed. Directly observing the technological aspects and talking to on site staff is of help in assessing critical process related issues raised within the face-to-face interviews. Besides field visits, evidence from direct observation is obtained from participation in meetings. The attended meetings are between the case study subject and potential collaboration partners in which the company is presented including its process and long-term plans strategy. These meetings represent a way to obtain a summarized overview about the case study subject from a somewhat different marketing perspective.

3.3.2. Principles to ensure quality of research

As stated above, Robert K. Yin (2009) considers the utilization of multiple sources of evidence to be one of the key strengths of case study design, as compared to other research methods that consider only isolated sources. Advantages of using multiple sources of evidence include the ability to deal with a broader variety of issues, prevent having biases distort possible results, and “the development of converging lines of inquiry, a process of triangulation and corroboration” (Yin, 2009, p. 115). Only by utilizing data from various sources, can all three research questions, i.e. a broad range of issues, be answered. To achieve the latter cited advantage of convergence, I collect evidence on the same issues as opposed to non-convergence of evidence, in which data on separate subunits is collected.

In order to guarantee quality of the research, I ensure construct validity, internal validity, external validity and reliability within this case study by adhering to the following principles: Firstly, I collect triangulated, converging data which means that I collect evidence from various sources on the same issue aiming to corroborate the obtained data on the specific issue. Wherever arguments and conclusions are put forth, I present the evidence in chains which allows the reader to trace the taken steps of argument development. Within these evidence chains, I make extensive use of archival records to ensure bias-free results. Using triangulated, converging data and maintaining chains of evidence represent the means to increase construct validity as well as generate more convincing and accurate results. I establish internal validity, which is primarily of concern when inferences are made, by employing logic building techniques in which empirically observed data is compared to and matched with data predicted by theory. The

utilization of all presented sources of evidence herewith helps to uncover convergent lines of inquiry. I ensure external validity by applying theory wherever possible throughout the whole analysis. Lastly, I ensure reliability by documenting the procedure to the utmost extent.

3.3.3. Analytical strategy

The theories which are presented within the literature review and initiated this case study form the basis for the analysis of this research and I make extensively use of them throughout the analysis section of this study. Robert K. Yin (2003) lists reliance on and application of theoretical propositions as the most preferred strategy for successful case study analysis. The requirement of starting the thesis by placing the case study within its appropriate literature context is hence fulfilled by chapter two, the review of literature. Putting the topic at the outset within its appropriate context of location theory, international business and entrepreneurship enables the utilization of results to “advance knowledge and understanding of a given topic” (ibid., p. 3). By initially presenting the relevant theories followed by consistent application throughout the analysis part I therefore increase an understanding of the topic.

Regarding the choice of analytic technique, I employ explanation building, which is a special type of pattern matching. The latter technique, pattern matching, predominantly focuses on comparing an empirically found pattern with a previously predicted one, and the former technique develops explanations through establishing causal connections explaining why something happened the way it did (Yin, 2009). I attempt to fill the literature gaps identified within the literature review by what is defined as “grounded theory” (Gillham, 2000, p. 12) “theory that is grounded in the evidence that is turned up”. While the explanation building technique is primarily employed by explanatory case studies, it is also highly relevant for exploratory case studies “as part of a hypothesis-generating process, but its goal is not to conclude a study but to develop ideas for further study” (Yin, 2009, p. 141). Yin (2003, p. 6) further defines the goal of theory application within exploratory case as “to discover theory by directly observing a social phenomenon in its raw form”. The result of this case study, the grounded theory, will hence be

open for further research testing. Thorough application of theory, coupled with the analytic technique of explanation building, has been found to be superior to other case study research designs: "The better case studies are the ones in which the explanations have reflected some theoretically significant propositions" (ibid, p. 141).

For the given case study, a qualitative approach is chosen. While some quantitative data is analyzed, in particular within the critical assessment of the business plan analysis, the primary focus is on qualitative methods which utilize data for the purpose of analyzing, interpreting and explaining the issues involved (Gillham, 2000).

3.3.4. Structure

Chapter two, Review of Literature, has already placed this study within its relevant literature context of location theory, international business and entrepreneurship. Chapter four, Presentation Data, provides a general overview of the case study subject followed by a definition of its product which shows that the case study subject fulfills the definition of a classic entrepreneurial company. In the third part of the fourth chapter I present the subject's first business activities on the market. The case study subject and all process specific information largely rely on documentation provided by the case study subject. This documentary evidence is presented as provided. The data provided in chapter four is subsequently thoroughly analyzed in chapter five. Therefore, while the data in section four might be influenced by reporting bias and biased selectivity due to having been prepared and provided by the case study subject itself, I investigate its potential subjectivity in subchapter 5.3. by assessing the business plan from a critical external point of view. General market data and information stems from archival records such as Encyclopedias and official sources such as the Central Intelligence Agency and its accuracy, reliability and validity is not put in question. All other data presented in chapter five is cross-validated with other sources, unless otherwise indicated.

4. Presentation Data: The case study subject

4.1. Company Profile Convolant Ltd.

Convolant Ltd. was founded in 2008 as a Project Corporation of the Polamar Engineering GmbH with the objective of establishing facilities for Polamar's newly developed innovative technologies in Côte d'Ivoire and potentially other countries. Besides having undergone small-scale tests, the developed innovative process has never been applied on a large-scale and Polamar has not obtained any experience with regards to establishing a market for its product (F.J. Phillip, personal communication, April 9, 2009).

4.2. The CeMin28 Waste Product Cycle

The development of waste management has undergone three distinct phases in human history. While the very first approach to waste management, "dilute and disperse" (McKinney and Schoch, 2003, p. 444), worked well in ancient times with waste being mainly part of natural cycles, simply leaving the waste behind soon proved to be environmentally problematic with the arising of industrial times characterized by a steep increase in generated waste not being part of natural cycles (Moll, 2004). Under the new waste strategy, "concentrate and contain" (McKinney and Schoch, 2003, p. 445), waste was collected and permanently stored in areas such as sanitary landfills. While this approach solved the previously experienced issues of uncontrolled water, air, and soil pollution, a new problem was faced, namely, the resources were removed, used and lost forever (Moll, 2004). As a consequence, the current strategy emerged, "resource recovery" (McKinney and Schoch, 2003, p. 445), which is an integral part of sustainable waste management: "Sustainable waste management calls for the recovery and reuse of materials so as to conserve raw materials, the use of waste as a source of energy in order to conserve renewable natural resources and finally the safe disposal of unavoidable waste" (Eduljee, 1999, p. 300).

Based on the highly useful components which are thrown away together with waste every day and in line with the trend towards sustainable waste management and resource recovery, Convolant Ltd. considers waste the most important raw material of the future and has developed a process which use today's humanity problem to solve tomorrow's raw material shortage (F.J. Phillip, personal communication, February 10, 2009).

In its in-house developed CeMin28 Waste Product Cycle, municipal and commercial solid wastes are converted into an intermediate product with the technical name "CeMin28" which can be further processed into a variety of products such as building materials. The most outstanding feature of the Waste Product Cycle is that all input materials are neutralized which results in all end products being completely environmentally friendly (Convolant, 2008b).

In the following section, Convolant's innovative process including inputs, outputs and special characteristic of being completely environmentally friendly is introduced based on the documentation provided by Convolant Ltd. The documentation is presented as supplied, which means no critical assessment regarding data accuracy, reliability, or validity is carried out since this section mainly serves the purpose to present an overview of the technological process in order to be able to assess the business plan and facility configuration within the analysis section of this study.

4.2.1. Process

The CeMin28 Waste Product Cycle is a highly flexible process with regards to in- and output. Any type of municipal and commercial solid waste can be processed into the intermediate product CeMin28 to be further converted into various end products. The process is hence universally applicable with waste composition and required output being decisive of facility configuration and consequently end product.

Additives, the 'secret ingredient' of the process, are essentially a compound of rare minerals which enable a time compressed growth process. During the Waste Product Cycle, additives are added together with other aggregates to the size-reduced solid waste and a reactive mixture is created. The additives cause an accelerated reaction and trigger the physico-chemical process which can be

described as separation and moderate exothermal oxidation process. During this process all waste fractions including any contained toxic substances are fissioned into its original substances and stored as molecules or molecule groups. Heavy metals are intercalated with the crystalline structure of the developing minerals. The end product of this process is CeMin28, a granular material which is comparable to coarse grey sand. CeMin 28 is completely environmentally neutral and can further be processed into various end products (Convolant, 2008b).

The process is based on techniques and technologies which are partially already employed in different application fields. Previously, however, no attempts had been made to combine several individual processes with additional knowledge from research and laboratory tests to develop a process which is able to convert any municipal solid waste fraction residue-free into neutralized end products. In essence Convolant Ltd. is planning to establish large-scale environmentally friendly waste treatment and processing facilities which is something that has not been attempted before (Convolant, 2008b; F. Schirling, personal communication, March 24, 2009).

4.2.2. Process inputs

The input into the Waste Product Cycle generally consists of approximately eighty per cent solid waste, seventeen per cent aggregates and three per cent additives.

The main input into the process, waste, can be any type of municipal and commercial solid waste and, after pre-analysis and process adjustments, also industrial wastes. Excluded from processing are radioactive and highly infectious materials. All metal fractions need to be removed prior to mechanical shredding since the crushing process may cause sparks. Further materials, which hinder optimal waste processing and should hence be removed before waste processing, are glass which, if not extracted, results in increased tool wear, rubber-like substances which cannot be optimally shredded, electronic scrap, and thread-like components such as string or tapes which easily wrap around rotating components (Convolant, 2008a).

Depending on composition and quality of waste and desired end product, the appropriate mixture of additives is added. Some of its components include but are not limited to: clay, bentonites, zeolites, red mud, power station ash, lignin

compounds, calcium carbonate, limestone, limestone powder, and iron vitriol. In order to produce the intermediate product CeMin28, additional required means are electric energy and small quantities of water. The fully neutralized, contaminant free CeMin28 powder is further processed under the addition of aggregates so that the desired end product's technologically and technically required bulk density is met. To set the density the following materials may be used: grit, gravel or sand, or alternatively sediments or sewage and industrial sludge which has gone through a preprocessing analogous to the waste process (Convolant 2008a; Convolant, 2008b).

4.2.3. Environmental friendliness

As already indicated, one of the most outstanding features of the CeMin28 Waste Product Cycle is its environmental friendliness. The physico-chemical reaction caused by the additives is able to bind heavy metals, many of which are toxic and dangerous to health and environment. Further, pathogens and other harmful hormonal concentrations are killed within the process by heat. The intermediate product CeMin28 as well as all end products are hence fully neutralized and contaminant-free (Convolant, 2008b).

As described above, to further process the intermediate product CeMin28 in terms of setting the required density, sewage sludge, industrial sludge or sediments may be used. Sediments are for instance mud sediments from lakes, industrial facilities or storage basins, solid waste products from production processes etc., all of which often contain highly toxic heavy metals. Due to sediments and sludge typically containing harmful substances, a neutralization process analog the solid waste conversion process must be carried out before they can be added to the CeMin28 product. The neutralization of sludge and sediments adds an additional environmentally beneficial aspect to the process while at the same time lengthening the process and increasing cost. Alternatively, if no additional processing and neutralization of contaminated materials is desired, grit, gravel and sand can be used to set the desired bulk density. Since no pre-neutralization process is required for these component, this alternative is the cheaper and more efficient solution. The ecological impact, however, is reduced by not processing and neutralizing sediments and sludge. A trade-off decision

between economical and ecological considerations must hence be made (F. Schirling, personal communication, March 24).

4.2.4. Possible end products

Type and characteristics of the final end products depend on the further processing of the intermediate CeMin28 product. Under the addition of different amounts and types of aggregates, various bulk density loads are achieved. For light wall building materials, for instance, a bulk density of 400 kg/m³ is recommended which does not require further aggregates to be added to the intermediate product CeMin 28. Paving stones and civil engineering products exposed to traffic flow, on the other hand, require a bulk density of 800 kg/m³ which results in the CeMin28 product mixed with aggregates in the ratio 1 to 2 (Convolant, 2008c).

Some of the possible end products include building materials such as facing bricks, prefabricated wall components, paving stones and bulk materials, various wood substitute products, oil binder, water retainer, and aerobic and anaerobic processes organic waste to be further used in agriculture (Convolant, 2008a).

4.3. The Building- and Raw Materials Center Abobo

The market for Convolant's first large-scale waste conversion facility has been chosen: The very first waste processing facility with subsequent building material production is planned to be established in a peripheral area of the city of Abidjan, Côte d'Ivoire.

The contact to Côte d'Ivoire was initiated as follows: In early 2008, German logistics service provider Montan Brennstoffhandel und Schiffahrt GmbH & Co. KG [MBS] was approached by the German ministry of economics regarding a potential interest in establishing business contacts with Côte d'Ivoire. Concerning the ministry's objective of finding a solution to Côte d'Ivoire's waste management problem, MBS referred the ministry to Polamar Engineering GmbH. MBS had been supplying the Polamar Group with waste to be processed within their established

testing facility in Kretz in an effort to develop an innovative waste conversion process. During a visit by Franz Josef Phillip to Abidjan in summer 2008, the decision was made to try to attend to the waste problem by developing a local Building- and Raw Materials Center (F.J. Phillip, personal communication, April 9, 2009).

In the following section, I give an overview of Côte d'Ivoire and Abidjan including a presentation of local characteristics which are of interest for Convolant's local strategy and facility configuration. After the general overview, I show Convolant's multiple objectives with the facility followed by a detailed presentation of planned facility configuration data, investment costs, planned input, output, and estimated revenues and operating costs. The information provided within 4.3.1 is gathered from Archival Records, such as Encyclopedias and official sources and hence objectivity and freedom of bias is implied. Since the business plan documentation is obtained from Convolant and not publicly available, the data is provided in a summarized yet sufficiently detailed form to provide all the necessary information required for the critical assessment within the fifth part of this study. Analogous to subchapter 4.2, the documentation is presented as supplied by Convolant without any critical evaluation with regards to potential reporting bias or biased selectivity. This section is merely intended to provide general background information, to generate an overview of the planned facility as well as to provide the basis data needed for the facility configuration analysis carried out in chapter five. In short, this section provides the input needed to answer the research questions.

4.3.1. Introduction Abidjan and local relevant characteristics

The Republic of Côte d'Ivoire is located in Western Africa on the Gulf of Guinea in the North Atlantic Ocean and shares land borders with Burkina Faso and Mali in the north, Guinea in the northwest, in the southwest Liberia and in the east Ghana (Middleton, 2008; Robbins, 2007). The country has a total area of 322,460 square meters and the population is estimated to be 20.6 million inhabitants in 2009 (Central Intelligence Agency [CIA], 2009a).

According to the Human Development Index provided by the United Nations Development Programme (2007/2008) Côte d'Ivoire is ranked 166 of 192 UN

member states as country with low human development and 37 per cent of the population is estimated to live in poverty (Robbins, 2007). Regarding income rates and availability of labor, Côte d'Ivoire shows the following characteristics: At the purchasing power parity (PPP) US Dollar rate, estimated annual income for females and males are PPP US\$ 795 and PPP US\$ 2,472 which is 3.6 per cent (females) and 6.6 per cent (males) of Germany's labor costs (United Nations Development Programme [UNDP], 2007/2008). A large labor pool is available: estimated unemployment rate is 40 - 50 percent (CIA, 2009a). Skilled as well as unskilled labor is available: 48.7 per cent of the population is literate and 20 percent is enrolled in secondary education (UNDP, 2007/2008).

Even though the republic's capital is Yamoussoukro, most people live along the coast, particularly in the area of Abidjan, Côte d'Ivoire's economic and commercial capital. Abidjan is the largest city in Côte d'Ivoire and has a population of 3.8 million people. The city is divided into ten communes, which, especially towards the outskirts of the city, are characterized by overcrowded slums (N'Diaye, 2009)

Being located on the Gulf of Guinea the country has 515 kilometer of coastline (Robbins, 2007) and Abidjan being the economic center of Côte d'Ivoire has the busiest Western African seaport which is stated to be the center of West African imports and exports (N'Diaye, 2009). In addition to Côte d'Ivoire's access to the Atlantic Ocean, Côte d'Ivoire has 980 kilometers of inland waterways including rivers, canals, and lagoons. 660 kilometers of railway tracks connect Côte d'Ivoire's major cities and offer a direct connection to Burkina Faso via railway. Côte d'Ivoire has 80,000 kilometers of intercity and urban roads and 20,000 kilometers of dirt roads. The current road infrastructure is in poor condition with 92 per cent of all urban roads being unpaved. An additional 20,000 kilometers of dirt roads are also in bad condition and hardly passable. The country also has a total of 34 airports, seven of which with paved runways (CIA, 2009a). Abidjan International Airport claims to be "the hub of West Africa" (Aeria Abidjan International Airport).

Abidjan's as well as the whole country's coastal areas are characterized by tropical climate (Robbins, 2007) and Abidjan receives an average precipitation of 2,200 mm per year (Sané, 2002). The wet tropical climate is highly favorable for extensive agricultural production resulting in a lot of produce and green waste

ending up in the waste. The following composition of waste is encountered in Abidjan:

Figure 1: Composition of Waste in Abidjan⁹

| Waste Type | Percentage (rounded) |
|------------------|----------------------|
| Paper, Cardboard | 6% |
| Textiles | 2% |
| Wood | 1% |
| Green waste | 18% |
| Food, Food waste | 51% |
| Glass | 1% |
| Metal | 1% |
| Plastic | 5% |
| Other | 15% |

4.3.2. Objectives

Convolant pursues multiple objectives with its first facility. The following official objectives have been put forth for the Building and Raw Materials Center Abobo: extension and improvement of the local building materials market as basis for modern highly efficient building systems; solving Abidjan's waste problems by setting up waste management and waste treatment with subsequent usage within a production process while neutralizing or eliminating pollutants and eventual conversion into building materials; job creation by building and operating the Building- and Raw Materials center as well as by peripheral and subsequent investments and structures; and economical and efficient handling of natural resources (Convolant, 2009). Despite unstated within the official business plan, 'unofficial' economic objectives have been confirmed by F. J. Phillip (personal communication, February 10, 2009); these include establishing a worldwide interrelated network of facilities while pursuing profit and cost minimization objectives.

⁹ Source: Clean Development Mechanism (CDM) – Executive Board (2008)

4.3.3. Facility configuration

The Building- and Raw Materials Center in Abobo is the very first facility to be constructed and is planned to be established on a currently undeveloped property in Abobo, the northernmost of Abidjan's ten communes (see Appendix 1 and Appendix 2).

In coordination with the local government it has been planned to process all of Abobo's generated waste which is estimated to be 1,200 tons daily. Two parallel technological processing and production lines are planned to be producing two main categories of output, paving and facing stones and wall elements to be sold as large-scale building solution within prefabricated housing solutions.

Production times for the Building- and Raw Material Center are set to 300 working days per year and 20 working hours per day (Convolant, 2009).

4.3.4. Investment costs

An initial investment budget of 100.6 million Euros has been estimated for building the Building- and Raw Material Center in Abobo including property, all development costs and technology and machinery. All investment costs are presented in a condensed form in Figure 2.

Figure 2: Investment Costs¹⁰

| Investment Costs | |
|--|----------------------|
| 1 Property | 600,000 € |
| 2 Buildings / Halls (production halls, administration, shipping) | 21,750,000 € |
| 3 Technology and Machinery (waste separation, production lines, material handling technology, storage areas etc.) | 51,830,000 € |
| 4 Site Development (connection to external water and energy supply, rain water collection etc.) | 2,850,000 € |
| 5 Outside Facilities (property preparation, straightening, foundation, paving, security installation) | 6,450,000 € |
| 6 Additional Construction Costs (18% 1 - 5) | 15,026,400 € |
| 7 Equipment / Furniture | 600,000 € |
| 8 Technology Forklift, mobile crans, trucks, shipping equipment etc. | 1,500,000 € |
| Total Investment Sum | 100,606,400 € |

4.3.5. Input, output and estimated revenues

Figure 3 lists the daily in- and outputs. The daily input of 1,200 tons of solid waste is converted residue-free into four main outputs:

- I. 1,275 tons of CeMin28, of which forty per cent are processed into stones (see II. and III.) and sixty per cent planned to be exported
- II. 981 tons of paving stones which is equivalent to 10,902 m² per day
- III. 1,472 tons of facing stones which is equivalent to 16,352 m² per day
- IV. 600 tons of wall panels daily which corresponds to 4,976 m²

¹⁰ Source: Convolant (2009)

Figure 3: Processed In- and Outputs per day¹¹

| Process Description | | Per cent | Amount (T/d) |
|--|-------------------------------------|----------|--------------|
| 1 | Input Waste | | 1,200 |
| 2. | Separation and Shredding | | |
| 2.1 | 15% to 6. Wall element production | 15% | 180 |
| 2.2 | 85% to 3. CeMin 28 production | 85% | 1,020 |
| 3. | CeMin28 Production | | |
| 3.1 | Input from 2.2. | 80% | 1,020 |
| 3.2 | Additives | 3% | 35 |
| 3.3 | Aggregates | 17% | 220 |
| 3.4 | Sum | 100% | 1,275 |
| Output CeMin28 Production | | | |
| 40% to 4. Preparation Stone Production | | 40% | 510 |
| 60% Export | | 60% | 765 |
| 4. | Preparation Stone Production | | |
| 4.1 | Input CeMin28 from 3. | 25% | 510 |
| 4.2 | Splitt | 75% | 1,530 |
| 4.3 | Sum | 100% | 2,040 |
| 4.4 | Input from 4.3 | 84% | 2,040 |
| 4.5 | Binding Materials (Cement) | 16% | 389 |
| 4.6 | Sum | 100% | 2,429 |
| 4.7 | Coloring Materials | 1% | 24 |
| 4.8 | Total | | 2,453 |
| Output Stone Production | | | |
| 40% Paving stones | | 40% | 981 |
| 60% Facing stones | | 60% | 1,472 |
| 5. | Production Wall panels | | |
| 5.1 | Input from 2.1 | 30% | 180 |
| 5.2 | Paper Sludge | 10% | 60 |
| 5.3 | Additives | 5% | 30 |
| 5.4 | Three-Layer-Minerals | 55% | 330 |
| Output Wall panel production | | | |
| 100% Wall panels from 6. | | 100% | 600 |

¹¹ Source: Convolant (2009)

The four output categories and waste processing license fees are estimated to generate daily and annual revenues of 293,112 Euros and 87.9 million Euros respectively (see Figure 4).

Figure 4: Revenues¹²

| Product | Daily Quantity | Expected Price / unit | Daily Revenue | Annual Revenue |
|-----------------------|-----------------------|-----------------------|------------------|---------------------|
| CeMin28 | 765 T | 20.00 € | 15,300 € | 4,590,000 € |
| Paving Stones | 10,902 m ² | 6.00 € | 65,412 € | 19,623,600 € |
| Facing Stones | 16,352 m ² | 10.00 € | 163,520 € | 49,056,000 € |
| Wall Panels | 4,976 m ² | 5.00 € | 24,880 € | 7,464,000 € |
| "Green Dot" Fees* | 1,200 T | 20.00 € | 24,000 € | 7,200,000 € |
| Total Revenues | | | 293,112 € | 87,933,600 € |

* Analog to Germany's dual system of waste collection (<http://www.gruener-punkt.de>) green dot license fees are expected to be obtained for waste processing

4.3.6. Operating costs

Operating costs are estimated to amount to 73.9 million Euros annually which corresponds to daily operating costs of 246,000 Euros (see Figure 5).

¹² Source: Convolant (2009)

Figure 5: Operating Costs¹³

| Required raw materials | Daily Quantity | Estimated Price / unit | Daily Cost | Annual Cost |
|---|------------------------|------------------------|------------------|---------------------|
| Aggregates for CeMin28 Production | 220 T | 28 € | 6,160 € | 1,848,000 € |
| Grit / Splitt | 1,530 T | 20 € | 30,600 € | 9,180,000 € |
| Additives | 65 T | 320 € | 20,800 € | 6,240,000 € |
| Cement | 390 T | 100 € | 39,000 € | 11,700,000 € |
| Paper Sludge | 60 T | 4 € | 240 € | 72,000 € |
| Three-Layer-Mineral | 330 T | 20 € | 6,600 € | 1,980,000 € |
| Coloring Materials | 24 T | 300 € | 7,200 € | 2,160,000 € |
| Total Raw Materials | | | 110,600 € | 33,180,000 € |
| Energy and water | Annual Quantity | | | |
| Energy costs | 20,000 MWH | 80 € | | 1,600,000 € |
| Water costs | 5,000 m ³ | 4 € | | 20,000 € |
| Utilities | | | | 1,620,000 € |
| Labor Costs | Number | | | |
| Annual Labor Costs | 330 | | | 2,719,000 € |
| Bonuses, other premiums | 5% of labor costs | | | 135,950 € |
| Total Labor Costs | | | | 2,854,950 € |
| Other costs | Percentage | | | |
| Wear and Repairs | 4 % | 56,780,000 € | | 2,271,200 € |
| Fees, insurance, charges | | | | 5,000,000 € |
| Investment financing costs | 10 % | 100,606,400 € | | 10,060,640 € |
| Depreciation technology + equipment | 20 % | 53,930,000 € | | 10,786,000 € |
| Deprec. building | 5 % | 21,750,000 € | | 1,087,500 € |
| Deprec. outside facilities and addtl constr costs | 20 % | 21,476,400 € | | 4,295,280 € |
| Deprec. investment site development | 10 % | 2,850,000 € | | 285,000 € |
| Costs for office, cars, marketing etc. | | | | 2,500,000 € |
| Total other costs | | | | 36,285,620 € |
| Total annual operating costs | | | | 73,940,570 € |
| Total daily operating costs | | | : 300 | 246,469 € |

For the operation of the Building- and Raw Materials Center a total of 330 positions are needed. The top management positions, position 1 – 5, (see Figure 6) are filled by Germans, the remaining 316 positions are planned to be filled by local employees.

¹³ Source: Convolant (2009)

Figure 6: Annual Labor Costs Building- and Raw Materials Center Abobo¹⁴

| Position | Number | Annual Salary per person | Total Annual Salaries |
|-------------------------------|---------------|---------------------------------|------------------------------|
| 1. CEO | 1 | 120,000 € | 120,000 € |
| 2. Plant Manager | 2 | 80,000 € | 160,000 € |
| 3. Technical Manager | 2 | 80,000 € | 160,000 € |
| 4. Quality Manager | 3 | 60,000 € | 180,000 € |
| 5. Process Control Technician | 6 | 60,000 € | 360,000 € |
| 6. Area Manager | 3 | 24,000 € | 72,000 € |
| 7. Administration | 30 | 9,000 € | 270,000 € |
| 8. Shift Supervisor | 10 | 15,000 € | 150,000 € |
| 9. Maintenance | 30 | 8,000 € | 240,000 € |
| 10. Laboratory Technician | 3 | 9,000 € | 27,000 € |
| 11. Qualified Labor | 120 | 5,000 € | 600,000 € |
| 12. Unskilled Labor | 100 | 3,000 € | 300,000 € |
| 13. Security Services | 20 | 4,000 € | 80,000 € |
| Bonuses, other premiums | 5% | | 135,950 € |
| Total | | | 2,854,950 € |

¹⁴ Source: Convolant (2009)

5. Analysis Data: Assessment and Evaluation

5.1. Definition of target market requirements

Being a newly founded startup company with an innovative process, the case study subject Convolant Ltd. fulfills the definition of a classic entrepreneurial company. Its revolutionary process has the potential to create value and by focusing on proper capitalization, management and location, some of Timmons and Spinelli's odds of survival are in favor of the company.

Convolant Ltd. is currently in the process of establishing its first Building and Raw Materials Center in Abidjan, Côte d'Ivoire. Being a German company internationalizing immediately after its foundation, makes it a true born global organization. Convolant's patented innovative waste conversion process which simultaneously offers a solution for tomorrow's raw material shortage is assumedly superior to many international markets' processes and hence fulfills one of the reasons why organizations go global immediately after their births.

In the following section I carry out an industry assessment in line with Michael Porter's industry-based view of Convolant's home market Germany. Based on these findings, I generate the required market characteristics for a potentially successful market entry which I subsequently apply to Abidjan in order to determine whether the Building and Raw Materials Center is favorably positioned within the industry which is one of the stated criteria in favor of business startup survival.

The overall goal of this section is to explore the extent to which traditional international business strategy is applicable to footloose born global classic entrepreneurial companies in setting target markets at the outset of their business activities.

5.1.1. Industry assessment of German market

Convolant's waste product cycle facility is able to convert large quantities of waste into large amounts of various end products, which are particularly suitable for building industry and road construction. An assessment of industry-based factors of Convolant's home market Germany as potential market entry point has results in the following findings:

Firstly, the German materials and supply market is characterized by a high degree of rivalry among competitors. An indicators of an intense interfirm rivalry is the finding by a study by Roland Berger Strategy Consultants (2009), that the German construction materials and supply industry is stated to be facing declining sales volumes while at the same time operating costs are rising. According to the study, two thirds of industry executives state to be suffering from the consequences of the currently ongoing financial crisis. The consequences are expected to be impacting the industry for several years to come with more than half the players in the market of building materials and supply market "looking for attractive acquisition targets" (Roland Berger Strategy Consultants, 2009, para. 9).

The second finding regarding Convolant's respective home market is that a high degree of rivalry among competitors also exists in the domestic development market due to a high degree of housing and urban development with a low need for additional development. Germany's Federal Statistical Office Destatis¹⁵ registered the lowest building permit rate in 2008 since Germany's reunification. According to a study by Germany's Federal Office for Building and Regional Planning BBR¹⁶ (2001) building activities have been steadily decreasing over the last decade and according to forecasts continued declines are expected while apartment vacancies of up to fifteen percent are encountered in certain areas of Germany. The currently existing interfirm rivalry is hence not expected to relax, on the contrary an increasing intensity can be expected.

In addition to a high and potentially increasing degree of rivalry in the structural development and building materials and supply market, saturation and hence interfirm rivalry is also encountered in the waste management market. Germany is characterized by an intense and increasing competition for waste. As

15 Statistisches Bundesamt Deutschland

16 Bundesamt für Bauwesen und Raumordnung

a consequence of its formal waste regulation hierarchy of preventing, processing and removing, waste amounts have decreased significantly turning the fight against waste into a fight for waste (Bünder, H, 2005, translated by the author). According to a study by the German Society for Nature Conservation NABU¹⁷ (2009), Germany has considerable excess waste processing capacities and is currently importing approximately two million tons of waste per year. With additional planned investments into waste processing facilities (while the population and generated waste amounts are decreasing) Germany's excess waste processing capacities are estimated to reach 8.6 million tons annually by 2020. As a consequence, an increase of the already large number of competing players is likely to result in an even more intense interfirm rivalry. Another indicator of intense rivalry is the fact that establishing waste disposal and treatment technologies involves substantial costs which means that new capacities can only be added in large increments. Considering the high, long-term investments involved and consequently high exit costs, coupled with substantial excess capacities and the "fight for waste" (Bünder, H, 2005, translated by the author), all generated waste has been distributed in the long-run to the various facilities.

Supporting the prediction of increasing interfirm rivalries in the fields of materials, supply, domestic development and waste management market is the fact that Germany's population is estimated to decline by 0.053 per cent in 2009 (Central Intelligence Agency [CIA], 2009b). The declining birth rate in the fifteen nation-European Union from 2003, is estimated to result in a population decrease by 23 per cent by 2100 compared to its level of 2000 (Cosgrove-Mather, 2003).

In sum, Germany's housing and urban infrastructure is well developed and, owing to factors such as a negative population growth, apartment vacancies are increasing while construction demand and activities are decreasing. The building materials and supply market is saturated and characterized by a large number of players which is indicative of a high degree of rivalry among competitors. A decrease in construction demand has been faced and, in addition, consequences from the economic crisis are currently dealt with which are assumed to keep having an impact for several years to come. Demand for road and building materials is hence low and with forecasted continued negative population growth

17 Naturschutzbund Deutschland e.V.

and in light of the economic crisis, an increase in building material demand is not to be expected, i.e. the intensity of interfirm rivalry will increase.

With low levels of current demand and the assumption of negative forecasts regarding future demand, it can be inferred that demand for innovative materials cannot be created and consequently, in order for Convolant to position itself, current players would need to be driven out of the market. Attempting to break into these markets, however, can be expected to be faced with opposition and lobbying work by the currently rivaling industry players.

Since input into Convolant's waste product cycle consists of approximately one third municipal solid waste, attempts to break into the waste processing market can also be expected to be faced with opposition and lobbying constraints by current waste management stakeholders in an attempt to ensure profitability of their own long-term investments into respective processing technologies.

To conclude, according to collected evidence for the assessment of the German building material and waste management market, the currently already intense rivalry is expected to increase in the future, creating high barriers to entry. The high intensity of rivalry, which is expected to increase, makes Convolant's industry environment highly unfavorable and hence the evidence suggest a successful launch of the waste product cycle to the German market to be unlikely if not impossible. Thus, the first leading perspective on strategy, the industry-based view, leads to the conclusion that the substantial competitive force of rivalry among competitors does not make a successful positioning very likely.

5.1.2. Required industry characteristics and market definition

5.1.2.1. Required Market Characteristics

As in the German market, substantial industry constraints are also posed by other equivalently developed countries. I base this assumption on obtained data which provides similar information for other developed markets with regards to intense interfirm rivalry in development and building materials industries, well developed waste management systems, negative population growth etc. I do not consider a presentation of a thorough industry assessment of developed countries of great assistance in answering the research question regarding the required market characteristics for a potential successful market entry. Therefore, I only refer to

one representative quote for the above given statement: „Nearly all of world population growth is now concentrated in the world’s poorer countries“ (Bill Butz in Population Reference Bureau, 2008, Supplementary information para. 3).

In order to increase its chance of successful market positioning, the case study subject must find a favorable industry environment especially with regards to Michael Porter’s force of rivalry among competitors. As presented, Convolant’s inputs and outputs are large quantities of waste and building materials respectively and hence Convolant needs markets with current and long-term availability of waste and demand for its produced output. The requirement of low intensity of rivalry among competitors within Convolant’s target industries is satisfied by markets characterized by the following:

- a) Insufficient or lack of developed waste management and current inability to provide own solutions
- b) Insufficient settlement structures and demand for development
- c) Unsaturated building materials and supply market with a small number of players
- d) Non-declining, possibly increasing population growth

By considering entering foreign markets, whether developing or developed country, costs are incurred such as constraints due to liability of foreignness. Regarding formal and informal institutional constraints, one time fixed costs of acquiring respective local market knowledge can be planned for and incorporated into the budget. Formal and informal discrimination by the state and society, however, are much more difficult to plan for. Regardless the country and regardless the circumstance, political awareness and will with regards to a need for solutions and development represents a factor from the “musts list for a new location” (Schmenner, 1982, p. 18) since low institutional constraints are crucial in order to allow Convolant to enter a market, establish itself and be able to contribute to stabilization and development. I therefore add a fifth point to the four market requirements presented above, namely

- e) Appropriate governmental support to find solutions to the problems and encourage development

Applying Hymer's (1976) Monopolistic Advantage Theory to the case study subject, Convolant's patented process and know-how in the field of municipal solid waste treatment and conversion into building materials represents the case study subject's required advantage over the local firms in their own markets to justify market entrance. Assuming that institutional constraints within the company's control can be dealt with through acquiring respective knowledge and further assuming that discrimination can be prevented by actively seeking governmental and societal support, the advantages will outweigh the costs of doing business internationally and hence, the operation can be profitable. In this equation currently unconsidered is the institutional constraint of an issue of potentially tremendous implications: political risk. Political risk is beyond a company's level of influence and I will consider it in a separate assessment in subchapter 5.2.6.3.

5.1.2.2. Target Market Definition

The market requirements presented above are fulfilled to a large extent by many developing countries. The World Bank Group defines developing countries as: "Low- and middle-income countries in which most people have a lower standard of living with access to fewer goods and services than do most people in high-income countries. There are currently about 125 developing countries with populations over 1 million; in 1998, their total population was more than 5.0 billion" (The World Bank Group, 2003, para. 4). The statement that developing countries largely fulfill the presented market requirements is grounded in the following facts provided by multiple sources of particularly archival records:

According to the Population Reference Bureau (2008), stagnating or decreasing population growth in industrialized countries is in direct contrast to sharply increasing population growth in developing countries. "The projected increase of the world's population from the current 6 billion to 9-10 billion at the end of the century will be attributable almost entirely to population growth in developing countries" (The World Bank Group, 2004, para. 12). A study by the United Nations Human Settlements Programme (2005, para. 2) uncovers that most developing countries face "widespread poverty and inequality in cities, with millions of people living in slums without adequate basic services". The currently already large housing demand is expected to sharply increase over the next 25

years with more than 2 billion people being added to the group of people in need of houses and related infrastructural services. By 2030, approximately 40 per cent of the world's population will be in need of housing and infrastructure services, which means that 96,150 houses would need to be established daily to accommodate to the fast growing need (United Nations Human Settlements Programme [UNCHS], 2005).

Despite being a key factor in ensuring public health, safety and well-being, in maintaining the quality of life and in sustaining the environment (Schubeler, 1996), municipal solid waste management is characterized by large deficits in many developing countries. Richard J. Palczynsky's (2002) literature review on the status of waste management in particular in Africa uncovers that most countries lack efficient collection, sufficient coverage and proper waste disposal. Non existing waste management legislation and explosive population growth are cited to be the main reasons for disastrous waste management in developing countries. Particular problem zones are stated to be densely populated urban areas. Melody J. Hunt (2004, p. 112) summarizes the waste disposal issue in *The World Book Encyclopedia* as follows: "Disposing of municipal solid waste has become a serious problem because people produce more each year. At the same time, places to put the waste are filling up, and new locations are becoming more difficult to find". A market with population growth would further ensure demand and waste availability not only in the current but also in the future state.

In summary, based on the multiple sources of evidence which stem predominantly from biased-free archival records, I conclude that developing countries fulfill the required market characteristic for potential successful market entry. Due to Convolant's ability to produce large amounts of output and due to the constraints faced by developed countries similar to Germany, I recommend Convolant to focus on developing countries which are characterized by a "rapid population growth" (Population Reference Bureau, 2008), high demand for housing, road and other urban infrastructure solutions while simultaneously a sustainable solution to the pressing waste problem is created. By operating the facility in the respective country and benefiting from lower operating costs and offering prefabricated housing solution, affordable solutions can be offered at profitable prices to Convolant (F.J. Phillip, personal communication, February 10, 2009). Even though intense rivalry among competitors of Convolant's target

industry makes developed countries unattractive as focal market entry point, the exact opposite holds true for developing countries. As opposed to potentially facing massive lobbying constraints in developed countries, a substantial difference could be made in developing countries by reducing environmental pollution through waste collection and processing, by creating jobs, by improving and developing infrastructure development etc.

5.1.3. Industry assessment Abidjan according to developed market characteristics

In the following section I analyze Abidjan in light of the developed market characteristics. This analysis allows a prediction as to whether the first Building- and Raw Materials Center will be favorably positioned within the industry which represents one criterion in favor of business startup survival.

Abidjan's waste management system has been going through several changes over the last decades. The highest waste collection coverage of 77 per cent (Meyer, 1993) was recorded when a French private company serviced Abidjan from 1953 – 1990 (Attahi, 1999) After two years of very low waste collection carried out by Abidjan's municipal and communal services (Meyer, 1993) a local private company, Ash International took over. Internal mismanagement (Attahi, 1999) and payment disputes resulted in only 25 per cent of the city's waste being picked up leaving huge amounts of garbage piled up on the streets creating a threat to human health (Dzisah, 1998). Today, the part of the waste that is being picked up is taken to a single dumpsite on the north-eastern outskirts of Abidjan. Regarding the area of waste processing, rivalry among competitors is hence non-existing. The currently uncontrolled, un-treated dumping has resulted in the site's saturation leading to environmental and groundwater pollution and an abundance of rats, flies, mosquitoes and cockroaches posing health risks such as malaria or cholera. Due to the increased health threats the dump site's neighboring residents have organized several sit-ins and road barricades to block access to Ash's trucks resulting in less waste to be picked up from the streets (Attahi, 1999). Despite spending 61 percent of its communal budget on waste management, only 54 percent of waste is collected and disposed of in 2002 (Sané, 2002). As presented,

Abidjan's government has been unable to provide a solution to its waste problem and the population has been alarmed and sensitized to growing waste problem. Abidjan is in need of a solution to its waste problem and since providing a 'clean' solution to the waste problem would be to the visible benefit of the state and society, support is to be expected lowering liability of foreignness constraints. The need for a waste solution is expected to increase due to an estimated population growth of 2.1 per cent in 2009 in Côte d'Ivoire (CIA, 2009a).

As presented, Abidjan's roads, streets and houses are in a poor state and major road improvements are required. According to Youssouph Sané (2002) Ash International has been claiming inaccessibility of many urban areas to be a major reason for the city's low waste collection coverage. By starting at the root cause of collecting waste and converting it into paving and house building stones to be used for local construction, improved housing and roads would mean better accessibility of the whole city leading to better collection coverage possibilities. Simultaneously, jobs are created, raw materials are recovered and the burden on the environment will be eased.

To conclude, Abidjan fulfills all five presented market requirements. A market entry of Convolant into Abidjan yields an optimistic picture from a strategic point of view. The industry is characterized by non-existing rivalry among respective competitors. The second leading perspective on strategy, the resource-based view, yields an optimistic picture due to Convolant's internal strength of offering a valuable and innovative process. Lastly, the third perspective, the institution-based view is also favorable with regards to governmental and potentially population support which lower formal and informal institutional barriers tremendously. With all three perspectives on strategy being favorable for Convolant, the way is paved for a successful market entry.

5.2. Factors of Location Analysis

Because of Timmon and Spinelli's (2007) finding that one of the reasons that almost fifty per cent of classic entrepreneurial businesses fail is because they have made poor location decisions, I carry out an analysis of Convolant's first location choice.

Considering the large initial investment sum of 100 million Euros, with additional, potentially even larger future investment requirements, Convolant's location to operate and run all business activities from is fixed. At the very moment the location decision Abobo was made, constraints regarding labor climate, market availability etc. got defined by having to deal with the local characteristics. Due to the high investment involved, the made location decision cannot be easily reversed or if, only at a huge loss. Abobo must therefore be a "robust facility location" (Owen and Daskin, 1998, p. 423) and fit Convolant's current and long-term needs. Bearing in mind the implications the business location decision has, it becomes clear, that a thorough selection process is crucial as suggested by Söderman (1975).

As presented, Convolant pursues a range of officially stated and company internal objectives. Being of social and economic nature, these objectives are partly conflicting. Finding a location which meets the multiple criteria set forth while being "robust", i.e. satisfying the current as well as a potentially very different future system state, represents a highly complex undertaking.

In the following section I analyze traditional location theory's most commonly cited factors in light of the given case study. By analyzing relevant data, I carry out an assessment of the influence these factors had and have on the case study subject's first location and facility configuration. The goal of this section is to explore whether the general theories' applicability, and the degree of importance of traditional location factors differs for the case study subject compared to the theory's more traditional target companies. Since the case study subject is a representative case, the findings of this research question will lend itself to generalizations regarding the extent to which traditional location theory is applicable to footloose born global classic entrepreneurial company. Wherever required and applicable, I take into consideration input from the other two

academic fields which ultimately allows an answer to the question to what extent crossover research would be of assistance to young startup companies.

For each locational factor I present the findings followed by a preliminary assessment of the extent of influence each respective locational factor has had on the case study subject's location decision. Based on the case study subject's findings I present a summary regarding the applicability of location theory to footloose born global entrepreneurial companies including explanations as to why different foci for these types of companies are encountered.

I do not present the locational factors in order of their significance as cited in the literature but in an order which allow a logical flow of the given information. Further, during the assessment Söderman's (1975) presented validation concern¹⁸ needs to be kept in mind with regards to the difficulty of assessing whether the location decision might have been the worst selection from a set of very good alternatives.

5.2.1. Transportation systems and cost minimization

All input materials enter the end products residue-free which means that a total of two times a weight of 3,819 tons (1,200 tons of waste and a 2,619 tons of raw materials, see Figure 3) must be transported, firstly as input to and secondly as output away from the facility. Transportation costs hence represent a major cost driver and in order for the case study subject to keep these costs at a manageable level, local transportation systems variety and rates have undergone a company internal analysis (F.J. Phillip, personal communication, February 10, 2009).

5.2.1.1. Multiple modes of transportation and rates

The Building- and Raw Materials site in Abobo offers access to the most important modes of transportation, namely transportation by water, rail and road. As presented within 4.3.1, the busiest Western African port is located in Abidjan connecting the country to international as well as domestic destinations by means of access to the Atlantic Ocean and extensive inland waterways. The railway tracks which connect Côte d'Ivoire's major cities and offer a direct connection to Burkina Faso run tangent to the property in Abobo. Investment costs into a railway

¹⁸ See section 2.1., Location Theory

connection are estimated at 4.75 million Euros. This investment is currently not included in the development plan, the connection might however be considered in the future. Côte d'Ivoire has further been shown to have an extensive road system and an international airport.

Abidjan, the so-called "Paris of Africa" (French, 1994, para. 1) is located with easy access to multiple modes of transportation: The Building- and Raw Materials Center's proximity to the international port and inland waterways offers access to the slowest but most economical mode of transportation for long distance transport of some of the facility's inputs. Being within the direct vicinity of potential railroad transportation is particularly useful for intermediate distances such as accessing regional demand and supply points once local supply and demand is saturated. Due to having no terminal costs and "door to door flexibility" (Stafford, 1979, p. 29), being connected to the extensive road network offers advantages particularly for all transportation to be done within the vicinity of the Building- and Raw Materials Center. Lastly, despite being the most expensive mode of transportation, being within proximity to the airport offers the benefit of maximum speed and quick connection to Germany for Convolant's representatives and German employees.

In short, regarding access to multiple modes of transportation for different purposes and different transportation distances, Abobo represents a strategically well chosen site within Côte d'Ivoire and its neighboring countries in Africa.

5.2.1.2. *Specific problem of developing countries: poor road conditions*

As presented within 4.3.1., despite having an extensive road infrastructure, its state is poor with 92 per cent of the urban roads being unpaved. Convolant's translator, has confirmed that the infrastructural road system can by no means be compared to the well developed road system of more industrialized countries (E. Geiger, personal communication, April 6, 2009).

Since waste collection vehicles and all other transportation activities to and from the facility rely on roads, the road infrastructure's poor condition pose restrictions regarding facility in, - out, - and throughput. Inaccessibility due to bad infrastructural conditions has been stated to be one of the reasons of Abidjan's low waste collection coverage and, as will be presented in subchapter 5.3.1., poor

road conditions are also found to be the bottleneck with regards to logistical planning.

While the poor road infrastructure poses logistical constraints on one side, it also presents a sales and revenue source for Convolant. The facility's daily output of 10,900 m² of paving stones is planned to be utilized for large-scale improvement and development of the local road infrastructure. An improved road infrastructure will be beneficial for Abidjan's development; in addition Convolant itself will be a major beneficiary by securing sales and having access to a potentially much improved road network. Capacity and logistical restrictions posed by the currently poor road conditions will be removed and consequently more materials may be transported to and from the facility in the long run. Further, considering Convolant's large amounts of output, the regional and domestic market will eventually be saturated even if initial demand is huge. A significantly improved road infrastructure will result in a larger demand radius accessible by road.

To summarize, in line with Rushton's (1979) and Tybout's (2000) finding that developing countries pose problems over and beyond all the locational problems faced in developed countries, Côte d'Ivoire's poor road systems poses initial logistical challenges to a smooth operating of the facility from a logistical planning point of view. However, due to one of Convolant's output products being paving stones for road constructions, this limitation simultaneously represents an opportunity for long-term guaranteed demand without having to encounter high degrees of interfirm rivalry. Unless other road building companies enter the market, long-term sales of one of the facility's outputs is secured. The poor road conditions being a limitation with regards to logistics and transportation capacities hence simultaneously represent a long-term opportunity for stable sales.

5.2.1.3. *Transportation cost minimization*

In an effort to protect the process' "secret formula", Convolant plans to produce the additives in Germany and export them to Côte d'Ivoire. Coloring materials are either obtained from domestic production or imported. All other materials can be obtained locally and categorized as regional ubiquities according to Alfred Weber's (1958) categorization of materials since they are found within the vicinity of the facility. Waste being generated everywhere is classified as ubiquity, despite not being provided by nature. It may even be argued to classify waste as general

ubiquity since nowadays it is generated everywhere as opposed to being available in certain regions only. With approximately 98 per cent of the input materials being ubiquities, and the localized additives and possibly coloring materials being pure (i.e. entering the product without residues), the proportion of localized material to the weight of the final output is very small (approximately 0.02). The very low material index and low locational weight (ubiquities are disregarded in its calculation) are pulling the optimal facility location towards the place of consumption. Since an extensive waste collection system needs to be developed resulting in high transportation costs, it may be argued to classify waste as localized pure material. Nevertheless, since approximately 66 per cent of total input is obtained locally (grit, cement, paper sludge and minerals add up to 2,530 tons out of 3,819 tons of total input), a process consisting of 34 per cent localized pure materials has a material index of 0.34 resulting in the facility's location still being pulled towards the products' place of consumption. In short, regardless whether waste is classified as localized material or ubiquity, in order to minimize transportation costs, the Building- and Raw Materials Center must be located with particular emphasis on the facility's place of consumption. As has already been determined, Convolant's market is planned to be locally defined by a high demand for large-scale road and housing construction.

Considering the facility's long-term planning horizon, a strategic disposition regarding place of consumption must further be ensured under local demand saturation and possibly changing market circumstances. While the place of consumption may initially be locally, regionally or domestically defined, accessibility to a wider, potentially much improved transportation network will allow an extension of the place of consumption to international markets accessible by favorable transportation. Inquiries for Convolant's products have been received from Burkina Faso and the Congo.

To conclude, Abobo is strategically well located with regards to its downward supply chain as required by its process' low material index. As will be presented under 5.2.5., the site is also favorably located with regards to its process' inputs. In addition, with regards to transportation the facility location is 'robust' (Owen and Daskin, 1998, p. 423) by providing proximity to market and material supply point in the short- as well as in the long-run by means of multiple modes of transportation. Convolant has further confirmed that the plot in Abobo

was chosen due to its access to multiple modes of transportation. Location theory's dominant transportation focus is hence applicable to the studied subject.

5.2.2. Climatic influences

As presented in subchapter 4.3.1., Abidjan is characterized by a very wet and tropical climate. Due to the high amount of rainfall, water supply does not represent a problem and sufficient rain water can be collected to be used as process water. The wet and tropical climate has further been shown to be favorable for agricultural growth resulting in Abidjan's waste comprising of approximately 70 per cent of organic matter, i.e. food and green waste (see Figure 1), compared to approximately 27 per cent in Germany (Vehlow, 1997). Generally speaking, higher percentages of organic matter result in higher moisture contents and consequently higher densities of the waste (Palczynski, 2002).

Another climatic characteristic is Abidjan's extensive cultivation of oil palms and rubber trees for the extraction of palm oil and caoutchouc. Once the extraction process is finished, the trees are cut and burnt which, due to air humidity and high moisture content of the wood, results in heavy smoke or smoldering fires having a negative effect on environmental pollution and human health. Convolant has been offered a long-term commitment by one of Côte d'Ivoire's tree cultivation companies which has guaranteed a supply of 350 rubber trees and 380 oil palms per day at no cost other than transportation. These trees may be processed by Convolant into timber and furniture wood while the remaining wood fractions can be shredded and fed into the waste treatment process. The wood will be delivered as cut and will be characterized, like waste, by a high percentage of moisture.

The implications of Abidjan's climatic conditions for Convolant's activities and facility configuration can be summarized as follows: Firstly, due to the high precipitation, sufficient amounts of process water are available. A constant long-term supply of process water can be ensured by means of a one-time investment of 1.1 millions Euros into a rainwater collection pool and respective installations. Secondly, since the climate is highly favorable for extensive agricultural growth, the waste's comparably high percentage of organic matter can at least partially be attributed to the climatic factor. The resulting high moisture content of the waste has been stated to potentially pose a problem within the process and parts of the

organic matter might consequently have to be removed to lower the waste's moisture content (see 5.3.2.5., Extraction of Organic Matter). Lastly, according to Edgar Malone Hoover (1948) a positive correlation between hot climate and reduced productivity levels exists.

All in all, I find that Abidjan's climate is having a significant impact on Convolant's operational costs and output. These impacts are of both, positive as well as negative nature: The high degree of precipitation and hence availability of rain to be collected and used as process water is reducing operating costs compared to other locations where external water would need to be relied on and paid for. On a more negative side, expected productivity levels must potentially be adjusted downwards due to the hot climate (Hoover, 1948). Regarding the high degree of precipitation and hence moisture content of the waste, parts of the organic fraction might have to be extracted from the waste to allow optimal processing. This would result in reduced waste levels to be processed while at the same time alternative utilization solutions would be required for the extracted waste fractions. Lastly, the climate allows for massive tree cultivation which can supply the facility with wood at no cost. Again, due to the high moisture content, solutions for moisture extraction might have to be found.

To conclude, despite not regarded a highly influential locational factor within traditional location theory, I find that the climatic factor has a very high influence on the case study subject's facility configuration and operational and investment costs. Non-crossover general location theory hence lacks applicability to the presented case study subject by not placing sufficiently high emphasis on climatic factors as required.

5.2.3. Labor climate

Labor costs comprise of income rates, availability of labor and productivity (Stafford, 1979). Regarding the first variable, it has been shown in subchapter 4.3.1., that Côte d'Ivoire's income rates are 3.6 percent for females and 6.6 per cent for males of Germany's labor costs. Regarding the second variable, availability of labor, it has been presented that skilled as well as unskilled labor is available and that the estimated unemployment rate is approximately 40 – 50 per cent. The third variable of labor costs, productivity, is typically defined as units of

output per units of labor input (ibid.). Productivity is a non-quantifiable variable in the given case, firstly because no data has been found on Côte d'Ivoire's labor productivity and secondly because the Building- and Raw Materials Center in Abobo is Convolant's first facility and hence no comparable data exists at this point. While productivity levels might be calculated and compared in the future, assumptions for the current facility must be based on literature findings.

As presented within planned operating expenses (Figure 6), Convolant plans to fill 316 of the 330 positions with local personnel. The local personnel's salaries are planned at a higher rate than the national average annual income figure provided by UNDP¹⁹ for two reasons. Firstly, due to operating in Abidjan, the economic center of Côte d'Ivoire, Convolant assumes somewhat higher annual incomes compared to the nationwide average. Secondly, higher base salaries will make the positions more attractive and it is hoped for a larger labor pool to choose from. Further, by paying above standard wages, the potential positive relationship between wage levels and productivity is attempted to be utilized (F.J. Phillip, personal communication, April 15, 2009). Job creation and visible improvements in road infrastructures and development of affordable housing is assumed to create positive attitudes resulting in a positive impact on productivity levels. Simultaneously, due to Hoover's (1948) observation of lower labor productivity levels in very hot regions, potentially boosted productivity might be compensated by generally lower productivity levels due to Côte d'Ivoire's hot climate. Since the Building- and Raw Materials Center in Abobo will be the first facility, no baseline data is available for comparison or for estimates regarding productivity levels. In how far other countries' higher labor costs would be compensated by higher productivity levels is speculative and beyond this research.

In line with Hoover's (1948) statement of many production factors not being required at a set proportion, Côte d'Ivoire's low labor costs are utilized by not investing into automated equipment for machine sorting; instead all waste will be hand-sorted.

In sum, as shown in subchapter 4.3.1., Côte d'Ivoire offers comparably low income rates and a large labor pool of qualified and unqualified people. Based on other countries' annual income figures provided by the reliable and unbiased source Central Intelligence Agency, much higher labor costs are involved with

¹⁹ See section 4.3.1., Introduction Abidjan and local relevant characteristics

operating in other countries. Regarding income rates and availability of labor, the Building- and Raw Materials Center is hence favorably located in terms of encountering lower operating costs. Again, the extent to which productivity is increased or lowered due to motivational and climatic influences remains speculative and is not incorporated within the business plan.

5.2.4. Market availability

As presented under 5.1.3. Abidjan's market is characterized by a high need for structural development. O'Sullivan's (1993) three market size determinants are indicative of a high degree of market availability for the case study's output: high levels of output are planned to be produced, per capita demand has been found to be high and the market is densely populated. Due to a favorable transportation network, the definition of market availability can be extended to international markets once local demand is saturated or if the market changes. The locational factor of market availability is hence fulfilled in the present and in the future also with regards to dynamic facility locations.

For the analyzed case study subject, market availability referring to the required market characteristics presented above (waste problem, need for structural development etc.) has been the decisive factor in choosing the location. Therefore, in case of the case study subject, market availability is assigned more significance than the most traditional location factor cost minimization.

5.2.5. Resource proximity and long-term availability

As demonstrated under 5.2.1.3., Transportation cost minimization, Alfred Weber's (1959) material categorization pulls the facility's location to its products' place of consumption. A strategic location with regards to the upward supply chain, however, must not be ignored either. Applying the locational factor 'proximity to suppliers and resources' to the case study subject, the term 'suppliers and resource' refers to the process' inputs. Due to the facility's long-term focus, dynamically changing markets must be anticipated, which means that it needs to be ensured that the inputs are not only available in the present but also in the future. Therefore, the analysis of the locational factor is extended by 'long-term availability'

5.2.5.1. Waste

In an effort to establish a sound waste management system, Côte d'Ivoire's environmental minister Théodore Mel Eg has officially guaranteed all necessary support by his administration for the realization of Convolant's development plan including a long-term permission to collect and process municipal solid waste from Abobo and potentially other communities (see Appendix 3). The support is bound to the requirement that Convolant's process is environmentally friendly and excludes incineration.

Per capita solid waste generation in Côte d'Ivoire is 1.0 kilogram per day (World Resources Institute, The United Nations Environment Programme, the United Nations Development Programme, & The World Bank, 1998). With a population growth of 2.13 per cent (CIA, 2009a), the currently generated waste quantity is expected to increase. According to the United Nations Environment Programme (2001), the increase in waste generation may even outpace population growth: A study in Mumbai, for example, yielded the result that while population grew by 49 per cent from 1981 to 1991, waste generation increased by 67 per cent during the same time (United Nations Environment Programme [UNEP], 2001).

As long as Convolant fulfills the requirement of environmental friendliness and does not employ incineration, proximity and long-term provision of waste, which is one of the main inputs into Convolant's process, is secured. Further, due to the expected population growth and UNEP's study that waste generation development might even increase faster than population growth, waste availability is secured also in the long-term. Waste, hence fulfills the criteria of being close by and is further secured in the short- and in the long-term.

5.2.5.2. Other input materials

The following information regarding resource proximity and availability has been obtained for all other input materials into the process besides waste: Additives will be produced in Germany by a separate business unit under the Convolant umbrella. Coloring materials are easily obtainable in Germany or might be obtained locally in Abidjan. Widening the definition of resource proximity to 'easily obtainable through favorable international transportation networks', additives and

coloring materials fulfill the criteria of proximity. Further, due to company internal supply, current and future additive availability is ensured.

According to a local informant from Abidjan, a large cement plant has been in operation in Abidjan for several years. Grit and gravel can be purchased from outside the city of Abidjan (A.S. Elias, personal communication, April 21, 2009) No direct information has been obtained regarding paper sludge and three-layer minerals. According to Convolant, however, the availability of these two materials is ensured (F.J. Phillip, personal communication, April 15, 2009). All other input materials have also been stated to be available. Resource proximity and availability is hence given for all inputs into Convolant's process.

5.2.5.3. Wood

In addition to the input currently stated in the business plan, long-term supply of locally grown wood has been assured in a contract (see 5.2.2, climatic influences). Due to Abidjan's favorable climate, tree growth and hence availability of wood is also provided in the future.

To conclude, location theory's factor of resource proximity is of significance for Convolant's location decision and facility configuration. Being essentially a manufacturing company, a high amount of materials are processed within the facility and in order to keep transportation costs at a manageable level, resource proximity needs to be ensured in the short- and in the long-term. Having the capacity to process 1,200 tons of waste on a daily basis, proximity to the waste generating center is highly significant which is fulfilled by the Building- and Raw Materials Center's location in direct vicinity of the waste generating center. By choosing a market in need of a waste solution, long-term availability can be guaranteed as opposed to choosing markets characterized by a fight for waste. With all other daily inputs amounting to 2,619 tons, proximity and long-term availability needs to be ensured for these resources as well. By being favorably located with regards to multiple modes of transportation systems, resource proximity does not literally imply 'close by' but can be extended towards accessibility by inexpensive reliable means of transportation. The factor of resource proximity hence goes hand in hand with transportation costs and access to a favorable transportation network.

5.2.6. Official support and political risk

Due to operating in a foreign country, the case study subject is exposed to political risks and liability of foreignness constraints as a result of its nonnative status. Further, by being an entrepreneurial company which offers an innovative product, issues regarding skepticism, newness etc. have to be dealt with. While the host country's formal institutions and political risks are beyond the company's potential influence and must hence be assessed during the initial location evaluation, informal institutions such as attitudes, sentiment and discrimination by population and government can proactively be worked with. Furthermore, the informal institution of culture can be adjusted to by actively working towards an increased cultural understanding.

5.2.6.1. Population support

As presented, Abidjan's population has been sensitized to the pressing waste problem. Without an understanding by the local population, Convolant risks to encounter informal institutional constraints and discrimination since the Building- and Raw Materials Center might be viewed as another waste end solution causing health hazards as experienced with the current dumping site in Akouédo²⁰.

The Building- and Raw Materials Center will create 316 positions to be filled by local citizens. Additional jobs will be created for facility construction, for long term positions in waste management and in peripheral sectors such as supply services, logistics, external services and further processing of Convolant's output products. Once the facility is in operation, improvements in roads and housing infrastructure will be visible. Further, Convolant's output is suitable for prefabricated housing elements, which means access to more affordable housing solutions.

In addition to liability of foreignness constraints due to operating in a foreign market, the Building and Raw Materials Center being essentially a semi-desirable or undesirable facility, poses additional constraints regarding social acceptance. In order to prevent informal institutional constraints and discrimination by the population, equitable treatment is required. Demonstrating how the new facility will add to an improved environment and quality of life and giving affected groups a

²⁰ See section 5.1.3.

voice in the process, represents some of the means to obtain local approval and hence prevent actions such as the sit ins encountered by Ash International²¹. Considering the high unemployment rate, job creation can be expected to have a positive impact. Visible improvements in road, infrastructure and housing situation are further expected to have a positive impact on local sentiment towards the Building- and Raw Materials Center.

5.2.6.2. Governmental Support

Abidjan's government has become aware of a need for a solid waste management system. As mentioned above, Théodore Mel Eg, environmental minister of Côte d'Ivoire, has officially guaranteed all necessary support by his administration for Convolant to collect and process waste given that the process is shown to be environmentally friendly and excludes incineration. The plot in Abobo was chosen in coordination with the governing mayor.

5.2.6.3. Political Risk

Regarding its economic freedom which has been analyzed by the 2009 Index of Economic Freedom (The Heritage Foundation & Wall Street Journal, 2009), Côte d'Ivoire's score of 55 falls within the category of "economically mostly unfree". The following institutional constraints listed by the Index effect business activities in Côte d'Ivoire: political, economic and social instability, substantial tariff barriers, bureaucracy, corruption, unsecured property rights (ibid.).

In summary, population and governmental support represent highly influential factors of the case study subject's potential success. Due to having to deal with liability of foreignness constraints, the minimum prerequisite is to obtain governmental support in order to prevent possible discrimination attempts. Because of the officially guaranteed support by Côte d'Ivoire's environmental minister and because of the fact that the facility's site was chosen in coordination with the governing mayor, the site and the overall undertaking is compatible with governmental and communal development planning goals. Consequently formal and informal discrimination risks by Abidjan's government are hence not to be

21 Ibid.

expected. With two of Bolton and Curtis' (1990) three requirements regarding site characteristics of an un- or semi-desirable waste facility being fulfilled, namely environmental soundness and economical feasibility, the third requirement, I expect that social acceptance is obtainable by demonstrating the applicability of the former two characteristics. Convolant can hence actively work towards local population support by following the principle of equity. Once the facility has been in operation for a while, visible improvements with regards to job creation, infrastructure development, waste solution etc is assumed to take over initially required proactive demonstration activities required by Convolant.

While population and governmental support can actively be sought and influenced, formal institutional constraints of political and economical stability is beyond the case study subject's level of control. Since Côte d'Ivoire is ranked economically mostly unfree with substantial political and economic instability risks, it remains to be seen whether the location choice has been made optimal.

5.2.7. Utilities

Availability, reliability and costs of utilities differ tremendously among locations and impact operating costs and facility configurations.

5.2.7.1. Electricity

Required electrical energy to operate the Building- and Raw Materials Center is approximately 20,000 megawatt hours per year. The required estimated electricity demand has been confirmed to be the maximum of what can be reliably provided by external sources (F.J. Phillip, personal communication, February 10, 2009). If a higher electricity supply is required due to for instance wrong estimates or increased facility capacities, Convolant needs to investigate own electricity generation solutions.

5.2.7.2. Water

Water supply has been confirmed not to present a problem in Abidjan. For process water, Convolant plans to collect rain water in appropriate tanks and prepare it for production purposes. Investment costs for water reservoirs, pipes, hoppers etc.

amount to 1.1 million Euros, which is included in the site development costs within the investment costs. Drinking water is planned to be obtained from external water supply. As can be seen within the operating costs (see Figure 5), 20,000 Euros are estimated for the annual demand of approximately 5,000 m³ of drinking water. The wastewater from the social areas is planned to be led into a biological clarification plant, which will require an investment of approximately 250,000 Euros which is also included in the site development investment costs of Figure 2.

In sum, Abidjan's water supply does not constitute a problem. Electricity supply being somewhat unstable, however, might require own solutions. These solutions naturally involve additional investment costs. Investment and operating costs may hence vary considerably and need to be compared within the wider framework of location decisions. Just like required to be analyzed by traditional companies, availability and costs of utilities must be assessed by footloose born global entrepreneurial companies during the course of making business location decisions.

5.2.8. Summary applicability location theory

By applying location theory to the case of a footloose born global entrepreneurial company it is observed that several factors are applicable as suggested by traditional theory, while at the time several mismatches occur.

In general, I find that location theory mainly considers factors which differ from location to location within a known market. Regarding issues which are only encountered in very different markets, i.e. countries which are very different from the home country, I find a lack of consideration. Traditional location theory hence misses a strong focus on international aspects within its locational factors. This international focus is however precisely what is needed by international inexperienced entrepreneurs who are resource constrained with regards to extensive foreign market research.

In the following, I present a summary of the main findings of each analyzed location factor including explanation attempts as to why applicability differences – if any - are encountered.

Market Availability: As presented, before taking anything else into consideration, Convolant's location was chosen according to the market characteristics developed in 5.1.2. Market availability, expressed by a waste problem and a need for structural development hence represents the location factor of utmost importance for the investigated case subject. This finding can be generalized to footloose born global entrepreneurs on the following grounds: Footloose entrepreneurial companies, facing low or no location restrictions predominantly focus on establishing a market for their new product. Therefore, their considerations are primarily driven by an emphasis on market availability. Once market availability is ensured, other location factors will be considered and allowed to take their influence. I hence find that market availability is the most predominant factor influencing the location decisions of footloose born global entrepreneurial companies.

Transportation costs and systems: Regarding location theory's strong emphasis on cost factors in particular transportation cost I find general applicability to the case study subject since transportation costs represent a major cost driver having a substantial impact on a company's survival and success. I also find location theory's emphasis on transportation systems to be justified. Unless the footloose born global startup company is a service provider or a company with hardly any transporting activity, transportation costs is a major cost driver and hence a thorough analysis of transportation systems and rates is required to keep these costs at a manageable level.

Climatic Influence: Despite being listed as influencing factor within general theory, climate is not attributed a high significance within traditional location theory. Since traditional location theory predominantly addresses companies relocating or expanding within a known marketplace, a strong emphasis on climatic influences is not required since in a known marketplace, market-wide conditions such as climate are known and hence no special adjustments are needed with regards to facility configuration. Born global start-up companies entering international unknown markets, however, might face very different climatic conditions to their known markets and consequently, adjustments with regards to facility configuration, operational budget etc. can be required. Generalizing this finding to

the research question of what influence locational factors have on location decision, I suggest assigning a high degree of significance to the location factor climatic influences.

Labor Climate: Traditional theory states a favorable labor climate with regards to wage rates, training requirements, attitudes, and productivity to be a decisive factor which I find to be applicable to the case study subject's first location decision in terms of facility configuration. Therefore, the significance locational theory assigns to labor climate holds true for cases in which footloose born global entrepreneurial companies make location decisions.

Resource proximity and long-term availability: Without listing it as a separate locational factor, traditional location theory often integrates resource proximity into the factor of transportation systems and cost. This approach is reasonable from the standpoint that transportation costs deal with the costs arising due to transporting the in- and outputs. A problem with this practice, however, is that it does not explicitly emphasize a focus on ensuring long-term availability of the inputs. Considering the long-term planning horizon of locating a facility, a location which optimizes transportation costs does not help if this optimized state is only of a temporary nature. I line with the significance of a strong emphasis on long-term availability I therefore suggest to separately list resource proximity and long-term availability as a locational factor of importance²².

Official support and political risk: Factors such as community attitudes, official support, political risks, nontariff barriers etc. can pose severe limits to doing business in different unknown markets, and I find that simply including them in the list of issues to consider without any further elaboration as done by traditional location theory is insufficient. In order to be able to thoroughly assess official support and political risks, I find it useful to draw upon theories from the third perspective of international business strategy, the institutional based view. Particularly governmental and population support is of high significance since the companies under consideration enter foreign markets with entrepreneurial product

²² The extent to which resource proximity should not be integrated within the transportation factor for mature companies, but rather be separately listed with an added emphasis on long-time availability is beyond this research and should be studied within a separate research stream.

which means that in addition to liability of foreignness constraints, 'newness' constraints regarding offering innovative and unknown products are faced and must be dealt with. Opposition due to being foreign coupled with offering an innovative and unknown product can be substantial for any footloose born global classic entrepreneurial company and hence the entering company must proactively seek population and governmental support. The factor of economic and political risk is also crucial. Since dealing with these risks is beyond the entering company's control, these factors must objectively be assessed at the outset of the location decision. In general, I find that population and governmental support plays a more significant role for footloose startup companies due to the unique problem set of foreignness and innovativeness which is not covered by general location theory. I therefore recommend a high priority to be assigned to the support factor as well as to the factors of political risk. Drawing upon the institution-based view from International Business Strategy allows useful insight into this factor.

Utilities: Availability and costs of utilities are found to be influencing the case study subject's investment and operational costs. Since mature traditional companies are also assessing utilities within their location searches, I do not find the significance of this locational factor to be more or less substantial. The only difference international location decisions might have is the possibility of encountering issues such as foreign electricity or piping systems resulting in the cost estimations being different compared to known markets. In general however, I do not consider a big difference in significance between traditional and newly founded entrepreneurial companies.

Summary: As presented I find the influence location factors have on footloose born global entrepreneurial companies to be different from traditional location theory on a variety of accounts. While traditional theory's most prominent location factor costs, particularly transportation costs, is certainly influential regarding the case study subject's location choice, I find a different factor to be most influential for footloose entrepreneurial companies: market availability. Due to trying to launch an innovative product and being unconstrained with regards to location, footloose international entrepreneurs choose their locations firstly according to market

availability and only secondly according to other locational factors. Even though I do not find transportation costs the most significant factor as proposed by many scholars, I find their dominating role to be justified considering that transportation costs represent a major cost driver which can be actively influenced through site selection.

I do not find the degree of influence of the locational factors transportation systems, labor climate and utilities to vastly differ for footloose startups compared to their established counterparts which are primarily targeted by location theory. The only emphasis that I propose to be considered is international issues such as an assessment of international characteristics regarding labor costs, different type of electrical and water piping systems an the like.

Factors which do differ compared to traditional theory are climatic influences, resource proximity and long-term availability, population and governmental support and political risk. Climate can be very different to the company's domestic conditions resulting in required process and budget adjustments. Resource proximity is suggested as a separate locational factor with the addition of an emphasis on long-term availability. Population and governmental support is found to be highly significant due to operating in an international context with entrepreneurial products.

5.3. Assessment of project development plan and facility configuration

Since Convolant is a newly founded company which offers a highly innovative, unprecedented process, no experiences can be relied upon regarding optimal facility location, or facility capacity and process configuration. Despite its founders being experienced with entrepreneurial products and processes, all facets of the waste product cycle's specific operations management are to be learned. Also, while small-scale testing of all phases of the process has been carried out at various locations in Germany, no complete real-time production line has ever been set up as a whole. Fulfilling the requirement of extensive and thorough planning which has been shown to increase the chance of a new venture's success hence represents itself to be even more complicated by unavailability of past data to rely on.

In the following section I address the third research question by providing a critical assessment of the case study subject's first business plan and facility configuration which has been prepared for the chosen location Abobo, Côte d'Ivoire. These findings form the basis for an exploration whether the uncovered problems are representative of issues typically faced by born global classic entrepreneurial startups having made their first international location decision and to what extent theory could be of aid. The uncovered problems form the basis for the recommendations within section six in which also the extracted lessons learned are presented. Even though the critical assessment itself is not directly linked to the presented theory, the findings and lessons learned form the basis for the summary in subchapter 5.3.7 which ultimately contributes to the overall research objective, namely to what extent crossover research amongst the three fields location theory, international business and entrepreneurship could be of assistance.

Many of the critical issues raised within this section are developed collaboration with Frank Schirling. Despite the interviewee being an external consultant, which lowers the risk of reporting bias and subjectivity in comparison to internal interviewees, bias and inaccuracy must be expected to be encountered. In

order to prevent bias or inaccuracy influence the analysis, I corroborate the provided data and information wherever possible with data from other sources and seek opinions from other interviewees.

5.3.1. Supply chain logistics considerations

Based on the presented waste composition in Figure 1 (subchapter 4.3.1.), the 1,200 tons of waste correspond to a bulk density of approximately 3,190 m³ (see Appendix 4). According to F. Schirling (personal communication, April 2, 2009), the average waste density of 376 kg/m³ results in possible loads of eight tons per waste delivery truck²³. Dividing the daily waste to be processed by the truck's loading capacity (1,200 / 8) the result of having approximately 150 waste trucks deliver waste to the facility daily is obtained. All other input materials will also be delivered to the facility by trucks; at least as long as the railway connection has not yet been established. Grit, cement, additives and aggregates having an estimated bulk density 1,800, 2,200, 1,900 and 1,900 kg/m³ respectively, will be delivered by tractor trucks capable of transporting 25 tons (F. Schirling, personal communication, April 2, 2009). Using the facility's daily raw material requirements from Figure 5 (subchapter 4.3.5.) and dividing this total quantity²⁴ by the truck's loading capacity (2,535 / 25), the result is obtained that approximately 101 raw material trucks will arrive at the facility daily. No data has been obtained regarding truck capacity for paper sludge and coloring materials. The daily required quantity of 60 tons and 24 tons respectively is negligible and will not be taken into consideration within this analysis. Without taking into consideration truck arrivals for these two inputs, 251 trucks will arrive at the facility every day. A similar amount of truck runs has been estimated for outbound logistics. During the determined 20 hour working day, an hourly average of 12.5 trucks arriving and 12.5 trucks departing from the facility are to be processed.

The following concerns are raised by F. Schirling (personal communication, April 2, 2009) regarding the planned supply chain logistics:

Firstly, within the current project development plan, 1.5 million Euros are planned to be invested into technology (see Figure 2, Investment Costs,

²³ All capacity restrictions are based on estimates provided by F. Schirling (personal communication, April 2, 2009).

²⁴ Aggregates for CeMin28 Production 220 T + Grit 1,530 T + Additives 65T + Cement 390T + Three-Layer-Mineral 330 T = 2,535 Tons

Subchapter). If 12.5 inbound trucks and 12.5 outbound trucks are to be processed every hour within the facility, required technological equipment to handle all loading and unloading activities is estimated to be at a minimum 7.8 million Euros, which is five times the amount currently included within the business plan.

Secondly, as can be seen on the map (Appendix 1 and Appendix 2), the plot in Abobo is not connected to a wide network of roads. All transportation would hence rely on one major road accessing the facility. As previously presented, Abidjan's road infrastructure is predominantly unpaved and in a very poor state and one of the reasons of the low waste collection coverage has been claimed to be inaccessibility of many urban areas.

In sum, the plan of processing and converting 1,200 tons of waste and 2,619 tons of raw materials poses logistical challenges. Insufficient investment costs for technology to process all inbound and outbound supply are included in the current project development plan. Given the current poor state of roads, having a minimum of 500 trucks arrive and leave the facility every day poses challenges on the road infrastructure currently unaccounted for within the business plan.

No appropriate reference logistics system has been found and no historical documentation on Convolant's side is available to allow for a comparable assessment or quantitative analysis respectively. Without attempting to draw upon theories from the research topic of supply chain management, I rely on the information presented by Frank Schirling on April 2, 2009 during the course of an interview as primary source and cross-validate it where possible with observations from a second interviewee as well as empirical findings provided by Rushton. According to the interviewee, the logistics cannot work as stated within the current business plan. Firstly, much higher investments in technology are required or, alternatively, less input must be planned for. Secondly, as stated by official sources and confirmed by a second interviewee, Eugen Geiger (personal communication, April 6, 2009), the local roads are in a poor state and logistical standards from industrialized countries cannot be applied. One of Rushton's (1979) identified challenges of doing business in developing countries, poor road conditions, will hence be the defining factor in setting the facility's capacity. This has however not been the emphasis by the case study subject when developing the business plan.

5.3.2. Potential revenues of selling by-products

Richard J. Palczynski (2002) points out that while Côte d'Ivoire's waste is of little commercial value as such, the sale of recovered, commercially sellable waste fractions such as metals, glass, plastic and paper can make sense in densely populated areas where large amounts rather than actual percentages of the waste fraction add up to quantities sufficiently big to be sold. Within the case study subject's project development plan, however, potential revenues from extracted by-products are neglected.

5.3.2.1. Scrap metal

Regardless the facility configuration, all metal fractions need to be removed prior to mechanical shredding as identified in subchapter 4.2.2., Process Inputs. Considering Abidjan's waste composition with one per cent metals (see Figure 1, subchapter 4.3.1), approximately twelve tons of scrap metal are extracted daily.

The European Union spot market price for Scrap Metal on April 16, 2009 for typical truck load quantities of 40,000 pounds (approximately 18 metric tons) have a range from a low of 172 EUR per metric ton for No. 2 Steel to a high of 8,418 EUR per metric ton for Nickel Scrap (Recyclenet Composite Index, 2009c). Considering that the stated price refers to "sorted and prepared materials, packages and ready for shipment" (Recyclenet Composite Index, 2009a, para. 2), and since no information has been found regarding Côte d'Ivoire's waste metal composition, using the average price of 2,005 EUR as basis for potential revenue calculation might be too optimistic. Under the most pessimistic scenario of all extracted metal fractions being the lowest price category of No. 2 Steel for 172 EUR per ton and subtracting 25 per cent for preparation, packaging and shipment²⁵, the lowest obtainable price under the most pessimistic scenario is 129 EUR per ton.

With twelve tons of extracted metal fractions daily, a minimum of 1,548 EUR profit can be generated by selling to respective scrap metal dealers and fully contribute to cost recovery (see Figure 7). This figure represents the most

²⁵ Due to insufficient information, 25 per cent is estimated to cover all arising costs for preparation, packaging and shipment

pessimistic scenario; if the extracted scrap metal is of a higher quality metal, the profit would be higher.

The current business plan ignores scrap metal as revenue source. The business plan also forgets to subtract the extracted scrap metal fraction from the total waste amount when calculating CeMin28 production and further processing. All budgeted figures are therefore incorrect by having the extracted scrap metal fraction included in its calculation.

5.3.2.2. Scrap glass

As suggested within 4.2.2., the extraction of glass reduces tool wear and hence extends the life span of the shredders. In addition to saving cost for maintenance and repairs²⁶, extracted glass fractions can be sold and contribute to cost recovery analogous to scrap metal. According to the composition of waste (4.3.1), glass makes up approximately one per cent, which adds up to twelve tons daily. The European Union spot market price for mixed scrap glass on April 16, 2009 is 3.17 EUR per ton for a truck load of 18 tons. For glass scrap sorted by color and type, higher spot prices are obtainable; the average of all twenty-seven scrap glass categories is 17 EUR per ton (Recyclenet Composite Index, 2009b).

In order to extract scrap glass prior to the shredding process, Convolant would need to make a one-time investment into a wider conveyer belt whose investment cost is “negligible” (F. Schirling, personal communication, April 14, 2009, translated by the author) in light of the currently planned investment sum of 100 million Euros. Further, since the extraction of scrap glass would be done manually labor costs by employing additional staff for hand sorting would increase.

5.3.2.3. PET bottles

If the decision is made to install a wider conveyer belt and employ additional staff for manual glass separation, separation of PET bottles is an option. According to Abidjan’s composition of waste, approximately five per cent is plastic, which corresponds to a daily plastic fraction input of 60 tons. Since no data is available regarding the percentage of PET bottles within the plastic fractions, the assumption of having one third PET bottles appears reasonable. Employing a

²⁶ Quantification estimates of cost savings have not been able to obtained

pessimistic approach analogous to metal scrap by using the lowest obtainable spot market price of 167 EUR per metric ton for loose mixed PET Scrap on April 17, 2009 (Euro.recycle.net, 2009), and subtracting 25 per cent for preparation, packaging and transportation, the lowest obtainable price is 125.25 EUR per ton resulting in daily revenues of 1,878.75 EUR.

5.3.2.4. *Electronic scrap*

A further by-product which can be extracted during the manual hand sorting stage is electronic scrap. No data has been found regarding amounts of electronic scrap in Abidjan's waste and obtainable prices when selling this type of scrap. However, under the scenario that waste glass is extracted, the investment into a wider conveyer belt and additional labor costs would not be increased by additional extraction of electronic scrap. Extraction and sales of electronic scrap hence represents a revenue source at no additional cost.

5.3.2.5. *Extraction of organic matter*

Another option currently unconsidered within the business plan is the extraction of organic matter. As mentioned in subchapter 5.2.2., concern exists whether the waste can be processed as delivered due to its high moisture content. According to the interview with F. Schirling (personal communication, April 2, 2009), one of the machines, the Cross Flow Shredder, represents the weakness of the process with regards to the amount of moisture that can be handled. Since no real-time results from large-scale testing are available, a potentially required extraction of organic matter and alternative utilization needs to be considered. This has currently not been unconsidered within the business plan. One alternative would be to use parts of the organic matter as composting material (Palczynski, 2002) or feeding it into a biogas plant (see subchapter 5.3.4.1. Electricity)

In sum, investments for magnetic and Eddy Current Separator technology which extracts all metal fractions is included in the investment sum since all metal fractions must be removed prior to waste shredding. Revenues from selling the twelve tons of daily extracted metal fractions are however not included within the business plan's revenue calculation. Under the illustrated most pessimistic

scenario of all metal being of lowest quality and assuming 25 per cent for preparation, packaging and shipment, 1548 EUR of profit can be obtained daily, potentially even more if the metal shows higher quality characteristics. The business plan further wrongly states that the whole daily waste input is processed within the facility instead of subtracting the estimate for extracted waste fractions.

Within the current business plan, the by-product waste glass is unconsidered. Despite being optional, waste glass extraction reduces tool wear and hence prolongs the life span of the shredders. With a negligible investment into a wider conveyer belt as well as increased labor costs for manual sorting, not insignificant revenues can be obtained especially in combination with PET bottles and electronic scrap whose extraction would not require any further investment beyond the ones needed for waste glass. Daily sales of the extracted scrap glass and PET bottles, can, under the most pessimistic scenario of lowest quality scrap materials and substantial costs of 25 per cent for packaging and transportation, generate revenues of 1,908 EUR²⁷ (see Figure 7), which corresponds to 572,184 EUR in annual revenues. Using the average male annual income of 2,472 USD (approx. 1,888 EUR), 303 people could be employed with the additional generated revenue. Even though I do not have an actual estimate regarding the number of employees needed for manual separation, it is doubtful that more than 303 people are required for manual separation particularly under the consideration that the whole facility is planned to be operated with 330 persons. In addition, the estimated revenues are based on the most pessimistic scenario and might hence be much higher and further maintenance costs are reduced by prolonging the life span of the cross flow shredder.

Figure 7: Potential Revenues from By-Products

| | Quantity (T) | Minimum Daily Revenues | | Additional Costs |
|------------------|----------------|------------------------|----------------|---|
| | | Revenue (T)* | Total | |
| Scrap Metal | 12 | 129.00 € | 1,548 € | no additional costs |
| Scrap Glass | 12 | 2.38 € | 29 € | 1.negligible one-time investment for wider conveyer belt 2.additional labor costs for manual sorting |
| PET Bottles | 15 | 125.25 € | 1,879 € | |
| Electronic Scrap | to be assessed | | | |
| Total | | | 3,455 € | |

*Most pessimistic scenario based on assumptions of lowest quality scrap and 25% costs for sorting, preparing and packaging

27 Scrap Glass: $0.75 \times (12 \times 3.17 \text{ EUR})$ + PET Bottles: $0.75 \times (15 \times 167 \text{ EUR})$

5.3.3. Characteristics and production site of additives

Under the current project development plan, the daily estimated demand of 65 tons of additives is planned to be produced in Kretz, Germany and transported to Abidjan. The price of 320 Euros per ton of additives (see Figure 5) includes all production and transportation costs. According to a telephone quote obtained by MBS (R. Moll, personal communication, April 17, 2009), transportation costs by cargo ship for the additives amount to approximately 50 Euros per ton. The estimate is based on Franz Josef Phillip's (personal communication, April 9, 2009) confirmation that the product can be handled as bulk good and does not have to be transported in containers. The quoted price includes all handling and transportation costs from the production facility to the harbor in Abidjan. Excluded are any handling costs from Abidjan's harbor to the Building- and Raw Material Center. The price per ton is further based on an economy of scale calculation of shipping the semi-annual supply of 10,000 tons at a time since "the greater the volume shipped, the lower the per tone/mile cost" (Stafford, 1979, p. 30). Two concerns become apparent with this approach:

Firstly, according to Convolant, the additives are water resistant and can be handled and transported as bulk good. Frank Schirling (personal communication, April 2, 2009) has however raised doubts regarding the additives' water resistance levels due to their powdery consistence with powders being characterized by moisture absorbance. While the determination of the additives' real water absorbance level is beyond this research, it is to be mentioned, that the implications of less water resistance on Convolant's operational costs would be significant: shipping the additives in containers as opposed to as bulk goods, doubles or triples the estimated transportation costs (R. Moll, personal communication, April 17, 2009).

The second critical issue is seen in the planned semi-annual transportation of a six months supply of additives resulting in the necessity of on-site storage. No indication of any storage solution has been found within Convolant's current project development costs. If the additives further show not to be water resistant, moisture and humidity protected silos would be required, involving even higher costs.

Convolant plans to have the production site of additives remain in Germany since the additives represent the company's know-how and the "secret formula" is

attempted to be protected. Investment in local additive production machinery in Abidjan is estimated to be approximately seven million Euros (F. Schirling, personal communication, April 2, 2009). A local additive production facility would allow just-in-time production resulting in no need for finding a storage solution.

Figure 8: Comparison alternatives additive production sites

| | Quantity (T) | Scenario water resistance | | Scenario non-water resistance | |
|--|--------------|--|-------------|--|-------------|
| | | cost | Annual cost | cost | Annual cost |
| <i>Alternative I</i> shipment | 20,000 | 50 €/T | 1,000,000 € | 150 €/T | 3,000,000 € |
| storage | 10,000 | plus handling costs Abidjan to be assessed | | plus handling costs Abidjan to be assessed; > scenario 1 | |
| Total | | > 1,000,000 € annually + handling costs Abidjan + investment storage | | > 3,000,000 € annually + handling costs Abidjan + investment storage | |
| <i>Alternative II</i> investment cost | | 7,000,000 € | | 7,000,000 € | |
| storage | | n.a. (JIT) | | n.a. (JIT) | |
| Total | | 7,000,000 € one-time | | 7,000,000 € one-time | |

Figure 8 presents an overview of the relevant differing costs involved with the current plan of additive production in Germany compared to the proposed alternative of on-site additive production. As stated, in an effort to protect the patent, the current business plan only considers Alternative I, additive production in Germany. By shipping the product to Abidjan, one million Euros are incurred in annual transportation costs which increase to an estimated three million Euros if the additives are found to be non-water-resistant. To benefit from economies of scale, 10,000 tons are planned to be produced and bulk-shipped semi-annually which require storage solutions on site in Abobo. These are currently unconsidered within the business plan. Under the scenario that the additives are moisture absorbing, respective investment costs into storage solutions would be much higher²⁸. The alternative of on-site production²⁸ in Abobo would require a one-time investment cost of seven millions Euros into a local additive production plant. Shipping costs would be avoided as well as the need for storage solutions since a just-in-time [JIT] production could be employed.

²⁸ No quantifiable estimate has been obtained

Regarding the determination of the production site for additives, a thorough cost-benefit analysis must be carried out on Convolant's end during which the benefit of patent protection is weighed against shipping, handling and storage costs. This is of particular importance if the additives prove not to be water-resistant as currently assumed.

5.3.4. Utilities

5.3.4.1. Electricity

Electricity Prices

For electricity supply, the following prices have been obtained by a local electricity provider: According to an invoice by Compagnie Ivoirienne d'Electricite for the period of December 4, 2008 – February 2, 2009, a price of 57.43 XOF (0.09 EUR²⁹) and 47.96 XOF (0.08 EUR) per kilowatt hour excluding tax is charged (See Appendix 5). For the supplied 2,956 kilowatt hours a total of 187,940 XOF including all taxes is charged. Dividing the total invoice amount by the total electricity consumed, a price of 63.58 XOF (approx 0.10 EUR) per kilowatt hour is obtained which corresponds to 100 EUR per megawatt hour. Due to unavailability of information regarding which consumption is charged in what price category, the average price including all taxes is used as benchmark for Convolant.

Within the projected operational costs, Convolant estimates 80 Euros per megawatt hour which is 20 EUR less than the price found on the invoice by Côte d'Ivoire's electricity company. Admittedly, electricity might be cheaper for commercial companies; however, the obtained invoice represents a more reliable piece of evidence and hence the average price of 100 EUR per megawatt hour is proposed to be used within the calculation of Convolant's project development plan.

Electricity Supply

As previously presented, concern exists whether the high percentage of organic matter in Abidjan's waste presents problems with regards to high moisture contents of the waste to be processed (F. Schirling, personal communication, April 2, 2009). According to F.J. Phillip (personal communication, February 10, 2009),

²⁹ Based on currency exchange rate on April 21, 2009: 1 XOF = 0.001542449 EUR

local electricity supply has not been found to be fully reliable at all times, and if higher amounts were needed than the current estimates, own electricity generation solutions would need to be found.

One solution to own energy generation is to establish a biogas facility which produces biogas through anaerobic digestions of organic matter under lack of oxygen (Karagiannidis and Perkoulidis, 2009). The retrieved biogas is subsequently converted into energy and heat within a methane fermentation process. According to Vermögensgemeinschaft Möllern eG (n.d.), a biogas facility requires an investment of approximately 10 million Euros and according to an offer by Giese Energie- und Regeltechnik³⁰ (personal communication, April 4, 2009) an investment of approximately 2.6 million Euros is required for a block heat and power plant. An alternative to the biogas facility is an innovative process called Plastoil in which PVC-free plastic fractions are converted into oil³¹. Investments costs for this option amount to 9.5 million for Plastoil and 5.4 million Euros for electrification (F. Schirling, personal communication, April 2, 2009).

While the obtained electricity could be used for running all processes within the facility³², the simultaneously generated heat could be used to further dry the remaining waste prior to entering the conversion process. Alternatively, if the offer regarding supply of 350 rubber trees and 380 oil palms daily is accepted (see subchapter 5.2.2.), some of the wood's moisture could be extracted by using heat for drying.

Besides operational benefit of utilizing extracting organic matter and ensuring stable electricity supply to the facility, environmental advantages include higher amounts of obtained electricity and heat compared to traditional incineration while having the least negative environmental impact in terms of greenhouse gas emissions (Wong et al., 2008).

30 Online at: www.energator.de/

31 Further details at: <http://www.plastoil.com/>

32 Extracting 80 per cent of organic matter which corresponds to approximately 500 tons daily, and utilizing it within the biogas and block heat and power plant, an output of approximately 3.3 MWh electrical energy and 5.5 MWh thermal energy is generated.

Extracting 80 per cent plastic fractions, which corresponds to approximately 50 tons daily, and utilizing it within the Plastoil process, an output of approximately 6 MWh electrical energy and 6 MWh thermal energy is generated (F. Schirling, personal communication, April 2, 2009).

5.3.4.2. Water

For external water supply, the following prices have been obtained by a local company: Based on an invoice by Society de Distribution d'eau de la Cote-D'Ivoire for the quarter of August through October 2008, a price of 250.3 XOF (0.38 EUR) and 403.30 XOF (0.615 EUR) has been charged per cubic meter (see Appendix 6). For the supplied 90 cubic meters of water amounting to 33.543 XOF before tax, a value added tax for water of 2,952 XOF and 202 XOF for waste water is charged. Taking the complete amount and dividing it by the water usage of 90 m³ a price of approximately 0.60 EUR per cubic meter is obtained.

Within the projected operational costs, Convolant estimates 4 Euros per cubic meter, i.e. 3.60 EUR more than what has been charged by the water company in 2008. Again, water prices might be somewhat different for commercial companies; however, an estimate based on the invoice is more reliable than estimates based on prices charged in other countries.

Figure 9: Utilities

| | Annual Quantity | | Business Plan Estimate | | Market data | | Difference | | |
|--|-----------------|----------------|------------------------|-------------|-------------|-------------|------------|-------------|-------------------|
| | | | per unit | Annual cost | per unit | Annual cost | per unit | Annual cost | |
| Electricity | 20,000 | MWH | 80.00 € | 1,600,000 € | 100.00 € | 2,000,000 € | -20.00 € | -400,000 € | |
| Water | 5,000 | m ³ | 4.00 € | 20,000 € | 0.60 € | 3,000 € | 3.40 € | 17,000 € | |
| Total annual difference in cost | | | | | | | | | -383,000 € |

In sum, compared to the two invoices by Côte d'Ivoire's water and electricity providers, the estimate for electricity has been 20 Euros short per megawatt hour and the estimate for water has been overestimated by 3.60 Euros per cubic meter compared to the amounts charged on the invoices (see Figure 9). Considering an the estimated annual usage of 20,000 MWH and 5,000 cubic meters water, the wrong estimates amount to an annual divergence of minus 400,000 Euros for energy and plus 17,000 Euros if the amounts on the invoices are assumed to be the prices that Convolant will have to pay. The optional setting up of a biogas facility has not yet been looked into.

5.3.5. Lack of planning for institutional constraints

As presented in subchapter 5.2.6., Official support and political risk, Côte d'Ivoire is ranked as economically mostly unfree and is characterized by political, economic and social instability. While official support has actively been worked towards, issues such as political and economic risk are beyond the market entrant's level of influence. Within Convolant's project development plan, no precautionary measures or allowances for additional time and / or budget are found to have been incorporated to be able to flexibly adjust to unforeseen obstacles or circumstances. In line with a lack of emphasis on these factors within traditional location theory, Convolant does not take into consideration that "the overall freedom to conduct a business is seriously restricted by Côte d'Ivoire's regulatory environment" (The Heritage Foundation & Wall Street Journal, 2009, para. 5) by failing to incorporate a precautionary budget for institutional constraints and political risk beyond their control. Since the Heritage Foundation & Wall Street Journal (2009) further list Côte d'Ivoire's political, economic and social instability factor effecting business activities, a lack of installed precautions thereof is considered to be a flaw of the business plan.

5.3.6. Revenues from waste reception

According to Peter Schübeler's Conceptual Framework for Municipal Solid Waste Management in Low-Income Countries (1996) waste management falls within the responsibility of the local governments and it is up to them to establish priorities, determine roles and set the general legal and regulatory framework. Besides waste collection, municipal solid waste management systems also include the management of disposal services. For these services financing options include fees, taxes and intergovernmental transfers (Schübeler, 1996).

Since final waste handling is part of the overall municipal solid waste management system, financing should partly be attributed to this final stage of disposal. Regardless which technology for waste processing is employed, i.e. landfill, incineration or alternatively Convolant's waste management cycle, costs are incurred whose coverage falls within the responsibility of the respective government.

Jürgen Hübner, waste commissioner and material flow manager in Halle, Germany, has confirmed that in Germany a price between 20 to 40 Euros per ton is paid for the reception of mixed waste (J. Hübner, personal communication, April 24, 2009). Within Convolant's current operational budget, waste input is listed with zero income, which means that no money is planned to be obtained for reception and subsequent processing of the waste.

5.3.7. Summary of assessment

During the evaluation of the case study subject's first project development plan and facility configuration several critical points are found which results in the first business plan having substantial flaws.

As shown by Timmons and Spinelli (2007, p. 85), classic startups often fail because they are "undercapitalized and undermanaged". As shown throughout the thesis, footloose born global classic entrepreneurial companies are dealing with a unique problem set: Firstly, being newly founded, no experience in operating a facility such as the Building and Raw Materials Center exists. Secondly, being a classic entrepreneurial company, inexperience with regards to applying the innovative process on a large scale adds to the problem of inexperience in operating the whole undertaking. Thirdly, being footloose and born global, the first business plan is prepared for an international market which can be very different to the known home market and hence substantial differences are encountered, also in unexpected areas. Lastly, being a young startup company, resource constraints are faced which results in limitations regarding the carried out market research which worsens the impact of the first three presented points. I consider the presented flaws of the case study subject's business plan to be a result of a lack of experience coupled with a lack of market relevant data due to being resource-constrained with regards to the amount of obtainable competitive intelligence acquisition. Consequently, the company's first business plan is incomplete, contains flaws and is not backed up by thoroughly researched market data. Since Convolant is a representative case study subject I expect similarly flawed first business plans by other footloose born global classic entrepreneurial company which are characterized by the defined problem set.

In the following, I present a summary of the main findings of critical points within the case study subject's business plan. I further provide an explanation according to the four aspects of the defined problem set. The findings are followed by own recommendations with regards to how crossover theory would or would not be of assistance in preventing the encountered issue. Based on these findings I develop case study specific recommendations which I present in subchapter 6.2.

Supply Chain Logistics Considerations: With regards to the facility's logistics planning, Convolant has failed to fully account for its host country's infrastructure constraints by underestimating the constraint's significance as major limiting factor. Further, the planned amounts of in- and output cannot be processed with the currently planned technological investment. I conclude that the problem of planning for insufficient technology is encountered due to a lack of experience in planning for such a facility and the logistical problem of not realizing the extent to which road infrastructure limits possible truck runs is encountered due to a lack of local competitive intelligence which is the result of resource and capital constraints with regards to thorough market research. General entrepreneurship theory has not been of any help with regards to logistics planning by the inexperienced classic entrepreneurial case study subject. Bearing in mind the example of local infrastructure constraints, I consider an integration of a strong international focus to be of help in making the inexperienced entrepreneur aware of issues which he might not even expect to exist.

Potential revenues by selling by-products: Within the current business plan, potential revenues generated by selling by-products are unconsidered. Despite the process requiring the extraction of all metal fractions, and despite the inclusion of respective separation technology being included within the investment costs, the extracted metal fraction's potential as revenue source is ignored. The option of removing other materials which hinder optimal waste processing as well as materials of value such as PET bottles has also been unconsidered within the current business plan. The recommendation to extract these additional materials is corroborated with Convolant's supplied documentation CeMin28 Innovative Waste Product Cycle, in which the removal is suggested since they hinder optimal

waste processing³³. Being inexperienced coupled with resource constraints with regards to obtaining relevant competitive intelligence, Convolant currently ignores revenue sources of at least 3,455 Euros³⁴ (see Figure 7). I consider the lack of resources to obtain respective intelligence related to waste composition, international scrap market prices etc. and its resulting impact regarding incorrect business plan data to be typical of startup companies. General entrepreneurship theory does not assist in preventing the presented business plan flaw. I consider it however highly doubtful that company specific issues such as inconsideration of process related revenue sources or neglecting other potential activities can be included in theories. In my opinion experience rather than theory will ensure completeness with regards to including company specific issues into the business plan.

Characteristics and production site of additives: In an effort to protect its innovative and valuable process, the case study subject plans to produce additives in Germany and ship them to the Building- and Raw Materials Center in Côte d'Ivoire. As shown, substantial transportation costs are involved with this undertaking in addition to storage costs which are currently unconsidered within the business plan. With several factors being speculative and beyond this study, I am not able to carry out a full cost benefit analysis regarding the determination of the best additive production site. As illustrated, however, of particular significance is the determination of the moisture resistance level of the additives whose outcome can increase costs for shipping and storage solutions tremendously. The possible misperception regarding the moisture resistance level is typical of a first market launch of an entrepreneurial company. Further, the determination of additive production in Germany without having thoroughly assessed the alternatives is typical for a newly founded company which does neither have the experience nor the resources to carry out a comprehensive cost-benefit analysis. Despite being representative of issues faced by young classic entrepreneurial startups, misjudgments of product characteristics and similar encountered problems are typically case-specific and whether general theory can guide relevant analysis is questionable. The only way that I see that theoretical aid is possible, is by placing emphasis on the international factor for born global

³³ see section 4.2.2

³⁴ Additional labor costs are ignored due to applying the most pessimistic scenario

companies by suggesting allocated funds for unexpected and unforeseen issues to be higher when operating in the international marketplace

Utilities: As presented, the case study subject did not determine operational costs for electricity and water based on competitive market specific intelligence. The counterargument regarding the two shown invoices, that a commercial company might be charged different utility prices is not supported by the evidence, since, under this condition, both estimates would either be higher or lower. The problem of basing the budget on wrong estimates is encountered due to a lack of market research which is a consequence of resource and capital constraints. Due to theory's lack of strong emphasis on international issues, the case study subject is simply applying home market's typical figures for the business plan in this very different country. Using wrong estimates, however, alters the whole budget and must be prevented. Again, due to being resource constrained yet born global, entrepreneurship theory must place a high emphasis on the internationality issue by highlighting the potentially very different estimates required for a business plan established for the foreign market.

Lack of planning for institutional constraints: Precautionary measures to deal with institutional constraints beyond the company's control such as political risk are currently not incorporated in the business plan. Since Côte d'Ivoire is ranked economically mostly unfree and is characterized by political and economic instability, these constraints must however not be neglected within the planned activities. Being inexperienced and resource constrained, the threat which economical and political risks pose is either not considered with sufficient seriousness or, the respective competitive intelligence in this field has not been able to be obtained thorough market research due to being resource constrained. The negligence due to insufficient experience and / or competitive intelligence can however have disastrous effects if institutional constraints manifest themselves. I hence recommended to at least install precautionary measures to be able to adjust to unforeseen obstacles if experience or market research cannot be obtained. Since one of the three perspectives of international business strategy deals with the issue of institutional constraints, crossover theory specifically targeted towards

born global entrepreneurial startups, could aid these companies in realizing the potential impact issues such as political and economical risk can have.

Revenues from waste reception: Waste management including waste processing and financing thereof falls within the responsibility of governments. The case study subject's current business plan, does not state any planned revenues for the reception of waste. The problem of not planning for revenues from waste reception is encountered due to a lack of experience in process planning. Again, I consider inexperience coupled with resource constraints the reason for this detected business plan flaw.

Summary: I find that all found problems stem from the company being footloose, born global, and classic entrepreneurial and hence being characterized by the problem set of inexperience, dealing with international markets, and resource constraints.

6. Conclusion and Recommendation

Based on the finding that the current state of literature lacks a focus on footloose born global classic entrepreneurial companies by mainly providing generalized “one-size-fits-all” theories, I have explored the extent to which traditional theories are of assistance to the first market activities of footloose, entrepreneurial start-up businesses. My research objective has further been the exploration as to what extent crossover research among the studied theories could be of aid to footloose born global classic entrepreneurial companies. The means to find answers to the research objective has been a case study of a representative young innovative start-up firm for which three research questions were proposed.

In the following section I provide a summary of the results of the three research questions within the wider framework of the research objective. Since I have found a large improvement potential of the case study subject’s first business plan, I present specific modifications recommendations in subchapter 6.2.

6.1. Summary Research Questions

6.1.1. Research Question 1

Theories from the academic field of international business strategy, in particular Michael Porter’s industry-based view, have proven valuable in establishing the case study subject’s market requirements for potential successful market entry. Since the industry-based view assesses and evaluates industries from the general point of view of market entry, applicability is given for mature, established companies as well as newly founded entrepreneurial companies. I therefore summarize that in establishing the case study subject’s market requirements, general international business strategy theory is applicable. I do not consider any extensions of the theory or crossover research attempts to be able to add valuable input.

The first research question is hence able to be answered by general, non-crossover theories. The case study subject being a representative case for footloose born global entrepreneurial company leads to the overall conclusion, that, in order to determine market entry points, industry assessments according to

general non-crossover theory from International Business Strategy can be carried out. General non-crossover theory from the field of international business strategy is hence applicable to footloose born global entrepreneurial companies with regards to assessing potential market entry points and defining general target markets.

6.1.2. Research Question 2

As shown in subchapter 5.2., I find that all locational factors of general location theory have their applicability to footloose born global classic entrepreneurial companies. The extent of various factor's applicability, however, differs compared to the traditional target companies. Firstly, by offering entrepreneurial products, footloose startup company's primary emphasis is on market availability. Secondly, being footloose and born global and thus entering foreign countries, the international factor needs to be integrated into each consideration. Due to operating in foreign markets, official governmental and societal support is of a high significance to ensure that liability of foreignness constraints and political risks do not outweigh the advantages of locating in this particular place. I find that a high emphasis on official support and political risk is crucial for footloose born global classic entrepreneurial companies. This emphasis is, however, only insufficiently implemented in traditional theory by simply including them in the list of factors to consider.

The assessment drew heavily upon theories from the third leading perspective of international business strategy. Since the institution-based view deals with precisely what I find is lacking within location theory to achieve full applicability to footloose born global classic entrepreneurial, I recommend a crossover of these two theories. I consider the crossover helpful in aiding footloose born global classic entrepreneurial companies with their location assessment and pointing out the significance these factors may have on potential business success. I further recommend the integration of an entrepreneurship focus to ensure that the theories are applicable to inexperience and resource constrained entrepreneurial companies.

6.1.3. Research Question 3

As shown, classic entrepreneurial newly founded footloose companies deal with a unique problem set due to setting up undertakings in foreign markets while being resource constrained and completely inexperienced. Consequently, business plans are incomplete and contain flaws, and, to increase the odds of business survival by means of preparing realistic and thorough business plans, aid is needed.

Within entrepreneurship theory I find a predominant focus on explaining why business plans are significant and why extensive and thorough planning is necessary. Detailed information targeted towards inexperienced entrepreneurs regarding issues of particular significance in foreign, potentially very different markets, has however not been found. I consider a combination of general theories from location theory, international business strategy and entrepreneurship, which incorporate precisely the international issues detected within the analysis part, of value for footloose born global classic entrepreneurial companies such as Convolant Ltd.

I want to point out that every company is constrained by its very own setting and many times, company and product specific intelligence can only be obtained through experience and learning by doing. The constraint of being inexperienced in operating a facility can be assisted by theory only to a limited extent since these problems are typically company specific and non-generalizeable. The same holds true for inexperience regarding applying the innovative product or process on a large scale. The limitation, which I do find can greatly be assisted with by a crossover of location theory, international business strategy and entrepreneurship, is the factor of operating in an international market. Especially under the consideration of being resource constrained, the footloose born global company needs to be made aware of the critical points to pay attention to when planning operations in the foreign market.

6.2. Recommendations for project development plan

As explored within chapter five, the region of Abidjan is a strategically well chosen location with regards to location theories' most prominent factors. The actual site, Abobo, however, poses limitations which are currently unconsidered within the business plan. Due to the various explored problems with the current business plan and facility configuration, I recommend several modifications thereof. Many of the recommendations are developed in collaboration with Frank Schirling. Despite the threat of bias and subjectivity, Frank Schirling's input is worked with since bias and subjectivity is assumed to be at a manageable level due to him being an external consultant, and secondly his recommendations are corroborated wherever possible with other sources of evidence.

Due to being resource constrained regarding time and capability, I am not able to incorporate all detected issues into the recommendation. The following company-specific issues remain unconsidered within this recommendation section: revenue potential by electronic scrap; cost-benefit-analysis of composting, biogas, and plastoil plant; amount of savings for reduced tool wear by extracting all process hindering materials; lack of planning for institutional constraints, and patent security during on-site production.

In a first instance, all recommended modifications are presented followed by an explanation how they improve the critical points raised within the analysis of the business plan and facility configuration in part 5.3.

6.2.1. Extension of investment costs

Compared to 101 million Euros investment costs within the current budget (Figure 2), I propose to extend the budget by an on-site additive production facility, Plastoil technology and required technology to allow for loading and unloading of materials. These additions result in an investment budget of 128.8 million Euros (see Figure 14).

Figure 10: Extension of Investment Costs

| Modified Investment Costs | |
|---|----------------------|
| Investment costs current business plan (Figure 2) | 100,606,400 € |
| Additive Production | 7,000,000 € |
| Plastoil technology (energy generation) | 14,900,000 € |
| Additional Technology for loading and unloading | 6,300,000 € |
| Extension conveyer belt for by-product separation | negligible |
| Total | 128,806,400 € |

6.2.2. Modifications of input, output and estimated revenues

I recommend the removal of all materials which hinder optimal waste processing: Since the amounts of rubber, threadlike components and electronic scrap are not separately listed within Abidjan's composition of waste, I assume their quantities to be insignificant and hence I neglect their amounts instead of attempting to apply random estimates.

Scrap metal and scrap glass add up to 12 tons daily. Due to Frank Schirling's presented concern that the waste is too moist to be processed (see 5.3.2.5.), I suggest to extract eighty percent of organic matter. Inert waste typically consists of ash, small stones, clods and the like which are of a very fine structure, and it is not possible to prevent them from falling into the compost fraction, when sieving out the organic matter. Frank Schirling states that it is realistic to assume 90 per cent of inert waste to be extracted when sieving out organic matter (F. Schirling, personal communication, April 14, 2009). I recommend the extraction of two thirds of the plastic fractions which correspond to 40 tons. Based on the estimate of having a quarter of the total plastic PET bottles, 15 tons are sold as PET bottles. The rest, 25 tons, is utilized for energy generation within the Plastoil process. Based on F. Schirling's (personal communication, April 14, 2009) calculation of 50 tons of PVC-free plastic fractions to be converted into 6 MWh electrical energy and 6 MWh thermal energy, I assume that 25 tons can produce half the energy which is sufficient to operate the facility.

The recommended extracted components add up to 724 tons, which leaves a remaining waste fraction of 476 tons to be processed (see Figure 10). By extracting waste fractions for alternative on-site use, less output results in reduced

amounts of trucks leaving from the facility which improves the logistical considerations presented before.

Figure 11: Extracted Components and Remaining Waste

| Composition of waste (%) | | Waste (T/d) | Extracted components (T/d) | |
|---------------------------|-----|-------------|-----------------------------|------------|
| Organic components (food) | 51% | 612 | ~80% to composting plant | 500 |
| Paper, cardboard drenched | 6% | 72 | | |
| Green Waste | 18% | 216 | | |
| Textiles | 2% | 24 | | |
| Glass | 1% | 12 | to be sold | 12 |
| Metal | 1% | 12 | to be sold | 12 |
| Plastics | 5% | 60 | 2/3 to be sold and Plastoil | 40 |
| Wood | 1% | 12 | | |
| Other inert waste | 15% | 180 | ~90% to composting plant | 160 |
| Total | | 1200 | Extracted components | 724 |
| | | | Remaining Waste | 476 |

In order to produce the intermediate product CeMin28, aggregates and additives are added in a several step process to the 476 tons of remaining waste in the ratio twenty to eighty which produces a total of 596 tons of CeMin28 daily (see Figure 11).

Figure 12: Production of CeMin28

| Production of CeMin28 (T/d) | |
|---|------------|
| Remaining Waste | 476 |
| 20 % Aggregates and Additives | 120 |
| CeMin28 (Density 400 kg/m³) | 596 |

After discussing several output options with Frank Schirling, I recommend the 596 tons of CeMin28 to be processed into the following products: one sixth of CeMin28 is processed into paving stones for large scale road improvement. F. Schirling (personal communication, April 14, 2009) advises to process the rest of the CeMin28 according to the requirements of the prefabricated housing solution IMATON³⁵ instead of the currently considered MACOM construction method. An assessment of the prefabricated housing solution MACOM compared to IMATON is beyond this research. However, in order to provide recommendations of value to

³⁵ Online at: <http://www.imaton.eu/>

the case study subject, I choose to integrate Frank Schirling's suggestion, since the IMATON prefabricated housing solution has already been tested on a large-scale and has received all required certificates to be applied worldwide. The MACOM method on the other hand has not yet been tested by official relevant authorities. Besides the 4,000 square meters of paving stones I suggest the production of 2,000 square meters of prefabricated wall and ceiling elements, 1,120 square meters of light building bricks and 1,120 square meters of normal building bricks. These output materials are produced by processing CeMin28 together with aggregates, processed sediments, cement, water, and 100 tons of steel for the wall and ceiling elements.

For the remaining 201 tons of CeMin28, Frank Schirling (personal communication, April 14, 2009) suggests the production of concrete works according to demand. The characteristics of the demanded product defines the amount of required sediments and aggregates. Curbstones, for instance, which require a density of at least 900 kg/m³ result in high amounts of sediments and aggregates to be added while light building bricks, requiring a density of approximately 400 kg/m³ would be processed without addition of any sediments or aggregates. Hence, amounts of sediments and aggregates to be added to the remaining CeMin28 may vary greatly according to demanded end product (see Figure 13).

Figure 13: Recommended Daily Facility Output

| Daily Output | | | Required Inputs | | |
|---|----------------------------|------------------------------|-----------------|-----------------------------|--------------|
| End Product | Output (m ² /d) | Density (kg/m ³) | CeMin28 (T/d) | Aggregates/ Sediments (T/d) | Cement (T/d) |
| Prefabricated Wall and Ceiling Elements | 2,000 | 400 | 144 | 64 | 100 |
| Paving Stones | 4,000 | 800 | 106 | 212 | 65 |
| Building Bricks | 1,120 | 400 | 90 | - | 45 |
| Building Bricks | 1,120 | 600 | 55 | 55 | 45 |
| Concrete Works according to demand | depending on output | | 201 | depending on output | |

Figure 14 shows the estimated daily revenues according to the revised calculations. Compared to the currently estimated 6 Euros per ton of paving stones (Figure 4), Frank Schirling (personal communication, April 14, 2009) estimates 10 Euros to be a more realistic price for paving stones. The estimates

for the prefabricated housing components are based on estimates provided by Adolf Imhof (personal communication, May 25, 2009), who is the concept developer and founder of IMATON. Expected revenues for scrap metal, scrap glass and PET bottles are used from the analysis part 5.3.2.

Even though I have not carried out an analysis into this matter, I am uncertain whether the German concept of the Green Dot can be transferred and implemented in Côte d'Ivoire as stated within the current business plan budget. In an effort not to overstate the budget I choose not to include revenues from Green Dot fees into the expected revenues. I do recommend however, not to offer waste reception for free. I recommend charging the government 20 Euros per ton for providing an environmentally sound end solution to Abidjan's waste problem.

Figure 14: Adjusted Revenues

| Output / Service | Quantity | Expected Price / unit | Revenue |
|--|----------------------|-----------------------|------------------|
| Prefabricated Wall and Ceiling Elements | 2,000 m ² | 45.00 € * | 90,000 € |
| Paving Stones | 4,000 m ² | 10.00 € ** | 40,000 € |
| Building Bricks (400kg/m ³) | 1,120 m ² | 12.50 € * | 14,000 € |
| Building Bricks (600kg/m ³) | 1,120 m ² | 16.00 € * | 17,920 € |
| Concrete Works dependent upon demand (approx.) | 1,200 m ³ | 100.00 € * | 120,000 € |
| Scrap Metal | 12 T | 129.00 € | 1,548 € |
| Scrap Glass | 12 T | 2.38 € | 29 € |
| PET Bottles | 15 T | 125.25 € | 1,879 € |
| Compost | 500 T | 1.00 € ** | 500 € |
| Electric Energy | own supply | | |
| Thermal Energy | own supply | | |
| Waste reception | 1,200 T | 20.00 € | 24,000 € |
| Total | | | 309,875 € |
| * Estimates provided by Adolf Imhoff, Imaton | | | |
| ** Estimate provided by Frank Schirling | | | |

6.2.3. Modifications of operating costs

By using the modified input materials and quantities required for the IMATON parts, I obtain a total amount of required raw materials per day of 131,820 Euros. Instead of assuming that the production lines operate at 100 per cent capacity, I recommend to use a capacity utilization value of 80 per cent which allows for maintenance, unexpected breakdown times and the like without disturbing the whole budget.

For water costs I recommend using the average price obtained from the Côte d'Ivoirienne water company, 0.60 Euros per cubic meter. With regards to utilities, the recommended Plastoil process generates sufficient amounts of energy to operate the facility. As stated in 5.2.7.1., annual energy of 20,000 megawatt hours is the maximum amount which can be obtained from external sources. If the facility shows not to be in need of more energy and if the supply is found to be reliable, the investment into the Plastoil technology worth 14.9 million Euros can be avoided. In this scenario, I recommend to replace the energy costs of 80 Euros by 100 Euros per megawatt hour as suggested by the local invoice from Compagnie Ivoirienne d'Electricite.

The modified project development plan requires more personnel for manually extracting the recommended waste fractions, operating the composting plant and operating the Plastoil facility. I recommend planning for an additional 50 people whose salary I set as the average of all positions to be filled by locals³⁶.

Figure 15 summarizes the operating costs for raw materials, utilities, and labor costs according to the recommendation made. I do not include other costs, since I do not carry out an analysis regarding depreciation rates etc.

³⁶ Figure 6: Labor costs for positions 6-13: € 1,739,000 divided by 316 positions = € 5,503

Figure 15: Operating costs: raw materials, utilities, labor costs

| Required raw materials / day | Daily Quantity | Estimated Price / unit | Daily Cost | Annual Cost |
|--|------------------------|------------------------|------------------|---------------------|
| Aggregates and Additives | 350 T | 70 € | 24,500 € | 7,350,000 € |
| Steel | 16 T | 800 € | 12,800 € | 3,840,000 € |
| Cement | 375 T | 100 € | 37,500 € | 11,250,000 € |
| Water | 200 m ³ | 0.60 € | 120 € | 36,000 € |
| Chemical aggregates | 3,500 kg | 15 € | 52,500 € | 15,750,000 € |
| High quality grit | 20 T | 220 € | 4,400 € | 1,320,000 € |
| Sum | | | 131,820 € | 39,546,000 € |
| Total daily raw material costs at 80% utilization | | | 105,456 € | 31,636,800 € |
| Energy and water | | | | |
| | Annual Quantity | | | |
| Energy costs | 20,000 MWH | own supply | | - |
| Water costs | 5,000 m ³ | 0.60 € | | 3,000 € |
| Total utilities | | | | 3,000 € |
| Labor Costs | | | | |
| | Number | | | |
| current Annual Labor Costs | 330 | | | 2,719,000 € |
| additional labor costs | 50 | 5,503 € | | 275,150 € |
| Bonuses, other premiums | 5% of labor costs | | | 149,708 € |
| Total Labor Costs | | | | 3,143,858 € |

6.2.4. Summary benefits modified project development plan

Figure 16 shows a comparison of the costs and revenues for which I have made recommendations for modifications. While I recommend one time costs of additional 28.2 million Euros to be included in the investment budget, I estimate an additional five million Euros in revenues annually and 2.8 million Euros less in operating costs.

Figure 16: Comparison current and recommended project development plan

| | Convolant's Business Plan | | Recommendation | | Difference |
|------------------|---|--------------|----------------|--------------|---------------|
| | One-time costs | | One-time costs | | Total |
| Investment Costs | 100,606,400 € | | 128,806,400 € | | -28,200,000 € |
| | → one time investment costs of additional 28.2 million Euros | | | | |
| | per day | annually | per day | annually | annually |
| Revenues | 293,112 € | 87,933,600 € | 309,875 € | 92,962,500 € | 5,028,900 € |
| | → 5 million Euros additional revenues per year | | | | |
| Operating costs | | | | | |
| Raw materials | 110,600 € | 33,180,000 € | 105,456 € | 31,636,800 € | 1,543,200 € |
| Utilities | | 1,620,000 € | | 3,000 € | 1,617,000 € |
| Labor Costs | | 2,854,950 € | | 3,143,858 € | -288,908 € |
| Total | | | | | 2,871,292 € |
| | → 2.8 million Euros less operating costs per year | | | | |

Since the put forth recommendations are based on official records such as local invoices, official data obtained from, for instance, scrapmarket websites and corroborated information from an external consultant, I am confident that they improve the quality and thoroughness of the current business plan. However, I do not claim that my recommendations make Convolant's project development plan complete and accurate. Furthermore, it is not possible to directly contrast the currently budgeted figures and the recommended figures. For example, comparing on site production of additives to the option of importing is misleading since the current importing option does not have storage costs incorporated which consequently reduces the benefit of on-site production by not showing this amount as cost saving. Due to this incompleteness and unavailability of many estimates, I forgo net present value and other calculations, which are typically carried when comparing investment alternatives.

The footloose born global classic entrepreneurial company Convolant has prepared the current business plan under the limitations of i) inexperience with regards to planning and operating a Building- and Raw Materials Center; ii) inexperience with regards to applying its innovative process on a large scale; iii) being foreign to Côte d'Ivoire and hence not knowing specific issues which are encountered; iv) being resource constrained with regards to carrying out market research. If all put forth recommendations are implemented, many of the current

business plan flaws are removed leading to a more thorough business plan as required as odds for business startup survival.

7. References

- Aeria Abidjan International Airport. (n.d.) Retrieved March 21, 2009 from <http://www.aeria.ci/english.htm>
- Attahi, K. (1999). Abidjan, Côte d'Ivoire. In A.G. Onibokun (Ed.), *Managing the monster. Urban waste and governance in Africa* (pp. 11-48). Ottawa: International Development Research Centre.
- Barkema, H.G., Bell, J.H. J, & Pennings, J.B. (1996). Foreign entry, cultural barriers, and learning. *Strategic Management Journal*, 17(2), 151-166.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-121.
- Bolton, K.F., & Curtis, F.A. (1990). An environmental assessment procedure for siting solid waste disposal sites. *Environmental Impact Assessment Review*, 10(3), 285-296.
- Brandau, J., & Young, A. (2000). Competitive intelligence in entrepreneurial and start-up businesses. *Competitive Intelligence Review*, 11(1), 74-84.
- Bundesamt für Bauwesen und Raumordnung / BBR. (2001). *Wohnungsprognose 2015*. Bonn. Band 10. Retrieved April 16, 2009 from http://www.bbsr.bund.de/cln_007/nn_22386/BBSR/DE/Veroeffentlichungen/Berichte/2000__2005/Downloads/Bd10Wohnungsprognose2015,templateId=raw,property=publicationFile.pdf/Bd10Wohnungsprognose2015.pdf
- Bünder, H. (2005, October 25). Die Jagd nach dem Müll. *Frankfurter Allgemeine Zeitung*, 248 p.13.
- Central Intelligence Agency. (2009a). Côte d'Ivoire. In *The world factbook*. Retrieved February 26, 2009, from <https://www.cia.gov/library/publications/the-world-factbook/geos/iv.html>

- Central Intelligence Agency. (2009b). Germany. In *The world factbook*. Retrieved April 15, 2009, from <https://www.cia.gov/library/publications/the-world-factbook/geos/gm.html>
- Chapman, K., & Walker, D.F. (1992). *Industrial location. Principles and policies* (1st ed.). Oxford: Blackwell Publishers.
- Clean Development Mechanism (CDM) – Executive Board. (2008). *Abidjan municipal solid waste-to-energy project*. Retrieved February 6, 2009 from http://www.netinform.net/KE/files/pdf/CDM_PDD_Ivory_Coast_18022008-Draft.pdf
- Convolant (2008a). *CeMin 28 Innovativer Abfall Produkt Zyklus*
- Convolant (2008b). *Ecocycling*
- Convolant (2008c). *Prozess*
- Convolant (February 10, 2009). *Bau- und Rohstoffcenter Projektentwicklungsplan* (2nd ed.).
- Cook, W.D. (1988). Problems with ordinal data and multiple criteria. In B.H. Massam (Ed.), *Complex location problems: Interdisciplinary approaches* (pp.20-35), York: York University Press.
- Cooper, M.J.M. (1975). *The industrial location decision making process*. Occasional Paper 34. Centre for Urban and Regional Studies. Birmingham: Suttons.
- Cosgrove-Mather, B. (2003, March 27). European birth rate declines. *CBS News*, Washington.
- Current, J., Min, H., & Schilling, D. (1990). Multiobjective analysis of facility location decisions. *European Journal of Operational Research*, 49, 295-307.

- Dana, L.-P. (2004). *Handbook of research on international entrepreneurship*. Cheltenham, UK: Edward Elgar Publishing.
- Decker, J.M., & Crompton, J.L. (1993). Attracting footloose companies: An investigation of the business location decision process. *Journal of Professional Services Marketing*, 9(1), 69-94.
- Duchesneau, D.A., & Gartner, W.B. (1990). A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing*, 5, 297-312.
- Dzisah, M. (1998, November, 12). Mounds of garbage invade Abidjan streets. *New York Amsterdam News*, 89(46), 2.
- Eduljee, G. (1999). Environmental impact assessment and waste management. In J. Petts (Ed.), *Handbook of Environmental Impact Assessment. Volume 2. Environmental impact assessment in practice: Impact and limitations* (pp. 300-322). Oxford: Blackwell Science.
- Erkut, E., & Neuman, S. (1989). Analytical models for locating undesirable facilities. *European Journal of Operational Research*, 40, 275-291.
- Euro.recycle.net (2009) Spot Market Prices *PET Plastic Recycling (Polyethylene Terephthalate) Exchange*. Retrieved April 17, 2009 from <http://euro.recycle.net/a/3062.html?affilid=100094>
- French, H.W. (1994, August 23). Abidjan Journal; The Paris of West Africa is down at the heels. (New York edition). *The New York Times*, section A p. 4.
- George, A.L., & Bennett, A. (2004). *Case studies and theory development in the social sciences*. BCSIA Studies in International Security. Cambridge, MA: MIT Press.

- Gillham, B. (2000). *Case study research methods* (1st ed.). London: Continuum International Publishing Group.
- Greenhut, M.L. (1956). *Plant location in theory and in practise: The economics of space* (3rd ed.). Chapel Hill: University of North Carolina Press.
- Hansen, P. et al. (2001). *Harwood fundamentals of pure and applied economics: Systems of cities and facility location* (1st ed.). London: Routledge.
- Hoover, E.M.. (1948). *The location of economic activity* (1st ed.). New York-Toronto: McGraw-Hill.
- Hunt, M.J. (2009). Waste disposal. In *World Book Encyclopedia* (Vol. 21, p.112). Chicago: World Book.
- Hymer, S.H. (1976). *The international operations of national firms: A study of direct foreign investment*. Cambridge: MIT Press.
- Karagiannidis, A., & Perkoulidis, G. (2009). A multi-criteria ranking of different technologies for the anaerobic digestion for energy recovery of the organic fraction of municipal solid wastes. *Bioresource Technology*, 100, 2355-2360.
- Krajewski, L.J., & Ritzmann, L.P. (2005). *Operations management: Processes and value chains* (7th ed.). New Jersey: Pearson Prentice Hall.
- McKinney, M.L., & Schoch, R.M. (2003). *Environmental science. Systems and solution* (3rd ed.). London: Jones and Bartlett Publishers.
- McDougall, P.P., & Oviatt, B.M. (2000). International entrepreneurship: The intersection of two research paths. *The Academy of Management Journal*, 43(5), 902-906.

- Meyer, W.P. (1993). Community involvement in municipal solid waste collection in two West African cities – Findings of a mission. *International Reference Centre for Waste Disposal News*, 27, 11-15.
- Middleton, J. (2008). Côte d'Ivoire. In *The New Encyclopedia of Africa* (Vol 1). Detroit: Thomson/Gale.
- Moll, H.C. (2004). Material metabolism through society and environment: a new view on waste management. In P. Lens, A. Hamelers, H. Hoitink, & W. Bidlingmaier (Eds.), *Resource recovery and reuse in organic solid waste management* (pp.3-22), London: IWA Publishing.
- Naturschutzbund Deutschland e.V. / NABU. (2009). *Der Abfallmarkt in Deutschland und Perspektiven bis 2020*. Berlin: NABU Bundesgeschäftsstelle. Retrieved April 12, 2009 from http://www.nabu.de/imperia/md/content/nabude/abfallpolitik/nabu-studie_muellverbrennungskapazitaeten.pdf
- N'Diaye, B. (2009). Abidjan. In *World Book Encyclopedia* (Vol. 1, p. 11). Chicago: World Book.
- O'Sullivan, A. (1993). *Urban economics* (2nd ed.). Homewood, IL: Irwin.
- Oviatt, B.M., & McDougall, P.P. (2005). Defining international entrepreneurship and modeling the speed of internationalization. *Entrepreneurship Theory and Practice*, 29(5), 537-554.
- Owen, S.H., & Daskin, M.S. (1998). Strategic facility location: A review. *European Journal of Operational Research*, 111, 423-447.

- Palczynski, R. (2002). *Study on solid waste management options for Africa*. Project Report. Prepared for The African Development Bank – PSDU. Retrieved January 18, 2009 from http://www.bscw.ihe.nl/pub/nj_bscw.cgi/d1354356/SOLID%2520WASTE%2520MANAGEMENT%2520STUDY.pdf
- Peng, M.W. (2006). *Global strategy*. Taunton: South-Western Thomson.
- Petersen, G., & Pedersen, T. (2002). Coping with liability of foreignness: Different learning engagements of entrant firms. *Journal of International Management*, 8, 339-350.
- Population Reference Bureau. (2008). *2008 world population data sheet*. Retrieved May 10, 2009 from http://www.prb.org/pdf08/08WPDS_Eng.pdf
Supplementary information
<http://www.prb.org/Publications/Datasheets/2008/2008wpds.aspx>
- Porter, M.E. (1980). *Competitive strategy*. New York: Free Press.
- Recyclenet Composite Index. (2009a). *Common Trading Terms*. Retrieved April 16, 2009 from http://scrapindex.com/common_trading_terms.html
- Recyclenet Composite Index. (2009b). Sport Market Pricing. *Europe: Scrap glass prices*. Retrieved April 16, 2009 from <http://www.scrapindex.com/glass/europe/index.html>
- Recyclenet Composite Index. (2009c). Spot Market Pricing. *Europe: Scrap metal prices*. Retrieved April 16, 2009 from <http://www.scrapindex.com/metal/europe/index.html>
- Reed, R., Jr. (1967). *Plant location, layout, and maintenance*. Homewood, IL: Richard D. Irwin.

- Richardson, H.W. (1979). *Regional Economics*. Urbana: University of Illinois Press
- Robbins, P. (2007). Côte d'Ivoire. In *Encyclopedia of Environment and Society* (Vol. 3). New York: SAGE Publications.
- Roland Berger Strategy Consultants. (2009, March 31). *Study: Despite stimulus package, construction supply industry expects sharpest drop in sales in second half of 2009*. Munich. Retrieved April 22, 2009 from http://www.rolandberger.com/company/press/releases/Survey_building_materials_industry.html
- Rushton, G. (1979). *Optimal location of facilities*. Wentworth, NH: COMPress.
- Sané, Y. (2002). La gestion des déchets à Abidjan: un problème récurrent et apparemment sans solution. *Revue africaine de gestion et d'évaluation environnementales*, 4(1), 13-22.
- Schmenner, R.W. (1979). Look beyond the obvious in plant location. *Harvard Business Review*, 57(1), 126-132.
- Schmenner, R.W. (1982). *Making business location decisions*. Englewood Cliffs, N.J.: Prentice-Hall.
- Schübeler, P., UNDP, UNCHS, World Bank, & SDC. (1996). *Urban management and infrastructure: Conceptual framework for municipal solid waste management in low-income countries* (1st ed.). UMP Working Paper Series No. 9. St. Gallen: Swiss Centre for Development Cooperation in Technology and Management.
- Sloan, W.M. (1993). *Site selection for new hazardous waste management facilities*. Copenhagen: World Health Organization Regional Office for Europe.

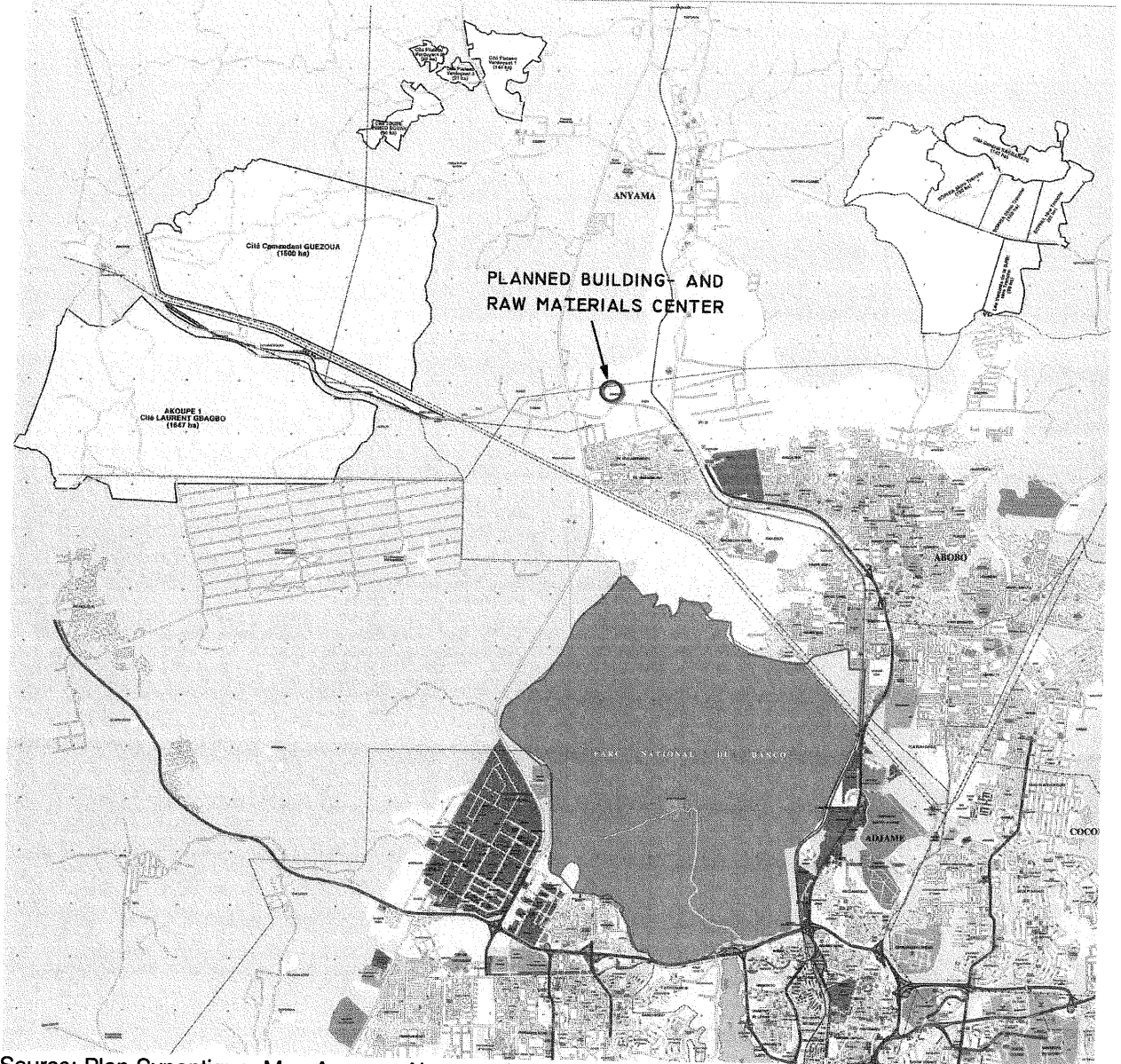
- Söderman, S. (1975). *Industrial location planning. An empirical investigation of company approaches to the problem of locating new plants* (1st ed.). Stockholm: Almqvist & Wiksell International.
- Stafford, H.A. (1979). *Principles of industrial facility location* (1st ed.). Atlanta: Conway Publications.
- Statistisches Bundesamt Deutschland Destatis. (2009) *Pressemitteilung Nr.094 vom 11.03.2009*. Retrieved April 15, 2009 from http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Presse/pm/2009/03/PD09__094__31111,templateId=renderPrint.psml
- Tabari, M., Kaboli, A., Aryanezhad, M.B., Shahanaghi, K., & Siadat, A. (2008). A new method for location selection: A hybrid analysis. *Applied Mathematics and Computation*, 206, 598-606.
- The Heritage Foundation & Wall Street Journal. Côte d'Ivoire. In *2009 Index of Economic Freedom*. Retrieved April 10, 2009 from <http://www.heritage.org/Index/Country/CoteDiviore>
- The World Bank Group. (2003). Development education program glossary. Retrieved May 29, 2009 from <http://www.worldbank.org/depweb/english/modules/glossary.html#d>
- The World Bank Group. (2004). World population growth In *Beyond Economic Growth. An Introduction to Sustainable Development*. (2nd ed.). Retrieved May 29, 2009 from <http://www.worldbank.org/depweb/english/beyond/global/beg-en.html#toc>
- Timmons, J.A. (2007). *New venture creation: Entrepreneurship for the 21st century* (7th ed.). Singapore: McGraw-Hill.
- Toyne, P. (1974). *Organisation, location and behaviour: Decision-making in economic geography* (1st ed.). London and Basingstoke: Macmillan Press.

- Tybout, J.R. (2000). Manufacturing firms in developing countries: How well do they do, and why? *Journal of Economic Literature*, 38(1), 11-44.
- United Nations Development Programme. (2007/2008). Côte d'Ivoire. In *Human Development Report*. Retrieved February 26, 2009 from http://hdrstats.undp.org/countries/data_sheets/cty_ds_CIV.html
- United Nations Environment Programme / UNEP. (2001). Hazardous waste: special reference to municipal solid waste management. In *State of the Environment. India 2001*. Retrieved February 21, 2009 from http://www.rrcap.unep.org/reports/soe/india_haza_waste.pdf
- United Nations Human Settlements Programme. (2005). The housing crisis. In *Financing Urban Shelter. Global Report on Human Settlements 2005*. Retrieved May 10, 2009 from <http://www.unhabitat.org/content.asp?cid=3392&catid=7&typeid=46&subMenuId=0>
- Vehlow, J. (1997). Municipal solid waste management in Germany. *Waste Management*, 16 (5/6), 367-374.
- Vermögensgemeinschaft Möllern eG. (n.d). *Landwirtschaftliche Biogasanlage Vermögensgemeinschaft Möllern e.G.* Retrieved April 3, 2009 from <http://www.vg-moellern.de/biogasanlage.htm>
- Von Thünen, J.H. (1966). *Von Thünen's isolated state: An English edition of Der isolierte Staat* (1st ed. 1826, trans. By C.M Wartenberg). Oxford: Pergamon Press.
- Weber, A. (1958). *Theory of the location of industries* (3rd ed.). Chicago: University of Chicago Press.

- Wong, L.-F., Fujita, T., & Xu, K. (2008). Evaluation of regional bioenergy recovery by local methane fermentation thermal recycling systems. *Waste Management, 28*, 2259-2270.
- World Resources Institute, The United Nations Environment Programme, the United Nations Development Programme, & The World Bank. Data table 9.3: The urban environment, city level *World Resources 1998-99: Environmental change and human health*. Retrieved March 18, 2009 from http://archive.wri.org/publication_detail.cfm?pubid=2889
- Yin, R.K. (2003). *Applications of case study research* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Yin, R.K. (2009). *Case Study Research. Design and methods* (4th ed.) Thousand Oaks, CA: Sage Publications.
- Zahra, S.A., & George, G. (2002). International entrepreneurship: The current status of the field and future research agenda. In M.A. Hitt, R.D. Ireland, S.M. Camp & D.L. Sexton (Eds.), *Strategic entrepreneurship. Creating a new mindset* (pp.253-282), Malden: Blackwell Publishers.

Appendices

Appendix 1: Abobo. Location of planned Building- and Raw Materials Center



Source: Plan Synoptique. Map Anyama-Akoupe - Anyama-Ahouabo – Akeikoi. Parcelles Sophia.

Appendix 2: Abobo. Location of planned Building- and Raw Materials Center II



Source: <http://earth.google.com/>

Appendix 3: Letter

Ministerium der Stadt
und der Stadtsauberkeit

Der Minister

Republik Elfenbeinküste
Einheit- Disziplin- Arbeit

Abidjan, d. 03. Febr. 2009

Nr. 040/MVSU/CAB 00/ fm

An
Herrn Franz Josef PHILLIP
POLAMAR ENGINEERING GmbH
Zweigniederlassung Deutschland
Kruppatrasse, 126
60338 FRANKFURT am Main

Betr.: AUFFODRUNG ZUR BESTÄTIGUNG VON INTERESSE
UND ZUR FORMALISIERUNG VON ANBIOTEN

Herr Direktor,

Im Anschluss an Ihre Erkundungsreise und der Beratungen zur Kontaktaufnahme die Sie mit meinem Kabinett in Abidjan im Laufe des Monats Oktober 2008 hatten, hat eine Delegation des Ministeriums für die Stadt und Stadtsauberkeit, Ihre technischen und industriellen Anlagen im Monat Dezember 2008 in Deutschland besucht.

Der Bericht, der mir darüber gegeben wurde, zeigt Ihre Absicht auf, in Abidjan ein generelles Vorhaben zur Behandlung von Abfällen aller Arten und Herkunft aufzubauen, und ausgehend von den Produkten aus der besagten Verarbeitung, von Materialien für den Bau von Immobilien zum Zwecke des gehobenen und sozialen Wohnungsbaues, des industriellen Bauens und des Straßenbaues zu nutzen.

Zu diesem Zwecke haben Sie von meinem Ministerium um die dauerhafte Unterstützung gebeten in den vielseitigen Behördengängen, die ein Vorhaben solchen Umfanges verlangt, insbesondere mit der Aussicht Ihnen die Formalitäten in Bezug auf direkte Investitionen in der Elfenbeinküste, auf die Liegenschaftsfragen, die verbunden sind mit den Standorten auf denen sie tätig werden, auf die Betriebszulassnisse, auf die durchzuführen Vorhaben, usw. zu erleichtern.

Da es sich insbesondere um die Behandlung von Abfällen handelt, wünschen Sie vom Ministerium für die Stadt und die Stadtsauberkeit die Genehmigung zum Sammeln, Sammelstellen einzurichten und mit einem innovativen Verfahren vorzugehen, der jedwede Zuhilfenahme von Verbrennung ausschließt, alles auf sauberen Grundlagen.

Von alledem schliesse ich, dass Ihr Vorhaben umso mehr sachdienlich ist, als dass sein globales Konzept und seine verschiedenen Bestandteile perfekt in die Aufgaben und die Anliegen meines Ministeriums hinein passen, vor allem was die Problematik der Sauberkeit und die Erneuerung des Wohnumfeldes anbetrifft, für welche Ihr Unternehmen Lösungen verspricht, die technisch effektiv sind und finanziell ökonomisch.

Was sich im übrigen einprägt, das ist der Gesichtspunkt einer beschleunigten und nachhaltigen Stadtentwicklung. Ihr Vorhaben ist eines von denen, von denen man neue Perspektiven für unsere Bevölkerungen erwartet. Das ist um so mehr anerkennenswert im Zusammenhang mit der Zeit nach der Krise mit der die Elfenbeinküste heute konfrontiert wird, mit vorausschaubarer Weiterführung in den kommenden Jahrzehnten.

Deswegen habe ich hiermit die Ehre, Ihnen mein prinzipielles Einverständnis für die Realisierung dieses Vorhabens zu geben, indem Ihnen aller notwendiger Beistand durch meiner Verwaltung versichert werden, welcher alle notwendigen Informationen zu diesem Thema gegeben werden.

Was die praktische Umsetzung angeht, bitte ich Sie, ihre technischen und finanziellen Vorstellungen meinem Kabinett vorzulegen, um über einen zeitlichen Ablauf so schnell wie möglich einig zu werden.

Wissend um ihr Vertrauen welches Sie in die Wiedergeburt der Elfenbeinküste gesetzt haben, drücke ich hier den Wunsch einer gegenseitig nutzbringenden Zusammenarbeit aus und bitte Sie, **Herr Direktor**, meine Hochachtung entgegen zu nehmen.

Stempel des Ministers

Théodore MEL EG

Atlantique Gruppe

Joël Cardier
Generaldirektor

Sitz Atlantique
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Mob: (+225) 02 03 03 03

Ministerium für die Stadt und die Stadtsauberkeit (Stadtsanierung?)

Herr Mel Eg Théodore
Minister für die Stadt und Stadtsauberkeit

Clos du Hameau Blvd F. Mitterrand
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www.mvsu-ci.org

Appendix 4: Bulk Density of waste

| Waste Type | Percentage | Bulk Density (in kg/m³) | Daily Waste (in T) | Daily Waste (in m³)* |
|--|-------------------|---|-------------------------------|--|
| Paper, Cardboard | 6% | 400 | 72 | 180 |
| Textiles | 2% | 400 | 24 | 60 |
| Wood | 1% | 300 | 12 | 40 |
| Green waste | 18% | 300 | 216 | 720 |
| Food, Food waste | 51% | 600 | 612 | 1020 |
| Glass | 1% | 800 | 12 | 15 |
| Metal | 1% | 450 | 12 | 27 |
| Plastic | 5% | 60 | 60 | 1000 |
| Other | 15% | 1400 | 180 | 129 |
| Total | 100% | | 1200 | 3190 |
| * based on formula Density (p) = mass (m) / volume (v) | | | | |
| 1200 tons of daily processed waste divided by 3190 m ³ /t total bulk density yields an average density of 376 kg/m³ . | | | | |

Appendix 5: Invoice Compagnie Ivoirienne d'Electricite



COMPAGNIE IVOIRIENNE D'ELECTRICITE Société Anonyme au capital de 14 Milliards de Francs CFA
 SIEGE SOCIAL : 01 BP 6924 ABIDJAN 07 - P.C. Abidjan 149296 - COMPTE CONTRIBUTABLE N° 80 04996 S - TEL : 23.36.06
 R.L. (Reel - C.O.F.) : Direction des Grandes Entreprises - Banque S.C.I.B.C.I. Abidjan 111 308 707 64
 Direction Régionale de ABIDJAN SUD TEL : Fax :

FACTURE D'ELECTRICITE BASSE TENSION N° 134 PERIODE : 01/2009

EXPLOITATION
 CLIENT : **KOUMASSI**
 REFERENCE : **021284684000 M H**
 GROUPEMENT : **0210300106900S**
 TYPE CLIENT :
 REGIME DESOMPTIF : **020**

Date :
 Non :
 Téléphone :
 Adresse postale : **00000000**
 C.C. Client :

PUISSANCE SOUSCRITE :
 CODE TARIF : **4,4**
 CODE USAGE : **02**
 QUALITE PAVILION :
 TYPE FACTURE : **villa 68**
 TYPE EQUIPEMENT : **00**
 TYPE BRANCHEMENT : **1**

MONTANT A REGLER :

Consommation du : **04/12/2008** au : **04/02/2009** **187940**
 Date limite de paiement : **05/03/2009**

| RELEVÉ COMPTEUR | | INDEX | | | COEFFICIENT DE LECTURE | CONSUMMATION ENREGISTRÉE (kWh) |
|----------------------------------|--------------|------------------|------------|----------|------------------------|--------------------------------|
| NUMERO | ANCIEN | NOUVEAU | DIFFERENCE | | | |
| 04064194 | 29318 | 32274 | 2956 | 1,0 | 2956 | |
| DETAILS DE LA FACTURATION | | | | | | |
| Tranches | Consommation | Prix Unitaire HT | Montant HT | Taux TVA | Montant TVA | Montant TTC (Fcfa) |
| 1 | 805 | 57,43 | 46230 | 18,00 | 8320 | 54550 |
| 2 | 2151 | 47,96 | 103160 | 18,00 | 18570 | 121730 |
| Prime fixe | | | | | | |
| Total Facture Energie | | | 5175 | 18,00 | 930 | 6105 |
| Autres taxes | | | 154565 | | 27820 | Montant TTC (82385) |
| Redevance électrification rurale | | | | | | 3055 |
| Taxe communale | | | | | | 0 |
| Redevance RTI | | | | | | 2000 |
| Timbre d'état (*) | | | | | | 500 |
| TOTAL FACTURE (Fcfa) | | | | | | 187940 |
| Impayés antérieurs CIE | | | | | | 0 |
| Impayés antérieurs RTI (*) | | | | | | 0 |
| Message au Client : | | | | | | 187940 |

(*) Pour un règlement par chèque, le timbre d'état n'est pas perçu; le montant à régler est alors de :

Au delà de la limite de paiement, il sera perçu la somme de : à titre de frais de recouvrement, et il sera procédé sans délai, à la suspension de la fourniture d'électricité **18745**

Appendix 6: Invoice Societe de Distribution D'Eau de la Cote-d'Ivoire



SOCIETE DE DISTRIBUTION D'EAU DE LA COTE-D'IVOIRE
 Societe Anonyme au capital de 4.500.000.000 de CFA - R.C.M d'Abidjan Plateau sous le numéro, CI-ABJ-1958-B-984
 SIEGE SOCIAL : TREICHVILLE - 1, Av Christiani - Tel : 21.23.30.00 01 BP 1843 ABIDJAN 01
 COMPTE CONTRIBUTABLE N° 01.00.984 A Compte SGBCI 1000801111 011130114871 14
 CENTRE DES IMPOTS : D.G.I./DGE - REGIME D'IMPOSITION : REEL NORMAL
 www.sodeci.ci

FACTURE

VOTRE POINT D'ACCUEIL :
SECTEUR DE KOUMASSI

REFERENCES A RAPPELER

| Centre | Police | Ordre | Clé | Code Secteur |
|--------|-------------------|--------|-------------------------------------|--------------|
| 136 | 11678 | 7 | 2 | 067038 |
| DR | Code Regroupement | Agence | N° de Compte DOMICILIATION BANCAIRE | |

FACTURATION DES CONSOMMATIONS D'EAU DE :

DATE LIMITE DE PAIEMENT **AOÛT 2008, SEPTEMBRE 2008, OCTOBRE 2008.** GF1

| Diam | N° de compt | INDEX | | PERIODE | | Cubage consommé | Libellé | Cubage Facture | Prix du m ³ | FNE | RACCORDE | | Mentant du cubage facture | Frais compteur | NET A PAYER |
|------|-------------|--------|--------|---------|------|-----------------|--|----------------|------------------------|------|------------------------|-----------|---------------------------|----------------|-------------|
| | | Ancien | Nouvel | Mois | An | | | | | | Dont Developpement eau | Assainis. | | | |
| 01 | 568 | 978 | 1068 | 10 | 2008 | 90 | FORFAIT-CONSUM. | 9 | 250.3 | 00.0 | 07.0 | 15.3 | 2.253 | | |
| | | | | | | | TARIF SOCIAL | 9 | 250.3 | 00.0 | 07.0 | 15.3 | 2.253 | | |
| | | | | | | | TARIF DOMESTIQ. | 72 | 403.3 | 21.0 | 77.3 | 36.0 | 29.038 | | |
| | | | | | | | TOTAL TTC EAU + ASSAINISSEMENT | 90 | | | | | 33.543 | | 33.543 |
| | | | | | | | DONT TVA PAYEE A L'ENCAISSEMENT SUR EAU | | | | | | 2.952 | | |
| | | | | | | | DONT TVA PAYEE A L'ENCAISSEMENT SUR ASSAINISSEMENT | | | | | | 202 | | |

Au delà de la date limite de paiement, il sera perçu la somme de à titre de frais de recouvrement, et il sera procédé à la fermeture de votre branchement sans préavis

3.354

TOTAL FACTURE ET IMPAYES AU :

sauf erreur ou omission de notre part 06/11/2008

(*)

33.543

(*)POUR LES REGLEMENTS EN ESPECES PREVOIR UNE SOMME DE 100 F. POUR FRAIS DE TIMBRE D'ETAT.

Voir informations utiles au verso