Industrial Buying Behavior in the Waste-to-Energy Market

A Case Study in Germany

Author: Lars Hendrik Klinkmann
Supervisor: Peter Hultén

Student
Umeå School of Business and Economics
Spring semester 2016

Master thesis, one-year, 15 hp
Abstract
Waste-to-Energy power generation describes the process of incinerating solid waste. The produced heat is used to drive a power generation unit generating electric energy or for direct district heating. Waste-to-Energy is a viable method to treat solid waste and to produce energy.

The Waste-to-Energy power generation market has significantly grown throughout the past decade. This is rather based on an increasingly important waste management issue than on higher demands for energy. Even in light of a growing market, literature concerned with the customers’ buying behavior and customer motives in the process of industrial buying in this segment is very limited. Therefore, this study investigates these aspects in further detail and determines patterns in the Waste-to-Energy market in Germany.

This research project solves and fills the problem and knowledge gap concerned with the affecting factors, influences and drivers in industrial buying in Germany. Since this is a very global perspective and exceeds the capacities of this study, more specific aspects such as the buying centers, buying situations or supplier selection criteria are assessed.

Pursuing an approach on the philosophical stances of constructivism and interpretivism, this research topic has been approached by conducting phone interviews with representatives from power plant operators and public authorities. These representatives mostly fill positions in purchasing and environmental departments, among others.

A number of Waste-to-Energy power plants in Germany have been investigated by interviewing individuals involved in the planning, purchasing and construction process. The information they provided on the topics of the plants’ backgrounds, buying centers, customer motives, buying decision phases and buyer-seller relations have been analyzed in order to draw conclusions and to answer the research questions.

It has emerged from this research study that the Waste-to-Energy power plants investigated were built primarily in order to solve waste management issues and not to produce energy. In these cases, power generation is just a byproduct of the waste incineration. Furthermore, it has evolved that constructions of power plants are rolled out as new tasks or modified re-buys, but never as straight re-buys. Additionally, buyers do not only focus on suppliers’ characteristics such as their pricing and their products’ quality, but also on their financial situation and performance, capability to meet deadlines and environmental impacts.
Acknowledgements
First and foremost, I express my greatest appreciation and gratitude to Isabel Tiger – who has always accompanied me on the journey of this thesis project – for all her love, encouragement and support.

Furthermore, my gratefulness goes to my supervisor Peter Hultén. He has willingly shared his knowledge and experience, guided me through the research process and never lacked providing valuable advice on short notice.

Additionally, I want to extend my thankfulness to the thesis coordinators Anna-Carin Nordvall and Tobias Svanström, as they have never failed to provide valuable guidance on formal procedures and requirements as well as content-related questions.

Last but not least, I would like to thank all the interviewees who have participated in my research project and shared their expert knowledge of the Waste-to-Energy market.
# Table of Contents

1 Introduction  
1.1 Waste-to-Energy as a Renewable Energy Source 1  
1.2 Waste-to-Energy around the Globe, in Europe and in Germany 1  
1.3 Theoretical Background 2  
1.4 Knowledge Gap 4  
1.5 Problem Background 4  
1.6 Research Questions 5  
1.7 Research Purpose 5  
1.8 Data Quality and Selection 6  

2 Industrial Background 7  
2.1 Political Factors 7  
2.2 Economical Factors 7  
2.3 Social Factors 8  

3 Literature Framework 9  
3.1 Industrial Buying Process 9  
3.2 Industrial Buying in Public and Private Enterprises 10  
3.3 Systems Buying and Selling 12  
3.4 Buying Centers 12  
3.5 Main Types of Buying Situations 14  
3.6 Buying Decision Phases 16  
3.7 Supplier Selection 19  
3.8 Customer Motives 20  
3.9 Buyer-Seller Relationships 21  
3.10 Summary of Relevant Topics 22  

4 Scientific Methodology 24  
4.1 Pre-Understandings 24  
4.2 Ontology 24  
4.3 Epistemology 25  
4.4 Research Approach 26  
4.5 Qualitative Research Design 27  
4.6 Case Study 27
5 Practical Method

5.1 Qualitative Data Collection 30
5.2 Qualitative Sampling Process 30
5.3 Interview Guide 32
5.4 Conduction of the Interviews and Transcription 34
5.5 Presentation of the Findings and Analysis 34
5.6 Literature Search 35
5.7 Reliability and Validity 35
  5.7.1 External Reliability 35
  5.7.2 Internal Reliability 35
  5.7.3 Internal Validity 36
  5.7.4 External Validity 36
5.8 Ethical Considerations 36

6 Presentation of Empirical Findings 38

6.1 Empirical Findings of the German Interviews 38
  6.1.1 Project Background 38
  6.1.2 Buying Centers 38
  6.1.3 Industrial Purchasing 39
  6.1.4 Buyer-Seller Relationships 41
6.2 Discussion of Empirical Findings 42

7 Thematic Network Analysis 43

7.1 Buying Centers 43
7.2 Types of Buying Situations 44
7.3 Buying Process 45
7.4 Buyer-Seller Relationships 47
7.5 Customer Motives 48

8 Conclusion 49

8.1 Additional Findings 50
  8.1.1 Rationales for Establishment of Waste-to-Energy Plants 50
  8.1.2 Influences from Legislation, Society and Politics 50

9 Managerial Implication 51
10 Alternative Criteria 53
11 Limitations and Further Research 54
Reference List 55
Appendices 59
  Appendix I – Interview Guide 59
  Appendix II – Condensed Transcript Company I, Interview A 61
  Appendix III – Condensed Transcript Company I, Interview B 63
  Appendix IV – Condensed Transcript Company X, Interview C 65
  Appendix V – Condensed Transcript Company III, Interview D 68
  Appendix VI – Condensed Transcript Company V, Interview E 73
  Appendix VII – Condensed Transcript Company IV, Interview F 76
  Appendix VIII – Condensed Transcript City IX, Interview G 79
  Appendix IX – Condensed Transcript Jörgen Carlsson, Umeå Energi 81
  Appendix X – Summarizing Table of Findings 85
  Appendix XI – Thematic Networks 88
viii
Table of Figures and Tables

Figure 1: Summarizing Model 23
Figure 2: Waste-to-Energy Power Plants in Germany in 2012 (Thiel, 2013) 31
Figure 3: Thematic Network of Buying Centers 43
Figure 4: Thematic Network of Buying Situations 44
Figure 5: Thematic Network of the Industrial Buying Process 45
Figure 6: Thematic Network of Buyer-Seller Relationships 47
Figure 7: Thematic Network of Customer Motives 48

Table 1: Sample Characteristics 32
Table 2: Interview Guide Summary 33
Table 3: Overview of Interviews 34
Table 4: Frequency of Customer Motives 41
1 Introduction

This first chapter of this thesis report for a Master’s of Science in marketing points out the Theoretical Background, the Knowledge Gap as well as the Problem Background. These aspects provide the backbone of the entire research project. Additionally, the main research question and the sub research questions that this research project aims on answering are outlined. The research purpose and the project’s limitations close this chapter.

1.1 Waste-to-Energy as a Renewable Energy Source

The 2020 targets of the European Union state to achieve a generation of at least 20% of the consumed energy from renewable energies. (European Union, 2016) As the Waste-to-Energy method is considered a renewable energy source, this way of generating power becomes greatly relevant for achieving this target. (Alternative Energy News, 2016) Simultaneously with the increase of relevance of the field as a whole, interest in its structures and processes is raised. One particular process that is relevant also from a business administration and marketing standpoint is the industrial buying behavior of customers acquiring components for Waste-to-Energy power plants. This phenomenon is further problematized as the amount of existing literature in this field is very scarce. In order to discover more characteristics of, gain insights into the buying process and to extend the literature, this research study is concerned with the industrial buying behavior or customers in the German Waste-to-Energy market. Therefore, this research study provides a contribution on both a theoretical and practical level. Before looking into theoretical concepts, the following sub chapter provides an insight into the field’s characteristics.

1.2 Waste-to-Energy around the Globe, in Europe and in Germany

As power generation through the Waste-to-Energy method has been applied with increasing frequency and represents an efficient renewable energy source, it has therefore become a market of significant importance in the energy sector.

In order to provide a general introduction into this market, this sub chapter glances at the Waste-to-Energy market globally, in Europe and eventually in Germany.

The global Waste-to-Energy market is expected to be worth a value of US$ 37.64 billion by 2020, according to a study by Grand View Research, Inc. The two most important drivers for this development are the trend towards energy security and a decreasing availability of landfill area. Furthermore, government supports such as tax benefits and subsidies are likely to be supporting aspects for a further expansion of the Waste-to-Energy market. Nonetheless, competition of several other sources of renewable energy is expected to remain significant. The strongest competitors are said to be power generators from solar, wind and hydro. Furthermore, high fixed costs for the establishment and set up of Waste-to-Energy power plants are a negative influence when it comes to development of the market. (GlobeNewswire, Inc., 2015) However, the US Environmental Protection Agency has gone as far as declaring Waste-to-Energy to be one of the cleanest sources of energy in 2003, mostly due to significant application and improvement of emission filter technologies. (Psomopoulos, Bourka and Themelis, 2009, p. 1718) Furthermore, Waste-to-Energy is the only alternative to treating non-recyclable waste in landfills. (Psomopoulos, Bourka and Themelis, 2009, p. 1719)
Europe is the worldwide largest Waste-to-Energy market and has experienced nearly 60% of the worldwide investments in Waste-to-Energy power plants. Asia has accounted for slightly more than 30% and North America for 9%. (PennWell Corporation, 2015) 520 Waste-to-Energy plants have been in utilization in Europe in 2013. These treat roughly 95 million tons of municipal solid waste (MSW) and commercial waste on a yearly basis. Throughout the past five years, the market has experienced a rapid growth in treatment capacity of 24% or 19 million tones. This is based on the fact that 73 new Waste-to-Energy power plants have been set up, while only eight old facilities have been shut down. Obviously, this raises interest for the reasons of the strong growth that the market experienced. Nonetheless, the growth of the Waste-to-Energy market is expected to slow down during the next five years to 65 new power plants and a capacity of 15 million tons. Investments in new facilities are estimated to decrease by 12% and the market as a whole is expected to experience a cut in the fast growth after 2015/16. (PennWell Corporation, 2015) Once again, this arouses interest with regard to the reasons for this anticipated decline in the market’s growth.

Germany has largely been dependent on fossil fuels derived from imports. However, the expansion of Waste-to-Energy methods is a goal on national as well as EU-level. 24 million tons of the 380 million tons of waste that occurred in 2008 was used for energy generation. (Biooekonomie-bw.de, 2011) It is the authorities’ goal to further increase this share, as politics perceive the energetic potential of Waste-to-Energy practices to be great. Therefore, this sub segment has been supported by legal frameworks. Significant is the legislation for renewable energies that has been in force since January 1, 2009 in its revised version. (Biooekonomie-bw.de, 2011) This legislation supports and develops power generation from renewable energies. It also guarantees the feed of electric energy derived from renewable power generation methods into the grid as well as a compensation structure that binds the grids’ providers to pay a fixed remuneration for the electric energy from renewable methods. This remuneration is accumulated of a basic compensation and several categories of premiums that reward efficiency of waste treatment for example. Besides legal frameworks, competitions have been initiated in order to drive research and development in the Waste-to-Energy market, as using the energetic potential of waste imposes a great challenge for research and technology. Also the efficiency of the Waste-to-Energy processes is to be increased in order to increase this sub segment’s contribution to the energy consumed. (Biooekonomie-bw.de, 2011)

1.3 Theoretical Background
The theoretical background that this thesis has been based on is the industrial customer behavior and customer motives in the Waste-to-Energy power generation market in Germany. Customer behavior and customer motives are two important pillars in nowadays marketing. This section is supposed to provide a brief outlook on the theories and models chosen as a basis for and explained in further detail in the Literature Framework.

Due to the fact that this thesis investigates industrial buying behavior in the Waste-to-Energy market, it is crucial to briefly introduce the market and its main characteristics: A renewable energy source is generated from converting non-recyclable waste materials into electricity and heat, decreasing the need for fossil energy sources and thereby reducing carbon emissions. Furthermore, use of and methane generation from landfill
areas is reduced. Waste-to-Energy power generation is included in the non-hazardous waste management hierarchy. (United States Environmental Protection Agency, 2015) Waste-to-Energy power generation comprises all processes converting non-recyclable waste materials into useable electricity or fuel. These include “combustion, gasification, pyrolyzation, anaerobic digestion, and landfill gas (LFG) recovery.” (United States Environmental Protection Agency, 2015) Furthermore, incineration is another popular method to generate power from waste and the method this research project focuses on. Explaining this process in short, the heat produced during the incineration process drives a turbine connected to a generator that produces electric energy. Alternatively, the heat can also directly be used for district heating.

Two types of organizations are to be investigated in the market segment of Waste-to-Energy: Private organizations and government institutions. At large, these two entities are very much comparable when it comes to characteristics of purchasing behavior. However, one very distinct difference is the fact that governmental institutions are primarily concerned with satisfying the needs of the community they are authorized with and not simply strive for financial profit. Also, it is to remark that governmental institutions spend taxpayers’ money instead of private assets like private organizations do. This difference is important to bear in mind when it comes to public utility companies whose main goal is to reliably supply base-load energy to a community. However, it is important to look into the concept of systems buying for both government and business organizations. Systems-buying is the purchase of - often times in an industrial context - product solutions that solve a buyer’s need entirely and as an entity. When purchasing a system, the buyer is not individually concerned with combining several single components and suppliers.

The next important theoretical concept to look into are buying centers. According to Webster and Wind (1972), buying centers are entities that are involved in the buying process. Users, influencers, buyers, deciders and gatekeepers are actors that are considered buying centers. However, it is possible that one group of individuals occupies the role of two or more buying centers. Furthermore, influencers and deciders are further subjects of this study. In addition to the buying centers, it is to look into the buying situations that organizational buyers are confronted with. Reeder et al. (1991) have defined three types of situations for an organizational buyer. These are a straight re-buy, a modified re-buy and a new task. A straight re-buy is conducted, when the exact same product with the same features is purchased again. As a result, a modified re-buy is the same or similar product with alterations in its features, while a new task is a completely new product with entirely different characteristics. Subsequently, it is essential to address the buying decision phases an organizational buyer runs through when conducting a purchase. The buying decision phases-model by Webster (1991) includes eight subsequent steps that describe the buying decision phases of an industrial purchase. These range from the need for recognition to performance feedback and evaluation. This model is relevant for this research project, since it is expected to determine phases that are particularly suitable for suppliers to gain a competitive advantage. The concept of supplier selection is an important aspect during the process of purchasing. Its significance is increased depending on the product’s or service’s complexity that is to be purchased. Given the fact that the industry of Waste-to-Energy power plants is concerned with significant investments and high financial volumes, the process of supplier selection is one that needs to be very well considered and justified.
1.4 Knowledge Gap
The knowledge gap that has been determined and is supposed to be filled with this research project is concerned with the industrial buying behavior and customer motives on the example of Waste-to-Energy power plants within the industrial sector of power generation in Germany. Since literature in this field is very scarce, it is to determine the industrial customers’ behavior during the buying process of components or solutions for Waste-to-Energy power plants. Also, it is to define the driving factors in the buying decision process. By filling this Knowledge Gap, this research project provides valuable insights for suppliers of components and systems for Waste-to-Energy plants for improving their sales strategies and increasing their competitive advantage.

Even though a certain amount of literature does exist, none of the prior work appears to be concerned with the issues this research project deals with. Previous research is either concerned with other matters in the Waste-to-Energy market segment or with industrial buying behavior in other markets. Therefore, the topic of industrial buying behavior in the Waste-to-Energy market can be considered as rather untouched. As a result, this research project offers both a theoretical as well as practical contribution and is therefore well worth pursuing. From a theoretical standpoint, this research study provides insight into the structures of the buying processes in the Waste-to-Energy market in Germany. This includes identifying the most relevant buying centers or the most important factors during the supplier selection. The practical perspective however, offers touch points for suppliers in the segment to improve their competitive advantage. Due to the fact that this research study analyzes the buying behavior of buyers in the Waste-to-Energy market, the findings are obviously relevant to the suppliers in the segment, as they reveal what their customers prioritize.

1.5 Problem Background
The renewable energy market as a whole is a relatively new market segment of the broad field of power generation. Therefore, the extent and availability of literature is greatly limited in general. When it comes to industrial customer behavior and customer motives in particular, it is obvious that literature is even less advanced. However, the chapter Industrial Background provides insights into the market’s industrial characteristics. Please refer there to obtain further information on the Problem Background from a more industrial point of view. From an academic perspective, this project aims on conducting a social research study on the reasoning of industrial buyers during purchase processes of the components and solutions of Waste-to-Energy power generation plants. This is expected to determine the aspects that are of importance and influence during the buying decision process. By defining these, this project has a high managerial relevance, since it enables product and sales managers on the suppliers’ side to take actions and alterations on both their products as well as their sales strategies in order to improve their competitive advantage.

Nowadays, waste incineration is widely applied throughout Europe. This process accounts for two major benefits: It enables the disposal of residual waste and the recovery of its energetic potential. Even though the practice of combusting municipal solid waste is not new, it has not been fully accepted as a waste management strategy by several European member states. (Grosso et al., 2010, p. 1238) This is due to early technologies - mostly emission filters - not ensuring the citizens’ health, since exhausted gases contain dioxins as well as heavy metals. With the development of air emission control systems, the risk of potential threats on humans’ health significantly decreased. Furthermore,
advanced technologies in the area of combustion further increased the incineration plants’ productivity and thereby attractiveness, resulting in numerous roll-outs of plants. Extending the plants with energy recovery sections led to the practice of municipal waste combustion being seen as a part of energy policies that offered possibilities for decreasing dependency on fossil fuels. (Grosso et al., 2010, p. 1238)

1.6 Research Questions
Careful consideration of the Knowledge Gap and Problem Background has led to the formulation of the research questions outlined below. These research questions are to be answered by this research study on the basis of the data collected as described later on.

This research study is different to prior studies, as it approaches the phenomena of industrial buying behavior from the perspective of a qualitative case study. This is a great advantage, as the possibilities for the definition of research questions and their nature are entirely different and allow looking into the phenomena in question in much closer detail and greater depth. Therefore, this research study aims to find out how buying decisions are influenced and how purchases of components and solutions for Waste-to-Energy plants are conducted. Resulting, the following research questions have been defined in order to be answered by this research:

How do industrial buying behavior and customer motives influence buying decisions in Germany?

How does an industrial buyer conduct purchases for a Waste-to-Energy plant?

How is a buyer influenced when conducting the purchase?

1.7 Research Purpose
The research purpose of this thesis project is the determination of behavioral patterns of industrial customers and the most prevalent customer and investment drivers in the sub segment of Waste-to-Energy power generation in the German market. This ought to result in a deeper understanding of industrial buying behavior.

A better and deeper insight into the actors and factors involved in the process of industrial buying in the Waste-to-Energy market as well as the social, political and economic aspects that actors are supported by or confronted with is expected to be of great relevance for this rather new market. The qualitative primary data used for analysis in this thesis is obtained from semi-structured interviews with stakeholders of selected cases of established Waste-to-Energy projects. In order to involve several perspectives, representatives of the plants’ operators as well as the local authorities responsible for the plants in question have been interviewed.

This research’s individuality is reflected in the fact that it investigates the in-depth structures of the behavioral patterns of industrial buyers in the German Waste-to-Energy market. Even though a case study analyzes a rather small quantity of cases, conducting a research study with this method enables a researcher to gain deep insights into the phenomena. Another interesting factor is the fact that even though this research focuses on the buyers’ perspective, the findings are relevant for the suppliers’ side just as much: Assuming that a supplier always aims on fulfilling a buyer’s needs, it is to be expected that they might adapt their business structures and methods as far as possible in order to satisfyingly match the clients’ expectations. Besides this, the inclusion of both publicly and privately owned and operated organizations increases this research’s relevance.
This research study thrives to shed light into the industrial buying processes in the Waste-to-Energy market aims thereby aims to provide valuable insights for both buyers and suppliers of power plant components. As it has been outlined in the sub chapter Knowledge Gap, literature is scarce in the Waste-to-Energy market in general and in the field of buying processes in particular. Therefore, the contribution is expected to be of high value in the theoretical way as it is in the practical.

It is also expected that the results of this study – even though it only investigates the German Waste-to-Energy market – are to a high extent replicable to other countries in the European Union, as they all need to comply with the same waste treatment regulations. This further alters the study’s relevance as well as uniqueness.

1.8 Data Quality and Selection
It is to be highlighted that even though the sample comprises only seven interviews, a great amount of data has been obtained from the interviewees. The interviews have been extensive with a high level of information and quality. Even though the sample has yielded a rather limited amount of data, it has been possible to determine consistencies among the individual respondents’ answers by conducting a deep and intensive analysis. The original goal of this research study has been a comparison of industrial buying behavior in Germany and in Sweden. However, it has turned out that finding suitable interviewees in the Swedish market is even more difficult than in the German. Therefore, it has been decided to exclude the data obtained from the interview with the Swedish respondent, to abolish the comparative aspect and to investigate the German market independently. However, the excluded data is to be found in Appendix IX – Condensed Transcript Jörgen Carlsson, Umeå Energi and Appendix X – Summarizing Table of Findings.
2 Industrial Background

After the Introduction into this research report, this chapter is supposed to further elaborate on the Problem Background from the industrial perspective. It explains the characteristics of the Waste-to-Energy market both in a European and a global scope and glances at political, economic and social factors.

2.1 Political Factors

The Confederation of European Waste-to-Energy Plants (CEWEP) represents 395 Waste-to-Energy plants in 18 European countries. These power plants account for 86% of the total Waste-to-Energy capacity in Europe. (Confederation of European Waste-to-Energy Plants, 2015) The CEWEP mentions three main goals in its policy:

- Reducing dependence on landfills
- Quality recycling
- Boosting energy efficiency

Incinerating waste in a reproductive manner in the sense of energy generation has the side effect of a severe reduction of dependence on landfills. Since non-recyclable combustible waste is treated in a much more sustainable manner by using it as fuel for Waste-to-Energy plants, it reduces the waste of natural resources and diminishes methane emissions caused by landfills. (Confederation of European Waste-to-Energy Plants, 2015) Fueling Waste-to-Energy power plants with waste prevents dirty or contaminated waste from entering the recycling chain and negatively impacting quality. Furthermore, waste that is not of sufficient quality for recycling, such as material that has been recycled for several times, is still profitable for incineration and subsequent power generation. (Confederation of European Waste-to-Energy Plants, 2015)

In order to boost energy efficiency, it is necessary to improve the network for heat and process steam in order to enable customers to make use of it. As a result, the infrastructure for district heating and cooling as well as the ambition of maximizing electricity production from waste is to be established further.

Furthermore, the Waste-to-Energy plants’ access to power grids has to be improved in order to improve energy gains from this production method. However, Waste-to-Energy plants qualify for the generation of reliable base-load energy and provide crucial waste disposal services simultaneously, making this method an attractive one for any government that is to reach environmental goals. (Confederation of European Waste-to-Energy Plants, 2015)

2.2 Economical Factors

Throughout the past years, more and more communities as well as countries have considered the establishment of Waste-to-Energy technology. One main reason for this is the fact that it eases two major concerns of local authorities: Firstly, providing a reliable and sufficient base-load supply is a significant issue in a continuously changing world with more and more energy-consuming technology. Secondly, this ever-changing and developing environment tends to produce increasingly large amounts of waste. Since the product-life-cycle does not end with the purchase of the product, but is also concerned with the disposal or recycling respectively, a proper after-use treatment is a great concern.

The Waste-to-Energy technology provides a combined solution for both these issues: It properly treats waste by generating fully usable energy as an outcome. (Miranda & Hale, 1997, p. 587) Resulting, it can be said that this method is economically highly attractive.
It goes without saying that also other power generation methods are economically attractive. However, the peculiar fact that Waste-to-Energy solves not one, but two governmental issues, provides this process with a great economical advantage compared to other renewable power generation methods.

2.3 Social Factors
From a social point of view, Waste-to-Energy power plants are likely to face certain restraints. In general, local communities show a widespread ignorance on waste management issues. (Achillas et al., 2011, p. 858) Waste-to-Energy is often times not perceived to be a competitive alternative to traditional energy resources such as fossil fuels simply due to financial aspects. Since they do not price-compete, Waste-to-Energy plants are not the first choice of communities. (Achillas et al., 2011, p. 857) This however, is altered by the fact that Waste-to-Energy more and more becomes the only cost-effective way for waste disposal providing a strongly supportive argument in favor of this method. However, oppositions of local communities have caused severe delays or even withdrawals of planned Waste-to-Energy projects. (Achillas et al., 2011, pp. 857-858) Surprisingly though, a study in the UK has shown that it is socially more cost-effective to meet the waste management targets of the European Union Directive than the practices currently applied (Jamasb & Nepal, 2010, p. 1341). Therefore and even in light of the ‘Not In My Back Yard-syndrome’ (Achillas et al., 2011, p. 858), it should be clear to communities that Waste-to-Energy in its combination of waste treatment and power generation is a highly attractive and profitable method.
3 Literature Framework

After having an insight into the subject’s practical characteristics, this chapter aims to present a review of theories which constitute a relevant theoretical background for answering the research questions and fulfilling the purpose of this research project. This is particularly relevant for giving the research project a theoretical ground to build on after elaborating on the practical matters of the sector in the previous chapter.

3.1 Industrial Buying Process

The author would like to state at this point that despite the fact that the search for appropriate literature has involved the reading and assessment of great amounts of previous research, only the theories that are considered relevant to this research study are presented and discussed in the Literature Framework.

Webster (1991) has investigated industrial marketing strategies as well as industrial goods and services, which are fields that are considered relevant for this research study. According to Webster (1991, p. 5), there are many different ways in which it is possible to define categories of industrial goods and services. One prevalent structure comprises the areas of construction, heavy equipment, light equipment, components and subassemblies, raw materials, process materials, maintenance, repair and operating supplies, and service (Webster, 1991, p. 5). Heavy equipment includes large machineries “such as machine tools, turbines, computers, locomotives, presses, tugs and barges, and earth moving equipment” (Webster, 1991, p. 5). Heavy equipment often appears in customized forms in order to satisfy a specific client’s unique needs. This category of heavy equipment is relevant for the Waste-to-Energy market, as for example turbines are an important component of the power plants in this market segment.

The processes of industrial buying are particularly relevant for any organization, as the products purchased have significant financial dimensions and constitute the fixed assets of the company. Therefore, any such organization should carry out their product acquisition with utmost care and caution in order to assure a sufficient level of quality. This acquisition is an extremely dynamic and intricate process, which frequently involves sellers with a complex set of issues and situational factors that directly or indirectly influence a buying firm’s behavior (Johnston et al., 1996, p.1). Industrial customers frequently are manufacturing and processing firms and distributors, who purchase goods and resell to other users, but also institutional and governmental customers (Webster, 1991, pp. 8-9). As far as this research study is concerned, both public and private entities are in the role of the purchasing party, as some Waste-to-Energy plants are privately owned and operated, whereas others fall within the range of responsibilities of communities.

No matter if a company is publicly or privately owned, every organization has its purchasing objectives. These purchasing objectives are commonly expressed as buying the right items in the right quantity at the right place for delivery at the right time and place. This aspect gains more relevance when taking into account that the purchased products may constitute the fixed assets of the organization, as explained above. Furthermore, as explained by Lutz and Ellegaard (2015, p. 108), industrial contexts are characterized by a state of high uncertainty and product and situational complexity. Therefore, the buying process for obtaining the needed resources is not at all comparable with in-exchange routines for the acquisition of standardized services and products (Lutz & Ellegaard, 2015, p. 108). As a result, buyers have to perform a challenging task, as
different types of exchange dynamics are in place and uncertainties are high. Furthermore, major factors are the time pressure, the general risk involved in meeting project objectives, the financial risk and the coordination activity across all the different contributing companies (Lutz & Ellegaard, 2015, p.108). It is a complex combination of characteristic elements like product specifications and quality, amount of purchase, price, and delivery.

A major responsibility of the procurement unit is to provide continuity in operations by ensuring that the purchased goods and services are available when and where needed. Maintaining product quality is an objective of purchasing as quality must be consistent with the specifications developed during the purchasing planning process. Furthermore, the right pricing is a highly important objective after availability and quality. The goal of the purchasing unit is to develop and receive the necessary services accompanying the purchase of goods such as technical support, application assistance, repair, and maintenance. The development of favorable long term relationships and new sources of supply is an additional ambition in order to guarantee the continued availability of goods and services (Webster, 1991, p 24).

As this sub chapter has provided insight into the buying process in an industrial setting, the next sub chapter distinguishes differences between the buying processes in public and in private companies. This is explicitly relevant due to the fact that both these sectors are important key players in the Waste-to-Energy market.

3.2 Industrial Buying in Public and Private Enterprises

The buying behavior of government organizations is very much consistent with the one of private organizations. However, it comprises specific issues related to their peculiar mission. In fact, government buyers purchase products and services with the aim of satisfying the needs of the community they have authority on (Kotler et al., 1999, p. 296). Government organizations - both on local and national level - have a strong connection with the territory they preside over, and their practices vary among countries and according to their specific legislation (Alexander et al., 1967, p. 32).

Environmental, organizational, interpersonal and individual factors affect government buyers in the same way as they affect organizations administrating private assets. A peculiar aspect of government buying consists of the fact that governmental organizations operate under the careful watch of the public in form of elected representatives and other politicians, but also the community itself and a variety of private stakeholders interested in how the government spends taxpayers’ money (Kotler et al., 1999, p. 297). The government’s financial availability for purchasing is determined by elected officials. This offsets large parts of regular marketing efforts for a development of this market.

Even though the purchasing behavior of public and private enterprises may be rather similar with regard to technicalities, it also entails significant differences with regards to the general structure. Stentoft Arlbjørn and Vagn Freytag (2012) argue that as conditions in the two sectors are different, the validity of comparing them is questionable. However, several aspects are well comparable. Firstly, it seems that the procurement in the public enterprise needs to comply with higher and a greater variety of requirements (Stentoft Arlbjørn & Vagn Freytag, 2012). Nonetheless - Stentoft Arlbjørn and Vagn Freytag (2012) argue further, most of the products and services procured and produced by the public sector could also be offered by private enterprises, even though there are
significant differences when it comes to regulations and transparency. Also the fact that politicians in public procurement processes are directly responsible is another difference to the private sector (Murray, 2009). Evald and Freytag (2007, p. 31) have identified further differentiators between the public and private sector: Key findings include the aspect that the users are rather citizens than customers. Also, targeting is not conducted by segmentation as in private enterprises, but through rights and legislation. Furthermore, they have found that changes are generally demand-driven in a private environment, whereas politics are usually the driver in public enterprises. Experts and politicians usually define services rather than users. An additional interesting finding is the one stating that communication usually has the goal of regulating behavior and informing about rights, while for a private enterprise communication is a means for positioning the organization. Also, the private sector is concerned with market innovation, whereas public enterprises are mostly budget-driven and aim for multiple goals.

As governmental organizations’ spending decisions are subject to public review, their purchases require elaborate processes before receiving approval. In fact, the high level of bureaucracy and strong political sensitivities make this type of organization place orders in a slower manner compared to private organizations. Convoluted regulations, frequent shifts in buying personnel, policy changes and decision-making delays have the effect of further complicating the process. Furthermore, government organizations often select suppliers through bids, typically awarding contracts to the lowest bidder and are therefore less influenced by advertising and personal selling (Kotler et al., 1999, p. 297).

Since the liberalization of the supply of public utility goods, public utility companies in such sectors as electricity, natural gas, water, transport, and telecommunications now compete in the market, facing binding budget constraints and having to deal with cost reductions while keeping a high service standard. In particular, privatized public utility companies are much more cost-sensitive and more prone to use open competition procedures for procurement (Günter & Bonaccorsi, 1996, p. 533).

As already mentioned earlier, Stentoft Arlbjørn and Vagn Freytag (2012) question the purposefulness of comparing the public with the private sector. However, it is believed that a comparison is always possible and meaningful, as great differences between the compared entities may just be an indicator for a successful comparing process. Nonetheless, it is not the purpose of this research to investigate the meaningfulness of such a comparison. Instead, it is the purpose of this section to outline the differences that exist between the given sectors. On the basis of this outlining, it has become clear that there are major differences between public and private enterprises, when it comes to the general structure and the way of doing business, but not so much with regard to processes on a lower level. In a nutshell, both enterprises merely acquire products and services in exchange for remuneration in - mostly commonly - financial form. It goes without question that aspects such as accountability, nature of stakeholders, budgets, process guidelines and business regulations may be greatly different. However, breaking these aspects down into smaller-scale processes, it emerges that these processes – such as systems or components buying, distinction between buying centers, buying situations, buying decision phases, supplier selection, customer motives and buyer-seller relationships – are indeed rather similar.

As such and even though this research investigates both public and private entities with regard to their purchasing behavior, it ought not to impede this research study’s quality
and validity, as the parameters chosen for assessment are among just these small-scale processes. In line with this understanding, the remaining sub chapters of this Literature Framework do not specifically distinguish public and private companies, but rather focus on the processes on a smaller scale.

3.3 Systems Buying and Selling
As systems buying and selling is very common in industrial business relationships and therefore also occurs in the Waste-to-Energy market with high frequency, it is believed to have a great relevance for this research study.

It is a frequent practice for organizations to opt for systems buying, which entails the purchase of a ‘packaged solution’ for a problem from a single seller, instead of individually considering all decisions, products and suppliers involved to solve the problem (Kotler et al., 1999, p. 284).

Many suppliers have adopted systems selling as a strategy for winning bids and holding accounts, as it is common that offering the most complete system meeting the customer’s needs represents a source of competitive advantage in many industries (Kotler et al., 1999, p. 284).

Instead of buying and subsequently assembling the components together respectively selecting another actor for doing it, companies look for suppliers who do not only sell the components, but also assemble the system. These systems are made of a large number of components like, for instance, products, subsystems as well as services, know-how and information. By selling systems, the supplier can sell a group of interrelated products, a system of production, inventory control, distribution and other services to meet the buyer’s need for operations running smoothly. System sellers mainly produce capital goods for both infrastructure and industrial use. Usually, capital goods are sold with discontinuity, in discrete transactions and have large financial outlays. The buyers of these capital goods are often government and public institutions (Günter & Bonaccorsi, 1996, p. 534).

Project complexity demands for a short lead time and tight coordination, meaning that the system buyer must engage suppliers long before project initiation. In fact, the majority of purchase routines is applied before and after the actual operational and financial exchanges (Lutz et al., 2015, p. 108).

After reviewing the concept of Systems Buying and Selling, the parties involved in the buying process are presented further. This ought to provide more insight into the parties’ individual relevance.

3.4 Buying Centers
After the industrial buying process as well as systems buying and selling have been approached, the entities involved in those processes need to be looked into. Morris et al. (1999) as well as Webster and Wind (1972) identify these entities and define them as ‘buying centers’.

Organizational purchasing decisions are not typically made by a single individual. Multiple actors are involved in both formal and informal ways over the course of the
decision process. They build alliances or coalitions in order to achieve particular group outcomes (Morris et al., 1999, p. 265).

Webster and Wind define a buying center as “all the individuals and units that participate in the business decision-making process” (1972, p. 284) of a buying organization (1972, p. 6).

The buying center is not to be understood as a static and official unit, but rather as the aggregation of all different activities performed by every actor involved in the buying process. Some of these actors can play less explicit roles than others, but they might equally affect the buying decision, even if in a less formal way. Therefore, it is vital to be aware of the actors involved and what the specific dynamics are among them in the buying decision, both from an organizational and an external perspective.

Webster and Wind (1972) define five typologies of actors:

**Users**

Users, which are the members of the organization who will use the product or service. Usually, they are those who initiate the buying proposal and help defining the product specifications.

**Influencers**

Influencers are the actors who affect the buying decision. They also help defining product specifications and provide information for evaluating alternatives. Technical personnel is a particularly important type of influencers.

**Buyers**

Buyers have formal authority to select the supplier and arrange the terms of purchase. They help in the phase of shaping product specifications, but their main function consists of selecting vendors and negotiating. For more complex purchases, buyers might also include high-level officers taking part in the negotiations.

**Deciders**

Deciders have the formal or informal power to select and approve the final suppliers. In routine buying, it is frequent for buyers to also be deciders.

**Gatekeepers**

Gatekeepers control the flow of information to other parties. They may be purchasing agents, technical personnel or even personal secretaries.

According to Webster and Wind, organizations operate under a complex variety of forces which affect their buying processes. These forces can be environmental, organizational, individual or social. However, economic influences are the most obvious ones. Buyers are likely to opt for decisions towards low-priced alternatives with high quality, especially when the products involved are commodities or have similar characteristics. However, when competing products differ greatly, buyers in private organizations are more accountable for their choice and tend to pay more attention to economic factors. These factors are related to the current and expected economic situation for example the level of primary demand, economic uncertainty, and the cost of money, but also to the technological, political and competitive environment, customs and cultural values.
Organizational factors consist of elements like the organization’s objectives, policies, procedures and structures of financial, technological and human resources. They lead industrial customers to take decisions that are related to a particular situation and that would be different if made in a different context than in the organization in question. Interpersonal factors include the influences that the single actors within the buying center have on each other. Webster and Wind (1972, p. 2) explain this as follows:

*Buying-center participants with the highest rank always have the most influence. Participants may have influence in the buying decision because they control rewards and punishments, are well liked, have special expertise, or have a special relationship with other important participants.*

All the members of a buying center include their own individual factors such as personal motives, perceptions and preferences which are affected by personal characteristics like age, income, education, professional identification, personality and attitudes towards risk as well as buying styles that can be intuitive, analytical, best-deal oriented or comparative in the decision process.

A study by Thompson et al. (1998) has shown that a current practice for high risk buying decisions is to opt for process-driven buying teams. These teams are not composed of different participants with conflicting objectives, but all members share the common goal of finding the best business solution to a purchasing problem. The team leader, who usually is a senior manager, works in cooperation with the other cross-functional team members, but holds the casting vote in case of split decisions. This proves how companies are no longer interested in avoiding to make mistakes, but in suppliers working with customers to create customer value and wealth for both businesses (Thompson et al., 1998, pp. 699-704).

After the *Buying Centers* have been presented, the following sub chapter provides insight into the buying situations that these parties are confronted with. The distinction between the individual situations is greatly relevant, as the whole buying process is expected to vary significantly depending on which buying situation a buyer faces.

### 3.5 Main Types of Buying Situations

After the buying centers that are concerned with the purchase acquisition have been identified, it is important to investigate which buying situations these buying centers are confronted with. As it is expected that a buying decision process is conducted in an entirely different way depending on if a product is purchased repetitively, in a modified form or if a completely new one is considered, these possible buying situations are laid out in the following. According to Reeder et al. (1991), there are three types of buying situations that buying organizations face when planning to conduct a purchase.

This distinction between the different buying situations is of great relevance for this research study, as the different types greatly affect the processes that constitute the purchasing behavior of the customer. The more standardized a process is, the less research, negotiation and effort in general is due in order to conduct a purchase. In the following, the three buying situations are displayed as presented by Reeder et al. (1991). Also the likelihood of the individual situations to occur in the German Waste-to-Energy market is discussed.
**Straight Re-Buy**

When conducting a straight re-buy, organizations reorder a product without any modifications, following the usual buying pattern and requiring minimum search for new information (Kotler et al., 1999). In other words, it is a routine activity of the purchasing department based on past buying satisfaction. As long as suppliers keep a constant level of product and service quality, the firm is unlikely to reevaluate alternatives and switch suppliers (Hassan et al., 2010). Suppliers try to ensure customers’ loyalty with automatic reordering systems so that the purchase agent saves reordering time and switching costs (Kotler et al., 1999). The possibility to conduct a straight re-buy can be considered an advantage for both supplier and buyer, as product development efforts, need identification as well as negotiations are kept to a bare minimum.

However, straight re-buys are not expected to occur in large quantities – if at all – in the Waste-to-Energy market segment, as business opportunities are imagined to be unique from case to case. Nonetheless, it may be possible that customers buy components via straight re-buys if the power plant that is to be constructed is supposed to comprise the same characteristics.

**Modified Re-Buy**

When buyers change one or more features of the purchase, such as product specifications, price, terms or suppliers, they conduct a modified re-buy (Kotler et al., 1999). This mainly occurs when organizations are not satisfied with the current suppliers’ performance or when these changes are expected to obtain significant benefits such as quality improvements, enhanced supply or cost reduction (Hassan et al., 2010). A modified re-buy is the chance for the competitors of the current supplier to obtain a new client, offering a more satisfying performance (Kotler et al., 1999).

According to Jobber and Lancaster (2000), modified re-buys often involve engineers, production managers, and purchasing officers, but little involvement from the top management (Kotler et al., 1999).

Modified re-buys are indeed expected to occur more often in the relevant market segment. This may be the case, if a customer concerned with the construction of power plants builds several sites that are very alike in parameters such as treatment method, capacity or output. However, it may not be expected that these cases occur very often, as the business with Waste-to-Energy power plants appears to be a rather specific one.

**New Task**

A new task occurs when an organization purchases a product or service for the first time, with the aim of satisfying a need which is different to those experienced in the past. In this situation, the buyer must take decisions concerning product specifications, suppliers, price range, payment terms, order quantities, delivery times and service terms (Kotler et al., 1999). The lack of experience of the buying center in this situation represents a great opportunity for marketers, as potential customers face an intricate problem-solving process getting information, comparing alternatives and collecting knowledge about product specifications and potential vendors. In situations that involve high costs or risk, the number of participants in this process is higher, while the efforts to collect information are more intense (Hassan et al., 2010). Resulting, a new task requires the greatest development and negotiation efforts.
As mentioned earlier, the business opportunities in the Waste-to-Energy segment seem to be rather complex and specific. Therefore, it is to be expected that a new task would be the most common and frequent buying situation to occur. Treatment method, desired capacity and output, but also softer factors such as local politics may be aspects that greatly influence each and every business opportunity. Every variable in this equation increases the chance for a new task-buying situation.

After it has been determined which type of buying situation is at hand, the individual phases of the buying decision are to be reviewed, as these are the elements that further define the buying process in closer detail.

3.6 Buying Decision Phases

Once the possible buying situations have been elaborated upon, it is essential to realize that these buying situations further split up into decision phases as identified by Webster (1991).

Webster (1991, p. 28) illustrates the industrial buying process by listing eight stages that the buying center runs through when conducting a purchase through a new task. Webster states that it is vital for the selling organization to analyze the different phases of the buying process in order to succeed in satisfying the needs of the buyers. In the cases of a modified re-buy or a straight re-buy, some of these stages may be skipped or shortened, as the buying center collected enough experience through prior purchase decisions. The steps usually present themselves in a logical sequence, but their appearance in a different order is also possible. Steps may also be added, repeated or take place simultaneously.

Webster (1991) defines the following buying decision phases:

1. **Need Recognition**
   The first step of the buying process is the recognition of a need that can be satisfied by purchasing a specific good or service (Kotler et al., 1999, p. 292). This recognition phase takes place after internal or external stimuli.

   In the case of the Waste-to-Energy market, these stimuli may possibly include an increase in the energy demand or a need for waste treatment. Additionally, a private energy provider may be motivated to extend their portfolio of power generation methods and move towards a renewable energy-centric power production.

2. **Definition of the Characteristics and Quantity of Item Needed**
   Once the need has been detected, the second step for the buyer is the development of a general need description of the characteristics and quantity of the needed item. If the purchase entails standard items, the process is smoother than the one involving complex or customized items. Customizing items might involve the participation of several actors to define the its features more accurately, possibly ranking the importance of reliability, durability, price and other attributes (Kotler et al., 1999, p. 293).

   Activities in this stage of the buying decision process in the Waste-to-Energy market would most likely include the definition of the future power plant’s characteristics. The most important aspects may be the plant’s capacity, output and treatment method. This phase of the process defines the plant’s nature on a larger scale.
3. **Development of the Specifications to Guide the Procurement**

The buying organization defines the best technical product specifications of the needed item. This often happens with the support of a value analysis by the engineering team aiming to obtain design improvements, reduction of the costs or standardization (Kotler et al., 1999, p. 293).

Further breaking down the key characteristics defined in the previous phase, the project is planned in more detail, as technical specifications are formulated. This may narrow down the pool of potential suppliers before the actual search has started, as it is to be expected that the more specific the demand, the less suppliers are able to provide the desired products and services.

4. **Search for and Qualification of Potential Sources**

The fourth phase consists of the search for the best supplier, grouping all the qualified vendors that will be considered for the purchase of the needed item. The necessary information can be collected in many ways, such as reviewing trade directories, internet search or recommendations from other companies (Kotler et al., 1999, p. 293). The estimated amount of time spent on this step increases with increasing levels of complexity and cost of the item.

Due to the fact that the Waste-to-Energy market is a rather small segment and the characteristics of a Waste-to-Energy power plant are highly specific, it is to be expected that the pool of potential suppliers is considerably limited.

5. **Acquisition and Analysis of Proposals**

The buyer requests the previously selected suppliers to submit proposals. Suppliers fulfill this request by presenting their products in catalogues, through salespersons and, when the purchase is rather complex or expensive, by submitting detailed written proposals or holding formal presentations (Kotler et al., 1999, p. 293). In these cases, it is also very likely for the buying process to become more elaborate and time consuming, involving the stipulation of counter-proposals and new offers (Robinson et al., 1967, p. 293).

After the pool of potential suppliers has been defined in the previous phase, the buyer requests proposals for the specific project in question. After these have been received, the analysis process starts. As power plants are a rather complex and cost-intense domain, this process may be very time-consuming.

6. **Evaluation of Proposals and Selection of Suppliers**

The sixth phase of the process consists of the evaluation and analysis of the proposals received, the selection of one or more suppliers and subsequently the rejection of the others (Kotler et al., 1999, p. 293). Nevertheless, at this stage, it is possible for the buying center to further negotiate with the selected suppliers for better prices and terms before making the final decision (Kotler et al., 1999, p. 293). Once the buyer has identified the proposal that best fits their needs and publicly releases this decision, it is not unusual for the competing suppliers to amend and resubmit their proposals.

Considering again that a Waste-to-Energy plant is a major project, it is rather likely that several suppliers are selected in order to provide the components needed. However, it is also possible that a power plant is constructed as a turnkey project. In this case, the operator would purchase the entire plant from a supplier. This would change the structure
of the purchasing process. Nonetheless, it is important to bear in mind that the supplier would be the party confronted with the procurement of components. Resulting, it could be stated that the purchasing process of turnkey projects contains one additional step.

Due to its particular relevance for answering the research questions of this study, this step and the factors that affect supplier selection are addressed in further detail in the following sub chapter.

7. **Selection of an Order Routine**
   The establishment of an order routine specification represents the seventh phase, entailing the final order with the selected supplier or suppliers and the list items such as technical specifications, quantity needed, expected time of delivery, return policies and warranties (Kotler et al., 1999, p. 294). Furthermore, the buying center and the suppliers agree on terms for maintenance, repair and operating items, with blanket contracts or periodic purchase orders.

Even though the finalization is of great importance, it is likely that the establishment of an order routine is rather limited. This is based on the assumption that a Waste-to-Energy plant is highly specific and only very rarely has similar characteristics to existing ones. Also, components for power plants are no FMCGs or parts used in manufacturing of everyday items, but highly complex and – mostly – expensive components. Therefore, they are not purchased on a very frequent basis, which questions the meaningfulness of an order routine.

8. **Performance Feedback and Evaluation**
   In the final stage of the process, the buyer gives feedback and reviews the supplier performance. The performance evaluation aims to attest whether the purchased product solved the problem and how well the supplier performed prior, during and after the purchase (Robinson et al., 1967) Depending on the degree of its satisfaction, the buying organization decides to continue, modify or drop the arrangement (Kotler et al., 1999, p. 294).

This last buying decision phase is of significant importance also in the Waste-to-Energy market. Even though it may not be the case that players in this market segment establish long-term co-operations – again due to the plants’ uniqueness and infrequent construction periods - after sale-relationships for maintenance and repair are expected to be greatly important in order to keep the power plant running reliably.

These buying decision phases constitute a good theoretical background for this research study. However, it is the purpose of this research to confirm or reject this theoretical model. It is to be investigated, if the phases outlined above indeed do occur in the buying processes in the Waste-to-Energy market or no, if only some of them occur or if they do in a similar form. Also, it is to be expected that some phases are more important and time-consuming than others. Furthermore, it may be that the phases greatly differ in both quantity and quality depending on the relationship between supplier and buyer. As such, it may be the case that the acquisition and analysis of proposals, as well as their evaluation and the supplier selection – phases 5 and 6 – are entirely obsolete, if there is a long-term business relationship in place that may have been developed during earlier projects. For situations where this is not the case and a supplier is to be selected, it is obvious that these
phases bear great importance. Therefore, the following sub chapter assess the subject of Supplier Selection in closer detail.

3.7 Supplier Selection
The importance of the selection of suppliers is a step in the buying process that increases with an increasing complexity of the purchase situation. It is usual for industrial customers to opt for multiple sources of supplies in order to satisfy a wider range of needs for different products and services, but also to avoid being dependent on one supplier and to get comparisons of performance among the suppliers chosen over time (Kotler et al., 1999, pp. 293-294). The members of the buying center choose the suppliers according to their capability of satisfying their specific situational needs for price, service, quality and delivery (Kotler et al., 1999, p. 294). Leender and Fearon (1991) list the most significant attributes in shaping successful relationships between supplier and customer:

- Past history
- Facilities and technical strengths
- Financial status
- Organization and management
- Reputation
- Systems
- Procedural compliance
- Communication
- Labor relations
- Location

Even though all these factors appear to be relevant, it may become clear that some are more important than others. The relevance of factors may also be influenced by or depend on the nature of the buying company. Public and private organizations may have different priorities when it comes to selecting their suppliers.

Hassan and et al. (2010) have conducted a study aiming to detect the factors affecting non-routine purchasing of industrial machinery, while especially focusing on new tasks and modified re-buys, in a Malaysian a manufacturing company. This research has been conducted to analyze the significant factors affecting the products purchased, supplier selection, marketing strategies of the suppliers and the influencers involved in product buying decision making.

This research has shown that the ranking of factors affecting supplier selection occurs as follows in both new tasks and modified re-buys:

1. Product test run availability
2. Long-term business relationship
3. High degree of contact ability
4. High negotiation flexibility
5. Excellent after sales service
6. Established supplier’s company
7. Established local suppliers
8. Customer recommendation
9. Competitors‘ factors
The study has identified the aspect of product test run availability as the most significant factor in supplier selection in both buying situations. This is likely to be caused by the fact that the engineers need to conduct an evaluation on product performance before justifying the purchase. Long-term business relationships have been ranked second, but the mean reached by this attribute was very close to the one scored by the first factor, meaning that this also is a factor of fundamental importance.

Other studies have focused on identifying supplier selection factors. Cebi and Bayraktar (2003) mention supplier reputation, earlier experience with the supplier, guarantees for results, supplier’s knowledge and competence and direct communication and contact with the supplier. Axelsson (1998) has instead shown the importance of price, product quality, accessibility to information, service and support, delivery costs, delivery time, stability in the delivery, participation in the product development, supplier flexibility, geographic localization and technological standards.

Just as it is the case for the buying decision phases, it has to be investigated which factors the prevalent ones in the supplier selection in the Waste-to-Energy market are. As this study is conducted in a very specific market segment, it is possible that some factors of the ones outlined above do not have any relevance and new ones become significantly important.

As the buying process and the parties involved have been dealt with theoretically, it also needs to be assessed how the initiation of this process has started. The Customer Motives describe an organization’s need justification for a Waste-to-Energy power plant and thereby for kicking off the buying process.

3.8 Customer Motives

Customer or buying motives are the reasons which induce a consumer to buy a particular product (Copeland, 1924, p. 304). Compared to individual end consumers’ motives, the buying motives of industrial purchasing are distinguished by a higher level of rationality, as industrial firms purchase for business reasons and are guided by profit considerations. Furthermore, industrial buyers have to justify their purchases to other staff members and superintendents in terms of performance (Alexander et al., 1967, p. 35). In the case of public institutions, this is even more complex as strict regulations are in place when spending public funds.

Copeland (1924) listed the motives that characterize the buying process of industrial products. The first and most important motive is the economy in use, which refers to the desire to secure economy in production, by lowering the number of employees, the quantity of material, operating maintenance and expenses necessary to the production process. Protection against loss is the second listed motive, also including the avoidance of worries and annoyance and not only economic aspects. Enhancing productivity of the plant is also considered important for industrial customers, as an increased output leads to higher revenues. Industrial users need equipment which will assure steady and continuous operation of the plant and products that can be relied upon to perform their assigned tasks. These two aspects are included in the motive of dependability in use. Other important factors detected by Copeland are dependability in quality, durability, flexibility in operation and use, simplicity in operation and use, handiness, facility of installation, stability enhancements of a product, facility in executive control, aiding sales promotions, save guiding welfare and morale of the employee and economy in purchase.
Patronage motives, instead, induce a customer to trade with a particular firm instead of its competitors. From an industrial perspective, these motives correspond to specific desirable aspects of a firm’s offer which, for instance, facilitate the customer’s job, such as promptness in delivery, dependability in quality and economy in purchase (Copeland, 1924, p. 314). A firm’s reputation also becomes a motive, when suppliers acquire credits for quoting fair prices, for their reliability or variety of selection. Securing the exact fulfillment of specifications, engineering and designing service and dependable repair service are also important industrial patronage motives (Copeland, 1924, p. 315). Patronage motives often lead to the establishment of effective buying habits and continuous business relationships between buyer and seller (Copeland, 1924, p. 314).

After the loop of the buying process has been closed by assessing the Customer Motives, it is left to review the establishment and maintenance of long-term Buyer-Seller Relationships.

3.9 Buyer-Seller Relationships

Many different studies have focused on identifying the key drivers of relationship satisfaction and commitment in industrial contexts. The main stances of some of the prevalent ones are outlined below, as the establishment of long-term buyer-seller relationships is expected to be of great interest in the Waste-to-Energy market:

The relationship between buyer and seller is one of the factors distinguishing industrial marketing from consumer marketing (Webster, 1991, p. 52). It consists of established rules and norms of behavior that build up the framework within which each individual activity takes place, such as negotiations, payments, deliveries or contacts (Ford, 1982, p. 298). This kind of relationship is developed during the purchasing process and continues throughout subsequent transactions, after-sales service and repeated orders and affects the buying behavior in many ways (Webster, 1991, p. 52). In fact, former experiences of individuals and their organizations have important influences on attitude and behavior in both purchasing and selling (Ford, 1982, p. 298). Relationships in industrial contexts are often complex and long-term oriented, even if it is also common for them to consist of a single purchase only (Ford, 1982, p. 299). Industrial relationships evolve over time and can be considered to traverse a series of stages characterized by increasing mutual adaptation, reduced “distance” and increasing commitment (Ford, 1982, p. 237).

The Industrial Marketing and Purchasing Group developed the interaction approach to explain the complexity of relationship management. This approach sees these relationships as actively generated by both the two parties. Problem solving and transfer ability are extremely relevant factors which characterize the selling firm and consequently shape this relationship (Håkansson, 1982, p. 393).

The problem solving ability includes both the abilities that the product comprises, such as function and quality as well as the services which are provided in combination with the product, like for instance the capability of comprehending the buyers’ needs and offering suitable solutions to their problems. (Ford, 1997, p. 26). Transfer ability describes the capacity and reliability of the deliveries and also the extent to which all the issues related to the negotiation phase can be solved (Ford, 1997, p. 26). The problem may have a higher or lower degree of difficulty. Both the problem’s as well as the transfer may be more or less difficult and unique (Håkansson, 1982, p. 393).
According to Homburg and Rudolph (2001, p. 29), the communication between buyer and seller is more complex than presented by Håkansson (1982, p. 394), as it does not only involve salespeople, but also has to include all internal staff members of the supplier.

The selling firms have to prove having resources in terms of equipment, knowledge, organization in order to make the buyer interested in a relationship (Ford, 1997, p. 26). Nevertheless, industrial buyers tend to develop defined expectations about the performance of the seller or prospective seller. Homburg and Rudolph (2001, pp. 28-29) define product characteristics and accompanying technical services as the two main dimensions that constitute the high level complexity of industrial customer satisfaction.

A study by Abdul-Muhmin (2005) has proven that product quality and interpersonal factors such as benevolence and credibility in combination are important factors of relationship satisfaction in industrial markets. In particular, instrumental factors represent critical aspects of satisfaction during the early stages of relationship development, while instead interpersonal factors become more important during later stages. Among the tested instrumental factors, product quality is the only one having a considerable effect on relationship satisfaction. In fact, in addition to representing a significant supplier selection criterion, it is also a key aspect of post-purchase relationship satisfaction.

The confirmation and fulfillment of buyers’ expectations regarding their purchases is crucial to increase the probability of re-buys or new purchases. A buyer’s post-purchase dissatisfaction is likely to prevent future purchases from the same seller (Harmon et al., 1997, p. 108).

The study by Lutz and Ellegaard (2015) has shown how essential it is to foster relationships both before and after the purchase, and also during the latent period between project purchases (Lutz & Ellegaard, 2015, p. 108). This is also consistent with the works by Gadde and Dubois (2010) and Ojansivu et al. (2014), who have gathered evidence on the cyclical nature of the project relationships, as well as the notion of post-project supplier relationships.

The review of literature as such closes with this sub chapter, while the following sub chapter provides an overview over the relevant theory presented.

3.10 Summary of Relevant Topics
In order to provide an overview over the content covered in this chapter, Figure 1: Summarizing Model summarizes the relevant models in the Literature Framework and points out the main themes of the Interview Guide. These main themes have provided the structural basis for the Thematic Network Analysis.

Therefore, the fields ‘buying centers’, ‘customer motives’, ‘types of buying situation’ and ‘buyer-seller relationship’ are the theoretical key pillars of the interview design, as they have evolved from the literature review outlined in this chapter. The concept of ‘types of buying situation’ is further narrowed down into ‘buying decision phases’ and ‘supplier selection’. Resulting, the interview structure has been organized around these concepts, as they are considered to constitute important elements of industrial buying behavior, which is the overarching topic. As it becomes clear in Appendix I – Interview Guide, the structure of the Interview Guide leans on the theoretical concepts in level 1. This is how
the concepts discussed in this chapter have supported the establishment of the interview guide and how theory and practice have been connected. It has been decided to present *Figure 1: Summarizing Model* and its explanation at this point of the research report, in order to round off the *Literature Framework*.

![Figure 1: Summarizing Model](image-url)
4 Scientific Methodology

After establishing the Literature Framework, this chapter elaborates upon the pre-understandings as well as the choice of subject. Furthermore, it intends to express the author’s philosophical positions towards research in the business administration field, with particular focus on discussing the nature of knowledge and social entities. Subsequently, the research approach and research design that were chosen when writing this thesis.

4.1 Pre-Understandings

This Master’s Thesis research project has been conducted at Umeå University in 2015 and 2016 by a German author enrolled in the Master of Science program in marketing at Umeå School of Business and Economics.

Due to the author’s employment in the energy sector in 2014, there has been a certain interest in conducting investigations in this market. The additional fact that the sector is one with significant importance in all developed countries elevated this interest to another level. Nonetheless, it has been out of question that the energy sector as a whole is far too broad for the scope of this project. Therefore, a more specific market for this research project had to be chosen. Since the renewable energy market has become a market segment of increasingly significant importance, it was decided to conduct the research in this field. Given the fact that this more specific field also includes many different sub segments and would – as a whole – still be too broad for the thesis’ scope, the subject had to be narrowed down even further to a more specific and distinct topic.

Even though the renewable energy market is relatively new, several methods of renewable power generation methods have been invented and further developed. Popular and frequently applied ones include hydro, biomass, wind, concentrated solar panels and Waste-to-Energy. It has been decided to focus on the method and sub segment of Waste-to-Energy, since the application of this method is broad and well developed. In order to further narrow down the research topic and to increase the extent of managerial relevance, the behavior of industrial customers in the market in question has been investigated in detail. This has included an investigation of the buying process as well as customer and investment motives. Furthermore, the market has been geographically defined to Waste-to-Energy plants in Germany. Desk research has revealed that the Waste-to-Energy market in Germany is rather well established compared to other countries in the European Union. This is the main argument for conducting this research study in this geographical market. Furthermore, the author’s origin and the fact that no language barriers have been expected in Germany are additional factors that have influenced the selection.

The methodological choices for this thesis have been made with the goal of pursuing a philosophical approach that is consistent with the thesis’ purpose and also with the author’s personal research believes. The study presented is exploratory as it is centered on finding explanations for happenings in the environment, seeking new insights and performs an investigation to assess new perspectives on the examined phenomena. As persons, events, structures and situations are portrayed in accurate profiles, this study provides to some extent descriptive aspects.

4.2 Ontology

The aspect of ontology assesses the nature of social entities and - more specifically - if they can be considered as independent from social actors or if they are generated by social
actors (Bryman & Bell, 2011, p. 20). The first ontological position is called objectivism and implies the existence of social phenomena and their categories - such as organizations - as external reality from the individuals who are related to it (Bryman & Bell 2011, p. 21). The antithetical position is constructionism (also constructivism) which asserts that social phenomena are continuously revised and produced by the interaction of social actors (Bryman & Bell 2011, p. 22). According to this conception, knowledge and categories are continuously constructed and revised and the process of building it generated by the interaction between interviewer and respondent. (Perry et al., 1999, p. 18). Thus, the striking difference between the two positions that is particularly relevant for this field of research, is that while objectivism considers social phenomena as having an independent existence from all social entities that can also be cultural values or organizations, constructivism assesses that the phenomena are real only due to the actions and relations of social actors (Bryman & Bell, 2011, p. 21). In particular, Berger and Luckmann see reality as shaped by institutionalization of habitualized behavior (1966, pp. 71-72).

The research problem presented in this thesis has been formulated in order to be solved in light of a constructionist approach, putting emphasis on the involvement of social actors in shaping the reality of the organization. This aspect is captured by the application of qualitative interviews for collecting data, stressing the ways in which social actors give a meaning to the social reality they are in (Bryman & Bell, 2011, p. 20). Qualitative interviews also enable the researcher to catch the dynamics and interactivity of people’s role in constructing the social world. The adoption of constructionism as ontological perspective for this thesis derives from the belief that exploring social actors’ subjective meanings for their purchase activities enables insight into their characteristics. Furthermore, the research questions of this study are shaped on the basis of a constructivist approach, as they tend to emphasize the different dynamics that are generated by the social actors who are involved in the buying process of a Waste-to-Energy plant. This process is seen as dynamic and continuously influenced and shaped by the interactions between social actors. Furthermore, its meaning is assessed in relation to the examined organizations as the studied phenomena would never take place without the interaction of its actors.

4.3 Epistemology

Epistemology questions the nature of knowledge with a particular attention on ‘what is or should be regarded as acceptable knowledge in a discipline?’ (Bryman & Bell, 2011, p. 15). On this matter, it is possible to choose between two main positions: Positivism and interpretivism.

Positivism considers knowledge as objective, ruled by the laws of nature and that “science must (and preferably can) be conducted in a way that is value free (that is, objective)” (Bryman & Bell, 2011, p. 15). Furthermore, positivism considers the acquisition of knowledge as phenomenalistic. This means that it is acquired and confirmed via the senses. Thus, a positivist research needs to be performed in a value-free set, without any inclusion of personal opinions and perspectives on the subject. The role of the researcher is, in this case, the one of an external observer, employing theory testing as process for creating new knowledge (Bryman & Bell, 2011, p. 15). The researcher has to keep a distance from the participants of the study, in order to be able to make clear distinctions between reason and personal emotions. This has the final goal of pursuing objectivity through a rational and logical approach to research (Carson et al., 2001, p. 5).
Contrasting positivism, interpretivism is an approach that neglects the possibility of applying the scientific model to the social world, in favor of a method that reflects the need for differentiation between the world of social phenomena and the world of natural sciences. According to this view, the social scientist needs to be capable of grasping “the subjective meaning of social action” (Bryman & Bell, 2011, p. 17). In fact, this view aims to capture all the complexity and peculiarities of the world of business research, in a way that would be impossible if applying the method of the natural sciences (Bryman & Bell, 2011, p. 17). Therefore, the knowledge acquired in this way is seen as socially constructed rather than objectively determined (Carson et al., 2001, p. 5).

By adopting the epistemological position of interpretivism, this research report does not consist of a mere presentation of the collected data, but also provides an interpretation of the research findings, in light of their specific social context. The fact that there is a compatible match between the selected epistemological and ontological stances further validates this choice and the interpretation that emerges from it. Furthermore, the research has been designed on the basis of these stances in order to increase this study’s academic rigor and consistency. Therefore, it has been decided to approach the research topic of this study through semi-structured interviews.

4.4 Research Approach

With regard to the relationship between theory and research, deduction, induction and abduction are the three reasoning options that researchers may choose from. When following a deductive approach, the researcher formulates hypotheses on the basis of what is known about a particular domain. These are then exposed to an empirical analysis (Bryman & Bell, 2011, p. 11) and subsequently tested, resulting in hypothesis acceptance or rejection (Saunders et al., 2009, p. 124). Saunders et al. (2009, p. 125) further define induction as a process characterized by the goal of explaining the causal relationships between the detected variables by collecting quantitative data and the creation of a control setting to test the hypotheses. The overall guideline of this approach is to follow scientific rigor through independent observation and operationalization and quantitative measuring of the concepts under study. Pursuing these aspects - in combination with the selection of a sample of sufficient size - enables generalization of the study’s findings (Saunders et al., 2009, p. 125). Inductive reasoning implicates a process of examination of a problem in order to detect its causes and to formulate possible solutions to solve it (Bryman & Bell, 2011, p. 13). This type of approach results in the creation of a theory by developing generalizable inferences from observation and building new theory from the collected data (Saunders et al., 2009, p. 126). In particular, the process generated by analyzing data as part of an inductive research strategy is extensive and time consuming as it consists of continuous shifts between theory and data (Bryman & Bell, 2011, p. 573). Following this approach, it is possible to gain better insights into the nature of the problem and the context in which it takes place (Saunders et al., 2009, p. 126). Therefore, small-scale samples are more suitable for this type of study. The third pursuable option is abduction (Dubois & Gadde, 2002), which has many common aspects with the inductive approach: The idea of a continuous interplay between theory and empirical observation and the aspiration to generate new concepts and theoretical models. However, the abductive approach focuses on theory development rather than on theory generation (Dubois & Gadde, 2002, p. 556). Furthermore, it criticizes the concept of research as made by following a list of phases in favor of ‘systematic combining’ in the sense of a constant back and forth from empirical findings and theory, based on the needs emerging during
the research process (Dubois & Gadde, 2002, p. 555). The collection of data in this approach has the aim of identifying a phenomenon, detecting themes, discovering new patterns (Saunders et al., 2012, p. 144) and contextualizing them in a theoretical framework which is continuously updated in accordance to the arising theoretical insights and findings acquired while researching (Dubois & Gadde, 2002, p. 555). Consistently with the ontological and epistemological positions discussed in the previous sub chapters, this research project adopts an inductive approach to research. In fact, this choice was made in relation to the researcher’s philosophical stances to both interpretivism and constructivism, which acknowledge the impact of social actors (Bryman & Bell, 2011, p. 17). Furthermore, an inductive approach appears to be particularly beneficial for this study, as it is consistent with its different characteristics such as research design and selected topic. In addition, the qualitative research design is often combined with an inductive research approach (Bryman & Bell, 2011, p. 13). As no hypotheses have been formulated that could be tested, a deductive approach would not be suitable. As aforementioned, given the fact that this thesis aims to gain a deeper understanding of the presented problem, the inductive approach is more reliable to achieve this objective, as it takes the context of the research into account, which is particularly relevant in the case of the topic investigated in this research study (Saunders et al., 2012, p. 146).

4.5 Qualitative Research Design
A researcher in the business research field can choose from a qualitative and a quantitative research design. The differences between these two designs are based on ontological and epistemological positions and on the assumptions of the connection between theory and data (Bryman & Bell, 2011, pp. 26-27). As explained in the previous sub chapters, this research follows constructivism and interpretivism. This choice of combining these perspectives is - as argued by Bryman and Bell - likely to result in a qualitative research design. Qualitative research is also suitable for building theories through inductive reasoning (Bryman & Bell, 2011, p. 387). The data collection takes place by interviewing different social entities with the goal of looking for in-depth insights. Therefore, the sample consists of a modest number of actors, if comparing with the sample size required for a quantitative research design (Bryman & Bell, 2011, pp. 410-412). In this framework, theory emerges from the data collection, appreciating the patterns that derive from the interviews with the actors, without imposing any shape on the data (Bryman & Bell, 2011, p. 392). Therefore, a qualitative research design is believed to be more effective to deal with the research problem presented in this thesis, as it helps getting more detailed and deeper insights that are needed to answer the research questions. Also, it is essential to mention the fact that even though an elaborate interview guide has been used in all interviews, it has always been considered only a guideline for structuring the interview. In none of the cases, the interviewer has stuck to all the questions, but has deliberately skipped and added questions based on the interviewee’s answers as well as the interview’s process.

4.6 Case Study
A case study is a research strategy with the goal of analyzing a single case in depth, focusing on understanding the dynamics of a contemporary phenomenon which exists in relation to a defined context (Saunders et al., 2009, p. 145). A case study is most commonly centered on geographical location or on a specific organization, but it could also analyze a person or event (Bryman & Bell, 2011, pp. 59-60). Case studies can be performed in any kind of social setting, in particular if they are characterized by technologically distinctive situations (Yin, 1994, p. 13). The focus can be on a single
element at a time (single case study) or involve the study of more than one element (multiple case study). In this context, it is important to investigate the reasons behind the existence of the discovered relationships, enhancing theoretical reflections in order to express connections in the findings.

The process of inductive theory building through case studies has been explored by Eisenhardt (1989), who asserts that theory resulting from a case study is likely to have empirical validity and consistency with empirical observation, thanks to the strong link between the theory building process and evidence. The main advantage, in fact, is that theory building in a case study does not rely on previous literature or previously collected evidence, but is often characterized by novelty, testability, and empirical validity (Eisenhardt, 1989, pp. 547-548). An additional strength of case studies is also that the information is collected from different types of sources, as this allows to provide multiple measures on the same phenomenon and to validate the findings, when the information acquired is convergent among the different sources (Yin, 1994, p. 92). Eisenhardt also expresses the possibility of making adjustments during the data collection, such as adding cases to explore new topics and patterns that emerge during the research activity. This is an iterative process which involves data from an extensive variety of sources. Therefore, qualitative data is especially effective when it comes to understanding the hidden dynamics of relationships and the reasons behind them (Eisenhardt, 1989, pp. 547-548).

For the sake of clearly understanding the researcher’s choice of conducting a case study, it is important to state that this research comprehends the German Waste-to-Energy market in its entirety as the case. This justifies and requires the decision of investigating several individual entities in this market segment.

In order to further justify the choice of a case study and to prove that this is the most appropriate option for fulfilling this research’s purpose, it is common practice to discuss other alternatives and to evaluate their suitability.

Even though an experiment is indeed suitable for answering research questions in the categories of ‘how?’ and ‘why?’ (Saunders et al., 2009, p. 142), this research strategy is not considered to be a good fit for this research, as the buying behavior structures in the Waste-to-Energy market are to be assessed in close detail, which exceeds the efforts of merely testing the influence of an event on a variable.

Due to the fact that a survey is usually concerned with answering the questions of ‘who?’, ‘what?’, ‘where?’, ‘how much?’ and ‘how many?’ (Saunders et al., 2009, p. 144), this research strategy is not suited for this study. Another reason for not choosing the option of a survey is the fact that it is rather suitable for collecting quantitative instead qualitative data. Even though it would be possible to cover a much larger sample by using a survey in this research’s time frame, the results would most likely fail to achieve the desired depth of insight.

Action research is not a viable option in the first place, as the researcher is not directly concerned with or affected by the research topic. Also, action research is prone to investigate phenomena of single individuals, entities or small parties of a community. As this research aims on gaining insight into the Waste-to-Energy market in the larger picture, this strategy would fail to fulfill its purpose.
The research strategy of grounded theory may be a good fit for this research study, as literature in this field is very underdeveloped. However, it has appeared more feasible to build upon the existing literature and to start the research with a Literature Framework. Also, it has been expected that a constant process of formulating and revising theory throughout the research would exceed the project’s time frame. As such, grounded theory does not appear to be a suitable option for this research study.

The resources required for conducting a research through ethnography are vast. This and the fact that an ethnographic research investigates the phenomena in its context are clear arguments for not adopting this research strategy for this study. Also, the circumstance that the construction of power plants that are investigated and thereby the purchasing of products and services have already been finalized does not allow researching the phenomena in their context.

Even though archival research may be a suitable strategy for fulfilling this research’s purpose and answering its research questions, gaining access to several relevant companies’ records is too great an administrative effort for this study and would also exceed its time frame.

After carefully evaluating and discussing the research strategies Saunders et al. (2009) point out, it has become clear that a case study is the most suitable option for conducting this research and fulfilling its purpose. The strategy of a case study also aligns with the nature of the research questions developed earlier, as deep insights in the form of qualitative data are pursued. A survey for example would most likely fail to achieve this objective.

By conducting a case study, the researcher wants to achieve the collection of qualitative data that enables deep and detailed insights into the buying behavior of key players in the Waste-to-Energy market in Germany. It is the goal to cover a high number of plants in order to obtain results that allow generalization.
5 Practical Method

After elaborating on this research project’s Scientific Methodology in theory, this section explains in detail how the process of data collection was conducted in practice. It also justifies the author’s choice for sampling Germany.

5.1 Qualitative Data Collection

Data collected by qualitative interviewing has the final goal of gathering evidence from the personal viewpoint of the respondents, getting a deeper understanding of phenomena and their underlying factors (Bryman & Bell, 2011, p. 466). A semi-structured interview allows respondents to give unrestrained answers and avoids standardized responses. The red line in this type of interview is provided by a selection of themes covering the most relevant topics and thereby guide the interview process. Nevertheless, the question design can vary among the different interviews, as the interviewer has the chance to further investigate the selected topics by asking follow-up questions and to explore upcoming and unforeseen patterns that emerge from each single interview (Bryman & Bell, 2011, pp. 466-467). In contrast to structured interviews, this method of data collection is suitable for obtaining the goal of this thesis, as it enables exploring the patterns generated by in-depth answers. Additional tailoring of the interview on the basis of each respondent’s characteristics – such as profession and function – offers a chance for fully exploiting the interviewees’ knowledge and experience as well as ensuring high relevance of the findings.

5.2 Qualitative Sampling Process

In light of the selected research design and method adopted for this thesis, it is important to choose a suitable strategy to collect the data that is needed for the study (Bryman & Bell, 2011, p. 427).

Probability sampling is not always appropriate for answering the research question of a study. As previously explained, this thesis is centered on an in-depth analysis of selected cases, aiming to gain generalizable insights. Therefore, non-probability sampling is an appropriate technique and consistent with all the other characteristics of the study (Saunders et al., 2009, p. 233). More specifically, the data is collected from a purposive sample, which has been chosen on personal judgment (Saunders et al., 2009, p. 234), according to what is considered most useful for fulfilling the objectives of the research project. This means that both private operators as well as governmental institutions have been included.

In fact, purposive sampling enables the researcher to use personal judgment for detecting the cases which have the highest potential to answer the research questions and purposes (Saunders et al., 2009, p. 233). This sampling method is also suitable to be employed in case studies, when it is necessary to entail small samples that are particularly informative (Saunders et al., 2009, p. 233). Nevertheless, it is essential to bear in mind that the non-probabilistic nature of this sample does not represent the entire population, but rather conveys an illustrative profile of selected cases.

Secondary research has revealed that Germany has a rather high Waste-to-Energy market volume. This characteristic as well as softer factors like the author’s origin have led to the decision of choosing the German Waste-to-Energy as a population for this study. The sampling process in Germany has been carried out on the basis of a list displaying Waste-
to-Energy power plants that was available online. *Figure 2: Waste-to-Energy Power Plants in Germany in 2012* displays an overview of Waste-to-Energy plants in Germany.

![Waste-to-Energy Power Plants in Germany in 2012](image)

*Figure 2: Waste-to-Energy Power Plants in Germany in 2012 (Thiel, 2013)*

In line with the *Research Purpose*, the sample for this research project has been defined in the German Waste-to-Energy market. The respondents for the qualitative interviews have been selected among the personnel of different Waste-to-Energy plants in Germany. In order to have a broader input of data and a point of view from several perspectives, employees from both public and private operators as well as representatives of municipalities in different positions and functions have been interviewed.

Via telephone and email, as many as 45 key players of operators and municipalities have been contacted. These entities have been selected on the basis of an overview of Waste-to-Energy plants in Germany that has been established through internet research. Due to the fact that this internet research has been very intense and thorough, it is assumed that this overview is very close to covering the whole market. It comprises power plants of different sizes, but also their operators and the municipalities concerned with the plants’
administration and management. As the Waste-to-Energy market as a whole is rather limited and finding informed interview partners in a B2B-environment is usually rather difficult, any chance for obtaining valid data has been made use of and no pre-selection taken place. It is also important to mention that the original goal was to contact members of the purchasing department. As these turned out to be either difficult to get a hold of or insecure about revealing information, representatives of the public relations departments have been consulted and included in the data collection process. This put the companies on the safe side of not disclosing any confidential data and thereby cause a higher motivation to participate in the first place. Seven individuals agreed to participate in this research, while the remaining 38 denied, mostly due to privacy matters, lack of resources and unwillingness to prioritize this study. However, the participating interviewees have enabled maintaining a diversification between smaller and larger and public and private corporations and plants. Table 1: Sample Characteristics displays the types of organization the interviewees belong to as well as the interviewees’ functions within these organizations.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Organization</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee A</td>
<td>Company I Public Utility Provider</td>
<td>Head of Internal Relations</td>
</tr>
<tr>
<td>Interviewee B</td>
<td>Company I Public Utility Provider</td>
<td>Assistant Purchasing</td>
</tr>
<tr>
<td>Interviewee C</td>
<td>Company X Public Corporation</td>
<td>Head of Finance and Controlling</td>
</tr>
<tr>
<td>Interviewee D</td>
<td>Company III Engineering Company</td>
<td>Project Manager Waste-to-Energy</td>
</tr>
<tr>
<td>Interviewee E</td>
<td>Company V Private Power Producer</td>
<td>Coordinator Contracts Environmental Issues and Protection</td>
</tr>
<tr>
<td>Interviewee F</td>
<td>Company IV Private Power Producer</td>
<td>Coordinator Purchasing</td>
</tr>
<tr>
<td>Interviewee G</td>
<td>City IX Public Authority</td>
<td>Referent Policy Issues in Waste Management</td>
</tr>
</tbody>
</table>

Table 1: Sample Characteristics

As established in *Industrial Buying in Public and Private Enterprises*, the differences between public and private organizations – such as the difference between spending taxpayers’ or private assets – are factors that may have an influence on spending behavior and decision takers. Also the dimension of a company – may it be public or private – is likely to have an effect on these aspects. In any case, interviewees of preference are representatives of either the purchasing department or public relations. It is without any doubt that purchasers are the optimal group of people to talk to, but they have been experienced to be reluctant with regard to revealing information at times, due to insecurities regarding their employer’s privacy policy. Many employees whose responsibilities do not include interaction with the public or media on a frequent basis have turned out to be very anxious about revealing company data and information that may be confidential. This was even the case for completed projects such as the ones investigated. Therefore, it has been decided to also interview members of the public relations department, as these are well informed about their employers’ privacy policy and which information they are allowed to reveal to third parties.

5.3 Interview Guide

The interview guide is a useful tool for semi-structured interviews, having the function of listing the specific topics to be covered during the interviewing process. It usually
includes a list of the defined questions that the interviewer intends to ask, which the interviewee can answer freely and without suggested answers (Bryman & Bell, 2011, p. 467). A certain degree of freedom and flexibility characterizes semi-structured interviewing, as the questions reported in the guide can be asked in a different order, or the interviewer can decide to follow-up whenever it is considered relevant (Bryman & Bell, 2011, p. 467).

The interview guide for this thesis was compiled on the basis of the theoretical background presented in Literature Framework. The specific connections between selected themes and presented theories are illustrated in Table 2: Interview Guide Summary.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Related Theories</th>
<th>Questions (Example)</th>
</tr>
</thead>
</table>
| Theme 1 | General information and background | • When was the plant built?  
• Which were the exact reasons for building a new power plant? |
| Theme 2 | Buying Centers by Webster and Wind (1972) | • Who are the professional figures involved in the buying process?  
• How much influence do they have? |
| Theme 3 | Types of Buying Situations by Reeder et al. (1991)  
Buying Decision Phases by Webster (1991)  
Supplier Selection by Hassan et al. (2010); Leender and Fearon (1991) | • Has there been an ongoing business relationship between supplier and buyer?  
• How is the need for a plant recognized?  
• Which are the main criteria for selecting the supplier of components? |
| Theme 4 | Buyer-Seller Relationship by Ford (1980) | • How will the relationship between supplier and buyer look like in the future? |

Table 2: Interview Guide Summary

Theme 1 is not directly linked to any theory, as it entails general information about the interviewee, their organization and projects. At this point, it is important to mention that the term ‘project’ describes one Waste-to-Energy power plant and can thereby comprise different actors, such as the plant’s operator as well as the responsible municipality. The data collected in this step of the interview has the function of defining the situational background and varies according to the specific case being analyzed. The full interview guide can be found in Appendix I – Interview Guide.
5.4 Conduction of the Interviews and Transcription

The qualitative interviews presented in this thesis were conducted between May 11 and May 26, 2015. *Table 3: Overview of Interviews* provides information on the interviewees’ functions, their markets, date, time and duration of the interviews.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Organization</th>
<th>Function</th>
<th>Date/Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Company I Public Utility Provider</td>
<td>Head of Internal Relations</td>
<td>May 13, 2015, 15:00</td>
<td>42 minutes</td>
</tr>
<tr>
<td>B</td>
<td>Company I Public Utility Provider</td>
<td>Assistant Purchasing</td>
<td>May 13, 2015, 14:00</td>
<td>24 minutes</td>
</tr>
<tr>
<td>C</td>
<td>Company X Public Corporation</td>
<td>Head of Finance and Controlling</td>
<td>May 13, 2015, 11:00</td>
<td>50 minutes</td>
</tr>
<tr>
<td>D</td>
<td>Company III Engineering Company</td>
<td>Project Manager Waste-to-Energy</td>
<td>May 19, 2015, 13:30</td>
<td>53 minutes</td>
</tr>
<tr>
<td>E</td>
<td>Company V Private Power Producer</td>
<td>Coordinator Contracts Environmental Issues and Protection</td>
<td>May 13, 2015, 10:00</td>
<td>44 minutes</td>
</tr>
<tr>
<td>F</td>
<td>Company IV Private Power Producer</td>
<td>Coordinator Purchasing</td>
<td>May 14, 2015, 10:00</td>
<td>68 minutes</td>
</tr>
<tr>
<td>G</td>
<td>City IX Public Authority</td>
<td>Referent Policy Issues in Waste Management</td>
<td>May 26, 2015, 11:30</td>
<td>33 minutes</td>
</tr>
</tbody>
</table>

*Table 3: Overview of Interviews*

The respondents have been contacted via their company phone numbers during office hours. This leads to the assumption that they were working in their organization at the time of the interviews and devoted working hours and not private time to the interviews. The interviews have been conducted according to the themes and the suggestions outlined in the interview guide. Therefore, the interview guide was used as a guideline to structure the interview and to eliminate the risk of missing important questions. Nonetheless, irrelevant questions have been skipped and suitable follow-up questions fitted in (Bryman & Bell, 2011, p. 213).

Furthermore, the interviews have been audio-recorded with the explicit consent of the respondent, respecting the interviewee’s right to deny their permission. Afterwards, the recordings were used for creating condensed transcripts in order to have easier accessibility during the process of analysis and to enable the reader of this research report to investigate the primary data.

The interviews with German representatives were held in German, while the interview with the Swedish plant was held in English. In order to eliminate any possibility of a language barrier, the transcript of the interview was sent back to the interviewee for approval before being included in the study.

Another important factor that emerged during the data collection process was an issue regarding anonymity: German companies and interviewees were rather reluctant to revealing information and being mentioned by name. The anxiety of publishing any data – confidential or not – that could in some way be linked to the interviewee and the organization was remarkably high. Therefore, the names of both the company and the respondents were masked.

5.5 Presentation of the Findings and Analysis

The findings resulting from the data collection described above are presented in *Presentation of Empirical Findings*. They are presented in different sections according to
the themes of the interview guide. In order to increase visibility, the most relevant findings have been pinpointed in a summarizing table. During the analysis of the obtained data, themes and the patterns that are to detect have been highlighted. Therefore, it has been decided to apply the thematic analysis method by Attride-Stirling (2001). This method for analyzing qualitative data comprises the explication of the themes through the use of diagrams. According to the author, the interconnectivity among themes is an extremely useful tool for enhancing the analysis, for suggesting interpretations and for answering a study’s research questions. This objective can be obtained by detecting the keywords in the collected data, by drawing thematic networks to link them and by subsequently interpreting the emerging patterns (Attride-Stirling, 2001, pp. 391-403).

Attride-Stirling detects three different kinds of themes: The lowest category of themes is constituted by basic themes. These basic themes start acquiring a meaning when they are logically grouped to form organizing themes which summarize the main assumption behind their groups of basic themes. Ultimately, these two kinds of themes are enclosed in a global theme which embodies the most comprehensive interpretation of all the others (Attride-Stirling, 2001, p. 389).

5.6 Literature Search
The literature search has been a significant part of this research, since a Literature Framework has been developed before commencing the collection of primary data. Furthermore, secondary research is important due to the fact that the findings have to be supported by earlier research. Therefore, secondary data in available literature in the university’s library has been investigated - both online and offline. Main sources have been books and academic journals and therefore are the backbone of the Literature Framework.

5.7 Reliability and Validity

5.7.1 External Reliability
External reliability is concerned with the replicability of the research (Bryman & Bell, 2011, p. 395). This means that the same results would be yielded, if the same research design would be carried out once again at a later point of time. Since this research is focused on a market situation at a particular point of time resulting in the study to be cross-sectional, it is obvious that this situation will not remain constant. Therefore, replicability is not given. Nevertheless, it is possible to conduct a research with the same design at a later point of time to re-assess the market situation in order to be able to display that market’s development and draw a comparison between the different points of time. Resulting, limited external reliability is assumed.

5.7.2 Internal Reliability
The aspect of internal reliability assesses if the data collected is perceived, dealt with and analyzed in the same way among several researchers (Bryman & Bell, 2011, p. 395). As this research study has been conducted by a single researcher, internal reliability has to be proven to a certain extent only. However, internal reliability is considered to be given, since the exact same procedure for all interviews has been followed during data collection and analysis. Firstly, the same interview guide has been used throughout all the interviews. Secondly and as mentioned earlier, all interviews have been audio-recorded in order to facilitate a subsequent transcribing. The condensed transcripts have then been
analyzed while ensuring that their interpretation would be consistent and putting a focus on the most important aspects.

5.7.3 Internal Validity
Internal validity is concerned with the question, if the data obtained is suitable for the subject to be studied (Bryman & Bell, 2011, p. 395). This means in turn that the participants chosen need to be knowledgeable enough to provide relevant information about the field of study. Throughout the sampling process, representatives of power producers as well as the municipalities responsible for the power plants have been addressed. The power producers usually referred to employees in their purchasing departments, while the municipalities forwarded the call to people responsible for the community’s environmental or energy-related concerns. Therefore, it is believed that all the participants that have been interviewed have knowledge of the field broad and deep enough in order to provide valid data for this research project.

5.7.4 External Validity
The aspect of external validity is concerned with the idea of generalizing the research’s findings beyond its particular context. Therefore, the characteristics of the selected sample are of significant importance (Bryman & Bell, 2011, p. 395). Given the fact that an exploratory case study has been employed and that its sample size is rather small, external validity may be questionable. However, the interviews in this case study have been extensive and yielded results in close detail which are consistent among each other. This leads to the assumption that these results reflect common characteristics in the market and that this research study thereby is generalizable.

5.8 Ethical Considerations
Throughout carrying out this research project, certain ethical standards and considerations have had to be complied with. This has ensured that both the researcher and the respondents have been enabled to act in every party’s best interest without creating disadvantages for anybody. First of all, it is important that the research participants are aware of the fact that they are being researched and informed about the research process. This main consideration splits up into four aspects that deal with the research ethics in a more detailed manner.

**Harm to Participants**
Firstly, it is important that no participant is harmed in any way. In this research context, this includes making sure that the respondents do not face any consequences by their employer for taking part in or that the business as a whole experiences complications as a result of the research. (Bryman & Bell, 2011, pp. 128-132)

**Lack of Informed Consent**
Secondly, the participants have to give their informed consent, meaning that they agree to participate on the one hand and know what the research is about on the other hand. Obviously, it is not possible to force individuals over the phone to participate. Therefore, it is not possible to interview someone who does not agree, so anyone who has been interviewed gave their permission. Furthermore, the research topic has been explained in an email beforehand and once again in the beginning of the interviews. Therefore, everybody was well informed. Additionally, the interviewees consent has been ensured
before starting the audio recording which enabled an easier and more detailed interview transcription. (Bryman & Bell, 2011, pp. 132-136)

Invasion of Privacy
The third aspect deals with the participants’ privacy. It is to be ensured that it is not invaded in any way, meaning that anonymity and confidentiality have to be granted. Especially in the market this research project has been conducted in, the companies’ representatives have been greatly concerned about breaching confidentiality policies and often times denied participation due to this reason. Nonetheless, it has been possible to find companies willing to take part and to maintain their anonymity as well as the confidentiality of the data revealed. (Bryman & Bell, 2011, p. 136)

Deception
No deception towards participants is the forth aspect of the ethical standards. This consideration ensures that respondents are not lied to or cheated on. (Bryman & Bell, 2011, pp. 136-138) It goes without saying that no interviewee has been lied to or cheated on while conducting this research study.

Concluding, it can honestly be stated that all ethical standards have been complied with throughout the conduction of this research project and that all research participants were informed about the research process and subsequently agreed to their participation.
6 Presentation of Empirical Findings

The data that has been derived from the data collection described in the previous section is presented in this chapter. It aims on providing a general overview over the data collected and is concerned with the question ‘what happened?’. The sub chapters have been divided and named on the basis of Figure 1: Summarizing Model. Additionally, the individual categories have particular managerial relevance, since conclusions for each section can be drawn from the findings and projected on future business operations. A summarizing table of the findings from the interviews can be found in Appendix X – Summarizing Table of Findings.

6.1 Empirical Findings of the German Interviews

The data collected is based on the information of six different representatives of four power plants located all over Germany. The identity of the interviewees and the exact names of the power plants and companies involved have to remain anonymous and have therefore been coded. The condensed transcripts of the German interviews can be found in anonymized forms in Appendix II – Condensed Transcript Company I, Interviewee A to Appendix VIII – Condensed Transcript City IX, Interview G.

6.1.1 Project Background

The first theme of the Interview Guide is concerned with the project’s background. This involves basic information regarding the interviewee and the project, as well as the reasons for constructing a new power plant and possible issues that were faced with regard to political, social or legal factors.

All the informants interviewed - and who have been able to make a statement in this matter - stated that the primary reason for constructing a new power plant was the fact that the concerned community had to find a new method for waste treatment and disposal. The associated power generation in the form of electricity and district heating was always only a byproduct of the heat generated by the incineration, but never a first priority.

Furthermore, only two interviewees - Interviewee C and Interviewee D, who both belonged to the same project - stated clear resistance against the establishment. Political groups, mainly environmental activists stepped up as well as the neighboring community, since the plant was constructed closely to the municipalities’ border. None of the other interviewees stated any direct issues that had to be faced.

6.1.2 Buying Centers

The concept of buying centers is concerned with the different parties involved in a purchasing process. In the case of this research project, this is the industrial purchasing process of components for a Waste-to-Energy power plant. The different organizational structures of the particular projects has enabled insight into several kinds of constructs regarding the management of planning, approval and construction of the power plants.

All interviewees have stated that the power plants’ operator is not only involved in the decision process, but the main decisive entity. This may not be surprising, since the operator is the body that deals with the power plant and its components on a daily basis for a long period of time, but it is worth looking into the structure of influence on the decision in closer detail. Even though the operator has the main voting right in all cases, the municipalities are always involved and have voting rights or influence to some extent.
In the case of Project I, the municipality does not have an official position which’s approval is needed for the decisions in question, but it employs representatives as members of the operator’s supervisory board. Therefore, it becomes clear that a certain extent of influence is granted and that the municipality is in a supervising role. The structure of power for Project II is slightly different: In this case, the operator is the only and fully responsible body when it comes to decision-taking, but the executive board of the operator is entirely made up out of the involved municipalities’ representatives. This is due to the fact that the operator is a union of these municipalities, founded for the purpose of treating and disposing the districts’ waste. The division of power of Project III is entirely different: Even though the operator has the full formal decision power, all major decisions are taken in amity and agreement with the municipalities involved. This is simply based on the history of the company itself. Back in time, it was founded on the basis and initiative of the cities in question. Therefore, it is obvious that these still have unofficial involvement in the company’s decisions. Regarding Project IV, there is a clear distribution of shares of the electricity grid’s ownership. The operator owns a share of 75% and the municipality the remaining 25%. This obviously implements a shared responsibility for decision-making.

Further looking into the structure of individuals that are responsible for decision-making, it has been difficult to find reliable information in most of the cases. On the one hand, this is caused by the interviewees not being informed about the individual responsibilities and on the other hand due to the fact that some of the plants were constructed before the interviewees’ employments in the particular companies. As a result, they have been able to comment on current ownership shares and decision-making structures, but not on which individuals actually took the decisions during the time of establishment and construction. Nonetheless, on the basis of the information provided and on the functions and positions of the interviewees, it has appeared that on the operators’ side the functions that are most involved are purchasers, engineers and technicians. Looking at the municipalities’ representatives involved, it has appeared that the individuals occupy positions responsible for environmental concerns, but also matters related to energy. It has become clear that these two fields are often combined in one position.

6.1.3 Industrial Purchasing

Types of Buying Situation
The structures of buying situations that have been discovered are divers: Project I bought components from several suppliers. There have been existing relationships with some suppliers, while new ones with other vendors have been established. Project II has not had any previous relationships, since it is the first Waste-to-Energy project rolled out by that particular operator. Project III has had a maintained relationship with a supplier, but for coal power plant components and not for Waste-to-Energy plants. Project IV has also had relationships beforehand, but they have not been made use of. Instead, new relationships have been established.

Buying Decision Phases
The section of buying decision phases deals with the decision for particular components in a way that assesses the individual steps in closer detail and the evolvement of the process from the recognition of the need for a plant to the evaluation of the suppliers’ performance.
The first phase of the buying decisions is concerned with the question how the need for a new Waste-to-Energy plant is recognized. The findings in the German market have revealed that the need evolved, because there is a waste management problem. An increased need of energy – may it be electricity or district heating – in the municipality or county is not the reason. All the plants assessed have shown this phenomenon. The generation of electricity was always just a byproduct of the incineration of household or industrial waste.

According to the respondents, this phenomenon is caused by a certain event in the legislation for waste management in Germany. Until June 1, 2005, large parts of the waste had been disposed in landfill areas. The amendment in the legislation that came into effect on June 1, 2005 prohibited this kind of treatment. Therefore, the authorities had to find other solutions for treating and disposing their waste. In many cases, it was decided to build incineration plants. Subsequently, communities wanted to make good use of the generated heat of the incineration process and implemented generation units in their incineration plants with outlets into the local grids.

After identifying and defining what kind of plant was needed and what kind of technology was supposed to be implemented, public announcements were issued in order to find the most suitable supplier with the most attractive offer. Prevalent aspects have been both economic value and product quality. In this phase of the process, the customer motives dealt with earlier are of particular importance, since these determine the customer’s preference for a particular supplier and product.

The last phase of the buying decision process actually takes place after the purchasing of components and the construction of the plant have been completed. This phase is concerned with the assessment of the suppliers’ performance. Interviewee D has mentioned that a workshop for all the relevant companies was held. This was done internally first and subsequently with all stakeholders involved. As a result, the general contractor developed a strategy on the basis of the workshop for future projects. Also Interviewee E has reported a meeting upon completion of the project for determining which aspects of the cooperation could have been carried out more efficiently. Interviewee F has about weekly meetings during the construction phase. Additionally, there was a follow-up meeting after the project had been completed where a list of shortcomings was presented.
Supplier Selection

In the section of supplier selection, the factors and aspects that drive industrial buyers like the operators or the construction company to deciding for one particular supplier and not for another have been looked into. Table 4: Frequency of Customer Motives displays the importance of the individual customer motives based on the frequency they were mentioned during the interviews with German representatives. It becomes clear that the price is the top criteria. Nevertheless, a factor that is not visible in this table is that the price is significantly important, but only as long as the product quality does not suffer. This is a condition that is worth being aware of. Furthermore, the components’ quality is very important as a lone-standing aspect. Another factor that was mentioned several times is the observance of deadlines from the side of the supplier. Project III has been excluded, because the respondent could not give any indication in this matter.

<table>
<thead>
<tr>
<th></th>
<th>Project I</th>
<th>Project II</th>
<th>Project IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Product quality</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Execution</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observance of deadlines</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Pledge for fulfillment of contract</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Economic situation</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Ability for performance</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Financial situation</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Creditworthiness</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Record of accidents</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Compliance with safety regulations</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Frequency of Customer Motives

6.1.4 Buyer-Seller Relationships

Last but not least, the buyer-seller relationship management has been investigated. This has included assessing the business relationship regarding after-sales, modifications or improvements of the power plant as well as cooperation for possible future projects.

This section has turned out to be particularly interesting, since the interviews have delivered rather surprising results. Due to the fact that all the power plants contacted were constructed in a process of the operator contracting several enterprises and not buying a turnkey project, the components necessary in different fields were delivered by many different manufacturers. Therefore, it has not been possible giving a global answer covering all after-sales relationships. Most of the interviewees have stated that the relationships with the suppliers would mostly be smooth and relaxed with regard to after-sales and technical support, but have also emphasized that this greatly varies among the suppliers and also on the extent of how business was conducted: It has been made clear that it is much more difficult to issue a claim for after-sales support, when the supplier delivered single components only. With the exemption of Project II that employed a construction company for the power plant’s building which reportedly did not deliver a good performance, all parties were satisfied with the suppliers of their main components. Therefore, they also consulted the same suppliers when it came to modifications or
exchanges of components. None of the interviewees has been able to provide information regarding projects in planning.

6.2 Discussion of Empirical Findings

After presenting the primary data obtained, it is important to discuss it in relation to secondary data in order to establish a connection between these two sources of input.

The respondents have been able to reveal a large amount of data regarding the buyers’ decision making structures as well as other internal processes that influence the purchasing of components for a Waste-to-Energy plant. Furthermore, the interviewees have mentioned laws and regulations repeatedly, mostly on European level. This is where it is suitable to draw a connection with the secondary data that was presented in Industrial Background. As it has been discovered during the desk research prior to conducting the interviews, the Waste-to-Energy power generation sector is strongly regulated. However, the role of the European Union is not to be seen as the restraining power in this matter. Despite the regulations, Waste-to-Energy power production is strongly supported respectively enforced among the members of the EU. As it has become clear, the development of Waste-to-Energy power production was originally caused by a law prohibiting the disposal of waste in landfill areas after 2005. Resulting, counties and municipalities were forced to make changes in their waste management, which is why many of them decided to kill two birds with one stone by incinerating their waste and recovering the energetic potential for electricity generation or district heating. Nonetheless, it is obvious that a body like the European Union also has to establish regulations for the sector. On the basis of the data obtained in the interviews, it can be said that the fiercest legislations in place are related to gases generated by the incineration processes and emitted into the atmosphere. These regulations ensure appropriate filtering in order to protect the environment as well as public health.

As it has become clear, the primary data has confirmed large parts of the characteristics described in earlier research. Furthermore, the legal background of the European Union is also clear connection between the data derived from the interviews and secondary data.
Thematic Network Analysis

This chapter further elaborates on and interprets the findings presented in the previous chapter. Furthermore, it is concerned with the question ‘why did the things happen like they did?’ The structure of the thematic networks presented can be found in Appendix XI – Thematic Networks.

7.1 Buying Centers

During the analysis of the buying centers, it has become clear that there are several actors of importance. Determining these is necessary in order to gain a deeper understanding of the industrial buying process and the division of power in organizations in the German Waste-to-Energy market. Either the public utility provider or the private plant operator have the largest decision power when it comes to general characteristics of the power plant in planning. Internally, there may be several departments involved in the process of planning a new plant. The community or municipality may also have influence in the form of either direct property shares or its representatives in the provider’s or operator’s board. The operator is the body that eventually deals with the decisions taken on a daily basis. Furthermore, it is responsible for the employees’ and environment’s safety and has to ensure that the plant runs smoothly in order to make a profit.

Connecting these findings with the theory by Webster and Wind (1972), it becomes clear that the public utility provider or the private plant operator occupy the position of the user. Furthermore, representatives of local municipalities are influencers. In some cases, the buying center of influencers may be supported by external consultants. The buying center of buyers is constituted by an entity combining the local municipality as well as the plant operator.

Regarding the plant specifications - which are the plant’s features on a more detailed level and a smaller scale, a new player is involved. Even though both the plant operator – usually the public utility provider or the private operator – as well as the municipality maintain their influence in making decisions, external engineering consultants may join in and provide advice on technical concerns. These engineering consultants are acquired,
since the operators often times do not have a technical knowledge background deep enough for assessing the plant’s technological options in the closest detail.

7.2 Types of Buying Situations

![Figure 4: Thematic Network of Buying Situations](image)

Defining the type of buying situation the company was in when constructing the plant is useful to gain a deeper understanding of the buying decision process. Based on the German projects assessed, it has been determined that there are no plants that are built and purchased in the form of a straight re-buy. Plants are constructed either through a modified re-buy or an entirely new task. A modified re-buy may be conducted, when the plant as such is new and employs a new concept, but there have been business relationships with suppliers due to cooperation in other market segments. A new task is carried out, when the operator is entirely new in the market segment and sets up its first plant. This is the case in Project II.

Further connecting these phenomena with the theory established by Reeder et al. in 1991, it has become clear that each and every plant built is a new task with new requirements and characteristics. Therefore, a modified re-buy is only conducted by using previously acquired business relationships or by applying the same or similar technology like in other projects. Nonetheless, most of the projects can be considered to be a new task, since the surrounding framework of requirements and characteristics are unique in almost every project. It has further occurred that no power plant among the ones assessed was built as a straight re-buy. It might be possible for bigger companies that operate in different cities or even different countries to conduct straight re-buys if they plan the construction of more than one plant at a time or within short period (Reeder et al., 1991).
7.3 Buying Process

The most relevant findings related to the buying decision phases are analyzed in three organizing themes, enclosed under the third global theme, the buying process. These three organizing themes split up once again among themselves, build the pillars of an industrial buying process and are the most significant aspects. The plant’s characteristics are defined by the municipality’s requirements, by the legislation that has to be complied with and by the proposals of suppliers in the bidding who may suggest several technologies for incineration as well as power generation. Each and every of these three aspects is greatly important when determining the plant’s characteristics on a larger scale.

In general, it has become clear that Webster’s phases of the buying process (1991) are followed in the majority of the cases. However, as respondents have had more insight into
some phases than others, the focus of this analysis shall be centered on the need for recognition, acquisition and analysis of proposals, evaluation of proposals and selection of suppliers as well as performance feedback and evaluation.

The supplier selection in all German cases was initiated by a public announcement in order to attract suppliers and to request proposals. The announcements were public in order to acquire diverse suggestions and to encourage competition among suppliers. The proposals were examined subsequently - for example by applying a decision matrix - in order to find the most suitable supplier with the most suitable product suggestion for the particular plant. Different criteria are set by the company, and a number reflecting their importance is assigned to each criterion. Afterwards, the suppliers’ offers are graded according to the set criteria and a weighted average is calculated. The winning bid is the one that reaches the highest score.

Moreover, the product specifications - which are concerned with the product’s features on a smaller scale - have to once again meet legal requirements. Among these may also be safety regulations. Furthermore, the operator might prefer an energy output method over another. However, it has to be beard in mind that the connection to the grid has to be technologically possible. Additionally, the product’s annual waste treatment capacity needs to be sufficiently high, since the treatment and disposal of waste was the dominant reason for building plants in Germany in the first place.

Another interesting aspect related to this theme is that the company has to decide if a system or components are to be bought. Kotler et al. (1999, p. 284) stated that it is frequent practice for organizations to opt for systems buying, which entails the purchase of a ‘packaged solution’ for a problem from a single supplier, instead of individually considering all the decisions involved in order to solve the problem. In fact, offering a complete solution that meets the customer’s needs represents a source of competitive advantage for industrial suppliers and a strategy for winning industrial buyers’ bids (Kotler et al., 1999, p. 284).
7.4 Buyer-Seller Relationships

The buyer-seller relationship is defined by the management of the customer relationship. It has become clear that the most important aspects of these relationships are after-sales actions such as technical support in the event of technical defects or breakdowns as well as the exchanges of components and wear parts on a regular basis.

It is vital for suppliers to eventually confirm buyers’ expectations with regard to their purchases (Harmon et al., 1997, p. 108). This is especially important in a market such the Waste-to-Energy sector, where strict legal requirements need to be complied with. Suppliers can foster their customer relationships after the purchase through after-sales partnerships. According to Ford (1997, p. 26) the services which are given in combination with the product and the capability of offering suitable solutions to buyers’ problems are essential for establishing a good buyer-seller relationship. It has become clear that the fact that Waste-to-Energy plants are constantly monitored to ensure that they operate safely and comply with the emission standards increases the importance of maintenance activities.

Furthermore, it has evolved that the establishment of customer relationships is highly dependent on the quantity and complexity of the components supplied by the particular supplier as well as the last step of the industrial buying process, which is the performance feedback and evaluation. It has emerged from the data collected that a customer has much more difficulty to issue an after-sales claim if only a single component is supplied by the vendor than if more components or even a system is purchased. Additionally, it seems logical that a well-structured feedback on and evaluation of the suppliers’ performance is in every party’s best interest for establishing a prosperous customer and after-sales relationship.

Analyzing the data, it has been determined that the relationship between buyer and seller in an industrial context is complex, ambiguous and also vulnerable to discussions and disagreements.
7.5 Customer Motives

![Thematic Network of Customer Motives](image)

Customer motives are the fifth and last global theme of the data analysis. The customer motives in the Waste-to-Energy market split up into patronage motives and purchase motives. Patronage motives are the characteristics of a supplier that are assessed by a potential customer, as defined by Copeland (1924). These include the price – first and foremost, the product quality, the supplier’s financial situation as well as its capability of meeting deadlines. It is rather obvious that the price and product quality are the aspects that are mentioned at first, since any customer pursues purchasing the best product for the lowest price available. However, the supplier’s financial situation is also important, since the product orders in the Waste-to-Energy market can easily reach volumes of several million euro. It therefore goes without saying that a certain liquidity is required for the supplier in order to manufacture the components that are subject of the order. Also the supplier’s observance of deadlines is a customer concern, since the operator needs to meet its own deadlines in order to commission the plant as planned and to generate income. Resulting, it can be said that Copeland’s patronage motives (1924) have been confirmed by this research. Purchase motives in contrary are more concerned with the superordinate reason for building a power plant. In all assessed German projects, this is the need for a new method of waste treatment and disposal. Therefore, this purchase motive is the driving force behind the whole process of constructing a new plant and is as a result the most basic, but simultaneously the most important one in the German market. Resulting, the energy production can be understood as a byproduct of the waste incineration. However, productivity enhancements in the plant in the sense of power generation are important for industrial customers, as an increased output leads to higher revenues (Copeland, 1924).
8 Conclusion

After analyzing the data obtained in the data collection process, this chapter concludes the key arguments and aspects and aims on answering the earlier formulated research questions.

How do industrial buying behavior and customer motives influence buying decisions in Germany?

Throughout this research study, several patterns with regard to the buying behavior of Waste-to-Energy projects have been detected. These are explained in further detail in the following answers to the sub research questions.

How does an industrial buyer conduct purchases for a Waste-to-Energy plant?

Most constructions of Waste-to-Energy plants are handled by industrial buyers as a new task. This buying situation occurs when the plant is constructed by starting a new buying process from scratch. According to the findings of this research study, a new task is the most common buying situation in the German Waste-to-Energy market.

When a new project is developed on the basis of existing business relationships, the purchase can be classified as a modified re-buy, even though the technical requirements and specifications of the product may be entirely different. In this case, buyers may have experienced the same kind of purchase before, and they just adjust the purchase characteristics and product features according to the present situation. It has been found that modified re-buys do occur, however much less frequently than new tasks.

The buying centers are composed by different actors. Decisions concerning general issues are taken by the public utility provider or private plant operator, respectively several internal departments and city representatives. The utility provider or plant operator represent the buying centers of users and buyers, city representatives are to be seen as influencers. It has become clear that the power plant’s specifications are developed by a rather high number of actors, especially in-house experts, sub-project leaders, project managers, but also external consultants.

During the assessment of the buying decision process in closer detail, it has become clear that the supplier selection process has been initiated through a public announcement requesting proposals from potential suppliers. Once proposals have been received, the supplier selection is performed by applying objective decision matrixes and mathematical calculations based on the weighted average of previously set criteria. Furthermore, after-sales and long-term business relationships are developed on the basis of follow-up and feedback meetings between supplier and customer.

How is a buyer influenced when conducting the purchase?

The products’ price and quality are the two dominant factors that influence a customer during supplier selection. Furthermore, a customer pays attention to the suppliers’ financial situation and performance, as most investments in the Waste-to-Energy market deal with high financial volumes and require a certain liquidity for being carried out. Additionally, the suppliers’ capability of meeting deadlines and their products’ environmental impact are of importance.
8.1 Additional Findings

8.1.1 Rationales for Establishment of Waste-to-Energy Plants

Essentially, there is one prevalent purchase motive for Waste-to-Energy power plants: The primary reason for constructing a new incineration plant with power output - mostly in the form of electricity or district heating – is the need for appropriate waste management. Since 2005, communities in the European Union have not been allowed to dispose their waste in landfills any longer and therefore need to employ another method of waste treatment and disposal. As a result, a large number of incineration plants was built, many of which implemented a power generation unit and produce power as a byproduct. Therefore, the power generation is the secondary goal.

8.1.2 Influences from Legislation, Society and Politics

The legislation for waste treatment and disposal as well as environmental protection is very strict. In fact, legal requirements are the strongest influence for purchasers and operators of Waste-to-Energy plants. Many aspects such as emission standards, disposal methods and waste management in general are strictly determined by legal requirements, in particular by European legislation.

Even though societal issues like the location of the plant and its impact on the environment are taken into account by plant operators, they are not considered problematical issues. In some cases, social resistances have occurred when it came to the construction of a new power plant. Nevertheless, all projects included in the sample managed to overcome these hindrances and were able to establish power plants as planned.

Regarding political aspects, it is to say that the legislative framework issued by and put into force by the European Union in 2005 is the most prevalent political aspect to comply with. However, it is important to take both sides of the coin into account. Having to comply with legislations of the European Union may firstly deliver the impression of being a restrictive aspect for commissioning a power plant. This indeed is largely true when it comes to emission controls and other environmental requirements. However, it is to be aware of that these very environmental requirements have given the Waste-to-Energy market a great boost by abolishing the use of landfill areas. Without this abolishment, the Waste-to-Energy market may have never become as significant as it is today. Resulting, the political background in this particular market may be seen as more supportive than restrictive.
9 Managerial Implication

As the key aspects have been concluded in the previous chapter, this chapter explains and examines the managerial implications that this research project comprises for the particular sector of Waste-to-Energy power generation.

As it has been outlined throughout this report, this research project is supposed to support and extend companies’ understanding and knowledge of industrial buying behavior in the Waste-to-Energy market in Germany. Thereby, it may assist suppliers striving to improve their competitive advantage against competitors in the market and buyers willing to optimize their purchasing processes. The following outlines this research study’s findings that very directly applicable to and implementable in the business environment.

The first equally interesting as surprising finding is the fact that the German Waste-to-Energy power plants that have been examined were constructed primarily for solving the problem of waste treatment and disposal. The power generation was always only a byproduct of the waste incineration and never the primary reason for constructing the power plant. This phenomenon was strengthened in Germany after the legal background had been changed in 2005 and disposing waste in landfill areas was not allowed any longer. The communities had to find another method for treating their waste. This caused an increasing construction rate of incineration plants. Subsequently, the option of generating energy – in the form of electricity or district heating – was employed. The managerial relevance that derives from this situation is the suggestion that the market should not primarily be assessed for its need for energy, but for its waste volumes and waste treatment methods when searching for potential buyers of Waste-to-Energy systems or their components.

Furthermore, the factors that influence industrial buyers - which are one main aspect of this research study – bear managerial relevance. Several and diverse factors have been stated to have an influence on a potential buyer’s decision making process. The most frequent one is the price of the components, followed by the product quality and the suppliers’ capability of meeting deadlines. Suppliers’ characteristics of concern for the customer that were mentioned less frequently, but are still relevant are listed below:

- Execution of the project
- Capability of fulfilling the contract
- Economic situation
- Ability for performance
- Financial situation
- References and previous projects
- Creditworthiness
- Record of accidents
- Compliance with safety regulations

All these aspects are worth for a supplier to take into consideration for improvement of their sales strategy when participating in the bidding for a project. Furthermore, it is advisable to sufficiently and satisfyingly cover all these points. From a buyer’s point of view, the totality of aspects provides a good foundation for a supplier-assessment matrix.
Another finding that appears to have a high managerial contribution is the fact that the German market has already passed its peak. After the amendment of the legislation in 2005 that was mentioned earlier, the capacity of newly constructed Waste-to-Energy power plants has been so high that the full potential of waste suitable and available for incineration has been treated in these plants. As a result, the power plants have run on full utilization. Throughout the past years nonetheless, the total volume of waste in Germany has been decreasing. The prevalent reason for this phenomenon is the fact that recycling methods reduce the percentage of waste available for treatment in incineration plants. Therefore, several plants currently struggle with maintaining full utilization, even though waste from the Netherlands and the United Kingdom is imported. However, the volumes of these imports are expected to decrease as well in the upcoming years. As a result, the Waste-to-Energy market volume in Germany is very likely to decrease in the near future, leading to shutdowns of Waste-to-Energy power plants. Even if this may not be the case, it can be said with relatively high certainty that no new plants will be constructed. Therefore, it may be advisable to focus on other member countries of the European Union when it comes to acquisition of business opportunities for suppliers of components or systems for Waste-to-Energy plants, since several of these – especially the new members – have to comply with the amendment of the laws for waste management.
10 Alternative Criteria

In order to increase this research project’s relevance, Alternative Criteria for the assessment of its reliability and validity have been applied. These are outlined and related to this particular study in this chapter.

The effectiveness of reliability and validity criteria applied to assess the value of qualitative research has been actively contested (Bryman & Bell, 2011, p. 395). Therefore, Guba and Lincoln (1994) suggest an alternative criterion evaluating the quality of qualitative research. This criterion is called trustworthiness and is divided into four principles:

- Credibility
- Transferability
- Dependability
- Confirmability

Applying these alternative criteria also has the effect of suggesting the existence of more than one single and absolute account of social reality (Bryman & Bell, 2011, p. 395).

In order to prove the credibility of this study’s findings, it is to say that all interviewees have been sufficiently knowledgeable to provide their subject-related input to this research project. Even though the process of calling and talking to several representatives in one company or institution until reaching the right individual has been an intense and time-consuming one, it has paid off as it has enabled the researcher to interview the most suitable person for this research project’s subject. Furthermore, the interviews have been conducted in both the interviewer’s and the interviewees’ mother tongue without technological complications, leading to the assumption of an error-free interpretation, which in turn increases credibility. The overall quality of the findings is considered high.

It is also believed that the research respects the transferability criterion as the interview guide could be applied to many other geographical markets, and still provide interesting findings. This could be of great value for any further research in this segment assessing other countries. A further validation source for this research report is the fact that the condensed transcripts and the analysis of the data are consistent with the auditing approach related to the dependability criterion (Bryman & Bell, 2011, p. 398). Given the fact that all actions during the research process have been taken in good faith, avoiding any interference with personal values and theoretical inclinations, the aspect of confirmability has also been complied with (Bryman & Bell, 2011, p. 398).
11 Limitations and Further Research

The most prevalent limitations of this research project are its rather tight time frame as well as the limited number of cases that have been investigated, as it is conducted through an exploratory case study on selected power plants. However, the information obtained from the interviews is relevant, since the individuals interviewed are highly involved in the industrial buying process. A broader perspective on the factors of importance has been established, since not only buyers, but also other buying centers such as users and influencers have been interviewed. Therefore, findings from this exploratory study are expected to be generalizable, broadening the managerial relevance and application for the market segment of Waste-to-Energy.

Another significant factor that has developed to be a severe limitation throughout the process of the research is the response rate of companies and potential interviewees. Throughout the sampling process, difficulties finding suitable informants that were in the right position, possessed the adequate knowledge required for answering the interview questions and that were willing and allowed to be interviewed have been faced. As a result, the sample comprises seven interviews only. It is undeniable that this is a rather limited sample. Given the fact that the research is conducted in a B2B-environment has firstly caused the issue that a rather large amount of desk research has been required prior to the actual primary data collection. Secondly, the population of power plants to choose from is relatively small, highly limiting the number of potential interviewees. Waste-to-Energy plants are not enterprises like supermarkets, banks or restaurants. They are much less common. As a result, the sector is very specific with a relatively small number of plants. The sample size reflects this characteristic. Furthermore, many potential interviewees have been reluctant to providing any kind of information that has only remote chances of revealing possibly classified company information. Additionally, there has been the problem that several interviewees willing to participate have had to be excluded, since their schedule has not matched with the thesis’ time frame. All these factors have impeded the research’s work flow. However, they are not considered to be significant enough to severely hamper the project’s outcome, as despite all limitations, the obtained data has been explored in order to learn about the buying behavior in the Waste-to-Energy market.

However, further research aiming to investigate the research purpose may bring further clarification into the research topic. As mentioned above, it is obvious that the restricted sample size represents an important limitation of this research study. Many of this study’s limitations were caused by the nature of the Waste-to-Energy market, which has turned out to be very complex and hard to permeate. Nevertheless, the relevance of the topic is strongly believed in and despite – or because of - the difficulty in collecting valid data in this field, further research on the topics dealt with in this research project should be conducted. The study could for example be replicated to other European countries in order to obtain the goal of finding further proof for the patterns that have been identified in this thesis. Also, it could be investigated, if buying processes in the Waste-to-Energy market differ greatly from the ones in other markets or sectors.
Reference List


Thiel, S. (2013). *Vivis | Ersatzbrennstoff-Kraftwerke in Deutschland und Österreich* [online] Available at:


Appendices

Appendix I – Interview Guide

Name: ________________
Organization: ________________
Date and Time: ________________
Duration: ________________

THEME 1: The Project’s Background

1. Background of the Interviewee
   - What is your position in the organization?
   - What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
   - Please name some demographics of the organization such as its geographical location or the number of plants operated?

2. Background of the Investment
   - When was the plant built?
   - Which were the exact reasons for building a new power plant?
     1. What is the reason for an increased energy output?
   - Which were the project’s limitations?
   - Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?
   - Who supplied the project’s components?
   - Did the supplier of components have a role in solving these issues?
   - In which ways did the supplier help (or could the supplier help)?

THEME 2: Buying Centers

3. The Actors Involved in the Decision Process
   - Which are the institutions involved in the buying process?
   - How much influence do they have?
     1. How much influence do they have in the decision concerned with the nature of the project as a whole such as reasons and location?
     2. How much influence do they have in the decision concerned with the project’s characteristics in further detail such as the power generation method, technology or technical concerns like the output?
   - Who are the professional figures involved in the buying process?
   - How much influence do they have?
     3. How much influence do they have in the decision concerned with the nature of the project as a whole such as reasons and location?
     4. How much influence do they have in the decision concerned with the project’s characteristics in further detail such as the power generation method, technology or technical concerns like the output?
THEME 3: Industrial Purchasing

4. **Types of Buying Situation**
   - Had there been an ongoing business relationship between supplier and buyer?

5. **Buying Decision Phases**
   - How is the need for a plant recognized?
   - How are the characteristics and the quantity of the product defined?
     1. Which factors determined the size of the plant in MW?
     2. What is the price level in €/kW?
   - How are the specifications that guide the procurement – such as specific characteristics, price or design - developed?
   - How are potential suppliers selected?
   - How are the suppliers’ proposals selected and analyzed?
   - How is the order routine defined?
   - How is the performance of the supplier evaluated?

6. **Supplier Selection**
   - Which are the main criteria for choosing the supplier of components?
   - Which are – according to your opinion – the strengths of your supplier?
   - Which aspects do you think suppliers could or should improve?

THEME 4: Customer Relationship

7. **Seller-Buyer Relationship in the Future**
   - How is the relationship regarding after-sales?
   - How is the relationship regarding project modifications or improvements?
   - How is the relationship regarding possible new projects?
Appendix II – Condensed Transcript Company I, Interview A

Name: Interviewee A
Organization: Company I
Date and Time: 13th May 2015; 15:00 hrs
Duration: 42 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   o What is your position in the organization?
     Head of Internal Relations of the power plant.
   o What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
     We are a public utility.

2. Background of the Investment
   o When was the plant built?
     The main power plant was built from 1997 until 1999. It picked up operations in beginning of 2000.
   o Which were the exact reasons for building a new power plant?
     The main reason was the fact that the city had to find new methods for treating and disposing its waste.
   o Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?
     There were no political problems. Also social issues did not occur. Nonetheless, there was some social excitement regarding the cut of personnel. Due to the shift from operating a coal power plant, employees had to be let go.
   o Who supplied the project’s components?
     The main components were supplied by Bilfinger und Berger. Piping systems were supplied and constructed by Kraftanlagen München. The boilers were supplied by Standardkessel Duisburg, while the electronics were contributed by ABB. The whole control technologies were supplied by Siemens.

THEME 2: Buying Centers

3. The Actors Involved in the Decision Process
   o Which are the institutions involved in the buying process?
     The actor mostly involved and actually in charge of the whole decision and buying process is Company I. Nonetheless, the municipality was represented by members of the supervisory board in the company. Therefore, they also had decision power to some extent respectively influence.

THEME 3: Industrial Purchasing

4. Types of Buying Situation
   o Had there been an ongoing business relationship between supplier and buyer?
Since there were many different suppliers, there are two answers to this question: There had been relationships with some of them, with others not. Therefore, a public announcement was issued in order to attract interest and to request proposals. Nonetheless, several companies had certain popularity for certain products, such as Sulzer. Additionally, there was a strong interest in quality, causing a focus on some companies.

5. **Buying Decision Phases**
   - How is the need for a plant recognized?
   - How are the characteristics and the quantity of the product defined?
     1. Which factors determined the size of the plant in MW?
     - The electrical output accounts for 83MW, while the thermic output accounts for 100 MW and an additional 120MW of hot water output.
   - How are potential suppliers selected?
   - As mentioned earlier, a public announcement was made to inquire potential suppliers and their solutions.
     - How are the suppliers’ proposals selected and analyzed?
     - Main criteria during the selection and analysis phase were quality, execution, price and not to forget the suppliers’ ability of sticking to deadlines.
   - How is the performance of the supplier evaluated?
     - Obviously, not everything always works as it is supposed to: One of the boilers caused issues with the hot water outflow. These were provided by Standardkessel Duisburg who bailed themselves out of the project. As a result, we solved the problem on our own.

6. **Supplier Selection**
   - Which are the main criteria for choosing the supplier of components?

**Previously explained**

**THEME 4: Customer Relationship**

7. **Seller-Buyer Relationship in the Future**
   - How is the relationship regarding after-sales?
     - Also here there is no standard answer. We have had many different suppliers and they all vary regarding their cooperation and support when it comes to after-sales. Several suppliers perform routine equipment checks on a regular basis.
     - How is the relationship regarding project modifications or improvements?
     - The plant lives! There are always maintenance works, improvements - of the turbines for example. Originally, the plant operated with a two-step air filter. Three or four years ago, we upgraded onto a third step. In 2012 or 2013, we set up a generating component next to the original plan. Additionally, we built another heat saving unit.
   - How is the relationship regarding possible new projects?
     - After carrying out the investments I just mentioned, we first have to generate a cash inflow before considering larger investments.

**Additional Comments**

Well, we only generate and sell energy for the City XI. Regarding district heating, we are the only generator and vendor.
Appendix III – Condensed Transcript Company I, Interview B

Name: Interviewee B
Organization: Company I
Date and Time: 13th May 2015, 14:00
Duration: 24 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   o What is your position in the organization?
     I am an assistant in the purchasing department.
   o What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
     Company I is a company with limited liability.

2. Background of the Investment
   o When was the plant built?
     The plant was built around year 2000.
   o Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?
     I cannot come up with anything from the top of my mind right now.
   o Who supplied the project’s components?
     I am well aware that Kraftanlagen München had a huge stake in the project, they supplied some components for sure. When it comes to the other ones, I am afraid I cannot specify any further.

THEME 2: Buying Centers

3. The Actors Involved in the Decision Process
   o Which are the institutions involved in the buying process?
     I think only Company I is involved in the process, but not the city itself, as far as I know. At least, the city is not involved in any official role such as a position or an entity that has to be consulted.

THEME 3: Industrial Purchasing

4. Types of Buying Situation
   o Had there been an ongoing business relationship between supplier and buyer?
     I have only been working in this company since 1997. Therefore, I do not know, if there had been established relationships between suppliers and us.

5. Buying Decision Phases
   o How are the suppliers’ proposals selected and analyzed?
     Bigger deals, such as this one, is managed by the bosses who select and negotiate. Investments of such a big volume are always managed by CEOs and heads of departments.

6. Supplier Selection
THEME 4: Customer Relationship

7. Seller-Buyer Relationship in the Future
   • How is the relationship regarding after-sales?
     Usually, the arrangements are made between technicians and suppliers, so I do not have
     any involvement there.
   • How is the relationship regarding project modifications or improvements?
     Also here, I am not really involved. The technical aspects are not dealt with in the
     purchasing department.
   • How is the relationship regarding possible new projects?
     Well, currently there are not projects planned. We just extended Unit 3 by one turbine.
     Therefore, I guess there will be no extensions in 2015. So like I said, the power plant was
     built in 2000 and until Unit 3 went into operation, there had only been two units.

Additional Comments
Maybe you should talk to Interviewee I-I, he is the Head of Internal Relations and is
located right in the power plant.
Appendix IV – Condensed Transcript Company X, Interview C

Name: Interviewee C
Organization: Company X
Date and Time: 13th May 2015, 11.00 hrs
Duration: 50 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   o What is your position in the organization?
   I am the Head of Finance and Controlling. My responsibilities start with accounting to financial transactions, the whole commercial area is in my responsibility. Bookkeeping, set-up of financial statements, management of the books, tax declarations, such as earnings tax, income tax, consumption tax. Well, then the field of controlling and reporting.
   o What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
   We are a state-owned company.

2. Background of the Investment
   o Which were the exact reasons for building a new power plant?
   In the year 1996, the legal background was changed, so that it was not allowed any longer to fill landfill areas with household garbage after 1st June 2005. One had to get rid of it. There were several forms of getting rid to fit. For example, the garbage could have been separated, decompose the biological parts and incinerate the rest, which would be a standard waste incineration. Then there are several possibilities of how to set up such an incineration with several methods, incineration methods. The union was founded with the purpose of getting rid of the waste here in the union’s area after 1st June 2005.
   An announcement was published and it became clear that an incineration plant was the right or the best method for the union, since power generation was possible as a second objective.
   So we produce steam. This steam is transferred into district heating which supplies the city of City I for the main parts. The rest of the steam goes through the turbine and we generate energy.

   We use as much as we need in the first place and the rest is fed into the grid of the public utility company. We sell the electricity commercially at the exchange in Leipzig, at the electricity exchange.
In the process of requesting and reviewing offers for an incineration plant, the methods for district heating and energy output were presented as well. So making good use of the heat was rather a result of the plant as such.

> Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?

Yes, there were problems, but I cannot give you any detailed information, since I have been in the company since 2004 only. There were resistances, though.

The changes in the legal backgrounds that I mentioned earlier were valid for whole Germany.

> Who supplied the project’s components?

Martin GmbH from Munich delivered the rust. Furthermore, there were several different contractors employed in the plant. The company MAN delivered the turbos, so the turbines and the generator. The company Integral delivered the exhaust gas filters. The company Alpine constructed the building. Kranwerke Mannheim built the cranes and Kraftanlagen München implemented the outlet of the district heating.

### THEME 2: Buying Centers

3. **The Actors Involved in the Decision Process**

   > Which are the institutions involved in the buying process?

   We have several departments where we generate the requirements. For example in the department for maintenance or supply and disposal or even in the department of finance. We request a proposal and we decide subsequently.

   The process was basically controlled by the union. There was an open announcement for finding the decision, if an incineration plant would be constructed. Of course there also was research beforehand. The basis for all of this was that we had to find a solution for disposing 160,000 tons of waste from the union’s area. Therefore, we consulted several operators and asked them to consider options and to request a proposal. Eventually, the decision was taken in favor of an incineration plant.

   The amount of 160,000 tons of waste would be per year.

### THEME 3: Industrial Purchasing

4. **Types of Buying Situation**

   > Had there been an ongoing business relationship between supplier and buyer?

   As far as I am aware, there had been no previous relationships.

5. **Buying Decision Phases**

   > How is the need for a plant recognized?

   The main reason and criteria was the disposal of 160,000 tons of waste per year.

   > How are the characteristics and the quantity of the product defined?

   1. Which factors determined the size of the plant in MW?

   Our turbine generates a net output of 13.7MW.

   We of course subtract the own consumption and end up with roughly 11.5MW that we basically can feed into the grid of *City I*. Nevertheless, this is only the case, if we cut the outlet for district heating. In that case, it does not work. Otherwise, taking into account the conservation of energy, the more district heating the less electricity.

   The outlet for district heating is roughly 30MW and then round about five or 5.5MW or roughly 7MW for the generation of electricity. From that we still have to deduct our own consumption, so that roughly 5MW remain that we can feed into the grid of *Company II*. 
The priority is on district heating. *Company II* buys the heat they need and the remainder goes through the turbine. Therefore, it is controlled by the demand of the city of *City I*.

2. What is the price level in €/kW?

Regarding the district heating, we currently have a price of roughly 8€ per MWh and the average price at the exchange that we currently achieve is at round about 31€ per MWh.

6. **Supplier Selection**

   o Which are the main criteria for choosing the supplier of components?

   There were two main criteria. These were firstly the price and secondly the potential suppliers had to pledge that they would fulfill the contract. That is how it was decided.

   o Which are – according to your opinion – the strengths of your supplier?

   This I cannot tell you, because it was before my time. I basically came in at the point of time, when the offer to build an incineration plant was on the table. We had to issue an application to the country of Thüringen, an application for approval of construction and operation of a waste treatment plant. When this application had already been issued for the country of Thüringen and was close before the decision, at that point of time I basically joined the company. In the beginning of 2005, the approval was given and then the order was carried out or initiated commercially basically. At that point, my professional career here in the company started and then I was involved in the process. For everything before that, I really cannot tell you anything.

**THEME 4: Customer Relationship**

7. **Seller-Buyer Relationship in the Future**

   o How is the relationship regarding after-sales?

   The relationship is relaxed.

   o How is the relationship regarding project modifications or improvements?

   There have been no modifications or improvements that would be worth mentioning.

   o How is the relationship regarding possible new projects?

   There are currently no concretely planned projects. There are no efforts currently.

**Additional Comments**

The situation of the Waste-to-Energy market is currently difficult due to the renewable energies. At the moment, if you see the prices at the exchange for electricity, you could think that electricity is a single-use product or so somehow. There currently is an excess supply, but I think this one out of many aspects. I actually do not want to say much more to this.

To me, this currently is a little of a malformation. There also is know-how behind the electricity of the renewable energies and there is also performance, but the guaranteed selling prices probably falsify the value system a little, let us put it like that.
Appendix V – Condensed Transcript Company III, Interview D

Name: Interviewee D
Organization: Company III
Date and Time: 19th May 2015; 13:30 hrs
Duration: 53 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   - What is your position in the organization?
     I am the project manager and leader as well as team leader for the completion of large projects, especially projects in the segment of waste-to-energy.
   - What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
     Company III is an engineering company that operates worldwide. Especially in Germany and Hamburg, one of our business’ core components is the energy segment with the construction of power plants, both conventional ones and Waste-to-Energy and also energy saving technologies. We do not work with nuclear energies, but gas and waste. We offer engineering services, both engineering and owners’ engineering. Actually everything we do is engineering.
     For the project in Thüringen, there was an announcement of the union, a so called general contractor-announcement. Martin GmbH from Munich won the contract and the assignment for construction and commissioning of an incineration plant. I will send you the project’s data sheet via email. The Martin GmbH set up the structure of an internal consortium within the project. This means that Martin GmbH was the GU with its rights and duties towards the client, but within the project, the companies Integral and ABB were responsible for the supply in certain areas.
     Company III was the engineering partner of Martin so to say, so we did the engineering for the whole plant. This ranged from the creation of an uncouth overview to detailed plans for certain areas. Nonetheless, this did not overlap with the areas of the partners or the scopes of supply of the company Martin. We also took care of the project’s organization, management, approval, documentation and supervision of construction.
     We are a private company, listed on the Finnish stock exchange and a subsidiary of the Finnish parent company.
   - Please name some demographics of the organization such as its geographical location or the number of plants operated?
     We have operated in Germany and also internationally in the Waste-to-Energy segment for many years. During 20 or 25 years, we have been involved in more than 60 Waste-to-Energy projects, so we have a list of references with more than 60 projects. Additionally, we also have other projects we are involved in, both internationally as well as gas and steam plants in Germany. In Hamburg, we employ between 40 and 60 employees, in Germany between 600 and 700 in total. We are active in many other segments, but especially power plants.

2. Background of the Investment
   - When was the plant built?
     It was completed in 2008, beginning of construction was in 2003. The planning process took place from 2003 until 2004, the construction and commissioning was actually from July 2005 until September 2008, but you can check all this in the project’s data sheet later.
The amendment in the legislation for the circulation economy allowed landfills only under certain requirements. The amendment was actually also called landfill prohibition. As a result, many municipalities in Germany had to change their structure and built thermal waste treatment plants. The goal of the amendment – which is valid for the whole European Union by now – was avoiding the homogenization of harmful substances, so certain treatments for household waste had to be implemented. The construction of such plants depends on, besides legal requirements, how the plant can be integrated in the system. This means assessing the value of the plant. The main questions are if it is possible to generate electricity, if the market can be supplied or if the electricity is consumed by the operator itself. If the plant has a good concept, the question comes up if it is possible to generate district heating. If this option is possible, then it is an efficient and economically well-established plant.

The delay in this project was caused by the fact that the client only wanted to give its confirmation for construction after the approval was given. This was the reason for the delay.

Main goal of the union was to live up to its duty of treating and disposing the waste according to the legal requirements. Electricity and district heating actually did not have anything to do with this, but is a very praiseworthy byproduct from an environmental point of view, because the energy potential can be used and other fuels substituted. The old plants for district heating in City I were cut back, but not closed down and now are only used for back-ups.

The district heating still has a constant price, it did not increase due to the new generation method. This is caused by the fact that the costs of disposal are covered by the fees for waste. Therefore, the outlet of district heating is under political influence and there are no hard costs.

Generally, an incineration plant is more expensive than a power producer that operates on gas due to the exhaust gas purification, the processing of residues and their appropriate disposal, which is all omitted during electricity generation fueled by gas.

Previously explained

- Which were the exact reasons for building a new power plant?
- Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?

The processes for approval were very complex. We met relatively much resistance of political groups, first of all nature conservancy groups, but also parties who did not accept the majority decision. The neighboring municipality did not like that the plant was constructed at the community’s border. There were several channels with much resistance. We faced several thousand objections. It was complex, also after the approval. It took a long time until the union received the go from all involved parties.

- Who supplied the project’s components?

Well, like mentioned earlier, the main components were supplied by Martin GmbH from Munich, Integral from Austria and ABB from Switzerland. These were the decisive suppliers.

Additionally, we had a company that constructed the building, but I do not want to mention the name here, since we were not happy with them.

Furthermore, we contracted several smaller enterprises from the region of City I, for example for windows and doors. We did this, because we wanted to have a regional placement of assignments. We wanted to support the economy in the region and also increase the acceptance of the plant.

- Did the supplier of components have a role in solving these issues?
We handled the objections for the general contractor Martin, technological concerns most of all. Martin GmbH contracted experts who provided support in the approval process and were part of the general contract, but everything went over our table. This is due to the fact that an operator usually does not have the technical knowledge to manage objections in detail.

THEME 2: Buying Centers

3. **The Actors Involved in the Decision Process**
   - Which are the institutions involved in the buying process?
   The union was the decisive body. The announcement was published for 160,000 tons of waste including household waste, enterprise waste and so on. It was to be made sure that generation of electricity and district heating as well as their outlet was possible with the given constraints. This was the core information of the announcement. The involved parties suggested solutions. The union carried out the analysis of safety and technical requirements, financial demands and so on. Subsequently and after receiving the proposals, there were placement briefings. Martin GmbH dominated, because their offer was technologically and economically favorable.
   So the main parties in the buying process were the union and the engineers’ office. The union’s board nonetheless consisted out of the counties, so the board received the results and decided for a proposal. The engineering office therefore had a supporting role.

THEME 3: Industrial Purchasing

4. **Types of Buying Situation**
   - Had there been an ongoing business relationship between supplier and buyer?
   Actually, there were no real business relationships beforehand, because it was the first plant of the union.
   We at Company III actually had a contact, because we issued a report regarding the possibilities of the union for fulfilling the requirements.
   At a later stage, we were asked for an offer again, but this was after Martin GmbH had already won the project.

5. **Buying Decision Phases**
   - How is the need for a plant recognized?
   *Previously explained*
   - Which factors determined the size of the plant in MW?
   The output of the plant was determined by the amount of waste to be treated.
   The peak outputs for both methods are 13MW on the side of electricity and 30MW on the side of district heating.
   Either one of the peaks can only be reached though, if there is no output on the other side. The district heating covers the base load supply and has priority.
   The market for electricity has to remain under supervision, because it has to be declared very early, how much is supposed to be fed into the grid. If the demand for district heating changes, the back-up generation may step up to the plate. District heating always needs to be available as needed.
   - What is the price level in €/kW?
   The plant generates roughly 100 million Euro of yearly income.
   - How are potential suppliers selected?
   Like explained earlier, there was a public announcement.
   - How are the suppliers’ proposals selected and analyzed?
There were two rounds of allocation. The first one was decided in favor of Martin GmbH to be the general contractor and included the assessment of the conceptual technology and concepts and an economical perspective: What does Martin GmbH want? Afterwards, there were many other packages that were allocated. This was carried out on the basis of three aspects. Firstly, the technical conception or the plant as such regarding performance, secondly the price and thirdly the regional proximity, but this one was rather subordinate.

- How is the performance of the supplier evaluated?

There was a workshop for project evaluation. All the relevant companies did this internally first and in a second step, there were super-ordinate talks, especially with Martin GmbH. Martin GmbH actually deducted a strategy on the basis of these talks for themselves and following projects. The workshops resulted in “lessons learned” for the general contractor, the partners in the consortium and us.

6. Supplier Selection

- Which are the main criteria for choosing the supplier of components?

The economic situation and ability for performance were assessed. Since there were several components involved that cost several millions, we wanted suppliers that operate in financially safe waters. Therefore, we did not necessarily go for the lowest price, if we somehow discovered that the company was close to a financial meltdown. This actually happened in this project, but we consulted a party based on existing relationships. The company went bankrupt and we had to deal with it. The delivery was not entirely ordered, but still ended up on the construction side. Then there were backers and banks in the background who claimed ownership for the components. We argued that we had paid a down payment and that they were our property. Nonetheless, the package had to be completed, so that the plant could go into operation as planned.

- Which aspects do you think suppliers could or should improve?

The communication always is a topic that is immensely suitable for improvements. It is always difficult to put a standard for communication, since it is costly and makes the whole process expensive. Other soft factors that are of significant importance is the quality of individual project managers that are available. If there are good and competent people and all the other conditions work rather fine, the project runs relatively smoothly. If you have weak people or people not as good, there is a certain risk that decisions are not taken at the right point of time or are even revoked. It is important that positions with key responsibility are well filled. Contracts are one story, but do not manage everything. Sometimes you have to ask yourself, if you want to take a risk and may cause dispute or if we are in the situation of finding a gentlemen-agreement for agreeing. There might be losses, but under the bottom line the potential for losses or lawsuits is lower.

THEME 4: Customer Relationship

7. Seller-Buyer Relationship in the Future

- How is the relationship regarding after-sales?

Actually we are not involved in after-sales, because we dropped out of the project after handing it over. Nevertheless, I visit the plant on a regular basis for maintaining the contact with the operator and I only get positive information.

- How is the relationship regarding project modifications or improvements?

There have been no major changes at the plant itself. One or another component has been exchanged, but that is absolutely normal. In the surroundings of the plant, there have been buildings added for storage space or garages.
In the core, there are the same components and method. It is a proven technology that has been optimized.

○ How is the relationship regarding possible new projects?
Currently there are not plants of this kind in planning in whole Germany. The legal amendments that took place caused a construction boom and the erected capacity is sufficient for the amount of waste. Actually, there is a yearly decrease of the amount due to recycling which causes utilization shortages for the existing plants. There are punctual renewals of certain components in Germany, but new constructions do not take place anymore.
The last big plant finally went into operation in 2014, but it was already observable that there would be no new ones.

Additional Comments
Due to the capacity there will not happen much that plants are added. The recent changes were caused by laws, but also here there are no significant changes in foreseeable future. Germany actually is a forerunner in Europe. The countries of the European Union are obliged to make up by implementing guidelines. This means that there is not much that will happen within the next 10 years in Germany. Internationally, countries that are not in the center of the European Union and relatively new in there or want to get in there are the ones where significant demand of capacity is developing. I am thinking about Poland or Turkey for example. There would be a great demand, but not in Germany in foreseeable future.

We are on the German Waste-to-Energy market since 1990 and also internationally active. There are projects that were carried out by our company ranging from plants in Germany in the area of Hamburg, Frankfurt or Oberhausen over international ones on Mallorca to China and so on. This results in a diverse operational field, since the requirements are different, because the legal background is another one. We are not active in Sweden, because there are subsidiaries in Sweden and Finland. The Swedish Company IV might be someone you would like to talk to when it comes to the Swedish market.
Appendix VI – Condensed Transcript Company V, Interview E

Name: Interviewee E
Organization: Company V
Date and Time: 13th May 2015, 10.00 hrs
Duration: 44 minutes

THEME 1: The Project’s Background

1. **Background of the Interviewee**
   - What is your position in the organization?
     I am responsible for all the contractual arrangements in the department for environmental issues and protection.
   - What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
     The Company V operates many different power plants. Therefore, our portfolio does not only comprise Waste-to-Energy plants. We are not a public, but a private company.

2. **Background of the Investment**
   - When was the plant built?
     The waste-to-energy power plant in City III was built 27 years ago.
   - Which were the exact reasons for building a new power plant?
     The main reason for the construction of the plant was the fact that an incineration plant was needed in order to solve the issue of waste disposal. This was carried out on the initiative of the five surrounding cities. Back then, they aimed on building a modern plant. Obviously, the generation of energy is a byproduct in the form of district heating, but the primary goal was the disposal of waste.
   - Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?
     Well, given the fact that the property used to employ a power plant for hard coal prior to the construction of the incineration-power generation plant, the residents were already used to trucks transporting coals to the plant. Waste was treated there to a certain extent as well by the way. Therefore, there were not problems or resistances pretty much more with the population in general or the residents in particular. Nonetheless, we faced rather high political requirements: Since the plant was constructed in the middle of a residential area, we had to apply the cutting edge of smoke and gas filter technology. The plant has the maximum of filter components which is obviously very complex. This nevertheless led to the result that – from a social point of view – we rather met consent for the plant than resistance.
     As a result, we ended up building a new waste incineration plant with valid limit values, when it comes to exhaust gases. Under the bottom line, the constructing was very complex. Today, it is more likely that cheaper versions of filters are applied. These would be filters with special tissue.
   - Who supplied the project’s components?
     The plant was originally built by Babcock. First with a two-step filter, afterwards two additional steps were applied. The boilers, the rusts and the filters were supplied by Babcock, the German company. The catalysts were delivered by AE&E from the United States.
     The electrical power output accounts for 50 MW gross, which results in roughly 40MW net.
Well, like I said, Babcock built the plant, the modifications were taken on by AE&E, since Babcock had been acquired by Hitachi.

THEME 2: Buying Centers

3. The Actors Involved in the Decision Process
   a. Which are the institutions involved in the buying process?
   During the whole planning and decision process we made sure to have the market leaders involved of course, since we did not want to have any inferior products applied. Nonetheless, the decision which technology to apply in the end was entirely Company V’s. We used coke filters.
   b. How much influence do they have?
   Well, Company V is the operator and the owner. Therefore, they have the full decision power.
   Nonetheless, the five cities – City IV, City V, City VI, City VII and City VIII – contributed in the financing of the plant. Other than those, there were no parties involved.

All in all the decisions were taken in amity among all the involved parties. As you may know, Company V is more than 110 years old. It actually evolved out of the municipalities themselves – out of City IV and City VIII. Therefore, the company always operates in amity and agreement with the municipalities.

THEME 3: Industrial Purchasing

4. Types of Buying Situation
   a. Had there been an ongoing business relationship between supplier and buyer?
   Company V had always maintained business relationships with Babcock. Nonetheless, there had been no incineration plant of that kind in Company V’s portfolio. Therefore, the relationship was solely based on the operations with lignite plants.

5. Buying Decision Phases
   a. How is the need for a plant recognized?
   Previously explained
   b. How is the performance of the supplier evaluated?
   Well, there are always aspects that could be improved. Therefore, we conducted meetings upon completion of the project in order to figure out where we could cooperate more efficiently.

6. Supplier Selection

THEME 4: Customer Relationship

7. Seller-Buyer Relationship in the Future
   a. How is the relationship regarding after-sales?
   Like mentioned earlier, there is no relationship with Babcock anymore, since they were bought by Hitachi, so the retrofitting was done by AE&E.
   b. How is the relationship regarding project modifications or improvements?
   Originally, we planned three operational units, then a fourth one was considered, which would have been delivered by the same supplier, but the filter systems would have been another manufacturer.
Additional Comments
There currently are many Waste-to-Energy plants in Germany. Nonetheless, the supply of waste suitable for incineration and subsequent power generation is slowing down. We have waste imports coming over the Netherlands that might remain active for maybe five more years. Afterwards, I expect the imports from Great Britain to decrease, which might result in plants having to close down.
Appendix VII – Condensed Transcript Company IV, Interview F

Name: Interviewee F
Organization: Company IV
Date and Time: 14th May 2015, 10:00 hrs
Duration: 68 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   o What is your position in the organization?
   My function is the coordination of purchasing in the purchasing department of the Company VI. I am the head of the team for the need of generation and disposal in the company. We are organized as follows: We have departments for grid purchasing, for project purchasing which is mainly responsible for new projects and a department for general purchasing. Well, I have the leading responsibility for the purchasing department for generation and disposal. Above those four teams I just mentioned, there is the Head of Purchasing who is in charge.
   
o What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
   I am employed in the holding, in the purchasing department. This is a central purchasing department and we are mainly busy with buying materials and services. This of course includes taking care of the whole contract management, negotiations and so on. We are a private company. We used to be a public energy provider. The city of City IX was the boss of the whole company so to say and at some point in the 1990s the company was privatized. Nonetheless, we are still the local energy provider for City IX and City X. The grids belong to 75% to the Company VI and to 25% the city of City IX. So the city still has a little involvement there. Our mother company is the Company VII, the currently fifth largest – well, I am not sure actually – maybe already the fourth largest energy provider in Germany. They bought us in 2008. City X was bought in 2003, just in order to further develop the business. Until then, City X had been independent and therefore, the Company VI decided to acquire the business field in City X as well, because the cities also belong together. City IX and City X are a city state and therefore, the business area was an optimal fit.

2. Background of the Investment
   We have a gas power plant for ArcelorMittal, so the former steel production plants. This one has an output of currently roughly 150MW. Furthermore, we have a newly built plant, a gas and steam turbine power plant, which is currently in the probation phase. It is supposed to switch to regular operation in the summer of this year with round about 227MW. We further have a coal power plant in the harbor having roughly 300MW of output. Furthermore, we have a plant for natural gas and another coal power plant. The one for natural gas puts out 162MW and the one for coal 119MW. Additionally, we have biogas plants and combined heat plants that we operate and wind parks, but all of that on a smaller scale, I would say.

Well, additionally we have a waste-to-energy plant.
All MW values are net, by the way.
   o Which were the exact reasons for building a new power plant?
The primary reason for building the plant was waste disposal.
Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?

We really did not face any restrictions or problems in front of legal, political or social backgrounds.

**THEME 2: Buying Centers**

3. **The Actors Involved in the Decision Process**
   - Which are the institutions involved in the buying process?

Like mentioned earlier, the grids are owned by the Company VI to 75% and by the city of City IX to 25%, so these are the parties involved. Other than those, there is nobody having any decision rights.

**THEME 3: Industrial Purchasing**

4. **Types of Buying Situation**
   - Had there been an ongoing business relationship between supplier and buyer?

We did not make use of any existing relationships. We just issued a public announcement covering the whole European Union.

5. **Buying Decision Phases**
   - How is the need for a plant recognized?

Previously explained
   - How are potential suppliers selected?

Like I mentioned earlier, we issued a public announcement and everybody interested in doing business was enabled to present a proposal.
   - How are the suppliers’ proposals selected and analyzed?

We apply a matrix comprising different categories of importance. In there we entered rankings on a very objective basis and decided based on these results.
   - How is the order routine defined?

Well, since we operate with many different suppliers and projects, we do not establish any order routines. At least we have not done so so far.
   - How is the performance of the supplier evaluated?

During the construction period, we conducted meetings on a weekly basis. Upon completion of the construction we had a subsequent meeting with a list of shortcomings in order to discuss the aspects that went well and the ones that did not go so well.

6. **Supplier Selection**
   - Which are the main criteria for choosing the supplier of components?

The absolute main criteria that we focus on are the price and the products’ quality.
   - Which are – according to your opinion – the strengths of your supplier?

Well, besides the price, product quality, references, ability to meet dates and deadlines, creditworthiness and financial stability and their record of accidents, we strongly focus on their compliance with safety regulations. This is very relevant, because we as the builder and contracting entity are responsible for the safety on the construction site. We are the ones who would have to pay fines, it the safety regulations are not complied with.
   - Which aspects do you think suppliers could or should improve?

One aspect that could definitely be improved is the communication. Furthermore, it is important to be honest and upright. They should not try covering mistakes made, but deal with them openly and honestly.
Nonetheless, every supplier is exchangeable.

**THEME 4: Customer Relationship**

7. **Seller-Buyer Relationship in the Future**
   - How is the relationship regarding after-sales?
     We have different relationships, since we had many different suppliers. Some of these work on the basis of obligingness, so they are easier to manage. Suppliers that only delivered single parts are harder to grab and to issue a claim for.
   - How is the relationship regarding possible new projects?
     We currently do not have any projects in planning.

**Additional Comments**

Based on the development of the Waste-to-Energy plants, a fight and competition for waste has evolved in Germany. Nonetheless, due to the low prices of electricity, you do not earn much money with electricity itself. Maybe it would be even more cost-efficient to sell the waste.

Under the bottom line, the profits made with electricity are nearly +/-0.
Appendix VIII – Condensed Transcript City IX, Interview G

Name: Interviewee G
Organization: City IX
Date and Time: 26th May 2015; 11:30 hrs
Duration: 33 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
   - What is your position in the organization?
     I am employed by the authority and the senator for environment, construction, traffic in the ministry of City IX. I am a referent for policy issues in the waste management.

   I am also responsible for updating the statistical table of the country City IX that is concerned with the amount of waste incinerated and the origin of the waste.
   - What type of organization are you employed in? Is it a private business, a governmental agency or a public utility?
     We are an administrative body and determine if the waste requirements are fulfilled. This means, we check if the waste can be treated and disposed or not. Furthermore, we control the requirements for the plants in the law for Waste-to-Energy plants, appendix 2, section 1, footnote 4. This is based on the formula of sustainment.
   - Please name some demographics of the organization such as its geographical location or the number of plants operated?
     In the country of City IX, there are four Waste-to-Energy plants in operation. Two are operated by Company VI, one by Company VIII and one by Company IX.

2. Background of the Investment
   - Which were the exact reasons for building a new power plant?
     The reason for building a new plant was the need for treating and disposing waste. One plant has been in operation since 1969, the one in City X since 1977. Waste disposal was the reason, energy output of the incineration plants was a byproduct and thereby secondary. Originally, the disposal was the primary reason which is not the case anymore today.
   - Which kind of issues had to be faced when building the plant such as legal requirements, social issues and political influences?
     There was a big political discussion regarding the plants’ emissions in the 1980s. As a result, the legal requirements were changed and the plants altered.

THEME 2: Buying Centers

3. The Actors Involved in the Decision Process

THEME 3: Industrial Purchasing

4. Types of Buying Situation
5. Buying Decision Phases
6. Supplier Selection
THEME 4: Customer Relationship

7. Seller-Buyer Relationship in the Future

Additional Comments
The market will further exist, but there are ambitions to treat the waste separately by substances. Therefore, we would lose material for input. Nonetheless, we do not only incinerate waste from City IX, but import from the European Union, since many countries do not have the capacity for incinerating their waste.
Appendix IX – Condensed Transcript Jörgen Carlsson, Umeå Energi

Name: Jörgen Carlsson
Organization: Umeå Energi
Date and Time: 11th May 2015
Duration: 75 minutes

THEME 1: The Project’s Background

1. Background of the Interviewee
Business developer at Umeå Energi, public utility owned by Umeå municipality.

2. Background of the Investment
   o When was the plant built?
   1998-2000
   The decision was taken in 1997, before we performed studies, research and preparation process. The actual process started 8 months after (1998-1999). The plant was inaugurated in August 2000.
   o Which were the exact reasons for building a new power plant?
   The plant was built after three main drivers:

   1. Increased demand for district heating
   2. The old waste incineration plant in Ålidhem was too old to operate so we needed to replace it.
   3. We have had a cooperation with the municipalities surrounding Umeå and belonging to the Umeå Region which were interested in delivering their waste to us.

   1. What is the reason for an increased energy output?
   We wanted to expand our district heating network and we had to replace the old plant. We also planned a strategy in order to have extra energy to manage the demand for extra heating power during the coldest days in the winter. For this reasons a good supply chain was needed.
   o Which were the project’s limitations?
   The Ålidhem plant was old and overcrowded and too close to the residential area. So it was not possible to expand it and we had to look for a new site. We had different options: one in Holmsund, one in Umedalen and a big site in Dåva. This last site was the most suitable for many factors: the land owned by the municipality and it was well connected to big roads (E4).
   Budget restraints were the main limitation: it was a big investment (700 mil. SEK).
   o Which kind of issues had to be faced when building the plant such as legal requirements, social issued and political influences?
   This plant had stringent legislation: in particular new EU legislation about waste incineration plants so this plant had to meet many new specific requirements such as:

   1. On how to measure emissions (in water and air)
   2. On how to make sure that measuring equipment works correctly
   3. On how we are asked to report it to local authorities (in what period of time)
   4. On the disposal of the rest products such as flue gas residues and bottom ash.
They also required test runs and external measuring experts that come to check the emissions and the quality of the operational plant. Furthermore, strict legislation in case of failure of the instrumentation that would make us shut down the plant made us need to have back up instrumentation for these cases. We didn’t have any issue with policy makers and governments.

Umeå has had Waste incineration plants from the 70s, so they are familiar with them. Furthermore, we are owned by the municipality of Umeå so our board consists of politicians. We didn’t get founds from the Swedish government but from the European Investment bank (almost half of the financing and the rest was from our own savings).

- Did the supplier of components have a role in solving these issues?
- Our suppliers helped by providing expertise needed to meet the legal requirements (in particular the flue gas cleaning system)
- In which ways did the supplier help (or could the supplier help)?

The output of the plant had to meet the expectations, in particular from a technical point of view.

**THEME 2: Buying Centers**

3. **The Actors Involved in the Decision Process**

- Who are the institutions involved in the buying process?
  
  The board of Umeå Energi is the main actor but, in the case of this big investments like this, the decision cannot be taken individually, so also the city council took part in these decisions.

  - How much influence do they have?
    - 1. How much influence do they have in the decision concerned with the nature of the project as a whole such as reasons and location?
    - 2. How much influence do they have in the decision concerned with the project’s characteristics in further detail such as the power generation method, technology or technical concerns like the output?

  For what concerns the location, we had to report to the City council, by proposing the three options and strongly suggesting the Dåva one. Then, they came back to us with questions on the different decision grounds, and after our answers they made the decision.

No, the City council is not involved in these issues.

- Who are the professional figures involved in the buying process?
  
  For these big projects a specific organization is set up. It is made by with project managers, project leaders with their teams, purchasing expertise prom Umeå Energi and also consultants from outside, as we need extra expertise to handle complex knowledge and documentation.

  - How much influence do they have?

They have a lot of influence on what objectives we have to fulfill and how. They set up the preliminary aspects of the purchasing phase (such as production of heat, electricity, net efficiency ratio...).
THEME 3: Industrial Purchasing

4. Types of Buying Situation
   - Had there been an ongoing business relationship between supplier and buyer?
   Yes. We had the same suppliers for the boilers and the furnace of the old plant, but there is no formal contract. It was a totally new situation.

5. Buying Decision Phases
   - How is the need for a plant recognized?
   Previously explained in theme 1 question 2
   - How are the characteristics and the quantity of the product defined?
     Thanks to our experience with incineration plants, we had a clear idea of what we wanted and even more of what we didn’t want, so we could draw a lot from that.

   1. Which factors determined the size of the plant in MW?
     The quantity was defined on the basis of the amount of waste collected every year and from the established partnerships with surrounding municipalities. In this way we could estimate roughly how much waste we would collect to incinerate. Furthermore we knew that we had the old plant to replace and plus the extra amount of electricity and heat that we needed.

   2. What is the price level in €/kW?
     80 million euro/65000kw (thermal) = 1231 (year 1998)
     - How are the specifications that guide the procurement – such as specific characteristics, price or design - developed?
     The design team and the legislation guidelines define these aspects. There is a stringent regulation for this kind of purchases in Sweden and in the EU for public utility purchases.

   - How are potential suppliers selected?
     There are many steps: a pre-qualification, a selection round where we create a list of requests (output of the plant, and other specifications) that should be fulfilled. Then we prepare the purchasing protocol documents regarding these issues. We have to choose if to buy a function or to buy a technical detail system. Usually we go for functions, so that we define some requests we have to fulfill and the suppliers have the power to decide how to meet these requests. Proposal and order routines are developed from this framework.

   - How are the suppliers’ proposals selected and analyzed?
     The bidding proposals are evaluated by weighted average based on scores for different criteria, weighted for their specific importance.

6. Supplier Selection
   - Which are the main criteria for choosing the supplier of components?
     Performance (quality and output) and financial aspects (price)
   - Which are – according to your opinion – the strengths of your supplier?
     They formed an industrial consortium to meet up for our demands, and financial strength is required.
   - Which aspects do you think suppliers could or should improve?
     We had lively discussions with supplies as we had hard times in finding agreements on some issues.
THEME 4: Customer relationship

7. Seller-Buyer Relationship in the Future
   o How is the relationship regarding after-sales?
   Our suppliers come every year for service and maintenance. Service partnerships are very important.
   o How is the relationship regarding possible new projects?
   We considered building a second plant, but a new method was chosen because there was not much more waste available in the surroundings (and policy decision of not importing from other countries). So we did not have this situation.
Appendix X – Summarizing Table of Findings

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Project’s Background</strong></td>
<td><strong>Project I</strong>&lt;br&gt;Interviewee A&lt;br&gt;Interviewee B&lt;br&gt;Interviewee C&lt;br&gt;Interviewee D</td>
<td>Dåva plant, Umeå</td>
</tr>
<tr>
<td>Interviewee A:</td>
<td>-New method for treating and disposing waste was needed</td>
<td>Jörgen Carlsson:</td>
</tr>
<tr>
<td></td>
<td>-Social excitement caused by cuts in personnel due to shift from coal</td>
<td>-Umea Energi, public utility owned by</td>
</tr>
<tr>
<td></td>
<td>power plant</td>
<td>Umea municipality</td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee C:</strong></td>
<td>-Increased demand for district heating</td>
</tr>
<tr>
<td></td>
<td>-Primarily waste treatment and disposal, secondarily power generation</td>
<td>-Needed to replace the old plant</td>
</tr>
<tr>
<td></td>
<td>-Resistance existed</td>
<td>-Waste from surrounding municipalities</td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee D:</strong></td>
<td>-Limitation: budget restraints</td>
</tr>
<tr>
<td></td>
<td>-Waste treatment and disposal of waste according to legal requirements</td>
<td>-Stringent EU-legislation</td>
</tr>
<tr>
<td></td>
<td>-Power generation is a byproduct</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Resistance from political groups and neighboring municipality</td>
<td></td>
</tr>
<tr>
<td><strong>Interviewee E:</strong></td>
<td>-Waste treatment and disposal primary reason, power generation secondary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reason, power generation secondary reason</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee F:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Primary reason was waste disposal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-No problems due to political, social or legal backgrounds</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee G:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Waste treatment and disposal primary reason, power generation secondary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reason</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Discussion regarding emissions: Laws changed, plants altered</td>
<td></td>
</tr>
<tr>
<td><strong>Buying Centers</strong></td>
<td><strong>Interviewee A:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Company I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-City represented in supervisory board</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee B:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Company I</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-City not in official position</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee C:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Several internal departments involved in the request for proposals</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Interviewee D:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Union’s board (members of the union) was the decisive body</td>
<td></td>
</tr>
<tr>
<td><strong>Interviewee E:</strong></td>
<td>-Entire decision process is Company V’s responsibility, decisions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>taken in amity with cities</td>
<td></td>
</tr>
<tr>
<td><strong>Interviewee F:</strong></td>
<td>-Company VI 75%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-City IX 25%</td>
<td></td>
</tr>
</tbody>
</table>
Interviewee A:  
- Many suppliers, so existing relationships with some, with others not  
- Public announcement  
- Quality, execution, price, sticking to deadlines  
- Large deals managed by CEOs

Interviewee B:  
- No previous relationships  
- Goal: disposal of 160,000 tons of waste per year  
- Price and pledge for fulfillment of contract  

Interviewee C:  
- No previous relationships  
- Goal: disposal of 160,000 tons of waste per year  
- Public announcement  

Interviewee D:  
- No relationships beforehand  
- Public announcement, then two decision phases:  
  1. Assessment of technology and concepts as well as economical perspective  
  2. Three important aspects: technical conception, price, regional proximity  
- Economical situation, ability for performance, financial situation

Interviewee E:  
- Relationship with the company, but for coal power plants  
- Recognition of issue of waste disposal

Interviewee F:  
- Relationships did exist, but were not made use of  
- Goal was the treatment and disposal of waste  
- Results of decision matrix: price, product quality, references, sticking to deadlines, creditworthiness, financial stability, record of accidents, compliance with safety regulations

Jörgen Carlsson:  
- New Task situation  
- Need: district heating, replace old plant, waste from the municipalities  
- Previous experience with incineration plants  
- Quantity: amount of waste collected every year, old plant to replace and the extra amount of electricity needed specifications defined by design team and the legislation guidelines  

Suppliers selected for: Performance (quality and output) and financial aspects (price)
<table>
<thead>
<tr>
<th>Interviewee A:</th>
<th>Interviewee C:</th>
<th>Interviewee E:</th>
<th>Jörgen Carlsson:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variation in relationships due to several suppliers</td>
<td>Positive and easy relationship regarding after-sales</td>
<td>Retrofitting done by new suppliers, since old ones do not exist any longer</td>
<td>Service and maintenance</td>
</tr>
<tr>
<td>Modifications by old and new suppliers</td>
<td></td>
<td>Modifications: old and new suppliers</td>
<td></td>
</tr>
<tr>
<td><strong>Interviewee B:</strong></td>
<td><strong>Interviewee D:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrangements regarding after-sales are made between technicians and suppliers</td>
<td>Relationships regarding after-sales seem to run smoothly</td>
<td>No real modifications, just exchanges of components</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix XI – Thematic Networks

- Global Theme 1: Buying Centers
  - Organizing Theme: General Characteristics
    - Basic Themes
      - Public Utility Provider
      - Plant Operator
      - City Council
      - Internal Departments
  - Organizing Theme: Plant Specifications
    - Basic Themes
      - In-House Expertise
      - Consultants
      - Sub-Project Leaders
      - Project Managers

- Global Theme 2: Buying Situation
  - Organizing Theme: New Task
    - Basic Themes
      - New Situation
      - New Operator
      - New Plant
  - Organizing Theme: Modified Re-Buy
    - Basic Themes
      - New Plant
      - Previous Relationships
• Global Theme 3: Buying Process
  o Organizing Theme: Definition of Plant Characteristics
    • Basic Themes
      • Previous Experience
      • Suggestions of Competing Suppliers
      • Municipality’s Requirements
      • Decision between Function or System
      • Suitable Location
  o Organizing Theme: Product Specifications
    • Basic Themes
      • Grid Connection
      • Desired Output Method
      • Waste Availability
      • Legal Requirements
  o Organizing Theme: Supplier Selection
    • Basic Themes
      • Bidding Proposals
      • Weighted Average of Criteria
      • Decision Matrix
• Global Theme 4: Buyer-Seller Relation
  o Organizing Theme: Customer Relationship Management
    • Basic Themes
      • Maintenance
      • After-Sales Agreements
      • Technical Support
• Exchanges of Components

• Global Theme 5: Customer motives
  o Organizing Theme: Patronage Motives
    • Basic Themes:
    • Price
    • Performance
    • Quality
    • Environment
    • Financial Situation
    • Observance of Deadlines

  o Organizing Theme: Purchase Motives
    • Basic Themes:
    • Waste Treatment Need