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Waste Management: Supplier Selection Criteria and Weighting Factors Within Tender Evaluation Processes

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**Waste Management: Supplier Selection Criteria and  
Weighting Factors Within Tender Evaluation Processes**  
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## Executive Summary

The research aims at investigating the connection between supplier selection criteria and the achievement of innovative and sustainable contracts. During 2017, the Norwegian waste market suffered from the bankruptcies of two of the largest household waste collectors. The municipalities that were responsible for the outsourcing of the contracts received massive criticism for how they conducted the tender evaluation processes, especially since the contracts were awarded to the supplier that offered the lowest price. Factors like changes in trends, new technology, and an increased focus on the circular economy have increased the complexity of waste collection and transport services. Thus, it is found evidence that it is no longer sustainable to outsource the service exclusively on price. One suggested action that has received attention lately is the usage of non-economic supplier selection criteria, which permits the selection of a supplier with a greater focus to other aspects like, i.e., their quality and environmental concerns. Since the usage of non-economic award criteria is emerging, uncertainties regarding the effect, definitions, and proper usage are still discussed. Based on the bankruptcies and increased usage of non-economic criteria, our research aims to answer the proposed research question: “How does the weighting of supplier selection criteria affect the tender evaluation processes, and in what manner does the usage of criteria promote the formulation of sustainable and innovative contracts?”.

A comparative case study approach was conducted to answer our research question. Semi-Structured interviews with decision-makers within several Norwegian municipalities provided an in-depth understanding of the usage and implications of supplier selection criteria. Due to the nature of contracting out a refuse collection service, theory within the area of public procurement, contract management, project management, and supplier selection become relevant. Further, the principal-agent theory is used to investigate communication and market transparency. Lastly, transport economics provide the public purchasers' insight into the cost drivers, which are found to be crucial for sustainable pricing.

**Key words:** *Household waste management, municipal solid waste, outsourcing, supplier selection criteria, award criteria, tender evaluation processes, public-private procurement, household waste collection*

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*Anna and Linn*

*Oslo, August 2018*



Picture 1 The Authors visiting the biogas plant in Vestfold

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Abbreviations	
<b>IMC</b>	Inter- municipal cooperation
<b>MSW</b>	Municipal Household Waste
<b>KOFA</b>	The Norwegian Complaints Board for Public Procurement
<b>FOA</b>	Forskrift for offentlige anskaffelser (Regulations for Public Procurement)
<b>DIFI</b>	Direktoratet for forvaltning og IKT
<b>NCA</b>	Nordic Competition Authorities
<b>VESAR</b>	Vestfold Avfall og Ressurs AS
<b>ROAF</b>	Romerike Avfallsforedling IKS
<b>BIR</b>	Bergensområdet Interkommunale Renovasjonsselskap AS
<b>RfD</b>	Renovasjonsselskapet for Drammensregionen

# 1.0 Introduction & Background

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There have been quite a few cases concerning different competition problems in waste management in the Nordic countries over the last few years (Nordic Competition Authorities (NCA), 2016). The Norwegian waste industry was suffering from bankruptcies of two of the biggest suppliers 2017 (Hovland, 2017; Kirkebøen, 2017). The bankruptcies created significant ripple effects in the Norwegian waste industry. In particular, we see signs of a transition regarding the formulation of contracts aiming to increase the sustainability. A brief presentation of the recent bankruptcies and the current market situation is conducted to get a deeper understanding of the tender evaluation processes that were conducted.

## 1.1 History of Recent Bankruptcies

### Veireno

The Norwegian household waste collector Veireno was owned by the VT-group (Tømmerås, 2015). Veireno acquired Mathisen Renovasjon in 2014. As part of the acquisition, responsibility for the waste collection services in Skedsmo and Nittedal, which was one out of four areas managed by ROAF, was transferred to Veireno. The following year, the waste collection company won the competitive tender in Oslo. The collection covered all four contract areas in the municipality, equaling the value of approximately 419 mNOK. Shortly after, the company was awarded a contract for the inter-municipal cooperation VESAR. In total, the relatively young company received contracts to a value of approximately 500 mNOK within a short period. An essential part of their winning strategy, especially concerning the contract of Oslo, was their suggestion of reducing costs by reformulate the vehicle fleet and implement a two-shift system, reduce the number of collectors, and to reduce wages (Tømmerås, 2015; Deloitte, 2017). This pricing strategy enabled them to offer contracts prices far below the competitors price propositions. However, their strategy eventually failed, mainly due to their lack of capacity deficits resulting in redundant trucks, causing illegal working hours and lack of payroll payments. At the end of February 2017, Veireno was stated bankrupt (Kirkebøen, 2017).



## RenoNorden

RenoNorden was established in 2000 and started operating in the Norwegian market during the fall of 2001 (RenoNorden, 2018). The following years were characterized by great success business-wise, as the company won several tenders and became the most prominent contractor in the market of household refuse collection services. Their progress was also significant in Sweden, Denmark, and Finland. In 2017, RenoNorden handled the household waste for approximately one-third of the Norwegian population, equaling a market share of 46 percent.

Reno Norden was stated bankrupt in September 2017 and had at the time 30 contracts in Norway, which comprise about 1.2 million people (renonorden.no). The main reason behind the bankruptcy of RenoNorden AS was them enter of 11 loss contracts in a relatively short period, by the end of 2015 and the beginning of 2016, which caused the estimated loss of more than 300 mNOK (RenoNorden, 2017; Hovland, 2017). As each of the loss contracts had a maturity for about eight to ten years, the total loss was making it impossible to change the decreasing results (Framstad, 2016). Another factor affecting their financial situation was their extensive investment of new vehicles and long-term leasing agreements during the pre-phase of the contract, partly influenced by the recent environmental regulations and required vehicle standards (Hovland, 2017).

An overview published by Dagbladet shows that 133 Norwegian municipalities suffered from the bankruptcy of RenoNorden (Breivik, 2017) (Attachment 1). The municipal decision makers handled the situation differently. Data shows that 53 municipalities have permanently insourced the activity because of the bankruptcy (Rønning, 2018). Further, 39 municipalities insourced the service temporarily, while the remaining six entered into temporary emergency contracts with private suppliers.

## The Waste Crisis in Oslo

During the autumn of 2016, the waste collection service provider Veireno was awarded the contract and further assigned the responsibility for waste collection services in the municipality of Oslo (Tømmerås, 2015). However, shortly after the contract commencement, Veireno went bankrupt, which was the beginning of what later on became recognized as the “waste crisis” in Oslo (Kirkebøen, 2017).

Furthermore, opinions have been shared, and criticisms have been expressed for reasons that potentially caused the failure of the contract and the newly launched project.

The consultancy agency Deloitte was commissioned to conduct a review of the recent procurement process conducted by Oslo Renovasjonsetat (REN), and their awarding of the contract to Veireno (Deloitte, 2017). The report identifies inadequate procedures on several critical points in the tender evaluation process and formulation of contract. Deficiencies were noted concerning the preparation phase, insufficient specified requirements, qualification requirements and award criteria. The consultants further objectify REN's lack of competence related to their knowledge concerning pricing of the contract and the perception of the supplier's understanding of the mission and overall operating model. Furthermore, the consultants emphasize that better utilization of the municipality's internal competence should be able to identify the lack of necessary resources required to meet Veireno's proposal.

The REN's evaluation was considered by "economically most advantageous tender" (MEAT), and the award criteria were formulated based on this consideration. The award criteria of price, environment, and mission understanding was equaling 75%, 10%, and 15% respectively. REN's description of the non-economic award criteria of quality and environmental aspects mainly included specifications regarding waste sorting bags, and ecological factors concerning fuel, use of climate-friendly automotive technology, and measures of noise reduction.

REN initially estimated the contract value to 1.25 billion NOK (Deloitte, 2017). However, the suggested offer from Veireno was significantly lower, equaling 420 mNOK, which besides was 20% less than the second lowest bid. Required conditions for Veireno's low contract price, was suggestions of a two-shift system and a reduced number of collectors needed during the contract period. Deloitte points critics to REN's approval of the proposal, even though their strict formulated contract requirements and furthermore to their possession of knowledge regarding the growing amounts of waste in the municipality. The contract included requirements regarding the vehicle fleet, biogas vehicles (Euro VI), technology requirements of a future software system implementation for

route optimization, and RFID. Furthermore, the contract included requirements regarding a solid quality plan for mission performance, health-society and Environmental (HSE) conditions, and adequate preparedness (of both workers and vehicles). However, some of the criteria and contract agreements were criticized in the report for not being adequately defined and fulfilled.

The consultants finalize their investigation of REN's procurement process and quality of performance by stating various suggestions for improvements such as increased documentation of required competence, and better involvement of relevant capability during the procurement process, and knowledge regarding legal- and waste management aspects. Consequently, Deloitte suggests better communication both within the agency and between other agencies.

## Consequences

Following the bankruptcies and the waste crisis in Oslo, experts have recognized an unhealthy price spiral in the supplier market, where the increased competition led to symptoms of predatory pricing. (Rønning, 2018). Regarding the tender in Oslo, Veireno offered a contract price that was approximately 82 mNOK beneath than the second lowest tender (Deloitte, 2017). Additionally, data shows that RenoNorden provided contract prices equaling 90 percent lower than the other competitors (Johannessen, 2017). Afterward, the tender authorities (municipalities and IMC) has received massive criticism due to their exclusive focus on price (e.g., Tømmerås, 2017; Eggesvik, 2017; Hovland, 2017, Johannessen, 2017). To avoid a recurring situation characterized by the selection of an underpriced and subordinated contract, decision-makers in the municipalities have directed an increased focus on sustainability through the use of non-economic criteria (Avfall Norge, 2017).

## 1.2 Motivation for the Research

Based on our economic background and major in logistics, operations, and supply chain management, we have chosen to deepen our research in the field of waste management. As a result of the recent bankruptcies, we have decided to focus on public-private procurement and outsourcing of transportation services.

Contractual agreements, formulation of tenders, decisions regarding supplier selection criteria, and the buyer-supplier relationship will be investigated to highlight their impact on sustainable contracts. Our motivation for this study is to gain a deeper understanding of supplier selection processes and the consequences for performance quality.

## 1.3 Trends and Statistics

Waste collection and transport services have become a complex task during the recent years (Andersson & Norrman, 2002; Bel & Warner, 2008). The development of new technology, population growth, environmental concerns, and a higher level of municipal waste are factors that have triggered the uniqueness and complexity of the service. The total amount of waste generated in Norway in 2016 was 11.4 million tons, corresponding to an increase of 3 percent from 2015 (the Norwegian Environment Agency, 2016; SSB, 2018a).

A crucial driver for the change in environmental considerations in the solid waste management is the political establishment of laws and regulations aiming for a sustainable market structure (European Commission, 2015). The regulations seek to minimize or prevent waste generation. The European Waste Directive defines the strategy for waste management in the waste hierarchy, which consists of five options for waste treatment in prioritized order (Attachment 2) (European Commission, 2008). The overall aim is for waste to be managed in a way that minimizes the impact on the environment through re-use and prevention (Price and Joseph, 2000).

A consequence of the increased focus on environmental aspects of society is the development of the concept of the circular economy (Legge & Klett, 2018). (Attachment 3). The critical insight behind the model is that waste is not waste but

a resource. The transmission from a previous linear economy, where products finalize as waste to be thrown away, has now transformed towards an extended product lifecycle with an increased product value. The aim of the circular economy is twofold; the concept seeks to convert waste into valuable resources and to connect production and consumption activities (Witjes & Lozano, 2016). Thus, the model takes on both the environmental and socio-economic aspects since recycling, re-usage, and consumer behavior is a crucial factor (Prosman & Sacchi, 2018).

The European Commission emphasizes that waste treatment is essential for the circular economy since waste serves as secondary raw material (European Commission, 2018c). The increase of household waste fractions is one out of several actions providing circular economy due to the increased degree of sorting the early stages in the waste supply chain (Figure 1). An example is the sorting of organic waste, which is recycled and reused by biogas trucks collecting household waste. The supplementary fraction leads to several consequences for the entire waste collection supply chain (Bø et al., 2012). What used to be one flow of goods are becoming multiple flows of goods which requires separate logistics regarding the collection process, influencing the distribution network. Thus, the complexity is increasing with the number of fractions.

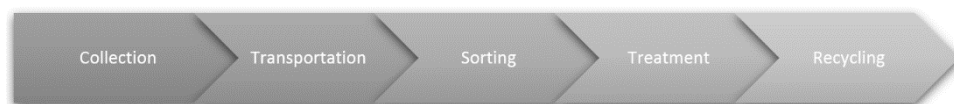


Figure 1 Waste Collection Supply Chain

Legge and Klett (2018) argue that waste collectors are an essential element of the circular economy value chain since they are responsible for the collection of the valuable resources. Privatization in the waste sector has been increasing across the globe (Simões et al., 2012). A study conducted by Dijkgraaf and Gradus (2008) shows that private companies supply more than 50% of the European population. The drivers for outsourcing the waste collection service is mainly founded on cost concerns and budgetary constraints (Bel & Fageda, 2009; Simões et al., 2012). Further, environmental concerns are considered through contractual requirements, while the quality of the service is ensured due to the competitive landscape.

## 1.4 Research Question

Based on the background and previous research, our research question is defined as:

*How does the weighting of supplier selection criteria affect the tender evaluation processes, and in what manner does the usage of criteria promote the formulation of sustainable and innovative contracts?*

Due to the increased market complexity, it is no longer sustainable to choose a supplier based on price (Karlsen, 2017). Non-economic award criteria are given a more critical role in the choice of supplier and are crucial to the outcome of public-private cooperation (Avfall Norge, 2017). To date, there is little standardization in the use of non-economic criteria among the municipalities. Furthermore, the variation in how the different non-economic criteria are defined and weighted is significant. As the focus on price is best suited for standardized tasks with a detailed description and strict specifications, the selection process that was used by the municipalities may have led to operational inefficiency and high total costs, the Oslo waste crisis serves as a brilliant example (Assaf et al., 1998; Karlsen, 2017).

The purpose of the study is to investigate and analyze how several selected municipalities are defining and weighting supplier selection criteria, and the implications of the tender evaluation decision and contractual outcome (Figure 2). Aspects like communication, competence, and innovation are highlighted to study phenomena like transparency, information sharing, and trust in the buyer-supplier relationship. The final aim is to provide recommendations to municipalities that could contribute to the selection of sustainable contracts with increased performance quality.

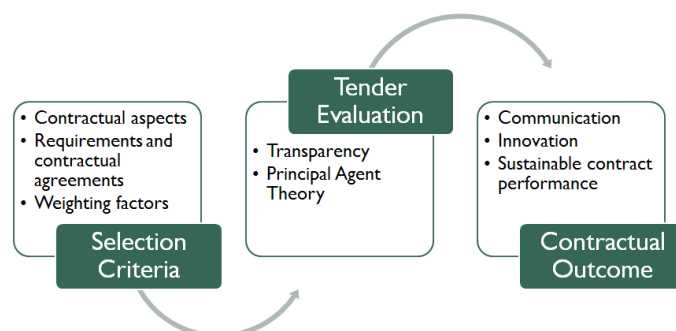


Figure 2 Implications

## 1.5 Scope of Study

Since the research aim to gain insights into social and organizational realities by investigating the usage of supplier selection criteria, Norwegian municipalities that outsource the waste collection service to private companies operates as interview objects. Their recent tenders will be of interest, as they are affected by the increased usage of award criteria and provide us the ability to analyze how the buyers currently use and define the award criteria. Both municipalities and inter-municipal cooperation are of interest for the study to provide insights into competence, geographical size, and the number of households. The waste collection supply chain consists of several steps. The research will focus on the collection of household waste (Figure 1). The industrial waste collection was excluded from the service to narrow the relevant research area to restrain the required time consumption. Due to time constraints, only the buyer- perspective is investigated in the study.

## 1.6 Thesis Outline

After this brief introduction, the paper is organized as follows. Chapter 2 includes a description of the empirical setting and an overview of the municipalities represented in this research. Chapter 3 present the research methodology used to answer the research question. Thoughts of why a comparative case study was found appropriate will be discussed, and our data collection process is presented. Chapter 4 contains relevant theory used in this study, while chapter 5 and 6 includes an analysis and discussion of data collected, a conclusion and suggested actions for municipalities when selecting suppliers.

## 2.0 Empirical Setting

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### 2.1 Norway's MSW Management Performance

In Norway, waste volumes have increased by approximately 60% since 1995. (The Norwegian Environment Agency, 2016; SSB, 2018c) (Attachment 4). Household waste comprises an increasingly bigger share of the total waste amount. Statistics from SSB shows that waste from households equaled 425 kg per capita in 2017, constituting a decrease equal 1 percent from the previous year (SSB, 2018b). Growth in production and consumption is the key driving force behind waste volumes in Norway. A national target states that the growth in the amount of waste shall be considerably lower than the growth in GDP (Norwegian Environment Agency, 2017). Even though several actions have been implemented, the target is still not fully met (Attachment 5).

According to the Norwegian act concerning protection against pollution and concerning waste, the municipalities are responsible for the collection of household waste (forurl. §30). Thus, local municipal governments are the most influential public authorities responsible for the prevention, collection, sorting, and treatment of municipal solid waste (MSW) (Soukopovà et al., 2017). Municipalities serve, in most cases, as both the administrators and organizers of waste management services (Nordic Report, 2016). Waste services are typically provided in two ways; pure public or by a hybrid approach consisting of public-private partnerships. The latter is characterized by a private waste collector offering collection and disposal of household waste.

Operations connected with MSW collection is affected by the climatic and geographical challenges in the Norwegian landscape. Some areas are characterized by big city tendencies, while other municipalities are rural with low population density. These factors are generating the risk of increased costs and obstacles for accurate calculations due to the uncertainties that cannot be quantified (Van Weele, 2014). In order to mitigate municipalities size differences, which affecting their amount of resources and implementation opportunities, a reform was established in 2014 (The Norwegian Government, 2017b). Today, Norway has 422 municipalities, but after the reform is completed in 2020, there will be 356 municipalities in total. The municipality reform has a purpose of



creating stronger municipalities that will generate good local communities and ensure proper performance of welfare issues in the future. This will have a positive effect on available capacity and competence among local authorities and lead to improved sustainability and robustness.

As many Norwegian municipalities are quite small, some researchers have found evidence that they are not optimal for self-service production (Bel & Costas, 2006; Bel & Fageda, 2010). Further, it is argued that financial advantages such as economies of scale can be achieved by entering a collaborative relationship with neighboring municipalities, especially in smaller rural municipalities with a small number of potential outside contractors (Bel & Costas, 2006). The collaboration between municipalities can consist of various dimensions. Inter-municipal cooperation (IMC) constitutes one approach that is frequently used in Norway. Bel & Warner (2015) defines an IMC as several municipalities that share ownership through joint corporations or administration practices. A shared ownership and cooperation can serve advantages like economies of scale through infrastructure, cost savings, and improved competence (Bel & Fageda, 2010).

The MSW management performance is further characterized by the joint platform Avfall Norge, which is an industry organization with around 200 members from the public and private waste sectors in Norway (Avfall Norge, 2018). As they represent both public and private waste and recycling companies, entrepreneurs, suppliers, and environmental consultants, an effective market communication and information sharing is enabled. In total, their members account for 95 percent of all household waste in Norway, as well as large amounts of industrial waste. Thus, they act as a key player in the development of waste management and public procurement by actively promoting transparency and better cooperation between actors.

Norway is associated with the EU's regulatory framework through the EEA Agreement, which affect the public procurement of infrastructure sectors, such as refuse- and household waste collection, in several manners (The Norwegian Government, 2015). The rules cover procurement procedures from the planning stage to the signing of a contract, aiming to ensure efficient use of resources in the public sector and increase value creation in society (European Union, 2018). According to the framework, the procurement of all goods and services above a

given threshold value must be subject to open tendering to achieve an efficient use of resources in the public service through healthy competition. As a relatively simple public service, waste collection is considered well suited or competitive tendering and outsourcing (Sørensen, 2007).

## 2.2 Tender Evaluation Process

Tenders can be conducted by using the ‘most economically advantageous tender’ (MEAT) approach or the lowest-price approach (The Norwegian Government, 2015). The usage of award criteria in public procurement using MEAT are especially affected by strict laws and regulations. According to the Norwegian Public Procurement Regulations, the contracting authority must choose an offer based on objective award criteria given in priority order in the procurement documents. Furthermore, the award criteria must be related to the delivery, and could consist of variables such as price, quality, life cycle costs, environment, social considerations and innovation (FOA §§8-11,8-11(2)). The regulations further states that by choosing suppliers based on MEAT, the contractual authorities shall indicate the relative weight of the award criteria in the competition documents.

The greatest impact a purchaser has to ensure a robust and sustainable procurement lies in the preparation phase, including design of requirements specification, qualification requirements, and award criteria (Deloitte, 2017). According to the European Commission (2014), the tender specification consists of the following steps: (1) Verification of non-exclusion of tenders on the basis of the exclusion criteria, (2) selection of tenders on the basis of selection criteria, and (3) evaluation of tenders on the basis of the award criteria. Only tenders meeting the requirements of one step will pass onto the next step in the evaluation process. Thus, the formulation of tender specifications is crucial to ensure a sustainable contractor.

Based on information retrieved from DIFI, following summary are provided to enlighten the different criteria in a supplier selection process within waste collectors among Norwegian municipalities:

Eligibility Requirements	Requirement Specification	Award Criteria	Contract Requirement
Pre-qualification. Minimum requirements made to the suppliers wanting to participate. E.g. the company's economic situation, competence, experience etc.	Characteristics of the service that must be fulfilled, typically connected with e.g. environmental aspects. Euro IV-vehicles, noise restrictions, HSE	The competition criteria/ weighting factors to which the offers are ranked. Definition of the criteria and following weighting proportion.	Requirements to be met by supplier during the contract period.

Table 1 The Tender Evaluation Process Steps

In addition to price, the use of non-economic award criteria has become crucial supplier selection criteria for the final choice of the supplier being awarded the contract (Avfall Norge, 2017). Non- economic award criteria may provide the purchasers the ability to focus on aspects like quality, environmental concerns, and an extended corporate social responsibility in the selection of a supplier. Chen (2000) defines that the establishment of selection criteria involves two tasks: the determination of the criteria and the development of weighting factors. The purchasers' needs, priorities, and weighting of each criterion will be unique in each project, making the supplier selection criteria critical for ensuring a supplier that reflect the project aim.

## 2.3 Conceptual Framework

The empirical setting of this thesis is profoundly affected by our conceptual framework shown in figure 3. The thesis takes on both the formal- and informal aspects when analyzing municipalities formulation of contracts. The formal elements of the contract refer to municipalities' decisions regarding supplier selection criteria and weighting factors, while the informal aspects relate to competence and the degree of communication between municipalities. The analysis of informal and formal elements of contracts will further result in an investigation regarding municipalities initiatives for innovation and the buyer-supplier relationship that occur during the contract period. In conclusion, a thorough analysis following this conceptual framework and related factors will provide indications of their impact on the performance quality.

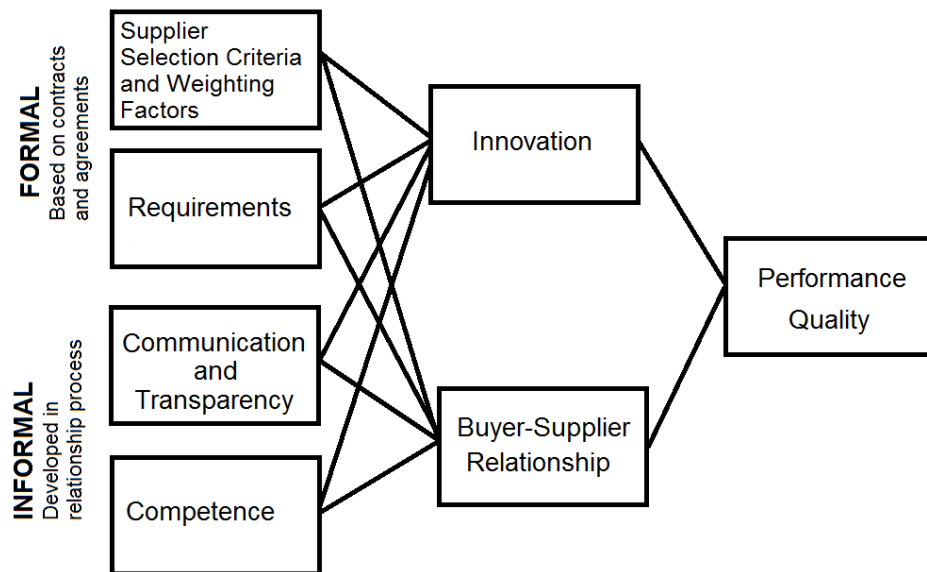


Figure 3 Conceptual Framework

## 2.4 Municipalities Studied

To answer our research question, several municipalities were compared. As the study aims to cover several aspects of the formal and informal aspects of a tendering process, both independent municipalities and inter- municipal cooperation were found to be of interest. Following table shows which municipalities and IMC that were used in this study.

Municipality		#households
Bærum		125 708 inhabitants distributed in 50.000 households
Halden		31.000 inhabitants (+1.382) distributed in 14.437 (+611) households
Asker		60.916 inhabitants distributed in 22.500 households
IMC	Owned by	#households
VESAR	Andebu, Hof, Holmestrand, Horten, Lardal, Larvik, Nøtterøy, Re, Sandefjord, Stokke, Tjøme and Tønsberg	137.000 inhabitants in the ten* owner municipalities  (*Andebu, Hof, Holmestrand, Horten, Lardal, Nøtterøy, Re, Stokke, Tjøme og Tønsberg) Sandefjord & Larvik are operating independent
ROAF	Aurskog-Høland, Enebakk, Fet, Gjerdrum, Lørenskog, Nittedal, Rælingen, Skedsmo, Sørum and Rømskog	200.000 inhabitants distributed in 90.000 households
RfD	Drammen, Hurum, Lier, Modum, Nedre Eiker, Røyken, Sande, Svelvik and Øvre Eiker	85 000 households and 5000 cabins
BIR	Askøy, Bergen, Fusa, Kvam, Os, Osterøy, Samnanger, Sund og Vaksdal.	360 000 inhabitants

Table 2 Municipalities Studied

Due to the nature of the research question, both municipalities operating as individual decision-makers and IMC consisting of several neighboring municipalities were of relevance. By comparing municipalities with a different number of households, we were enabled to achieve a broad perspective arising from factors like economies of scale, structural and institutional differences, financial situations, and resource utilization. All municipalities used to conduct the research are characterized by the outsourcing of their household waste collection service through open tendering. By comparing the supplier selection process and the weighting of award criteria, the effects and consequences of such purposes are explored. As our research approach empowers us to examine and replicate findings, an in-depth understanding of the formal and informal setting was made possible.

The bankruptcies and underpriced contracts further affected the sample. The municipalities of Bærum, Asker, and Halden, as well as RfD, BIR and ROAF's contractual area 1 and 2, were in a contract arrangement with RenoNorden in 2016 (Attachment 1). VESAR and ROAF's area 4 had outsourced their service to Veireno. The municipalities choose different solutions to how they handled the bankruptcies. Both Halden, VESAR, RfD, and Bærum entered temporary emergency contracts. BIR and ROAF decided to insource the service because of their available resources and expertise, which enabled them to perform the collection internally. Our analysis will be affected by the municipalities' temporary actions due to the publication of the last tender. While some contracts recently have been signed, others are still in the initial phase formulating the contract to be published shortly. Thus, certain supplier selection criteria analyzed in the paper are from the tenders where the underpriced supplier was awarded the contract, while other are post-bankruptcies and affected by the ripple effects.

The municipality of Bærum was, i.e., in the starting process of formulating a new contract during our data collection, which made their previous contract of interest. Halden was at the time we conducted our interview in the final process of compiling the last changes in their competition documents, which contributed to real-time insights into their contract formulation. VESAR and RfD recently signed contracts with their current suppliers. All municipalities used external competence in their formulation of contracts and the final choice of supplier. Two of the consultants with expertise in collection and transportation of household

waste were interviewed to gain insights into their thoughts of the usage of supplier selection criteria. A further description of why the sample consist of these municipalities is conducted in chapter 3.2.3.

The purpose of our analysis is to identify differences concerning supplier selection criteria, and how the weighting and definition are affected by the municipalities' level of competence, communication, and incentives for innovation. Furthermore, the selection of sample embraces the aim of coping a perspective of contrasts and similarities concerning contract performance and a sustainable outcome. The description of our empirical setting provides an essential basis for further analysis. The conceptual framework (figure 3) shows an overview of the relevant themes discussed throughout the study.

## 3.0 Research Methodology

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This chapter elaborates on the research methodology used to answer the research question. In this study, the aim is to evaluate the impacts of supplier selection criteria within the tendering of waste collection services. With this purpose, the discussion includes reasoning of why a qualitative method was found appropriate, and why a comparative case study was conducted. Further, the data collection process and the research design are discussed concerning the scope of the project, time restriction, and available resources.

### 3.1 Selection of Research Design

#### 3.1.1 Research Design

Research design can be defined as a framework for the collection and analysis of data used to answer the research question (Bryman & Bell, 2015). Easterby-Smith et al. (2015) explain a research design as the organization of research activity, including the collection of data, which are most likely to answer the stated research problem. Thus, the research design can be explained as the overall plan for relating the conceptual research problem to relevant and practicable empirical research (Ghauri & Grønhaug, 2010).

Since our research aims to gain insight into organizational realities through the tender evaluation processes among selected Norwegian municipalities, a case study was found appropriate. According to Ellram (1996), there are excellent opportunities for using a case study in several areas of logistics and purchasing, which support our choice of design. A case study looks in depth at one, or a small number of, organizations, events or individuals, generally over time (Easterby-Smith et al., 2015). Furthermore, a case study research is optimal when the concept and variables under study are difficult to quantify, and when best results are achieved through studying the phenomenon in its social context (Gauri & Grønhaug, 2010; Ellram, 1996). Consequently, a case study will provide us with the possibility to analyze Norwegian municipalities and achieve a comprehensive picture of the supplier selection process.



One of the fundamental issues in case study analysis is to determine whether a single case study or multiple case studies should be performed (Saunders et al., 2016). As the study utilizes a comparison of more than one case by investigating the tender evaluation process in several municipalities, a multiple case study appears (Bryman & Bell, 2015). Since the tender evaluation process seems to be characterized by several similarities, a comparison of multiple municipalities will provide a deeper insight in the usage of supplier selection criteria and the outcome of such decisions.

A multiple case study empowers our research to compare (replicate) the phenomenon studied in different cases in a systematic way (Ghauri & Grønhaug, 2010). By comparing and find contrasting factors, an in-depth understanding of the phenomenon is established through a comparative case study approach (Bryman & Bell, 2015). Ellram (1996) argues that comparative case design should be used to either predict similar results among replications, or to show contrasting results, but for predictable, explainable reasons. Hence, the comparative case design enables us to investigate and find both similarities and dissimilarities between Norwegian municipalities and provides an insight in the managers' way to use specifications when evaluating and selecting suppliers.

The research design is further influenced by the epistemology used for the research. Easterby-Smith et al. (2015) define epistemology as “views about the most appropriate ways of enquiring into the nature of the world” (p. 334). Since our research combining multiple cases, a hybrid approach combining positivist and constructionist epistemology appears (Easterby-Smith et al., 2015). A pioneer in the field of a hybrid epistemology is Eisenhardt, which is concerned with building theory from case-based research. The design is somewhat flexible, and adaption to theory throughout the research process is a crucial factor to achieve a successful result (Eisenhardt 1989, 2007). By collecting the data set through interviews with managers and decision-makers within the selected municipalities and then compare the findings both cross-case and within cases, a case-based and hybrid research were conducted.

The relationship between theory and research will further affect the study in several manners. Bryman & Bell (2015) distinguish between an inductive and deductive approach, based on whether a theory is generated out of research, or the

opposite. A deductive approach is typically characterized by the usage of hypotheses derived from existing theory, while an inductive method is described by allowing theory to emerge from data and specific observations (O'Reilly, 2012). Since the thesis is based on a flexible approach that have been adapted and evolved to data found in the process, the approach used is somewhat in between the mentioned methods. Dubois & Gadde (2002) argues for a third approach, namely systematic combining or an abductive approach, which they explain as a process where theoretical framework, empirical fieldwork, and case analysis evolve simultaneously. A similar approach is discussed by O' Reilly (2012), which describes the term interactive- inductive. He argues that data collection, analysis, and writing are not discrete phases but inextricably linked, which suits the method used in this research.

### 3.1.2 Research Strategy

A research strategy can be defined as “a plan of how a researcher will go about answering his or her research question” (Saunders et al., 2016, p.173). The strategy involves which method that is used to collected data, and how it is analyzed. Bryman & Bell (2015) distinguish between a qualitative and quantitative research strategy, which serves as two extremes. A qualitative research strategy usually emphasizes words and non- numerical data, whereas a quantitative research strategy uses numbers and quantification in the collection and analysis of data.

A qualitative method was found appropriate for this research, as it enables the researchers to focus on local perceptions and experiences of an event (Bartunek, 2012). Ghauri & Grønhaug (2010) defines a qualitative strategy as a mixture of the rational, explorative and intuitive, where the skills and experience of the researcher play an important role. Due to the nature of the research question, a qualitative research strategy will emphasize understanding and more profound knowledge of the dynamics associated with tender evaluation processes and the consequences for the buyer-supplier relationship. A mixed method combining both extremes were inappropriate due to the interest of the qualitative aspects rather than quantitative and numerical data.

A typical characteristic of a qualitative study is that data must be developed by the researcher himself (Easterby-Smith et al., 2015). Thus, qualitative research tends to be of a more explorative nature, using a verbal data set found through open-ended questions to answer the research question. Qualitative data exploited in this study was collected using an interactive and interpretative process, as we performed in-depth interviews with open-ended questions. Further elaboration regarding the data collection process will be provided in the upcoming chapter.

## 3.2 Data Collection

### 3.2.1 Data collection and initial research steps:

In-depth interviews with experts and decision-makers within the municipalities serve as primary data. The main steps of qualitative research as defined by Bryman & Bell (2015) were followed (Attachment 6). The data collection was further based on the model suggested by Dubois and Gadde (2002) since a systematic combining/abductive approach was used:

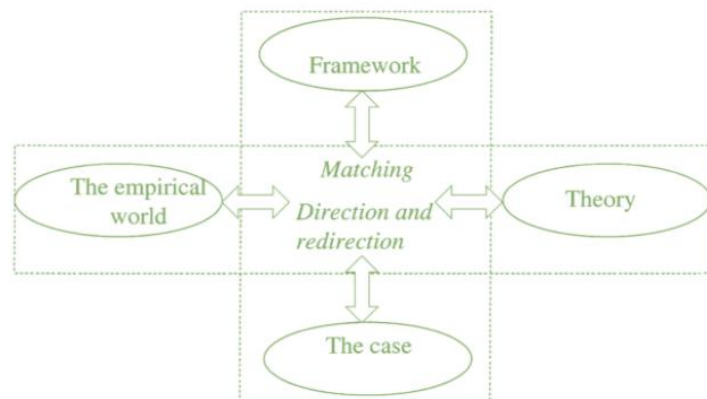


Figure 4 Systematic Combining by Dubois & Gadde (2002)

The data collection followed a flexible research design, as the data collection, analysis, and writing were conducted in parallel prior following a strict order. This is further reflected in the model suggested by Bryman & Bell (2015), where the data collection process is characterized by continuous analysis. Eisenhardt (1989) promotes the importance of continuously adapting the process to new theory and data collected. Our research question was continuously adapted to data found throughout the data collection process to achieve a highly customized research question related to the observations. Several aspects arose during the process, which made the original research question outdated in relation to the actual real-

life experiences explained by the decision-makers and consultants in the field. A flexible research design made it possible to adapt to the gathered data, especially when findings of relevance were uncovered.

The data collection process was initiated by reading reports about the usage of non-economical specifications written by Avfall Norge. The report written by Deloitte regarding the crisis that occurred in Oslo was also of high relevance to get an impression of what went wrong. Public tender documents found online at Doffin served as a baseline for elements we wanted to elaborate throughout the research. Initial and unstructured interviews with Avfall Norge and DIFI were conducted to gain a deeper knowledge of the field and provide us the ability to ask questions regarding relevant issues found in the reports. The interviewees further provided us with information and insights in a project they are working on regarding the usage of non-economical specifications and environmental concerns. Based on this initial process step we figured out what we needed as primary and secondary data, which interview objects that were of relevance, and what sampling approach that were optimal to conduct the study.

### 3.2.2 Primary data

Semi-structured interviews were used to obtain data containing comparable answers, and yet enable follow-up questions based on the factors that separate the decision process conducted by the different municipalities. Saunders et al. (2016) define the research interview as a purposeful conversation between two or more people, whereas the interviewer must ask concise and unambiguous questions, and carefully listening to the answers to be able to explore these further. Semi-structured interviews enabled us to vary the order of the questions, add additional questions, and omit questions and themes custom to each interview, dependent on the specific organizational context, the flow of the conversation, and the interviewee (Saunders et al., 2016).

An interview guide was prepared based on the research question and conceptual framework (Attachment 7). Public information regarding the tenders used in previous contracts served as a baseline for additional questions. The interview guide was separated into the following topics; key information, specifications, buyer-supplier relationships, innovative contracts, information sharing, risk allocation, and additional questions. By using a clear distribution of the questions,

the opportunities to vary the order of the subject discussed during the interview were enlightened.

### 3.2.3 Sample/interview objects

Data were collected through interviews with one or two interview objects from each selected municipality. Key personnel within the municipal waste departments, which operates as the buyers of the transportation service, serves as interview objects in this study. Their position differs in some manner, with specialties varying from purchasing officers to head of the waste department. Although, all the interview objects were directly related to the previous tender. The interview objects were first contacted by email. When the interview request was accepted, all interviewees received a consent form which included the master thesis topic, the usage of a tape recorder, and how sensitive and personal information was considered through anonymity in the study (Attachment 8). By developing interview themes and supplying information to the interviewee beforehand, they were able to prepare for the interviews, and some typical data quality issues were coped with (Saunders et al., 2016).

The interviewees were gathered through a purpose and convenience sampling approach (Easterby-Smith et al., 2015). Purposive sampling was optimal since we had a bright idea of what sample units that were needed to reach the study aims. Further, the sampling unit was affected by some characteristics from a convenience sampling approach, as sample units were selected based on availability. Mainly municipalities nearby Oslo were chosen, as the interviewers aimed to collect the data face- to- face and needed to consider the time- and resource constraint influencing the master thesis. Face- to- face contact between researcher and respondent provides more information than the verbal responding through the usage of facial expressions, body language, and a deeper understanding of the feelings and attitude towards the subjects being discussed (Brønn, 2015).

Based on the research question and sampling approach, the data set contains interviews with four IMC and three municipalities. All interview-objects are subject to open tendering and has recently completed a supplier selection process. Both municipalities and IMC were of interest for the study to achieve a broad perspective arising from economies of scale, structural and institutional

differences in leadership and administrative aspects, the financial situation, and resource utilization. In addition, two consultants with expertise in public procurement of household waste collection services were interviewed as they serve as experts in the field. The usage of non-economic award criteria differs among the interviewees, which gives a spread in data and provides the basis for further analysis.

### 3.2.4 Data Collection Timeline

<b>Date</b>		
<b>28.02.18</b>	Meeting	Avfall Norge
<b>10.04.18</b>	Meeting	DIFI
<b>19.04.18</b>	Interview	Asker
<b>20.04.18</b>	Interview	VESAR
<b>23.04.18</b>	Interview	RfD
<b>26.04.18</b>	Interview	Bærum
<b>27.04.18</b>	Interview	ROAF
<b>02.05.18</b>	Interview	Halden
<b>08.05.18</b>	Interview	Consultant
<b>24.05.18</b>	Interview	Consultant
<b>29.05.18</b>	Interview (by Phone)	BIR
<b>30.05.18</b>	Seminar	

Table 3 Primary Data Collection, Timeline

### 3.2.5 Sample Size

The sample consists of 9 interviews, whereas seven interview objects are representatives from municipalities and inter-municipal cooperation, and two are consultants that function as external competence (Table 3). The time spent on each meeting varied from 1.5 hours to 2 hours. A tape recorder was used during the interviews to enable the interviewers to focus on the conversation rather than taking notes (Bryman & Bell, 2015). The transcription was conducted shortly after the interviews were held. The location for the meetings was allocated in the different municipalities, except for one skype-interview.

The number of cases used in a qualitative and comparative case study has been widely discussed. Collins and Onwuegbuzie (2007) argue that the sample size should not be so small that it is difficult to achieve data saturation, theoretical saturation, or informal redundancy, nor so large that it is difficult to undertake an in-depth, case-oriented analysis due to information overload. Teddelie and Yu (2007) refer to this as the representativeness/saturation trade-off. Eisenhardt (1989) has suggested that four to ten cases are optimal when using a multiple case study since an in-depth knowledge and understanding of each of the cases are crucial. As several similarities and differences were found between the interview objects, a sample size of nine served as a useful amount for this research.

### 3.2.6 Secondary Data

Previous studies on the field and other relevant academic articles serve as secondary data for this research. Secondary data consist of textual sources like reports, documents, and other literature (Bryman & Bell, 2015). A literature search matrix was generated to enable the researchers to map which articles that could be of interest, and avoid pitfalls connected with biased data collection (Attachment 9). As stated by Easterby-Smith et al. (2015) regarding student projects; it is generally necessary to use theory, not to demonstrate a contribution to theory. Hence, the research project was initiated by formulating a draft of the research question, before listing relevant subjects and theories that could be of relevance. Public tenders and recent reports on the Norwegian waste sector were of particular interest as the aim of the research was to compare tenders and mapping the research field.

### 3.3 Quality of Research

A high degree of quality is crucial for assuring correct and credible results of the research. Bryman and Bell (2015) distinguish between several criteria to establish and assess the quality of qualitative research. Due to the subjective nature of the data collection, trustworthiness and authenticity are proposed as alternative criteria for validity and reliability (Bryman & Bell, 2015). Trustworthiness covers credibility, transferability, dependability, and confirmability, and will be discussed in the following section. Further, Saunders et al. (2016) distinguish between interviewer bias, interviewee/response bias and participation bias, which are discussed in the light of trustworthiness.

*Credibility* is the parallel criterion to internal validity and entails whether the findings are true and accurate. To obtain a high degree of credibility, the researchers should ensure that the representations of the research participants' socially constructed realities match what the participants intended (Saunders et al., 2016; p. 206). To increase research credibility, triangulation was found appropriate. Several sources of data were conducted by interviewing several municipalities, inter-municipal cooperation and consultants in the field. Further, the usage of two interviewers and a tape-recorder regulates the degree of interviewer and response bias.

*Transferability* measures to what extent the results apply to other contexts and is adapted from external validity. The findings should be generalizable to similar cases involving municipal outsourcing of transportation and collection of household waste. Furthermore, some of the results could be adapted to cases involving public-private procurement and tender evaluation decisions in other industries, since the thesis goes in-depth into several issues that evolve in a supplier selection and tender process. Hence, the transferability is relatively high, especially in cases where municipalities and other public companies are outsourcing a logistic service to a private company using tender evaluations.

A challenge is the lack of standardization of many techniques for creating qualitative data, which restricts the number of individuals or organizations an individual researcher can work with (Easterby-Smith et al., 2015). Also, it limits the aggregation of data and usage of statistical data caused by the information



overload that qualitative research typically is characterized by. Since the dataset only contains interviews with a relatively few municipalities characterized by several similarities, it is reasonable to think that some population aspects could be missing. In that case, the results could be affected by selection- and participant bias, which gives a low transferability. On the other side, it is reasonable to think that the municipalities have several similarities with the rest of the population regarding the contractual phases and the supplier selection decisions. Hence, the results should be representative of the population and replicable.

*Dependability* corresponds to reliability and is defined as the degree to which a measure of a concept is stable (Bryman & Bell, 2015). Since a tendering process is studied in its natural context, the research will be affected by changes. Further, reliability in the conventional term concerns the repeatability of the study (Ellram, 1996). The repeatability is ensured by writing the process of the research in a manner which makes it possible to repeat it. Since the interview guide is provided as an attachment and the steps of our process is replicated through the thesis, the research should obtain the demand of dependability (Attachment 7). Furthermore, the researchers had a neutral attitude when conducting the interviews and analyzing data to avoid bias. The tape-recorder increases the dependability due to a correct transcription of the meetings, and avoidance of pitfalls occurring by authors perception.

*Confirmability* is the parallel to objectivity, and measures to what extent the researchers acted in good faith. A qualitative study will always be affected by subjectivity, but the degree can be coped with by several manners. A tape-recorder, two researchers present, the number of cases studied and compared, and the general attitude presented throughout the interviews are factors that affect the confirmability on our research. Since these concerns were present from the beginning to the execution of the study, the confirmability aspect should be satisfied.

In addition to the four criteria describing trustworthiness, authenticity contains a broader set of issues concerning the political impact of the research. Fairness enlightens the importance of a well and equitably distributed collection of data. As our study includes several interview objectives, the criterion of fairness is fulfilled. The research will provide some ontological and educative authenticity,

as the aim is to enlighten several crucial factors in a tender evaluation process. Catalytic and tactical authenticity is achieved if findings cause a change in actions due to the new composition of concepts.

### 3.4 Data Analysis Strategy

Data analysis is the central step in qualitative research and forms the outcome of the research (Flick, 2013). The aims of the data analysis are (1) to describe a phenomenon in some or greater detail, (2) identify the conditions on which such differences are based by looking for explanations for such differences, and (3) develop theory. Analysis of qualitative data have several obstacles due to the textual and complex material caused by information overload, the context-bound information, subjective influence, and perception, which makes it difficult to find analytical paths through the richness of material (Bryman & Bell, 2015; Ghauri & Grønhaug, 2010; Easterby-Smith et al., 2015). We cope with the complex material by dividing our interview guide into different topics. The analysis was then conducted by comparing the different answers within each subject to achieve an excellent basis for investment and conclusions.

Flick (2013) distinguish between several analytical strategies. Even though a comparative case study is used, grounded theory is found appropriate for parts of our data research due to the flexible approach used in the research strategy. Grounded theory is characterized by the usage of an abductive approach with some aspects of inductive research. Data collection and analysis take place simultaneously, providing the ability to adapt to data found during the process. Both cross-case analysis and within-case analysis are found appropriate due to the comparative and multiple case study design. The data analysis strategy is further influenced using content analysis. Easterby-Smith et al. (2015) define content analysis as “an approach that aims at drawing systematic inferences from qualitative data that have been structured by a set of ideas or concepts” (Easterby-Smith et al., 2015, p. 188). The strategy is characterized by a search of content and causally linked concepts and ideas.

The coding and framing of collected data were conducted using thematic analysis. Framing refers to a range of ways in which information or data can be made sense of (Easterby-Smith et al., 2015). One of the first analytical activities consists of categorization (Ghauri & Grønhaug, 2010). In qualitative research, data is typically categorized through coding. Ghauri & Grønhaug (2010) defines categorization as the process of classifying units of data. Further, Strauss & Corbin (1990) distinguish between open coding, axial coding, and selective coding, drawn from the grounded theory approach. Selective coding is defined as “the procedure of selecting the core category, systematically relating it to other categories, validating those relationships and filling in categories that need further refinement and development” (Strauss & Corbin, 1990, p. 116). Since our data collection and analysis are based on predetermined topics and subjects, a selective coding was used to categorize and distribute data.

Ghauri & Grønhaug (2010) states that in qualitative research data collection and analysis are often conducted simultaneously in an interactive way where collected data are analyzed, initiating new questions and further data collection. During the literature review and the interviews, new topics emerged which both added the scope and changed the directions of the research. This affected the frame used for the analysis. Thus, the data analysis strategy is influenced by the continuous adaptation. Furthermore, the sub-questions emerged during the data collection process depending on data found. The initial research question was adapted through the collection process and finally defined in parallel with the planning of the analysis to achieve a final research question matching findings and results.

## 4.0 Theoretical Background

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To investigate our initial problem statement, a presentation of relevant theory will be introduced in this chapter. The primary theoretical basis covers literature on development within public procurement regarding impacts of national and international directives/guidelines, increased privatization, cost-effectiveness, and innovation. Earlier research within principal-agent theory will enlighten the complexity of the buyer-supplier relationship and information asymmetry in a narrowed focus. Theory regarding project management, formulation of contracts, supplier selection criteria, and transportation costs will be presented.

### 4.1 Public Procurement

#### 4.1.1 Description, History and Development

Public procurement is defined as “the process by which public authorities, such as government departments or local authorities, purchase work, goods or services from companies” (European Commission, 2018a). Georghiou et al., (2014) continues with specifying public procurement as organizations purchasing goods and services required to perform its function. The description is primarily related to prominent public buying industries such as construction, health, and transport services.

Public procurement consists of a large proportion of the Gross Domestic Product (GDP). General estimates show that approximately 14% of total GDP per year covers public procurement in developed countries (European Commission, 2018a). In Norway, a total of 500 billion NOK per year covers procurement of public goods and services (The Norwegian Government, 2017a). The significant proportion shows the great decisiveness and impacts the power of public procurement to promote new solutions and serving as a great innovation policy instrument (Georghiou et al., 2014). Due to a considerable amount of government spend and related power, purchasing competence and expertise is therefore crucial to achieving optimal use of public goods (Matthews, 2005).

A significant transformation within public procurement is recognized during the last fifty to sixty years. The change in demand moving from purchasing goods

towards purchasing services is described as a dominant transformation driver (Abramson & Harris, 2003; Witjes & Lozano, 2016). The governmental role has evolved from being a provider of goods to become the manager of providers of goods and services, where the government has transformed into taking a more strategic role (Gordon Murray, 2007). Additionally, procurement has developed from having a process-based approach towards a results-based orientation. A process-based approach refers to traditional and routine activities, while the results-based approach adapts to the changing nature of procurement in a more significant matter concerning change within public contracting, more effective communication skills and abilities to build relationships across organizations (Matthews, 2005).

Although significant attention has been paid towards reforms and improvements, public procurement is described in the literature as a neglected area of academic education and research (Thai 2001; Schapper, 2006). Notably, due to its complexity, as public procurement requires knowledge in various areas including economics, law, political science, public administration and operational research among others (Thai, 2001). The author presents an analysis of elements included in the public procurement system enlightening governmental efforts to improve practice, such as raised communication and further education of public procurement. Suggested betterment actions of public contracting identified in the literature include precise identification of core capabilities, increased ability to lead change, and build relationships across organizations (Matthews, 2005).

Factors like the increased population growth, economic growth and a greater focus on the changing environment, turn the government towards more sustainable management (Arrow et al., 1995). Circular Economy is defined as “a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing and narrowing material and energy loops” (Geissdoerfer et al., 2017, p. 759). A circular economy can among others be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling. The concept is exemplified in the area of waste management, aiming to transform waste into new resources by bridging the activities of production and consumption (Witjes & Lozano, 2016). Witjes and Lozano (2016) argues that an increased focus on sustainability and collaboration between buyers and suppliers will, on the one hand, contribute to the

circular economy but also result in improved economic benefits for both parties. The research of Witjes and Lozano (2016) further shows that collaboration between suppliers and buyers throughout the procurement process will reduce the use of raw material and waste while it promotes the development of new business models.

Related to development towards increased sustainability and a circular economy, an analysis of two municipality policy instruments in Sweden, weight-based waste tariffs and an exclusive system for collecting food waste, was conducted to show their impact on collected volumes of waste aiming for a higher degree of a circular economy (Andersson & Stage, 2018). The analysis included instruments of weight-based waste tariffs and an exclusive system for collecting food waste. The analysis showed that a separate system collecting food waste is preferable, as it has positive effects on recycling, which shows positive indications towards increased incentives for sustainability and circularity. However, some academics state that the link between the circular economy and sustainability is blurred (Prosman & Sacchi, 2018; Geissdoerfer et al., 2017). A substantial need for change must be realized, aiming for the circular economy. NCA (2016) describes the history of waste in three phases calling for a fourth phase realizing a shift in public operators. Instead of managing waste, they should manage waste markets. Further, this calls for municipalities to adopt a different approach and framework.

### *Transparency*

Typical characteristics of public procurement frameworks identified in both developed and developing countries show an imbalance between public expectations of transparency, accountability, and efficient use of resource management (Schapper et al., 2006). Furthermore, it is revealed that these aspects should be measured and addressed together with workforce professionalism, value for money and ethics to achieve reform solutions within public procurement (Raymond, 2008).

Schapper et al. (2006) differentiate the effects of technology and lists three objectives to assess transparency of process, efficiency and policy coherence. Transparency has been found helpful on public administration in general, by profiling and put transparency in audits and simplify procurement fraud control.

For high-value complex procurement, transparency has led to the direct public disclosure of every stage in the procurement process. As it includes enhanced public access to up-to-date policies, information on bidding programs, standardized documentation and lodgment of bids, there is a progress of tender evaluation and announcement of outcomes (Schapper et al., 2006). Further, the authors mention an important aspect of effectiveness and technology affiliated by the purchaser's competence and skills. The benefits of improved "value for money outcomes" realizes where the procurement manager accompanies technology and skills. Finally, they state that greater transparency and access to documentation increases the attractiveness of bidding for government work and additionally increase the competition.

### *Accountability*

A more in-depth analysis of accountability is of importance within public procurement as it identifies who is accountable and states the division of responsibility (Diggs & Roman, 2012). The authors further mention the well-investigated theoretical area of accountability related to traditional administrative structures but state the need for further research on accountability within complex and evolving business relationships. Various definitions of accountability can be found in the literature (Dicke & Ott, 1999). Authors refer to accountability as "the duty to provide an account of the actions for which one is held responsible" (Gray et al., 1997, p. 334). Accountability is especially essential as it can be interpreted in various ways depending on institutional and organizational differences and affect administrative failure (Diggs & Roman, 2012).

Dicke and Ott (1999) state the issue of how accountability is established differently in theory and practice. Their analysis serves an identification of how governmental techniques and methods are used to ensure accountability within contract agreements of human services. Contracts are one example of this type of methods among others like auditing, monitoring, and outcomes-based assessments.

The implications of accountability are argued to be both positive and negative. On the one hand, it serves opportunities for flexibility, innovation, and lower cost of services. On the other hand, flexibility is achieved when it is in balance with the responsibility of public owners to uphold the five dimensions of accountability,

namely; hierarchical, legal, professional, political, and moral- and ethical accountability (Dicke & Ott, 1999). To improve administrative decision making, especially in complex business environments it is essential to find a suitable framework that encounters decision making and accountability in public procurement (Roman, 2014). The author further argues that it is this regimented and autocratic procurement process that allows the public purchaser to carry out orders without consequences. When questioning the outcome, the purchaser can merely acknowledge “just doing my job.” In the evaluation process, the purchaser can always blame the consultant. This environment in government procurement circles shows that the purchaser is insulted for accountability and therefore wears a mask of non-responsibility (Dicke & Ott, 1999). Matthews (2005) further mentions the lack of educational alignment in the field of purchasing and deficiencies in formalized training and credentials.

#### 4.1.2 The Procedure of Public Procurement

The purchasing process consists of planning, formalization, implementation, and evaluation (Dicke & Ott, 1999). Even if public procurement can be differentiated from private purchasing, many factors and activities within the purchasing process are similar (Caldwell et al., 2007). However, some significant factors are differentiating the public procurement process from the private procurement process taking in a broader perspective (van Weele, 2014). The author believes that procurement includes surrounding aspects, such as transportation, quality control and also recycling in addition to the purchasing process. Furthermore, due to governmental regulations of public services, the procurement processes are often more time consuming and costly (Brynhildsvoll, 2011). The procedure of public procurement generally consists of pre-qualification of potential contractors, the specification of the requirements into a formal tender, construction of selection criteria and finally the evaluation- and selection process (Georghiou et al., 2014).

Further, the authors describe that the procedure demands specific requirements of documentation in every process step. Therefore, the evaluation and decision making of suppliers are carefully completed. Due to the heavy regulations and bureaucratic structure in the public sector, the process needs to be precisely conducted to avoid fraud and corruption (Knight et al., 2012).



### 4.1.3 Framework of Public Procurement

#### *EU directives and guidelines*

Public procurement is performed under strict regulations of the Norwegian government which is further framed by European guidelines and directives. Free and unbiased competition can be ensured through governmental guidelines when tendering for a public contract (NCA, 2016). The purpose of public procurement directives, according to the European Court of Justice is to “develop effective competition in the field of public contracts” (Graells, 2015, p. 6). In addition, principles of equal treatment, non-discrimination, transparency and mutual recognition should be followed (Georghiou, 2014). Special requirements and guidelines are defined for procurements with values exceeding determined thresholds (NCA, 2016; European Union, 2018).

The World Trade Organization Government Procurement Agreement (WTOGPA) is the legal framework underlying the European Commission Directives on Procurement (The Norwegian Government, 2012). The European directives and guidelines have recently been reformed, aiming to simplify innovation and procurement process for public purchasers (Georghiou et al., 2014). The more flexible approach is especially visible in the procurement directives of 2016 (European Commission, 2016). Furthermore, the European Commission (2018) describes these new directives as an adjustment and modernization of public procurement framework to efficiently meet the needs of public buyers. Accordingly, the commission explains how this enables procurement opportunities such as higher quality, more efficient solutions related to the environmental and social benefits, and cost-effectiveness.

Furthermore, the European Commission investigates several of these policy interventions and identifies to which degree they correspond to the named changes. The initial focus on the detailed formulation of contracts has shifted towards a formulation of function-based contracts, which further is described as a possible solution to handle future challenges (NCA, 2016). The liberalized formulation of contract enables new solutions due to specified goals and results, rather than detailed performance throughout the contract (NCA, 2016).

Reflections upon competition issues and institutional guidelines is relevant aiming for development within the industry of public procurement, seen in parallel with the increased reliance of the public purchaser satisfying the public interest (Graells, 2015). The author describes competition as a mean to deter favoritisms and corruption, but also to obtain benefits among participators. In order to attain value for invested money, public procurement activities should be performed in competitive markets, and the public procurement rules should be pro-competitive to assure no restrict or distort competition in the market. NCA (2016) discusses competitive neutrality regarding private undertakings within public relationships, like i.e., municipalities. The report further mentions two reasons for why it may be problematic; firstly, due to the municipalities engagement in markets they should not compete in, and secondly due to the advantages of municipalities as competitors.

Graells (2015) serves an analysis of the interrelation between competition and public procurement law. The primary objective of the study investigates the possibilities of an application of the competition law within the process of public procurement. However, the author mentions an arising paradox by this application. On the one hand, it provides more flexible rules for public procurement, but at the same time, it generates less competitive results. Graells (2015) conduct a discussion regarding the development of competition policies, arguing that the competition rules primarily regulate the seller's competition, whereas buyers competition policy is relatively underdeveloped. In other words, the authors argue that the development of pro-competitive rules is incomplete to cope with the power of buyers. Furthermore, the imbalance in competition can have an impact on the contract agreement and affect the buyer-supplier relationship. The author further implies that private entities participating in public procurement processes have generated competition restrictions, i.e., collusion and bid-rigging, which has demanded much attention (Graells, 2015).

### *Bureaucracy and Power of Public Procurement*

As public procurement represents a significant proportion of the total national budget, it possesses great power. However, this power is somewhat limited due to bureaucracy principles (Hill & Varone, 2016). Bureaucracy is defined as “a neutral term used to describe a complex organization,” and can, therefore, be

applied to governmental organizations including the aspects of accountability, effectiveness, and efficiency (Hill & Varone, 2016, p.252). Additionally, identified limitations of power are specific standard policies, structures, and guidelines throughout the procurement process (Matthews, 2005).

Limitations within public procurement could further be recognized in the tension of the complex procurement environment. Conflicting interests are occurring between stakeholders, politicians, businesses, community and management levels in parallel with competing claims from executives, lawyers, technologists for lead roles in this matter (Schapper et al. 2006). The public choice theory takes on the issue of power distribution in decision making among the different actors such as policymakers, politicians, and consumers (private organizations) (Hill & Varone, 2016). The theory studies the occurrence of self-interest and rent-seeking behavior among involved actors.

#### 4.1.4 Public- Private Procurement

The development of public procurement took a significant step forward during the 1990's due to the new technology introducing e-procurement, e-commerce, and e-business (Prozman & Sacchi, 2018). Public purchasers were forced to become more strategic and take a leading role in the development to avoid the risk of being left behind (Matthews, 2005; Brandes 1994; Gadde & Håkansson, 1994). The Federal Acquisition Streamlining Act (FASA) is mentioned as an example of this significant shift, as it contributed to value-added techniques, enabling purchasers to handle more complex projects (Matthews, 2005). Methods such as strategic planning, direct supplier negotiation, and best value procurement became more common (Matthews, 2005). Osey-Kyei and Chan (2015) performed a long-term analysis between the year 1990-2013, where the authors highlight critical success factors and infrastructural gaps as primary drivers towards the increased interest of public-private partnership.

Furthermore, the transformation towards more privatization was founded in the rising pressure and expectations of cost efficiency within public services (Jacobsen et al., 2013). Further, the authors describe three ways of how the waste collection can be provided and how cost efficiency has characterized future business models. The waste collection can be provided and distinguished as

follows: (1) pure private service, (2) pure public service, and (3) a hybrid strategy. A public-private partnership is a hybrid strategy, characterized by a private service provider regulated by the public sector (Bel & Warner, 2008; Jacobsen et al. 2013; Diggs & Roman, 2012). Diggs and Roman (2012) argue that the hybrid strategy will be a fact, only if the private partner confirms and agree to work towards a common goal together with the public party, otherwise the relationship is defined as contracting or outsourcing. Sørensen (2007) serves a discussion of hybrid organizations and indirect ownership, arguing their loss of incentives for cost efficiency and weak company control, which further leads to inadequate performance.

Gadde and Håkansson (1994) describe different purchasing strategies and the related changing role of purchasing in three dimensions; the make or buy decisions, supply base structure and the buyer-supplier relationship. Initially, the make or buy decision concerns the strategic question of whether to produce in-house or to buy the service. Furthermore, the decision is followed by selecting the optimal number of suppliers and determine what kind of relationship that should be established. Advantages and disadvantages are found regarding public-private procurement and collaboration between public authorities and private actors. Simões et al., (2012) highlight the positive aspects of the political protection system in combination with the private sectors relevant knowledge as a significant advantage, but reduced flexibility and the rigid contract formats which inhibits innovation as considerable disadvantages.

#### 4.1.5 Public Procurement and Innovation

Public procurement promotes innovation, where effective innovation systems and new solutions are essential factors keeping a high competition environment and future productivity growth (Konkurrensverket, 2014; The Norwegian Government, 2018). Innovation strategies within the business environment must be up to date to cope with continuous development, upcoming challenges, and exposure to increased competition (Georghiou et al., 2014). Edquist and Zabala-Iturriagoitia (2012) argue that procurement for innovation can contribute to increasing the satisfaction of human needs and societal issues. Increased focus on finding innovative solutions within waste collection services is conducted through the increased use of technology aiming for more cost-effective collection

performance and route planning (Faccio et al., 2011). People argue that efforts for innovative solutions may have positive effects on social benefits but needs the financial support of doing so. However, studies emphasize that innovative solutions could be achieved in parallel with financial yields (Nidumolu et al., 2009). The authors argue that innovative actions such as environmentally friendly efforts will reduce costs while it generates revenue concerning new products and aim for sustainability can achieve competitive advantages.

The increased focus on innovation and efficiency in public procurement are especially founded due to the new establishment of EU directives (European Commission, 2018b). The tendering process has a significant impact on innovative solutions and effectiveness, in combination with how municipalities manage their waste management undertakings (NCA, 2016). The report continuously argues a lack of neutrality as an issue that will affect the entry of new small, medium-sized firms in the market and thereby reduce the willingness to invest in research and development. The issue regarding lack of neutrality has its starting point within the municipalities conflicting roles concerning, waste management, their exclusive rights to municipal waste, and advantages of municipal undertakings.

European policymakers emphasize public procurement as an instrument to stimulate innovation (Hommen, 2009; Georghiou et al., 2014; Uyarra & Flanagan, 2010). Various definitions of innovation exist, however, a broad description of innovation serves “a product, service or process that is novel to the buying organization” (Edler and Yeow, 2016, p. 414). The authors investigate the intermediation between supply and demand, by using public procurement of innovation and the link between different actors with complementary skills. Continuously, they state how intelligent- and tailored intermediation can tackle some of the well-known procedural- and capability failures in the process of public procurement of innovation (Edler and Yeow, 2016; Gadde and Håkansson, 1994).

The fundamental activity related to innovation occur through public purchasers’ make or buy decisions, either they demand goods or services that do not yet exists to trigger innovation, or they respond to it by selecting goods or services with innovative characteristics (Georghiou et al., 2014; Edler and Yeow, 2015; Edquist

et al., 2000). Additionally, an important aspect influencing innovation is the buyer-supplier relationship (Gadde & Håkansson, 1994). Hommen (2009) mentions a lack in literature and research enlightening strategic perspectives conducting particular attention related to the complete context when discussing public procurement of innovation. It is further argued that limited perspectives induce that national authorities which practicing specific models and specified principles of the procurement process are unable to approach strategies coping the aspects of variety and change in long-term processes, such as the development of new technologies. Accordingly, Matthews (2005) questioning the uniformity and consistency among governments arguing that settled guidelines, regulations and following a generally accepted code in carrying out one mission, hardly can be considered as innovative.

Georghiou et al. (2014) analyze the use of public procurement for innovation by applying policy interventions throughout the procurement process and finally provides a taxonomy of procurement policies and the events involved.

Accordingly, the authors divide the procurement cycle into four parts; (1) framework conditions, (2) organization and capabilities, (3) identification, specification and signaling of needs, and (4) Incentivizing innovative solutions. Under current legislation and the phases of a formal procurement process, the authors argue for several practices favoring innovation, by first include undertakings foresight activities, and then using a technical dialogue between purchasers and suppliers and finally writing specifications in functional terms. By describing the performance rather than the route, it allows variants of specifications to be considered, and the evaluation will be based on the whole lifecycle costs instead of the cheapest bid (Duren & Dorée, 2008).

A crucial factor required to be stated in conjunction with innovation is occurring risks (European Commission, 2010). The report concretizes the importance of risk management and discusses the issue concerning the identification of actual costs for authorities to cope these risks. For the purpose of public procurement, a risk is identified as “measurable uncertainty for something to happen that decreases the utility of an outcome of an activity or reduces the achievement of certain goals” (European Commission, 2010 p. 54). The report written by the European Commission regarding risks seeks to both identify current procurement risks related to innovative products or services and provide suggested risk management

practices to cope with these risks. Various types of risks were identified connected to public procurement of innovation, such as technical, organizational and societal, financial, market, and turbulence risks. One suggestion for public procurement to improve its impact on innovation and cope with future competition challenges is to cure the risk aversion among buyers and society (European Commission, 2010). A reduction of risk aversion among buyers and society is essential as risk aversion transforms into an obstacle for new solutions (Holt & Laury, 2002). Formal contracts are often used to reduce risks between buyer and supplier (Tate et al., 2009 cited in Broekhuis & Scholten, 2018).

## 4.2 Principal Agent Theory

When municipalities outsource their collection of household waste to private transport service providers, situations could occur where the contractor in various ways takes advantage of the relationship and utilizes it to his advantage (Simões et al., 2012). Accordingly, an investigation regarding the relationship between buyer and supplier becomes relevant. Agency theory approximates the issues of risks, responsibility distribution, and various uncertainties occurring within such a relationship (Eisenhardt, 1989). The agency problem often referred to as the principal-agent relationship, takes on the issue where the customer (principal) delegates a task to the provider (agent), where the parties involved has different goals and information access (Logan, 2000; Jensen & Meckling, 1976).

Imbalance in knowledge is one factor that causing information asymmetry which increases the risk of one party utilizing the opportunity of retrieved information and further gain exclusive benefits (Bel and Fageda, 2006; Eisenhardt, 1989; Delbufalo, 2018). Hammervoll and Bø (2010) describe how this imbalance can be taken advantage of from the agents' point of view; either by hiding information and their real intentions from the principal before contract signing or by hiding their real actions after signing the contract. By hiding their intentions and actions after contract signing, they will thereby mask their efforts towards the principal.

To avoid the agency problem, and make sure the agent (contractor) will satisfy and act in the principal's (customers) interest, van Weele (2014) highlights the awareness of specifically related risks, among others contractual risks. The relationship between buyer and supplier plays an important role related to the

organization's ability to respond to unpredictable change (Hoyt & Huq, 2000). There are various types of relationships depending on different degrees of trust, communication, and commitment (van Weele, 2014). The evolvement of buyer-supplier relationship, going from the characteristics of arms-length relationship, which refers to “little or no investment in assets with minimal information exchange,” towards a more collaborative relationship (Hoyt & Huq, 2000, p. 754). Hammervoll and Bø (2010) describe an arms-length relationship as most common within transportation services. However, a more profound interaction and collaboration could reduce the degree of information asymmetry towards a more symmetric balance, between the buyer and supplier. They further point out that a relationship's risk profile has various expressions; hence it is not static but instead varying throughout the contract period and should be characterized as a win-lose profile. This aspect is essential as it can strain the relationship and in the worst-case lead to bankruptcy.

Information asymmetry causes incomplete contracts which develop rent-seeking behavior as its future eventualities are difficult to predict accurately (Bel & Fageda, 2006). Hart (2003) points out that incomplete contracts often are the case in practice and describe it as “the owner of an asset or firm can then make all the decisions concerning the asset or firm that are not included in the initial contract” (Hart, 2003, p.70). Hence, the owner has residual control rights. Incomplete contracts and vertical relations develop transaction costs (Hart, 2003). Van Weele (2014, p. 429) defines transaction costs as “costs that are associated with an exchange between two parties.” In other words, costs related to establishing, monitoring, and enforcing the contract together with relationship management are described as typical transaction costs. Unforeseen events, risks, and administrative costs are factors pointed out as central problematics when it comes to public delivery of local services (Brown and Potoski, 2003; Bel and Fageda, 2006). Specifically, concerning public ownership, transaction costs are related to bureaucracy and tender costs (Williamson, 1999; De Boer, 2017).

An opposite discussion serves that transaction costs can be reduced and limited through complete contracts, using more detailed specifications and supplementary logistics services (Hoek, 2000). Followed by complete contracts aiming for a reduction in transaction costs and various risks, privatization also arises as an optimistic service delivery reducing costs (Bell & Warner, 2008). However,



regarding privatization and the degree of success, it is argued that it depends upon the level of transaction costs (Bel & Fageda, 2007). High transaction costs lower the benefits of service privatization. To cope with the development throughout the contract and potential risks occurrence, this can be counteracted by measuring input variables, such as numbers of bins per trip and driven km through GPS through information systems like KomTek. Hence, higher transparency can be reached as well as an improved relationship by enable increased interaction and symmetric information sharing (European Commission, 2010).

### 4.3 Formulation of Contract

Studies state that risks and issues related to a buyer-supplier relationship can be mitigated by match the risks in the contract design (Tate et al. 2009). Goetz (1985, p.262) defines a contract as “an exchange of promises between parties” with the essential function of providing information about a future happening. Description of instrumental expectations, requirements that are concrete and measurable, creates a formal which are often used to reduce risks between buyer and supplier (Tate et al., 2009). Broekhuis and Scholten (2018) further argue that an establishment of a social contract in beforehand, in compliance with the supplier, will have a positive influence on the formal contract in addition to contract management. Design and formulation of the contract are of great importance as it sets the framework that embraces and guides all practical transactions between the involved actors.

Logan (2000) describes two types of contracts; namely outcome-based contracts and behavior-based contracts. The outcome-based contract is formulated with a focus on the final outcome, where the principal assumes to have increased control over the agent's activities and thereby will have the ability to affect the agent's incentives to behave in the interest of the principal (Eisenhardt, 1989). The behavior-based contracts have a continuous focus throughout the contract period and seem to make the principal acting more risk-averse and for conflict of goals more likely to occur (Logan, 2000). Additionally, there is another collaborative contract type which is based on trust and serves higher transparency, the ability to calculate cost per trip and, open up for flexible pricing (Hammervoll & Bø, 2010).

Similarly, a partnership follows a framework based on trust, shared goals, an ability to evaluate performance and excellent communication (Diggs & Roman, 2012). Broekhuis and Scholten (2018) suggest a combination of performance- and behavior-based contracts to be able to cope with the interest of all involved actors, both buyer-supplier relationship and external customers.

Communication is an essential aspect of a buyer-supplier relationship with regards to increased collaboration, information sharing, and development between parties. NCA (2016) argues that improved communication can be applied through the opportunities of dialogue sessions and individual meetings, aiming at one opportunity for clients to meet their potential providers face to face during the investigation for needs. During these meetings, the report argues that ideas for new solutions can be presented and thereby reduce the risk of formulating excluding contracts specifications later.

In the light of the European Union directives towards a circular economy, the goals of improved recycling have increased, and a focus towards function-based contracts can be identified (Prosman & Sacchi, 2018). In function-based contracts, clients describe the characteristics of the complete service and functional requirements, without specifying how these requirements should be met in detail (NCA, 2016). In the history of tender processes and purchasing of logistics services, the price can be identified as a one dominant decision factor (Andersson & Norrman, 2002; Bhutta & Huq, 2002). Even if this selection tactic has been successful for some time, recently many contracts have failed and developed re-evaluation of contracts, financial problems and in worst cases even bankruptcy (Hammervoll & Bø, 2010; Goetz, 1985). However, the recent development of contracts shows that several aspects such as quality, functionality, and incentives for innovation are given a higher focus and increased emphasis than earlier (Triantis, 2012). The author further identifies three drivers for contract innovation, such as learning, and changes concerning both regulation and market conditions. Embracement of new technology can lead to lower costs of innovation, and regulation can increase incentives for innovation and formulation of the contract is indirectly affected by conditions in the market.

## 4.4 Contract Management

Literature related to management of contracts is of importance as it provides essential factors leading to sustainable contract performance (Brown & Potoski, 2003). Analysis of contract management provides information identifying why some contract arrangements are more successful than others. Critics argue that contracts create accountability problems, and that benefits of reduced costs and increased efficiency come at the expense of reduced quality (Brown & Potoski, 2003).

Concerning our analysis of public-private procurement focusing on the purchase of waste collection service providers for long-term projects, theory around contract management for complex projects is primarily of relevance (van Weele, 2014). The complexity in contracts can partly be explained by bounded rationality, which explains the party's limitations in knowledge and information, which prevents them from specifying all actions in the contract (De Boer, 2000; van Weele, 2014). Buying, or contracting, for projects is distinguished from a traditional purchase of goods and services as each case is unique (van Weele, 2014; Brown & Potoski, 2003). One definition of contract management is "deciding on the right type of contract for the product, service or project to be delivered" (van Weele, 2014 p. 95).

Brown and Potiski (2003) argue that contract phases can be divided into three parts, firstly the feasibility assessment capacity, constituting the make or buy decision, secondly, the implementation capacity handling the process of bidding and negotiation tenders, and finally the evaluation capacity, showing the capacity to evaluate contractor's performance. Broekhuis & Scholten (2018) have investigated how activities ex-ante contracting influences ex-post contract management, and additionally what impacts these activities have on the satisfaction of buyer and supplier. One suggested activity by the authors is a formulation of a social contract between buyer and supplier to better clarify relationship characteristics. The social contract builds on the assumptions of transparency between the parties regarding their aim, capabilities, and aspirations.

Van Weele (2014) argues how to hold a collaborative attitude within contract management and keep the interaction between buyer and supplier in four dimensions; through the flow of information, financials, goods, and relationship. First, to achieve a successful collaboration between parties is an organized attitude regarding information sharing important- decisions concerning what, how and when to share this information. Second, continuous tracking and tracing of project performance are essential to ensure contract quality. Thirdly, the parties should establish an explicit agreement regarding contract payments and costs for the project period. Finally, specific arrangement regarding relationship maintenance and care is essential to achieve a sustainable relationship among all parties included. As a proposal for contract follows up, monitoring- and development meetings can be held during the contract period and continued with a closing conference in the contract-end, sharing recent experiences (NCA, 2016).

## 4.5 Project Management

Many similarities can be found in the characteristics of a general project and the characteristics coping the complete process of select, purchase, and delivery in waste collection- and transportation services. Karlsen (2015) describes a project by five characteristics: (1) the contract period has a precisely defined time frame, defined in the contract (2) limited resource access caused by a financial budget (3) the task is unique (4) cross-sectoral work, and (5) a specific goal. Several of these characteristics can be seen in waste management during the selection process and the contract period of transport service providers. Hence, parallels can be drawn from project management.

The contractual phase of the project implementation will be the primary focus of this research, specifically analyzing the relationship between the formulation of specifications and the selection of suppliers. The initial steps of a project are crucial for the final outcome since contracts cannot be modified after project start (Karlsen, 2017). Thus, it is crucial that the contractor have rational thoughts of the desired outcome of the project before implementation. Further, a contract strategy is essential for a successful implementation and can be defined as “the contracting means for achieving the project objective” (Ward, 2008, p. 25). The contract strategy and specifications have several direct and indirect effects on the buyer-supplier relationship and the total costs involved

Challenges in decision making within project management are often derived from the behavior dimensions resulting in decision delays or optimism bias (Wen et al., 2018). Optimal timing and high frequency in decision making are essential within today's continuously changing and complex project environment (Karlsen, 2017). Other factors influencing the project outcome are a well-structured supplier selection process and a clearly defined procurement strategy corresponding to the specific project situation (Chen, 2000). The author states three phases typically identified during project procurement; planning process, execution process and closing process.

To estimate project success, several factors have to be taken into consideration. The "Iron triangle," consisting of costs, quality, and time, have over the past fifty years measured project success (Atkinson, 1999). Various techniques within project management are addressing essential decision factors. For a project to be successful, Zurbrügg et al., (2012) furthermore argue the importance of flexible design and continuous adaptability to excellent satisfy the changing social-, environmental and economic conditions. Another technique that is often applied to solid waste projects is life cycle analysis (LCA), which identifies the energy use, materials and resources of goods, and services during the project's lifecycle. In order to calculate the total costs for a project, all related economic factors are included in the life cycle analysis.

## 4.6 Supplier Selection

Supplier selection is a step in the purchasing process and can further be described as a part of purchasing decision making (van Weele, 2014). Besides some cases where the decision making is straightforward, it usually needs careful analysis beforehand (De Boer, 2017). Methods and models which simplifies the purchaser's decision making aiming to find the optimal supplier are essential as our research involves the formulation of contracts, specifications, supplier selection, and tender processes. Further, the purchasing decision can be divided into two groups; operational purchasing which handles the ordering of goods, and initial purchasing which handles the contracting of suppliers. A number of successive stages construct the supplier selection process; problem formulation, selection of criteria, qualification, and final selection (De Boer et al., 2000).

### *Supplier base*

Various trends influence the characteristics of the supply base, both regarding complexity and interdependence (Bygballe & Persson, 2015). Optimally, a sufficient number of satisfactory suppliers should be present for evaluation at every stage (De Boer, 2017). However, the amount should not be so significant that it prevents excessive costs. An optimal number of suppliers is described as the balance between potential benefits and related costs of adding one more supplier into the evaluation (De Boer et al., 2000). The evaluation should be constrained by the aspects of costs and time (De Boer, 2017). The statement is an extension of the initial Economic Tender Quantity (ETQ) model, which was found to assist the purchaser in the decision making by finding the optimal number of tenderers that minimizes the expected total costs of the process (De Boer et al., 2000).

De Boer et al., (2000) differentiate between three basic shapes of supplier selection, where one of them describes the shape typically found in public sector procurement. The characteristics of this procurement process start with a request for proposal which is published in a public database, open for all suppliers to submit a proposal. Secondly, from the submitted offers and before a determined deadline, the purchaser must evaluate the received proposals out of a set of criteria, and finally choose a winner contract. This process follows the typical process for purchasing waste collection services.

#### 4.6.1 Supplier Selection Criteria

As a part of the public sector, municipalities are described to have an influential position concerning the creation and development of waste markets (NCA, 2016). Due to the constitutional autonomy, municipalities independently choose how to manage their local waste markets. However, problems of fair competition arise from organizational or executive issues inherent within the existing legal framework (NCA, 2016). During the contract formulation process, factors such as quality requirements, specifications, and selection criteria become crucial (Ho et al., 2010). In practice, especially the weighing of specifications concerning price, environment, and performance have a significant impact on the final contract price (De Boer, 2017).

The traditional selection of contractors according to the lowest bid, is described as only seeming to raise the competition level without affecting the performance quality level (Duren & Dorée, 2008). This type of selection has an exclusive focus on a single criterion, price, which may negatively affect the other criteria (Prosman & Sacchi, 2018). To overcome and turn away from the traditional selection of contractors, we see an increased focus on functional requirements aiming for higher customer satisfaction and better recycling (Konkurransverket, 2014). Instead of requiring specific costs from the purchaser, heuristic models can be used as a compliment, requiring comparative and verbal statements from the purchaser about relative costs and benefits of different supplier selection criteria. (De Boer, 2017).

The environmental and innovative focus continues to grow which further influence requirements and specifications within contracts. However, the amount of environmental efforts embedded in selection criteria varies (Prosman & Sacchi, 2018). Several well investigated environmental supplier selection criteria are uncovered for linear supply chains, while there consists a lack of definitions in circular supply chains. Stating environmental aspects as minimum requirements or supplier selection criteria are complicated due to its complexity and general characteristics (Bai & Sarkis, 2010). Prosman and Sacchi (2018) contribute with guidelines, proposing the environmental supplier selection criteria in addition to the earlier mentioned LCA, to better cope with environmental issues during the supplier selection process.

Prosman and Sacchi (2018) develops three selection criteria for circular supply chains, which is supposed to explain the most of the environmental impacts; (1) supplier selection may prefer waste handling activities that are environmentally related, (2) sourcing from the market of second tier-suppliers may lead to indirect transport that again are using other markets to compensate for the deflected products, (3) inefficient use of rejected products compared to the substituted new material may lead to additional emissions (Prosman & Sacchi, 2018). The author further argues simultaneous consideration of these criteria to achieve a sustainable result.

The contract regulates the business relationship between the parties, whereas specifications have a direct effect (Kolltveit et al., 2009). Towards achieving best

value procurement within project-based industries, the industry must become more performance-based (Shane et al., 2006). An extended model is developed by Kashiwagi (2011), the performance information procurement system, which is an information-based system that is suggested to be an excellent complement to a contract containing functional specifications and a fixed budget (Kashiwagi, 2011; Duren & Dorée, 2008).

To cope with non-economic factors such as environmental and quality aspects, a standardized formulation of criteria is essential (Bhutta & Huq, 2002). With regards to evaluation and the ability to distribute justified scores between non-economic criteria and the price criterium, the authors discuss two models, total cost of ownership (TCO) and the analytic hierarchy process. By using the TCO approach, decision makers can transform critical key factors in the evaluation of cost components, which afterward can be included in their cost calculations. The TCO approach in combination with the analytic hierarchy process approach, which accounts for both qualitative- and quantitative factors, these methods can assist decision makers to select the most sustainable supplier.

## 4.7 Transport Economics

Collection of household waste consists of massive investments and several cost drivers that are crucial to get an understanding of the service and to enable calculation of the approximate cost level (Bel & Fageda, 2010; Greco et al., 2015). Collection of municipal household waste is characterized by time-consuming operations, where the costs are tightly connected with the time used at each stop (Bø et al., 2012). Main cost drivers affecting the service are collection frequency, number of containers, and possessed capacity. Further, constraints regarding the collection time window and the possibilities for route changes are posing barriers for cost optimization.

Due to the complex nature of municipal household waste collection, several methods and techniques have been developed to enable estimation of contract costs (i.e., Hammervoll & Bø, 2010; Simões et al., 2012). The calculation of the total contract cost is characterized by direct and indirect costs (De Boer, 2016). Especially the indirect costs are challenging to calculate due to the lack of definitions and standardized quantification. Further, the cost associated with the collection of household waste is hard to calculate accurately due to the



uncertainties that are affecting the service. Long-term contracts influenced by substantial investments in trucks, geographical differences and extreme weather conditions are factors influencing costs. Uncertainties regarding the number of trucks and collectors that are needed do further pose a risk due to the close connection between generated costs and the number of trucks, wages, and increased administrative costs. Hammervoll and Bø (2010) present a decision support tool (DST), which includes all main cost categories divided into fixed- and variable costs along with wage costs. The cost categories do further include specific cost drivers concerning household waste collection such as loading- and waiting time, fuel usage, and the number of collectors.

Transport economic are further profoundly affected by bureaucratic regulations. Plata-Diaz et al., (2014) investigate the impact of economic and political factors regarding costs and fiscal stress, and how the impact of these factors varies on management forms, such as i.e., outsourcing or inter-municipal cooperation. Private contractors who provide public services in several nearby municipalities can achieve economies of scale through their distributing of fixed costs (Hart et al., 1997). Furthermore, the phenomenon of the learning curve is argued to depend on experience and economies of scale (Oslo Economics, 2017). Reduced costs will be achieved because of increased production utilization. The report stresses that more experience will lead to efficiency in production which in turn will create economies of scale. However, the report points out the paradox caused by the learning curve. The innovation of new products or services requires excellent investments at the start that will shortly afterward decrease in value. Public support schemes can serve a great value and preserve incentives for innovation (Oslo Economics, 2017).

Faccio et al., (2011) discusses a vehicle routing model adopted in waste collection services as a tool to identify related expenses such as material investment-, operational-, and environmental costs. By implementing an innovative vehicle routing model which can manage simulation and real-time traceability data, such as RFID and GPS systems, buyers can enable operational cost reductions as well as reduced investment costs. However, differences in the number of waste fractions can cause challenges aiming towards efficient collection and optimal route planning (Bø et al., 2012).

A report presented by the Oslo Economics (2017) study the marginal abatement costs (MAC) connected to the performance of green procurement strategies. MAC is described as the cost of reducing climate emissions with one unit/or ton of pollution (CO<sub>2</sub>), accordingly, it identifies the degree of cost-effectiveness concerning a specific action aiming for a given environmental goal. The report further discusses the relationship between invested MAC, technology, and procurement competence. The report promotes the acceptance of high MAC's in exchange for a future-developed technology and increased knowledge. However, related risks concerning uncertain future change are pointed out. The report presents one case that exemplifies several risk factors during the procurement process of waste collection services in Sarpsborg regarding the investment of electric trucks. The initial MAC was relatively high, equaling 3000 NOK per ton CO<sub>2</sub>, whereas 40% consisted of transaction costs related to the lack of relevant experience of electric vehicles among decision makers. However, as time passes the decision makers will conduct more experience and competence which will reduce future transaction costs. The contribution of green procurement will enable cost-effectiveness and increase the demand for environmental-friendly technology and developed learning.

DeBoer (2000) examines an Economic Tender Quantity (ETQ) model, which investigates the costs of supplier selection. Costs related to sending out tender invitations, evaluation of received offers, and supplier communication are accounted for in the ETQ model. The authors aiming to constitute a model that can assist buyers in the decision making, selecting the optimal number of suppliers which minimizes the costs. The trade-off between tendering costs (indirect costs) and the best-offered bid is dependent on the purchasers' judgment and competence, likewise, the number of available suppliers affects the degree of complexity regarding tender-decisions. De Boer (2016) addresses criticism of the former ETQ model, by highlighting its exclusive view on costs only considering the quantifiable costs factors and price.

## 5.0 Analysis and Discussion of Findings

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### 5.1 Introduction

This section presents our analysis, discussion, and empirical findings obtained in our study, based on the defined research question “*How does the weighting of supplier selection criteria affect the tender evaluation processes, and in what manner does the usage of criteria promote the formulation of sustainable and innovative contracts?*”. The study aims to analyze the current market situation related to municipal household waste collection and tender evaluation processes. By investigate recent tenders and map possible pitfalls, recommendations could be provided to increase the supplier selection efficiency and achieve sustainable contracts.

To conduct a thorough analysis of current formulations of requirements and supplier selection criteria in tenders, a review of the initial usage of award criteria in tenders among selected municipalities will be presented. The analysis is divided into three parts, where a separate analysis is conducted of each criterion in order to easily identify its individual impact in tender evaluation processes. As price is the only criterion that includes a monetary value, it is advisable to analyze and discuss it exclusively. The non-economic criteria regarding environmental- and quality aspects will be discussed in parallel as a certain degree of dependency is noted.

To complete our study, an analysis and discussion regarding various incentives for innovation and change among municipalities will be conducted. Municipalities’ individual incentives for innovation will be elaborated in light of their current use of internal- and external competence, technology, and their effort for communication and information sharing. A discussion regarding cost of innovation and the influence of public procurement regulations are further elaborated. Based on the analysis and discussion, several suggested actions are provided to increase the sustainability in future contracts.

## 5.2 General Findings

Table 4 shows an overview of the weighting criteria the interviewed municipalities used in the analyzed tenders. It is worth to keep in mind that the municipalities chose different handlings of the bankruptcies, which affected the date for their recent tenders. Some municipalities entered the new contract shortly after the bankruptcy, while others chose temporary solutions and are still in the process of formulating the next long- term contract. However, we base our analysis on their recent tender, and the data provided in table 4 are thus relevant for our study, although some tenders are pre-bankruptcy, and others were recently entered.

Award Criteria							
	ROAF	RfD	VESAR	Bærum	Halden	Asker	BIR
Price	100%	60%	40%	80%	50%	50%	100%
Environment		20%	30%	15%	16%	25%	
Quality		20%	30%	5%	34%	25%	

Table 4 Supplier Selection Criteria

The concept of circular economy and the issue of recycling has had an increased growth over the past decades (NCA, 2016). Besides the weighing and evaluation of contract price, the environmental and quality aspects, described as non-economic criteria, should be considered (Avfall Norge, 2017). The weighing process of these criteria are often seen as challenging as they lack a specific definition and have no direct monetary value. The interpretation and definition are based on the buyer’s subjective understanding and is thus varying among local authorities.

The joint industry platform, Avfall Norge, has prepared a guide regarding the usage of non-economic criteria in public tender evaluation processes (Avfall Norge, 2017). The report argues that increased focus on non- economic criteria will have a significant positive effect on the contract performance quality concerning further development of waste management and public procurement.

As in the case of weakly formulated criteria, there is an increased risk of receiving complaints by involved suppliers, which have had a low barrier to register cases at KOFA (the Norwegian Complaints Board for Public Procurement). High lawyer expenses and time-consuming lawsuits have affected the MSW- market the recent years. But based on findings, it seems like the market is adapting to the new formulation of the tenders, allowing the existence of non-economic award criteria to a greater extent.

During data collection and analysis, we identified a trend consisting of a relatively high focus on non-economic criteria among the municipalities. The challenges regarding definition and weighting is still posing a barrier for an optimal confidence in the usage, and strict eligibility requirement and requirement specifications are still used in an extensive manner to ensure quality of the tender evaluation process. Findings shows that eligibility requirements repeated in the contracts are specifying aspect like; a certain level of equity, credit rating, earlier equivalent experience, and competence. Further, the selection and definition of requirements and supplier selection criteria are crucial to achieve a supplier base characterized by sustainability. Too strict requirements can exclude small and newly established suppliers from the tender and pose high barriers to enter the market. On the contrary, to vague requirements could make it hard for the municipalities to deselect suppliers that are not satisfactory for the service. Thus, a balance is crucial to obtain sustainable contracts that is not posing a barrier for market development and healthy competition.

The public purchasing process is characterized by strict regulations, which affect the purchasers' flexibility and decision power. When choosing the most economically advantageous offer, the selection of the award criteria and the weighting of these has a great significance for the offers received (Cretu & Bienkowska, 2015). Thus, it is crucial that the municipalities thoroughly consider what they want to obtain with the tender: Are environmental aspects crucial or has the municipality a goal of being innovative and enable the suppliers the ability to find their own solutions to the collection.

There is still a relative variation in the percentage used to weight the award criteria, and how they are defined. Furthermore, there are differences in the interviewees' thoughts regarding weighting factors: some are very positive, while

others are somewhat more skeptical and feel that clear and specific requirement specifications should be satisfying to achieve a sustainable contract. The main argument for the skeptics is the difficulties regarding the definition and usage of the award criteria. From the analysis of public documents, an apparent tendency of variation in descriptions of the criteria is found.

Norway is associated with the EU's regulatory framework in this area through the EEA Agreement, which affects public procurement in several manners (The Norwegian Government, 2015). The rules cover procurement procedures from the planning stage to the signing of a contract, aiming to ensure efficient use of resources in the public sector and increase value creation in society. The usage of award criteria in public tenders and performing the evaluation of the economically most advantageous tender are further affected by strict laws and regulations. According to FOA §8-11, the contracting authority must choose an offer based on objective award criteria given in priority order in the procurement documents (Anskaffelsesforskriften, 2017). Furthermore, the award criteria must be related to the delivery purchased and could consist of variables such as price, quality, life cycle costs, environment, social considerations, and innovation (FOA §8-11(2)). The regulations further states that if choosing offers based on the economically most advantageous offer, the contracting authorities must indicate the relative weight of the award criteria. The contractor should specify the weight within a frame with an appropriate maximum score (FOA §18-1). Some uncertainty regarding flexibility within the law poses a barrier to achieve behavior- based contracts that allows change and adaptation to innovative solutions throughout the contract period.

### 5.3 Analysis of the Price Criterion

The table introduced below shows an overview of the weighting of price criterion among the municipalities interviewed regarding their previous tender (Table 5). Data shows that the increased focus on non- economic award criteria like quality and environment has reduced the total focus on lowest price in tender evaluations. The lowest weight proportion of the price criterion is found in VESAR, that chose to adjust the criteria from 100% to 40% in their last tender to enable innovative and environmentally friendly solutions. All interview objects are using, or are planning to use, a 50-50 approach where price consists of approximately 50% of

the criteria, while quality-, environmental- and other criteria constitute the remaining 50%. Findings from our data collection shows that all municipalities chose to change their tendering approach as a consequence of the waste crisis and bankruptcies; while some insourced the service, the main share of the interviewed municipalities rather increased their usage of non-economic criteria to ensure sustainability.

Award Criteria:							
	ROAF	RfD	VESAR	Bærum	Halden	Asker	BIR
Price	100%	60%	40%	80%	50%	50%	100%

Table 5 Award criterion: Price

Even though the weighting of price has decreased, findings show that the price criterion still possesses the most significant decision power in the final supplier selection, especially when received offers contain considerable differences in price. As we see tendencies of a 50-50 approach in the market, price is the individual criterion constituting the prominent weighting proportion. Experts interviewed states that the criterion is decisive because the waste collection service often is described as an “A4- service”. Since suppliers have access to all official documents, it is often hard to distinguish the different suppliers as they imitate each other and adapt their bids to the requirements and criteria in each tender. Non- economic criteria are characterized by subjectivity, and could be challenging to measure, while the price criterion serve as the easiest factor to distinguish the bids received. As stated by Halden:

*“Do you think the award criteria chosen in the new contract will determine whom you choose as a supplier to a large extent?”*

*- No, what I think is going to happen is that the price will be essential.”*

Some of the municipalities that are choosing to weight price above 50 percent point out that several minimum requirements are used to supplement the use of award criteria. They highlight that instead of using multiple subjective award criteria that could be misunderstood and misinterpreted, they rather simplify their tender by using more specific minimum requirements and fewer award criteria. They argue that non-economic criteria could be hard to distinguish due to the lack

of proper definitions. Both ROAF and Bærum promote that they received great feedback from suppliers when formulating tenders using this format due to the clear price competition which simplified the formulation of bids. On the other hand, the municipality and IMC point out that they had not seen the consequences that occurred by wholly using price criterion as a base for the supplier selection. The suppliers began to subjugate each other and offered loss projects, which lead to the bankruptcies and increased life-cycle costs affecting both parties in a negative manner.

Pricing strategies differ among the interviewed municipalities. Some are basing their decision mainly on the offers given in each tender, while some have calculated a fixed price for each container and offer a variable payment for each container emptied per route. The pricing strategy is intimately connected with the municipality's strategy and political structures. A similarity between the municipalities interviewed is that the cost of emptying each bin is set to a fixed price. Especially the usage of RFID chips and the software program KomTek is highlighted as a technological tool that promote more exact knowledge regarding the emptied bins and deviations occurring on the daily routes. On the contrary, none of the interviewees seems to use big data and the information provided by RFID and other technological data as a conventional method to calculate the price and costs. ROAF further states that trends in the market are affecting some areas of pricing strategies. An example is that they used to have a price per ton of paper, but since tonnage on the paper decreases, the price matrix needs to be changed. Adoption of market trends is thus crucial to provide an adequate pricing of the service.

The interview- object that stands out the most regarding the usage of the price criterion is BIR. They are the only actor that is still weighing price by 100% in their tenders, and their strategy is to use specification requirements rather than award criteria. Price is converted to annual cost, and all providers are given an equal fixed unit price. By an efficient usage of RFID in collection services, the suppliers receive an additional payment based on whether the bin is emptied or not. Their waste collection service is planned differently compared to the other municipalities/IMC. Instead of using a fixed household waste collection fee, the inhabitants are paying a variable price dependent on each bin emptied. This



pricing strategy is made possible due to the tactical approach which is following the demand variations in the market.

Since price is the only economic award criteria, it is least affected by the uncertainty regarding definition and weighting. One challenge that occurs is the comparison between price and remaining criteria since the price is set in NOK, while the other criteria are demanding a subjective assessment. By defining the weighting factors as the same unit, the relative difference can be identified and efficiently compared to other offers. The interview object in Asker highlights that there are two approaches to the scoring of price: recalculate other criteria into a monetary value or change price into a linear point score. A formula used to reformulate price into points is:

$$10 * P_b / P_e$$

Where  $P_e$  is the price that is evaluated, while  $P_b$  is the lowest bid received. A weakness of the formula is the lack of consideration regarding tenders characterized by large price variations. Even though the weighting of the supplier selection criterion consists a lower proportion in the total evaluation, the supplier selection process may be highly affected by the price if the linear point score is characterized by a steep curve. The pricing point score may possess major impact in the final assessment, which have been a challenge in the waste collection market lately.

The interviewees emphasized that the competition has been extreme the last decade, which led to unsustainable performance quality among the suppliers. RfD uses the contract announced in 2016 as an example. They received offers from five providers, and the bids were approximately halved since their previous contract period. Several of the interview objects highlight that they noticed that the contract prices offered were low, but that they thought it was a part of the supplier's low-cost strategy. Even if the purchaser saw that the supplier had to suffer from deficits in the first contractual years, they believed that it was a possibility to gain profits the second half of the period. Further, they point out that they were unaware of the fact that RenoNorden had entered multiple loss contracts within the short time. This shows signs of a market that has opportunities for increased transparency.

A great example is Bærum, which used an 80-20 approach in their last tender. Even if the contract they signed had a low price, they accepted the offer as they thought it was a part of the supplier's low-cost strategy.

A common phenomenon between all municipalities and IMC is that they blame the supplier market for the bankruptcies, as they are obligated to accept the prices that are offered due to the strict legislation. Furthermore, they claim that the supplier possesses most knowledge on costs levels and that prices offered in the tenders should reflect a sustainable performance throughout the contract period. Data shows that the focus on price has changed as a consequence of the bankruptcies. The buyers of the waste collection services are more concerned with the quality of the service to ensure sustainable contracts. The municipal decision-makers are searching for ways to conduct the tender without choosing an underpriced contract. By weighing the price criterion less, they are provided the opportunity to select another supplier rather than the one offering the lowest priced contract.

### 5.3.1 Discussion

Even though the weighting of the price criterion has decreased, it is still the most dominant criteria affecting the decision process the most. During the recent years, significant differences in contract prices have led to a recurring trend where the contract with the lowest price is chosen, even though the price constituted a weight equaling 50%. In the previous tender in Bærum, both the buyer and the external consultant state that if they intended to choose a supplier on terms other than the lowest price, they would have needed to weight the price criterion as low as 30%, which is considered too risky. The outsourcing of public transport services is after all conducted through a price-competition, where the suppliers mainly are competing on price. The municipalities have further strict budget requirements that they must adhere to. The public waste collection market influenced by strict regulations and information asymmetry, which affects the usage of price in the evaluation process of logistics service providers.

Experts and consultants interviewed highlight that household waste collection was previously seen as a standardized service, and that price was regarded as the only

relevant criterion to measure when selecting suppliers. When the tender is clearly specified, the price often serves as the only criteria (Karlsen, 2017). Several of the interviewees are further emphasizing that the service is characterized by a detailed description of how the service should be conducted, which prevents innovative solutions. Hence, the price should constitute a high weight. The suppliers have further the opportunity to copy each other, which could make it hard to distinguish the content of their offers by using subjective criteria. On the other hand, we see that the service has evolved, and technology is affecting the waste collection supply chain. The historical perspective only focusing on price is therefore seen as an expired approach, and especially the recent bankruptcies are forcing the municipalities to think differently.

Data shows a big variety of how the service is conducted in the different municipalities, which convey the complexity of the service. By weighting the price criterion less, the municipalities get the opportunity to choose a supplier that provides higher quality in their service, rather than to be “forced” to outsource the service to the supplier offering the contract with the lowest price. By weighting the price criterion less, buyers of logistic services get the opportunity to choose the economically most advantageous offer, and to control the supplier risk connected to situations like lack of capacity and competence, financial problems, bankruptcy and costly re-evaluations of the contracts (Hartmann, 2000). Thus, the total cost of the service may decrease even if the contract price itself is increasing. Similarities to the total cost of ownership approach can be noted here as all aspects of the criteria act as cost components in the final calculation of the contract price (Bhutta & Huq, 2002).

By only weighting the price criterion and rather supplement the usage of selection criteria with strict requirements, only suppliers that satisfy the municipalities’ needs are considered in the final selection process of the tender. Municipalities interviewed that used this strategy in their previous tender argue that the suppliers were satisfied with the approach due to the simplification of the documents involved, and a increased transparency throughout the tender evaluation process. ROAF highlight that they got plenty of positive feedback from suppliers when they used detailed requirements and rather had price as the only award criterion. A consequence the buyers did not consider was the negative trend that occurred in the market, consisting of underpricing and tendencies of predatory pricing. Thus,

it seems like the strategy did not pose enough consideration to the market situation. On the contrary, an important consideration to have in mind is that the purchasers had little influence to avoid this situation due to constraints caused by the law and regulations. It is in addition worth noting that lack of transparency poses a barrier for the involved decision-makers.

In the Ministry of trade, industries and fisheries' guide to public procurement regulations, it is stated that "low price is a competitive advantage and is not in itself sufficient ground for rejection (...) even if the supplier wants a minimum return or are losing money on the project, this is hardly a reason to reject the offer, as long as it does not pose a risk of implementation of the project. If the low price poses a risk in the performance of the supplier's contractual obligations, for example, because the price indicates poor quality of service or poses a risk to the supplier's financial position, the contracting authority will have a right of rejection." (Mæland, 2017, p.197). Hence, the decision makers in the municipalities are operating under strict regulations, and the low price offered from the suppliers that went bankrupt was by itself not a good not reason for the municipalities to reject the offers. The regulations seem to prevent flexibility, but an increased use of most economically advantageous tender and increased usage of non-economic criteria may prevent unsustainable contracts.

Another aspect highlighted by most of the interview objects are the risk of end up in KOFA if the bidder offering the lowest price does not get awarded contract. Aggressive competition has characterized the market, and the risk of receiving complaints and lawsuits after a tender has been high. The municipalities that are most skeptical of using a lot of award criterion emphasizes that a non-economic criterion could be hard to define, which increase the possibility of a case in KOFA. Consequently, they appreciate competing on price and strict requirement rather than several subjective criteria. The primary challenge of evaluating an offer solely by the lowest price is the lack of concern regarding quality. The regulation of public purchasing states that low price itself is not enough to reject an offer, as it is a competitive advantage. If the price is unusually low, it can constitute part of a rejection basis.

A question that is relevant to highlight is whether these suppliers could have been rejected if the tenders contained less weighting of the price criterion. From the

findings, we see that the previous bids consisted of a significant price variation. Due to the large pricing interval, the point score of the lowest bids were high, which provided a considerable amount of decision power. Tenders including bids with big price difference will be sensitive to the price criterion almost regardless of the weighting proportion, due to the point score the supplier gain by offering the lowest contract price. Bærum states that if the second lowest offer should have won, the price criterion must have weighted below 30%. VESAR further points out that even though the criterion only was weighted 40%, the price ended up being a crucial factor in the final decision. Furthermore, Halden express that price most likely will be the deciding factor in their next tender since it constitutes 50%, while the remaining award criteria equals 50%.

On the other hand, the analysis shows that by weighting the price criterion by a lower percentage, the municipalities allow suppliers to compete on other factors which could promote sustainability (Oslo Economics, 2017). This enables tenders with a focus on innovative and environmentally friendly solutions and could reduce the negative trend of predatory pricing, as discussed in the second half of chapter 5. On the contrary, it could be hard for the suppliers to calculate the costs of innovative solutions, especially if the service has not been conducted in the same way previously. Thus, the uncertainty could increase the risks occurring in the service, both for the supplier and buyer. The uncertainty of the associated cost values could affect the price in several manners: the contract could be underpriced and promote high life-cycle costs, or the supplier predict too high costs and lose the bidding to a better-priced competitor. Consequently, an increased knowledge regarding cost drivers associated with innovative solutions could cope with uncertainties regarding contract pricing.

Further, the results from the analysis show that the municipalities use little effort to calculate costs in advance of the tender competitions. According to Asker, the suppliers have not conducted negotiations regarding the fleet and so on when the offer is submitted. In case of uncertainty about terms in the contract, the buyer of the service can ask for insights and explanation of cost levels in the suppliers' calculations, but no suppliers will start with such negotiations before the conclusion of the contract. Precise numbers will therefore not be available. When VESAR evaluated the offers received in their recent tender, they saw that at least three of the proposals had a fairly similar price. They further compared them to

previous prices and looked at the amount of resources to see if the cost level matched. They did not find it necessary to calculate the costs in-depth. The municipalities trust that the suppliers are offering sustainable contract prices and highlight that they outsource the collection to experts which possess the competence regarding costs levels.

Altogether, we see that the price criterion is still crucial for the supplier selection, but the usage of non-economic award criteria enable the suppliers to influence the final decision and deselect suppliers they think are less suitable to conduct the service than others. This could promote choosing an underpriced contract and further avoid a crisis like bankruptcies since the municipalities gain increased decision power in the selection process. On the contrary, this could lead to biased selections based on the decision makers perception and subjective opinions. Altogether, the municipalities should strive for a balance in the weighting of the price criterion. If it is weighted too low, vendors will not have the initiative to compete on price, and at too high weighting will pose a risk for selecting an underpriced contract that is not sustainable.

### 5.3.2 The Influence of Transport Economic

Transport economics is crucial to enable buyers to get a realistic picture of how much the service they are purchasing should cost. In-depth knowledge of transport economic will provide the municipalities the ability to understand cost drivers and calculate an approximate price for the service (Bel & Fageda, 2010; Greco et al., 2015). Bø et al. (2012) estimated the cost of one second extra loading time per stop by a household waste collection route equaling approximately 20.000 NOK per year. Other cost drivers affecting the service are material (trucks, chambers), refuse collectors, fuel usage, and administrative costs. Results from our data collection show a varying degree of transport economic competence within the municipalities and inter-municipal cooperation. A similarity between all interview objects is that none of them are sacrificing much effort calculating the price before the publication of the tender. Some of the municipalities are calculating an approximate minimum and maximum price, where the difference are several mNOK, while others are using historical prices as a benchmark, and perhaps adjusting it for population growth.

Furthermore, we see that a majority of the municipalities interviewed use the price on the bids received by the suppliers as a baseline. When many bids are received, this should provide a realistic picture of the market. However, as we have seen, a few suppliers represent the most significant market share today, which could give the municipalities incorrect information regarding market costs and increase the risk of information asymmetry that occurs in principal-agent theory. Thus, the suppliers possess much power when it comes to information regarding costs. As stated by ROAF “This competence has the suppliers that purchase the trucks and are hiring the collectors, and they are the one calculating the price. We think that we need to trust the suppliers since they conduct the calculations and measurements”. Furthermore, RfD states that it is the supplier’s responsibility to calculate how much material and waste collectors they need to ensure proper capacity, and that the costs involved after contract signing should be the suppliers’ risk considerations.

Our research shows that the municipalities have small to no information of what the suppliers’ costs were during the previous contract period. As most are calculating the approximate price of the tender based on historical prices, the results lack considerations on whether the previous contract price contained a big margin, or if the suppliers were suffering from a deficit. The suppliers could further find information on the previous tender and use this price to calculate an approximate bid for the new tender. This could lead to a biased price, and one of the parts in the buyer-supplier relationship could suffer, while the other part gain benefits. Altogether, this will have a negative impact on the service efficiency and thus performance and sustainability. If the contract price is too low, the supplier could suffer from internal inefficiency. On the other hand, a contract price that is too big will have a negative impact on the municipality and promote inefficiency as well. Cost-information sharing could improve the firm's’ efficiency, as well as improve future cost savings. This result is also found in empirical studies done by Bel and Fageda (2010) and Greco et al. (2015), which investigated the municipal solid waste collection costs.

Further, data shows that the suppliers possess much power regarding the costs associated with the service, while the municipalities accept the costs calculated by the suppliers. This information asymmetry provides the suppliers' abilities to misuse the cost calculations provided when municipalities are asking for insight

into the suppliers' calculations due to FOA §24-9. It is impossible to know whether the bids are priced correctly when the municipalities have little or no information regarding relevant cost drivers. The numbers of trucks and waste collectors generate increased costs, and it is crucial for the municipalities to gain a higher knowledge of the cost levels to understand the service they are outsourcing. Furthermore, previous studies regarding time- consumption should be implemented when municipalities are calculating the value of the tender since the service is profoundly affected by the time used for emptying each bin and the frequency of each stop (Bø et al., 2012).

The lack of knowledge regarding transport economics could have been a factor affecting the suppliers' behavior and aggressive market competition that lead to underpriced contracts and bankruptcies in Norway. An example of this is when Oslo asked for insight in Veireno's calculations and accepted the offer even though several critical cost elements such as administrative costs were omitted (Kommunerevisjonen, 2018). The bid that was priced far below Oslo's pre-calculated contract value was seemingly accepted due to a lack of transport competence since aspects like usage of half the previous vehicle fleet was recognized as a solution. The contractor can only reject an offer if the price or cost level cannot be explained to the necessary extent from the information requested in the regulations for public procurement (FOA, § 24-9 (2)). Thus, the municipalities do have the possibility to reject an offer, but it requires several omitted cost elements, or the implementation of the service is at stake due to economic problems. Increased knowledge of cost drivers could thus promote a sustainable contract due to an accurate price calculation in advance of the publication of the tender.



## 5.3 Quality and Environment

### 5.3.1 Environment Analysis

Following weighting of the quality criteria were found among the interviewed municipalities:

Award Criteria: Environment							
Common weighting factors	ROAF	RfD	VESAR	Bærum	Halden	Asker	BIR
Environment Total	0%	20%	30%	15%	16%	25%	0%
HSE					8%		
Climate/measurements					8%		

Table 6 Award Criteria: Environment

Findings provided by the data collected shows that the environmental concern formulated in contracts often interacts with the municipality’s overall vision. Established municipality goals and strategies aiming for a reduction in vehicle emissions and pollution are often a recurring example. Data shows that the weighting of environmental aspects within tender evaluation decisions among municipalities accounts for 0-30% of the total evaluation. A dominant factor in the evaluation process among the majority of municipalities was concerning the design of the vehicle fleet and the distribution of biogas and Euro VI vehicles.

The inter-municipal cooperation of RfD had biogas vehicles and Euro VI as a minimum requirement rather than weighing it as an award criterium. Although, they awarded extra points to suppliers who performed immediate actions to reduce the usage of fossil fuel on special vehicles that were unable to use biogas during the first six months of the contract. RfD’s weight of the award criteria for environmental actions was therefore relatively low, equaling 20%. Likewise, the municipality of Halden placed biogas vehicles as a minimum requirement. Furthermore, data shows that Halden initially weighted environment together with quality at 50%, but reduced it to 35%, whereas 10% consisted of environmental aspects when finalizing the contract. However, the weighting of non-economic criteria was reformulated once again and transformed back to its initial weight of

50%. After the transformation, recent data shows how each factor constitutes an individual weight, whereas climate- and environmental measures and HSE constitute a weight of 8% each equaling a total of 16%. Arguments for this relatively low weighing priority on environmental aspects were their positioning of biogas as a minimum requirement.

On the contrary, even if the inter-municipal cooperation of VESAR similarly placed biogas as a minimum requirement, they were weighing environmental factors relatively high equaling 30%, compared to Halden and several other municipalities in the sample. VESAR divided the environmental criteria in two parts, where one part constituted “suggestions to reduce the use of fossil fuel on special vehicles that are unable to use biogas” and were assigned a weight equal to 10%, while the other part constituted a weight of 20% and focused on suggested actions aiming to increase recycling and improved distribution of waste fractions. The high focus on recycling is related to VESAR’s strategic plan of achieving 70% recycling before 2020 (the basis year 2016). The design and formulation of these criteria facilitate supplier suggestions, where the supplier of Norsk Gjenvinning got elected due to their suggestions for further development on environmentally friendly solutions.

The municipality of Asker defines their environmental criteria as “Environment, society- and innovation” which constituted a weight of 25% in the recent tender evaluation. The criterium contained a further detailed description of environmental weighting factors related to; fuel (with respect to special vehicles unable to use biogas), transport distance for transshipment, noise- and climate impact, and innovation. Asker was the only municipality that stated innovation as a weighting criterion which mainly referred to suggestions for “how innovation and development are supposed to be implemented during the contract period.” With regards to biogas vehicles and Euro VI standard, it was formulated as a minimum requirement. Other vehicles were described to be weighted in the order of; electrical, hybrid, HVO diesel, diesel, and gasoline.

The inter-municipal cooperation of BIR shows a different procurement strategy and evaluation of tenders. Instead of defining the environmental aspects as different weighting factors, they settled some strict minimum requirements and evaluated the tenders by setting 100% weight on the price criterion. The tender of

BIR describes minimum requirements concerning environmental aspects constituting the usage of biogas vehicles in addition to relevant competence concerning environmentally friendly service performance and required routines. Furthermore, the interview object explains that their strict minimum requirements initially formulated in the tender were subsequently followed up to ensure the suppliers' implementation. BIR referred this process to their supplier measurement system, which consisted of 18 criteria covering the main areas of the economy, quality, and HSE. Besides, data shows that BIR was the only principal that had started clear actions concerning the procurement of electrical trucks. The analysis found that one electric vehicle expects to arrive in June and an additional three at the end of this year (2018).

Even though the inter-municipal cooperation of ROAF weighted price at 100% during their evaluation, they showed great environmental focus. Data shows that strict minimum requirements regarding the environment were preferable instead of weighting criteria according to the interview objects, which also is highlighted in their latest tender. Although, data show that one of the interview objects is involved in DIFI's current project of developing a set of non-economic weighting criteria which has an object to improve general understanding regarding the use of non-economic award criteria among both principals and agents during tender evaluation. As an increased understanding of award criteria will have a positive effect on efficiency and develop a shared understanding among suppliers and buyers with regards to the evaluation process. However, the interview object points out the challenge of developing concrete and straightforward criteria that can transform environmental aspects into a numeric score.

Another example that differed significantly from the sample was the municipality of Bærum. Data show a high prioritization on price equaling a weight of 80% and remaining 20% on "plan for implementation of the assignment," more specifically 15% of the total 20% in evaluation consisted of environmental factors. These weighting factors furthermore consisted of various specifications regarding project organization, HSE, and choices related to vehicle types. However, the analysis indicates that most environmental factors were defined as minimum requirements, such as the use of biogas vehicles, apart from the first nine months into the contract period where diesel was allowed. Another related environmental

factor defined as a requirement in the tender was a program for energy efficiency driving and the implementation of food collection and new bins.

### 5.3.2 Quality Analysis

Following table provides an overview of the weighting of the award criteria covering quality aspects (Table 7). The findings are further analyzed concerning the municipalities interviewed.

Award Criteria: Quality							
Weighting factors	ROAF	RfD	VESAR	Bærum	Halden	Asker	BIR
Quality Total	0%	20%	30%	5%	34%	25%	0%
Mission Understanding & Society				5%	18%		
Org. & Service					8%		
Competence					8%		

Table 7 Award Criteria: Quality

Our research finds evidence of increased usage of non-economic criteria. An increased interest can especially be noted among decision makers concerning the criteria of quality. The quality criteria contain aspects related to performance and general standards of suppliers. Experience, competence, capacity, organization and service, and mission understanding are common factors to determine the criteria.

As mentioned, the inter-municipal cooperation VESAR was one of the principals that weighed the non-economic criteria relatively high. The quality criterion accounted for 30% in the evaluation and consisted of factors weighing the degree of robustness and whether suppliers’ suggestions concerning organizational performance, and logistics- and transport solutions, were realistic. Relevant competence and experience of the key personnel and their design of service operation, route planning, and vehicle park were some of the dominating weighting factors. Evaluation of performance quality was further weighted regarding suggestions for management and reporting of deviations. Additionally,

VESAR adapted a so-called “triangulation method” to ensure contract quality, where both a consultant, an internal buyer and one with operational responsibility was assisting during the tender evaluation and weighting of award criteria.

Three of the interview objects are distinguishable from the sample regarding their formulation of contract, the selection of evaluation criteria, and their focus on quality aspects. These consisted of the inter-municipal corporations VESAR and RfD, along with the municipality Halden. All three had a relatively high focus on non-economic award criteria in addition to a stable formulation of requirements in their tenders. Examples of requirements used were related to equity, credit rating, and equivalent experience and competence. The requirement of earlier experience was further specified by VESAR and RfD, where a minimum requirement was that suppliers had completed at least two similar contracts in the past three years. Additionally, RfD and VESAR used an enhanced specification regarding suppliers’ previous experience, where the scope of the contract must have been completed in an area of at least 50,000 inhabitants. The requirement related to the level of equity showed some variations in value, whereas VESAR had the highest amount with eight mNOK followed by RfD with seven mNOK and Halden with three mNOK.

Data shows the high focus on quality aspects in RfD primarily by their 20% weight on “mission understanding” in the evaluation. The criteria are also covering various weighting factors such as the formulation of a robust production plan, project- and organizational performance and adaption of the vehicle fleet. The interview object points out the last two as the most critical factors.

After the latest reformulation of a contract made by Halden, issues regarding HSE and training of new employees, project organization, and service (systems for deviation reports, et cetera.), as well as competence and earlier experience where each was constituting a weight of 8%. Factors regarding mission understanding, material and staffing consisted of a higher weight, equaling 18%. In the municipality of Asker, the quality award criteria were weighted 25% and included organization of the administrative- and operative work, preparedness capacity concerning the vehicle fleet, and overall preparation routines before contract start. Furthermore, supplier performance of robust activities regarding systems for HSE among their employees was stated as a requirement, which additionally was

obligated to be proved through a completed self-declaration scheme. Rules regarding acquisitions of earlier employees were also made applicable through a minimum requirement, of which all former collectors have priority regarding further employment in the new contract. Documentation for possible subcontracting needs was further required in the tender.

As described above, the municipality of Bærum constituted a relatively low weight on non-economic criteria in general, 20%, but more specifically 5% weight of quality during their evaluation process. Data show that the main factors included in this criterion were a description of a storage operation and factors of performance quality related to the planned implementation of new containers. Performance of continuous operation of the container park together with maintenance, replacement, and removal of collection equipment was also included in the weighing of contract quality. However, the municipality partially demonstrated its focus on quality through the requirement of previous experience of similar assignments over the last five years.

Even though the inter-municipal cooperation BIR excluded non-economic weighting factors in their evaluation process, by weighting price equaling 100%, the analysis still captured BIR as one of the front actors when it came to contract quality. Data showed robust requirements covering aspects of contract performance, HSE declaration not older than 12 months, enough capacity and relevant competence among the suppliers. Besides, they also required credit rating and that the supplier had minimum completed two similar contracts before over the last three years. However, without any specified dimensions.

## 5.4 Discussion of Environment and Quality

Following section will elaborate a discussion regarding the various prioritization of non-economic criteria among the selected municipalities within our data analysis. Both environmental- and quality aspects will be discussed in parallel as they show a significant level of dependency and interrelation during the analysis.

When discussing the environment, the area is broad, and analysis shows that it takes on a lot of different aspects. The increased focus and awareness among local

authorities has further been pushed and structured by the national and international legal framework. The European Commission has developed some guidelines and directives to encourage organizations to conduct an increased focus on the environment and implement a circular mindset on the market (European Commission, 2015). The non-economic factor of equality elaborates the municipalities' description and distribution of quality aspects as either minimum requirements or weighting criteria. Frequently recurring quality aspects identified in the analysis are related to equity, credit rating, relevant competence and suppliers' earlier experience.

Findings regarding environmental actions and municipalities varied weighting of these aspects as award criteria during tender evaluation, were often found to be closely connected to the municipality's overall vision and incentives towards improved sustainability. The inter-municipal cooperation RfD has a vision "from waste to value," and aiming at a net climate gain of 100 000 tons reduced vehicle emission (Annual Report RfD, 2017). The municipality of Asker has established an "environment-and energy plan 2013-2030" which affects the municipality's focus on reduced vehicle emission in transport services (Asker Kommune, 2016). Similarly, the high environmental focus in the inter-municipal cooperation ROAF is found in their core values "environment liability," and was furthermore reflected in their tender process and the use of minimum requirements (ROAF Annual Report, 2017).

Likewise, biogas vehicles were similarly formulated as a minimum requirement instead of weighting criteria in the inter-municipal cooperation RfD. The cooperation had a well-developed strategy with regards to the environment. Their strategy of awarding extra points to suppliers that suggested immediate environmental performance actions within the first six months of a project exemplifies a successful initiative aiming at increased sustainability. As mentioned, the municipality had relatively high weight, 40%, on non-economic criteria. Furthermore, both the environmental- and quality criteria were explained in two parts and great detail. The first part covered the aspects of environment and society, while the other concerned the general understanding of the mission. The social aspects constituted by measures that aim to improve HSE, working environment and actions to improve social responsibility. Furthermore, the environmental aspects considered suggested actions aiming for a reduction of

fossil fuel usage and service noise while emptying bins together with measures to increase recycling. The second part covered the quality factors such as mission understanding- and performance, a compiled project plan, adaption of the vehicle fleet and reserve capacity. Although the tender was formulated in great detail covering all the essential aspects, the percentage spread could be wider distributed.

The municipality of Halden showed similar prioritizing as they placed biogas vehicles as a requirement and other environmental- and quality factors got a weight of totally 50% in their final evaluation. However, regarding the relatively high weight on non-economic criteria, the core environmental factors, like, i.e., climate only accounted for 8% and HSE 8%. The interview object argued that there were not so many other environmental factors to put into the contract besides the requirement of biogas vehicles. They also pointed out the challenge when it comes to environmental measures and the uncertainty regarding which parameters to use when using weighting criteria. Although, Halden differs from the other municipalities with regards to their formulation of contract. The original formulation was mainly due to their specific emphasis on the individual factors under each criterion. The structure exemplifies a straightforward formulated contract, which can be assumed to be more understandable.

Furthermore, the municipality showed proper incentives for innovation and development through their well-established cooperation with university students. This process is argued to be used in projects with an object of joint product development, where collaborators strategically can complement their expertise and create new solutions (Prabhu, 1998). Currently, the municipality offered an internship for students investigating the environmental impacts of waste collection services. Furthermore, a significant focus on improving the collectors working conditions were noted as well.

VESAR showed the highest weight on environmental factors, in total 30% weight in the final evaluation. The high value on the environment was mainly due to their implementation of a new sorting system concerning waste fractions and recycling, which equaled 20% weight in the evaluation. The remaining 10% was awarded to suppliers that provided suggestions aiming for a reduction of vehicle emissions. Evaluation of quality aspects such as robust suggestions connected to transport



solutions, logistics and competence were constituting a weight of 30% should further be noted. In other words, the generous weight, in total 60%, on non-economic criteria show great incentives for environmental-friendly actions and aims at improved sustainability.

Additionally, VESAR were in front communicating with the supplier market. Through their initiative of a dialogue conference before the formulation and publication of the tender, they were able to adapt solutions suggested by suppliers and improve their ability to cope with new ideas. The performance of dialogue conferences is in the literature described as “opening communicative space” and enable actors to open up for discussion (Wicks & Reason, 2009). However, criticism can be directed against the formulation of the criteria to be quite vague, as they were mainly asking for suggestions for new solutions from the suppliers. Although, non-strict formulated criteria and the opportunity of dialogue conferences enable the supplier to come up with innovative ideas. The throughout environmental focus is seemed initially founded in the IMCs’ reliable infrastructure which affects the availability and great possibilities for environmentally friendly actions. The location of VESAR is on the south country of Norway, where the infrastructure and recycling behavior is widespread, mainly due to the established biogas plant of “the magical factory” (Vesar.no). The barrier to increase material recycling and preserve an environmental focus is therefore relatively low. Furthermore, better opportunities for recycling and consistency of a green focus seems to have had significant implications on the final choice of supplier. The IMC’s final choice of supplier, Norsk Gjenvinning, got elected partly based for their innovative suggestions.

ROAF showed strict environmental requirements in their previous tender. The analysis shows that they were the first municipality to introduce requirements of biogas vehicles with a Euro VI standard. By active dialogue with different suppliers on the market, the buyers were able to create competition and furthermore reform the vehicle park into only using biogas within a year. Regarding the issue of electrical trucks, the municipality pointed out critics concerning its lack of strength when it comes to endurance and hydraulics. The interview objects argued that it is better to demand environmental actions in the form of requirements instead of weighting factors. They further argued that “in many cases, strict requirements may be as strong as award criteria, just that

everyone is treated more equally.” Although data showed that one of the interview objects was involved with DIFI’s current project of developing a set of weighting criteria, they still criticized the use of weighting criteria in evaluation due to its lack of a suitable definition. A more standardized definition of, i.e. “environment” should result in more effective use (Bhutta & Huq, 2002). The buyers emphasize that the municipality’s demand for new solutions should be formulated as requirements instead of award criteria because this would encourage suppliers’ incentive to make required investments of new ideas. Furthermore, they highlight that they did not have the opportunity to implement biogas vehicles as early as in 2014, without formulating it as a requirement since the superior initiative for the massive investment were low among suppliers. Finally, the interview objects argue their beliefs in the future development and implementation of hydrogen rather than electric vehicles, mainly due to their more extended range, high effect, and quietness.

Several municipalities argue that award criteria can be used to a greater extent compared to earlier, especially concerning some technical areas that are relatively developed. One example of this is Bærum, where previous critics regarding their imbalance of weighing factors have been reconsidered in their new upcoming contract, where non-economic criteria are receiving a higher priority. The interview object further highlighted their readjustment with regards to HSE among the collectors. A higher focus will be paid to contract management, wages, housing conditions, and working hours in the upcoming tender.

The municipality of Asker was one of the primary actors regarding practicing environmentally friendly development and technology. This focus is reflected in their relatively high weight of non-economic criteria, equaling 50% in the evaluation. Besides, they were the only municipality within the data collection that demanded suggestions for innovation directly in their tender. These innovative proposals would preferably address areas such as deviation handling, reporting, weight-based drainage, and suggestions for new digital services.

Additionally, the municipality of Asker showed an excellent practice through their allowance of collectors’ possibility to share routes. This flexibility exemplifies an active use of available technology and incentives for innovation. Route sharing have positive effects on efficiency and collectors’ working environment, as they

can collaborate the task to a greater extent. Furthermore, active usage of available technology is reflected in their RFID system. The system makes it possible for the operation manager to collect useful data on the weight of collected waste, update the subscription register, and tailor the collection service (Bø et al., 2012).

The environmental criteria, which also included innovation, was formulated with the aim of receiving new ideas from suppliers. More specifically, they desired suggestions that would reduce noise and climate impact and volume of food waste as well as a suggestion of how to increase recycling and improve the working conditions. The municipality furthermore works actively to promote environmentally friendly solutions and recycling through the arrangement of special theme days, i.e., recycling day. The formulation of requirements and weighting criteria work as an extension of the municipality's well-founded strategy plan with an objective to reduce waste volume, increase material recycling and reach 80% reduction in emissions before 2020 (the basis year 2007). The strategy is a part of the "municipality plan for 2014-2026", towards the vision of being "climate neutral" before 2030 (Asker Kommune, 2016). Other actions considered within this strategy are stricter requirements referring to pay- and working conditions (HSE). Preferential rights for employees in the previous contract. The interview object promotes increased use of award criteria, as it can promote market development and innovation. However, the interview object points out the difficulties in defining the environmental aspects into concrete criteria and that it requires excellent competence.

BIR should also be emphasized in the discussion of innovation, as they front active use of technology and prioritizing the environment. They are the only principal within our data collection that has implemented electrical vehicles in waste collection services. BIR is expecting one electric vehicle to arrive in June, and another three electric vehicles are expected this winter, in December (2018). As mentioned, BIR distinguishes from the other municipalities in the data collection regarding their procurement strategy. Although they performed full weight, 100% on price exclusively, they still show great focus on environmental aspects and performance quality. However, these aspects were stated as minimum requirements instead of variable weighting factors during evaluation. Their implemented supplier measurement system can be seen as a robust method to ensure high quality in the evaluation of suppliers. However, some critics can be

made concerning the economics and the required credit rating of suppliers. The requirement demands that the suppliers should have served two similar contracts over the past three years. However, the requirement lacks specification regarding size and dimension. Furthermore, the interview object defended the strategy of using requirements instead of weighting criteria, by pointing out the challenges of weighing the environmental aspects as award criteria, mainly due to the increased risk of ending up at KOFA.

The Norwegian government believes that the authority and municipalities do not use their purchasing power as effectively as they should regarding environmental considerations during the purchasing processes (Regjeringen, 2017c). Therefore, they want to emphasize the importance of municipalities starting to increase the weight of environmental aspects in future purchases. In the light of the new regulation established 1st of May 2017, combined with new guidelines from DIFI, they want to achieve a more active usage of the environment as an award criterion during tender evaluation processes. Besides, for optimal use, the criterion is suggested to constitute a weight of 30% (Regjeringen, 2017c).

On the contrary, it is argued that award criteria lack a determining power because the criteria are relative and can easily be influenced by subjective perceptions. Increased environmental considerations together with proposals for new solutions should, therefore, be formulated as requirements rather than award criteria. In this way, local authorities increase their ability to demand new solutions from the supplier and push market development. This strategy was promoted by the inter-municipal cooperation ROAF, as the interviewee argued that their implementation and transformation of the complete vehicle fleet into biogas vehicles would not be possible in 2014 if they had stated biogas vehicles as an award criterion. Thus, we argue that it is more useful to place environmental aspects as requirements rather than as an award criterion when it comes to realizing new environmental goals. Based on our findings, it is not necessary to impose a weight as high as 30% on the award criterion related to environmental aspects with the aim of increasing incentives for new environmentally friendly solutions. The environmental award criteria should be given some weight to achieve a viable result but should primarily be stated as a requirement to develop concrete results.

Consequently, the award criteria should be seen in parallel with requirements to achieve the most sustainable result, as it exists a significant degree of dependency and interaction between specifications relating to environment and quality.

Practical use of award criteria is essential as it helps distinguish suppliers during evaluation and could promote more flexible solutions consisting of increased environmentally friendly actions and a higher possibility for innovation. To realize the aimed degree of environmental considerations, several of these criteria should be formulated as requirements. The remaining share should be defined as weighting criteria to enable suppliers to find their own solutions that promote the environmental aspect, as they possess the transport competence. Altogether, this will encourage sustainable contracts since the buyers of the transportation services pose more influence in the final choice, allowing them to enter a contract with the most suited supplier.

## 5.5 Contracts and Innovation

Through data collection, several interesting findings regarding innovation arose. Data shows that the incentives and motivation for change and innovation distinguished across municipalities. General factors that are described to affect the degree of incentives for innovation are described as, i.e., the weakening of public organizations, lack of competence, risk-taking and legislation (Konkurransverket, 2014). Furthermore, a discussion is served regarding the legal framework concerning public procurement, public contract formats, and identified barriers. The transformation of legal guidelines has transitioned into being more open for new solutions, changes and promotes more flexibility. By mapping the innovation efforts across municipalities, differences will be noted to answer the questions of why and how the incentives for innovation differs among municipalities. Moreover, purchasing competence and enhanced knowledge about waste collection services is essential, as it has an impact on the final contract price, selection of suppliers, weighting of award criteria in the final tender evaluation.

### 5.5.1 Incentives for Innovation

Data shows differences within local authorities regarding incentives for innovation and the aim of finding new solutions within waste management and public procurement. Actions for change and various incentives for innovation are

analyzed in the light of degree of relevant competence among principals and communication performance between municipalities.

### *Communication*

Data shows that vertical communication between municipalities and suppliers was performed in varying degree, as well as horizontal communication between municipalities exclusively and through the joint industry organization platform, Avfall Norge. The inter-municipal cooperation RfD, VESAR, and ROAF showed great horizontal communication performance. Occasional dialogues were identified between the public buyers in each municipality, either on their initiative or in organized meetings through Avfall Norge. VESAR showed great communication initiatives by sharing their experiences across borders. The interview object mentioned their dialogue with experts at the industry platform in Sweden.

Several municipalities showed frequent contact with operations managers, however not so frequent dialogues with the renovators. The municipality of Asker showed a prominent performance of vertical communication as they had daily contact with the operations manager and even occasionally accompanied the renovator out on the field. In addition, ROAF exemplifies a good example regarding the improvement of communication performance. As they changed their strategy, from previously outsourcing to currently insourcing, they have achieved better communication with their renovators. Findings show that they had weekly meetings with their renovators.

With regards to communication performance, the question whether it exists retrieved information between buyer and suppliers become relevant. Through the interview with one of the consultants, it came to our knowledge that the market is affected by some degree of business secrets and methods for determining project prices. Factors mentioned as the main competitive advantages are the number of vehicles, logistics, and employees/collectors.

On the contrary, related to horizontal communication, data shows that some municipalities were not as prominent in their communication with other municipalities. One example is Halden, as they did not show much of an effort communicating with other municipalities regarding the collection service or usage of weighting criteria. Continuously, the municipality of Bærum did not use that

much of shared information from other municipalities, with regards to weighting and evaluation of award criteria. However, during their procurement process and formulation of contract design they had a daily meeting with other municipalities, regarding their earlier experience. Similarly, other municipalities such as Asker, Halden, VESAR, and RfD which also used dialogue conferences in conjunction with their market analysis before formulating their contract.

### *Competence*

Data shows a clear pattern of municipalities with high population density possessing a higher level of expertise. Primarily, the inter-municipal cooperation shows greater incentives and interest towards information sharing and additionally pose a higher level of waste management knowledge.

Although, during procurement- and tender evaluation processes, the use of external competence was a common phenomenon among municipalities in the data collection. All the municipalities enhanced their area of expertise through consultancy, specialized in public procurement and waste collection services. However, some municipalities considered that the required competence was covered internally within their organization. One example is ROAF, where data show that the municipality possesses excellent expertise in the areas of procurement, waste collection, operation, and transport. The purchasers of ROAF were found to have previous experiences in the supplier area. In addition, they conducted internal expertise concerning route optimization and planning, mainly due to an employee who was educated and had experience in the field. Likewise, BIR was also using their internal competence during the contract formulation, although the final call was made by a third party externally to ensure incompatibility.

Furthermore, with regards to external competence, the municipality of Halden used a different method when formulating and optimizing their routes. Specialized competence was added through established cooperation with various university students doing periodically internship projects. This method has been used by the municipality for some time and has added new innovative ideas concerning waste collection and adoption of new technology.

## *Technology*

Regarding fleet management systems, the municipality of Asker shows an active use of RFID sensors placed on each container and later transferred to the CRM system KomTek. The sensors enable the suppliers to identify expected stops on the routes which in turn makes it possible for the suppliers to share and streamline the routes. The interview object argues that this will have further implications for the working conditions as it promotes characteristics of teamwork and make the collectors be able to finish work at the same time.

Furthermore, ROAF shows good knowledge with regards to technology and fleet management systems. As employees and service material are the primary cost drivers, a developed fleet management system can be helpful in mapping different cost parameters and improve service efficiency. In their plan of implementing a new fleet management system, they are aiming to create a register of collector's fuel consumption, km driven, performed routes, acceleration and the degree of eco-driving. By an effective data usage from this system, ROAF will be able to create an "environmental profile" on each collector, which will work as a helpful tool to improve HSE and efficient vehicle driving. Furthermore, the interview objects mentioned their current system, KomTek, as a useful tool to map all containers on the routes, register current container volume and the rate of emptying. These factors help to formulate a more accurate waste fee.

As mentioned earlier, BIR's price strategy distinguishes from the other municipalities in our analysis. Due to a well-developed technology, they performed active use of electronic logging during their waste collection. They had both a fixed price per container, but also a variable price depending on whether the container is emptied during a daily route or not.

Data shows that VESARs' formulation of the new contract was more development based and open for flexibility, where the award criteria concerning "environment" and "measures that can increase recycling" were weighted 10% respectively 20%. In addition, VESAR showed enhanced incentives for innovation through their extension of recycling system, by implementation an additional step of a collection of textiles.



Asker included innovation as a criterion combined with social and environmental aspects. The criteria account for how innovation and new solutions are planned to be implemented throughout the complete contract period. Another incentive for innovation established by Asker is a bonus scheme for their suppliers. They are primarily focusing on areas regarding handling deviations and weight-based drainage. During the beginning of the contract, they implemented an incentive, 10% additional payment the first four months if they achieve the settled requirement, connected to the collection on time.

Data shows an active use of fleet management system in ROAF, as they performed a pilot program aiming to identify how long time it takes for the collector to step out of the truck, pick up the waste, and the total loading time. The calculation of service time was possible due to an implementation of a camera behind the truck. Furthermore, they were able to create a standardized service time which had an impact on the calculation of costs. Likewise, a pilot project in this area was presented by the municipality of Halden concerning finding new routes collecting household waste. The project consisted of implementation of new sensors and RFID on every bin which was able to measure the level of waste and signaling depletion.

### 5.5.2 Discussion

Excellent communication and an interactive relationship between buyer and supplier, are two essential factors that have a significant impact on business development (Porter, 2000; The Norwegian Government, 2018). Communication is an essential key factor towards developing and sharing new information (Greco et al., 2015). With regards to communication, the aspects of what information is shared and how they share it is of interest. Additionally, the frequency of information sharing is essential, whether it happens continuously, once a year, or very rarely in connection with tendering processes. Face-to-face communication between parties allows for more customized communication, where potential problems and new information can be shared in a practical way (Cannon & Homburg, 2001).

ROAF changed their strategy, from outsourcing to insourcing their majority of areas related to waste collection, which had a positive effect on their

communication with their suppliers as they had dialogue meetings once a week. With regards to the formulation of a contract, Broekhuis and Sholten (2017) suggest that performance- and behavior-based contracts should be combined to achieve a sustainable buyer-supplier relationship. It is further argued that relationship management during the contract pre-phase will provide greater opportunities for aligned goals among the actors. Performance- and behavior-based contracts require a continuous follow-up and thorough contract management throughout the contract period to ensure proper performance. Based on the discussion above, we consider that there are opportunities potential for improvement potential in this area among the municipalities today, i.e. through effective use of dialogue conferences valuable information can be shared which will increase the market transparency.

The municipality of Halden performed communication with the supplier market during the pre-phase of their procurement process. Actions such as dialogue conferences early in the process led to a detailed analysis of the supplier market, with opportunities for identification of market signals and the ability to adopt new ideas. Furthermore, the buyers were able to match these new ideas and take them into account, during their formulation of contract. Common key areas that were identified in the data were concerning choices of vehicles, fuel, places for reloading, employees and handling deviations.

Bærum was suffering from the previous bankruptcy of RenoNorden and were in the progress of formulating a new tender (autumn 2018). Some significant changes were performed in this new tender. By performing a dialogue conference beforehand, incentives and ideas from suppliers could be taken into consideration when formulating the contract. However, the municipality argued that the degree of responding ideas from suppliers was not that impressive. We did not note that much incentives for innovation here, as the interview object referred waste collection services as a so-called “off the shelf” service, which did not require that much new ideas and changes.

### *Competence*

VESAR among other municipalities in the data collection conducted external competence related to the contract formulation and weighting of award criteria. Due to this, they achieved a “standardized structure” in the contract which was

recognizable for suppliers. However, criticism was directed from the interview object concerning the consultancy's way of "copy/paste" when weighting award criteria and insinuated little significance of uniqueness in their contract. Moreover, VESAR showed incentives for developing purchasing competence internally, and concerning communication with other municipalities they pointed out their current collaboration with Grenland (sister company) in this matter. Through the performance of dialogue conferences, VESAR were able to implement new ideas from suppliers without "significant changes" in the contract. This phenomenon can be seen as an incentive for innovation as it indirectly includes competence and ideas from the supplier in beforehand of a project, which further can be heightened for within the formulation of contract and furthermore implemented later on during the contract period. The phenomenon is further described as a "win-win project," as it takes on the interest of both buyer and supplier.

For municipalities to efficiently implement and be receptive to new innovative ideas from, i.e., suppliers, concerning waste collection services, it requires a change in the formulation of award criteria and requirements. To achieve increased flexibility, creativeness and developing innovative solutions, the formulation of contract needs to be based on functional requirements rather than technical and detailed requirements (Konkurransverket, 2014). Though, functional requirements can be challenging for public authorities to apply due to the lack of specific competence. Buyers' competence needs to cover areas as procurement, transport economic and waste management.

Although, ROAF has a route planner internally in the organization and has a developed expert group in the field. "we make small changes continuously on our routes to constantly strive for the optimal, but do not make too big changes for our customers." They also point out the difference between private households and buried solutions, where possibilities for flexibility are slightly higher as the collecting frequency is not as significant.

On the contrary, the municipality of ASKER have fixed routes and a well-developed technology regarding their collection services and does not focus on continuously reformulation of routes as an incentive for innovation. With fixed routes, Asker believes they are pushing for innovation, as they are driving routes

that are subsequently becoming more efficient. The municipality of Asker is also at the forefront of having weights on their trucks. This implementation enables access to Big data and a high potential for further development within waste management.

ROAF describes the supplier as a central player driving the innovation and suggestions of new solutions with regards to organizational development, new routines, and new technology. In supplier selection, the municipality's ambition is to select a supplier who has an impetus for innovation and developing projects. After the bankruptcy of Veireno and Reno Norden, they changed their strategy and decided to insource their collection services in three of four areas. This change in strategy affects the possibilities for change and implementation of new solutions. Improved solutions such as a joystick, emptying with faucet, making the collector work more attractive. Even if they insource the collection service, they point out the importance of HMS, follow restrictions regarding recruitment, and perform as they still are under public regulations.

Halden showed a distinctive method of using external competence compared to the other municipalities in the sample, as the municipality had established cooperation with university students. By this strategy, Halden was able to conduct new competence and innovative ideas in a useful way. This phenomenon is known as an industry-university partnership, where the industry is interacting with university students in the innovation process, to capture new ideas and new knowledge (Westnes & Gjelsvik, 2010).

### *Promotion of Change and Innovation*

Some municipalities seemed to have greater incentives and interest for finding new solutions with regards to optimization of routes, increased effectiveness, technology, cost-effectiveness and environmental efforts (recycling). The inter-municipal cooperation of ROAF promotes the need for change as "we have collected waste the same way for the past 100 years, it is time to develop the service and look at opportunities".

Other suggestion for a change in waste collection services was concerning the collection strategy based on waste volume instead of current strategy based on a number of bins, i.e., implementing measurements on containers in an attempt to

increase efficiency. However, interview objectives argue that this may lead to reduced business as the industry is based on price/container. This collection strategy can lead to significant cuts of employees, which is considered “significant changes” in the contract which is not allowed. Furthermore, as the municipality lack logistic expertise, the municipality located the complete responsibility of route planning to the supplier.

Although, the municipality of Asker points out the challenge of combining economics (cost-effectiveness) with politics, ideology and municipalities individual goals and at the same time aiming at innovative solutions.

Standardization of award criteria is argued as a decisive action striving for a common understanding and definition of the criteria. However, maintain flexibility is essential as municipalities distinguish in their structure and goals. Asker points out that good suggestions for changes often bring along negative consequences; hence it is crucial to take this aspect into account when promoting new solutions.

The pilot project performed by Halden, regarding relative collection frequency based on waste volumes, had a positive effect on the customer service level as the collection services took into account the individual customer needs. However, the collaborative performance from suppliers regarding this solution was not impressive at the beginning of the project but were transformed into being more encouraging along the project duration. This phenomenon shows similar characteristics to high transaction costs and steep learning curve, related to the implementation of new practice (Oslo Economics, 2017).

### 5.5.3 Cost of Innovation

A challenge that occurs as a consequence of an innovative solution is the extra costs that occur. Innovation is seen as an investment, which generates costs in the short term, and the possibility for increased profit long-term (Oslo Economics, 2017). In our study, we did not find systematic evidence of close collaboration and partnership among the municipal buyers and suppliers. The found of limited cooperation could increase the challenge of distributing extra cost and profit among the parties. Transaction costs are increasing since the principal, and the supplier needs to develop new competence, and operating cost expand due to the

increased focus on innovation. Innovation further poses a high risk connected with the uncertainty of success. Innovation could lead to environmental benefits for the municipality, increased efficiency and save costs for the supplier, and reduced costs for the service bought by the municipality. Hence, both parties could obtain benefits from the innovative solutions and should cooperate exploring these.

FOA § 8-12(1) states that contractual terms can be determined by the contracting authority, for example regarding the economy, innovation, environment, et cetera. FOA § 8-12(2) concerns the use of contractual change clauses. The change clauses must be stated in the procurement documents, and it shall be clear what changes the principal can make to what extent and under what conditions. Thus, the regulations facilitate changes during the contract period to some degree. On the other hand, the regulations stated that a significant change of contract is illegal after contract signing (FOA § 11-2). The municipalities possess the most significant impact in the contractual pre-phase, and should, therefore, strive for implementation of innovative solutions here. VESAR's develop-based contract led to an innovative solution regarding an additional waste fraction. Innovation occurred in the contractual pre-phase.

Another crucial aspect of innovation is how it should be rewarded. If an innovative solution that provides costs savings is implemented, it is fair that both parties should achieve advantages. Avfall Norge (2017) argues that it is challenging to reward innovation directly as the specific effects are hard to appreciate for the principal. Instead, they suggest rewarding the result created by innovative solutions concerning the environment, quality and increased efficiency. Asker implemented a supplier bonus in their latest contract to provide incentives for the supplier to develop new solutions. The interviewee states that the supplier has a central role for innovation, as they possess knowledge regarding technical solutions, organization, and the routines connected with the collection of household waste. Asker municipality aims for the supplier to both be a partner and a driver for innovation for this project, also a co-player in innovation and development processes. By using this approach, the municipality facilitates innovation during the contractual period.

## 6.0 Conclusion

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The usage of supplier selection criteria is recently moving the focus from choosing the offer with the lowest price towards a broader emphasis on quality and environmental considerations. After the bankruptcy of two of the largest waste collection suppliers in Norway, municipalities are concerned with quality criteria to avoid choosing an underpriced offer. As discussed, the legislation creates restrictions on how to reject suppliers, and the market has been characterized by aggressiveness towards the buyers when choosing a supplier which is not offering the lowest price. The use of non-economic selection criteria constitutes a new method when municipalities are purchasing a transport service like the waste collection.

From our analysis and discussion, we see that price serve as the criterion that influences the final decision the most, even though the percental weight of the factor has decreased during the last decade. The formula used to set a point score when evaluating price does not consider the risk of significant variety in bids, which have been a challenge recently. Price is still the individual criterion constituting the greatest share of percentage weighting. Since the market is characterized by a price competition, the criteria should be a critical decision factor in order to promote healthy competition. Data does further show that decision-makers find it too risky to weight the criterion less than 40-50%, as the municipalities have strict budgetary constraints to consider. A sustainable supplier is characterized by the balance between price and quality. By distributing the weighting criteria by using an approximate 50-50 approach, the supplier selection process is still influenced by the focus on price but promotes considerations regarding quality and environmental aspects.

The bankruptcies and the negative trend that arose in the market have further affected the municipalities to become more concerned with the quality of the service. By setting higher requirements in their tenders, the suppliers are forced to deliver a service of higher quality rather than offer an underpriced bid in order to remain competitive. The selection criterion concerning environment has further gained increased importance due to political and socio-economic trends. The market is still characterized by the uncertainty regarding the weighting of criteria. Regulations of public procurement suggest that environment should be weighted

30%, but our analysis promotes that the environmental concerns mainly should be described in the technical requirement specifications and be used to lower degree as an award criterion.

From primary and secondary data, we see an increasing trend towards a 50-50 approach between price and the remaining award criteria. Since quality and environmental considerations usually constitute 50% together, they should be described in parallel to achieve an optimal performance quality. The weighting approach provides the municipalities the opportunity to choose a low-priced contract, while at the same time establish a decision consisting a higher level of sustainability. Thus, the approach provides the most economically advantageous tender. Award criteria considering environmental aspects serve as an initiative for suppliers to offer environmentally friendly solutions. Quality criteria is on the other hand a method for increased innovative solutions if defined properly. This could further result in optimal life cycle costs among the municipalities, and a healthier buyer-supplier relationship than we have seen in the market the recent years.

A conclusion we can draw from the analysis and discussion regarding transport economics is that a higher level of competence and knowledge regarding the cost that occurs in the service could give the municipalities a stronger argument to reject tenders that are underpriced. The regulations state that the buyer needs a specific reason to reject an offer, and if they have a more detailed cost calculation the municipalities could refer to this if the rejection is questioned. Generally, there is little knowledge about costs, and the actors (municipalities, IMC, and consultants) relies on historical prices and the offers they receive. Knowledge of whether suppliers are left with profits are non-existent. Consequently, an increased knowledge regarding costs would provide the municipalities a better understanding of the prices offered and would reduce the power the suppliers possess regarding the market pricing. Currently, we see tendencies of a market characterized by information asymmetry which is affected by suppliers' dominant power regarding market pricing.

The analysis of vertical communication shows an emerging trend regarding the use of dialogue conferences in advance of the invitation to tenders. The dialogue conferences enable discussion and feedback regarding innovative solutions



considered implemented in the new contract. Thus, both parties in the buyer-supplier relationship can discuss ideas before concretizing it in the tender. The dialogue conferences are also functioning as a tool for mutual market analysis, as both parties get an insight into market demand and interests. Due to the discussion of suggested innovative solutions in plenary, a greater insight in the operative outcome and associated costs can be mapped. This could enlighten the basis for pricing of the contract and provide suppliers more information in what the expected service cost is before formulating the offer. An opportunity for improvement in the dialogue conferences is an increased participant activity, which currently seems to lack full utilization.

A conclusion that can be drawn from the analysis regarding horizontal communication is that there is a great opportunity for improvement. Findings show that there is a varied use of communication among the municipalities and IMC. Several of the interview objects are mentioning Avfall Norge during the interview, but the exploitation of each other's experiences with the usage of supplier selection criteria is somewhat weak. Since the decision makers within the different municipalities and IMC perform the same process, they should strive for an in-depth information sharing regarding their experiences. This could further increase the power they pose in tenders. Findings show signs that the suppliers possess a higher knowledge regarding pricing, operational costs and the service itself, which causes imbalance and information asymmetry in the buyer-supplier relationship. This have provided the suppliers the ability of predatory pricing. The lack of transparency did further lead to the possibility for some of the market actors to offer several underpriced contracts without the buyers knowing about it before it was too late.

The usage of supplier selection criteria provides the municipalities and IMC the ability to select suppliers with a greater focus on innovation, which could develop the waste collection industry in the long term. There are still possibilities for increased collaboration between buyers and suppliers, as the "us" and "them" attitude is present during the data collection. By moving toward partnership, an increased sense of community could promote a more active approach towards innovation. Further, technological tools permit detailed information sharing in the buyer-supplier relationship. There are still opportunities to increase the usage of big data to increase knowledge of cost drivers. Both parties should try to achieve a

high utilization rate of given data to be able to calculate the cost, disclose deviations, and facilitate improvement in the collection process throughout the contract period. Technological tools can further provide insights in both quality and environmental aspects given the correct usage.

## 6.1 Suggested Actions

Based on our findings and conclusion, actions are proposed to improve the opportunities for innovation and increase the achievement of sustainable contracts. The suggested actions for municipalities when selecting suppliers are:

- **Dialogue conferences** promote municipalities and IMC the ability to inquire about new ideas and get feedback from renovators regarding suggested innovative solutions. Furthermore, the suppliers can express ideas for change in actions as they possess the most knowledge regarding the operative part of the service.
- A **50-50 approach** seems appropriate when defining supplier selection criteria, of which the price consists of approximately 50%, while quality- and environmental factors constitute the remaining share.
- **Environmental aspects** should mainly be defined as requirements to ensure that it gets implemented. Remaining environmental considerations should be formulated as award criteria to serve as an initiative for the suppliers to provide even more environmentally friendly solutions, but it does not seem necessary to weight the criterion by 30%.
- More extensive use of **horizontal communication** between municipalities and IMC to share experiences and thoughts will counteract to select underpriced contracts and promote performance quality.
- The market should aim to become more **transparent** to decrease the information asymmetry and avoid a recurring situation where several of the suppliers are suffering from bankruptcies. This could further improve the buyer-supplier relationship and market sustainability.

- A **standardization of supplier selection criteria** could prevent misinterpret of the content and simplify the point scoring to distinguish the offers for the decision makers.
- Methods to increase the **possibility for innovation** during the contract period could increase the development within the area of waste management. Change clauses and contractual initiatives could promote more innovation during the contract period.
- The municipalities should opt for a **greater competence regarding costs** and transport economics. More excellent use of **technology and big data** could generate a broader knowledge of service time and cost levels.

## References

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- Abramson, M. A., & Harris III, R. S. (Eds.). (2003). *The procurement revolution*. Rowman & Littlefield.
- Andersson, D., & Norrman, A. (2002). Procurement of logistics services - a minutes work or a multi-year project? *European Journal of Purchasing & Supply Management.*, 8(1), 3-14.
- Andersson, C., Stage, J. (2018). Direct and indirect effects of waste management policies on household waste behavior: The case of Sweden. *Waste Management*, 76, 19-27.
- Anskaffelsesforskriften (FOA). (2016). Forskrift om offentlige anskaffelser. Retrieved from: <https://lovdata.no/dokument/SF/forskrift/2016-08-12-974>
- Anskaffelsesloven (offanskl.) (2017). Lov om offentlige anskaffelser (LOV-1999-07-16-69). Retrieved from: <https://lovdata.no/dokument/NLO/lov/1999-07-16-69>
- Arrow, K., Bolin, B., Costanza, R., Dasgupta, P., Folke, C., Holling, C.,..., Pimentel, D. (1995). Economic Growth, Carrying Capacity, and the Environment. *Science*, 268(5210), 520-521.
- Asker Kommune. (2016) – Energi og Klimaplan 2013-2030. Retrieved from: <https://www.asker.kommune.no/samfunnsutvikling/strategiske-planer/planer-for-samfunnsutvikling/miljo/>
- Assaf, S. (1998). Bid-awarding systems: An overview. *Cost Engineering: A Publication of the American Association of Cost Engineers.*, 40(8), 37.
- Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. *International journal of Project management*, 17(6), 337-342.
- Avfall Norge. (2017). Bruk av ikke-økonomiske tildelingskriterier ved anbud. En veileder for avfallsbransjen. Avfall Norge Rapport. Retrieved from: <https://s3-eu-west-1.amazonaws.com/avfall-norge-no/dokumenter/2017-05-Bruk-av-ikke-okonomiske-kriterier-ved-anbud.pdf>

Avfall Norge. (2018). Om Avfall Norge. Retrieved from:  
<https://www.avfallnorge.no/om-avfall-norge/om-avfall-norge-1>

Bai, C., & Sarkis, J. (2010). Integrating sustainability into supplier selection with grey system and rough set methodologies. *International Journal of Production Economics*, 124(1), 252-264.

Bartunek, J. M. (2012). How qualitative research on change can contribute to changing practice. *The Journal of Applied Behavioral Science*, 48(2), 272- 277.

Bel, G., & Costas, A. (2006). Do Public Sector Reforms Get Rusty? Local Privatization in Spain. *The Journal of Policy Reform.*, 9(1), 1-24.

Bel, G., & Fageda, X. (2006). Between privatization and intermunicipal cooperation: Small municipalities, scale economies and transaction costs1. *Urban Public Economics Review*, (6), 13-31.

Bel, G., & Fageda, X. (2007). Why do local governments privatize public services, a survey of empirical studies? *Local Government Studies*, 33 (4) (2007), pp. 517-534

Bel, G., & Fageda, X. (2009). Factors explaining local privatization: a meta-regression analysis. *Public Choice*, 139(1-2), 105-119.

Bel & Fageda. (2010). Empirical analysis of solid management waste costs: Some evidence from Galicia, Spain. *Resources, Conservation & Recycling*, 54(3), 187-193.

Bel, G., & Warner, M. (2008). Does privatization of solid waste and water services reduce costs? A review of empirical studies. *Resources, Conservation, and Recycling*, 52(12), 1337-1348.

Bel, G., & Warner, M. E. (2015). Inter-municipal cooperation and costs: Expectations and evidence. *Public Administration*, 93(1), 52-67.

Bhutta, K., & Huq, F. (2002). Supplier selection problem: A comparison of the total cost of ownership and analytic hierarchy process approaches. *Supply Chain Management: An International Journal*, 7(3), 126-135.

- Brandes, H. (1994). Strategic Changes in Purchasing. *European Journal of Purchasing & Supply Management.*, 1(2), 77-87.
- Breivik, S. R., (19.09.2017). Sjekk listen: Disse rammes av søppelkonkursen. E24. Retrieved from: <https://e24.no/boers-og-finans/renonorden/disse-kommunene-rammes-av-soeppekonskursen/24144467>
- Broekhuis, M., & Scholten, K., (2018). Purchasing in service triads: the influence of contracting on contract management. *International Journal of Operations & Production Management* 38.5: 1188-1204.
- Brown, T., & Potoski, M. (2003). Contract-Management Capacity in Municipal and County Governments. *Public Administration Review.*, 63(2), 153-164.
- Bryman, A., & Bell, E. (2015). *Business research methods*. Oxford University Press (4<sup>th</sup> ed.).
- Brynhildsvoll, I., & Abrahamsen, T. (2011). *Prinsipper for Bedre Innkjøp*. (2. utg. ed.). Bergen: bokforlag.
- Brønn, A. (2015). *Kommunikasjon for ledere og organisasjoner*: Fagbokforlaget.
- Bygballe, L. E., & Persson, G. (2015). Developing supply base strategies. *IMP Journal*, 9(1), 64-84.
- Bø, E., Flygansvær, B., & Grønland, S-E. (2012). Miljøvennlig innsamling av avfall – en studie av nye renovasjonstekniske løsninger. *Sitma*.
- Caldwell, N., Bakker, E., & Read, J. J. (2007). 11 The purchasing process in public procurement. L. Knight., C. Harland., J Telgen., K.V. Thai., G. Callender., K. McKen. *Public Procurement: International Cases and Commentary*, (p. 149-159). Routledge
- Cannon, J. P., & Homburg, C. (2001). Buyer-supplier relationships and customer firm costs. *Journal of Marketing*, 65(1), 29-43.
- Chen, M. (2000). Selecting the right engineer, contractor, and supplier. *AACE International Transactions*, P7A-P7.7.

Collins, K. M. T., Onwuegbuzie, A. J., & Jiao, Q. G. (2007). A Mixed Methods Investigation of Mixed Methods Sampling Designs in Social and Health Science Research. *Journal of Mixed Methods Research*, 1(3), 267-294.

doi:10.1177/1558689807299526

Cretu, C. & Bienkowska, E. (2015). Public Procurement Guidance for Practitioners. *Publications Office of the European Union, 2015*: Retrieved from: [http://ec.europa.eu/regional\\_policy/sources/docgener/informat/2014/guidance\\_public\\_proc\\_en.pdf](http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_public_proc_en.pdf)

De Boer, L. (2017). Procedural rationality in supplier selection. *Management Decision*, 55(1), 32-56.

De Boer, L., Van Dijkhuizen, G., & Telgen, J. (2000). A basis for modelling the costs of supplier selection: The economic tender quantity. *The Journal of the Operational Research Society*, 51(10), 1128-1135.

Delbufalo, E., (2018). Agency Theory and Supply Chain Management: A Literature Review. *Agency Theory and Sustainability in the Global Supply Chain*. (p.1-15). Retrieved from: [https://link-springer-com.ezproxy.library.bi.no/chapter/10.1007/978-3-319-72793-6\\_1](https://link-springer-com.ezproxy.library.bi.no/chapter/10.1007/978-3-319-72793-6_1)

Deloitte (2017). Renovasjonsetaten, Oslo Kommune. Gjennomgang av anskaffelsesprosess og kontraktsoppfølging i Renovasjonsetaten. Retrieved from: <https://www.oslo.kommune.no/getfile.php/13213690/Innhold/Politikk%20og%20administrasjon/Politikk/Byrådet/For%20pressen/Pressemeldinger/Gjennomgang%20av%20anskaffelsesprosess%20og%20kontraktsoppfølging%20-%20Renovasjonsetaten%20-%20rapport%20fra%20Deloitte%20-%2027042017.pdf>

Dicke, L., & Ott, J. (1999). Public agency accountability in human services contracting. *Public Productivity & Management Review*, 22(4), 502-516.

Diggs, S., & Roman, A. (2012). Understanding and Tracing Accountability in the Public Procurement Process. *Public Performance & Management Review*, 36(2), 290-315.

- Dijkgraaf, E., Gradus, R., & Melenberg, B. (2003). Contracting out refuse collection. *Empirical Economics*, 28(3), 553-570.
- Dijkgraaf, E., & Gradus, R. H. (Eds.). (2008). *The waste market: Institutional developments in Europe*. Springer Science & Business Media.
- Dubois, A., & Gadde, L. E. (2002). Systematic combining: an abductive approach to case research. *Journal of business research*, 55(7), 553-560.
- Easterby-Smith, M., Thorpe, R., Jackson, P. R. (2015). *Management & Business Research*. Sage Edge (5<sup>th</sup> ed.).
- Edler, J., & Yeow, J. (2016). Connecting demand and supply: The role of intermediation in public procurement of innovation. *Research Policy*, 45(2), 414-426.
- Edquist, C., Hommen, L., & Tsipouri, L. (2000). Introduction. In *Public Technology Procurement and Innovation* (pp. 1-4). Springer, Boston, MA.
- Edquist, C., & Zabala-Iturriagoitia, J. (2012). Public Procurement for Innovation as mission-oriented innovation policy. *Research Policy*, 41(10), 1757-1769.
- Eggesvik, O. (20.02.2017). Her star ordkrigen etter Veireno-skandalen i Oslo. *Aftenposten*. Retrieved from: <https://www.aftenposten.no/osloby/i/xo8O8/Her-star-ordkrigen-etter-Veireno-skandalen-i-Oslo>
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532-550.  
doi:10.5465/AMR.1989.4308385
- Eisenhardt, K., & Graebner, M. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50(1), 25-32.  
doi:10.5465/AMJ.2007.24160888
- Ellram, L. M. (1996). The use of the case study method in logistics research. *Journal of Business Logistics*, 17(2), 93-138.



European Commission. (2008). *Directive 2008/98/EC on waste (Waste Framework Directive)*. Retrieved from:

<http://ec.europa.eu/environment/waste/framework/#>

European Commission. (2010). Risk management in the procurement of innovation - Concepts and empirical evidence in the *European Commission*, 2010.

Retrieved from: [http://ec.europa.eu/invest-in-research/pdf/download\\_en/risk\\_management.pdf](http://ec.europa.eu/invest-in-research/pdf/download_en/risk_management.pdf)

European Commission. (2014). Tender Specifications. Retrieved from:

[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwj4jvrumNjcAhW0yqYKHechDFgQFjAAegQIABAC&url=http%3A%2F%2Fec.europa.eu%2Fculture%2Fcalls%2Fgeneral%2F0114%2Fspecifications\\_en.pdf&usg=AOvVaw0fzgbKCBLiUcSved76QXz](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwj4jvrumNjcAhW0yqYKHechDFgQFjAAegQIABAC&url=http%3A%2F%2Fec.europa.eu%2Fculture%2Fcalls%2Fgeneral%2F0114%2Fspecifications_en.pdf&usg=AOvVaw0fzgbKCBLiUcSved76QXz)

European Commission. (2015). Closing the loop – An EU action plan for the

Circular Economy. Retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614>

European Commission. (2016). EU Public Procurement Reform: Less Bureaucracy, Higher efficiency. Retrieved from:

<http://ec.europa.eu/DocsRoom/documents/16412/attachments/1/translations>

European Commission. (2018a). Public Procurement. Retrieved from:

[https://ec.europa.eu/growth/single-market/public-procurement\\_en](https://ec.europa.eu/growth/single-market/public-procurement_en)

European Commission. (2018b). Commission Notice - Guidance on Innovation

Procurement. Retrieved from: <https://ec.europa.eu/docsroom/documents/29261>

European Commission. (2018c). Implementation of the Circular Economy Action Plan – 2018 Circular Economy Package. Retrieved from:

[http://ec.europa.eu/environment/circular-economy/index\\_en.htm](http://ec.europa.eu/environment/circular-economy/index_en.htm)

European Union (2018). Tendering Rules and Procedures. Retrieved from:

[https://europa.eu/youreurope/business/public-tenders/rules-procedures/index\\_en.htm](https://europa.eu/youreurope/business/public-tenders/rules-procedures/index_en.htm)

Faccio, M., Persona, A., & Zanin, G. (2011). Waste collection multi objective model with real time traceability data. *Waste Management*, 31(12), 2391-2405.

Flick, U. (2013). *The SAGE Handbook of Qualitative Data Analysis*: Sage Publications Ltd.

Forurensningsloven (forurl.) (2017). Lov om vern mot forurensninger og om avfall av 01. oktober 1983 ([LOV-2017-05-11-26](#)). Retrieved from: <https://lovdata.no/dokument/NL/lov/1981-03-13-6>

Framstad, A. P., (16.08.2016). Har bundet seg til tapskontrakter i opp til ti år etter anbudsfeil. *E24*. Retrieved from: <https://e24.no/boers-og-finans/renonorden/har-bundet-seg-til-tapskontrakter-i-opp-til-ti-aar-etter-anbudsfeil/23767104>

Gadde, L-E, & Håkansson, H. (1994). The changing role of purchasing: reconsidering three strategic issues. *European Journal of Purchasing & Supply Management* 27-35.

Geissdoerfer, M., Savaget, P., Bocken, N., & Hultink, E. (2017). The Circular Economy – A new sustainability paradigm? *Journal of Cleaner Production.*, 143, 757-768.

Georghiou, L., Edler, J., Uyerra, E., & Yeow, J. (2014). Policy instruments for public procurement of innovation: Choice, design and assessment. *Technological Forecasting and Social Change.*, 86, 1-12.

Ghauri, P., Grønhaug, K. (2010). *Research Methods in Business Studies*. Pearson Education Limited (4<sup>th</sup> ed.).

Goetz, C. (1985). The limits of expanded choice: An analysis of the interactions between express and implied contract terms. *California Law Review.*, 73, 261.

Gordon Murray, J. (2009). Improving the validity of public procurement research. *The International Journal of Public Sector Management*, 22(2), 91-103.

Graells, A. S. (2015). Public procurement and the EU competition rules. *Bloomsbury Publishing*.

Gray, R., Dey, C., Owen, D., Evans, R., & Zadek, S. (1997). Struggling with the praxis of social accounting. *Accounting, Auditing and Accountability.*, 10(3), 325-364.

- Greco, G., Allegrini, M., Del Lungo, C., Gori Savellini, P., & Gabellini, L. (2015). Drivers of solid waste collection costs. Empirical evidence from Italy. *Journal of Cleaner Production*, 106, 364-371.  
doi:<https://doi.org/10.1016/j.jclepro.2014.07.011>
- Hammervoll, T., & Bø, E. (2010). Shipper-carrier integration: Overcoming the transparency problem through trust and collaboration. *European Journal of Marketing*, 44(7/8), 1121-1139.
- Hart, O., Shleifer, A., & Vishny, R. (1997). The Proper Scope of Government: Theory and an Application to Prisons. *The Quarterly Journal of Economics*, 112(4), 1127-1161.
- Hart, O. (2003). Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships. *The Economic Journal: The Journal of the British Economic Association.*, 113(486), C69-C76.
- Hartman, F. (2000). *Don't Park Your Brain Outside*. Project Management Institute.
- Hill, M., & Varone, F. (2016). *The Public Policy Process* (7th ed ed.). London: London: Taylor and Francis
- Ho, W., Xu, X., & Dey, P. (2010). Multi-criteria decision-making approaches for supplier evaluation and selection: A literature review. *European Journal of Operational Research*, 202(1), 16-24
- Hoek, R. (2000). The Purchasing and Control of Supplementary Third-Party Logistics Services. *The Journal of Supply Chain Management: A Global Review of Purchasing and Supply*, 36(3), 14-26.
- Holt, C., & Laury, S. (2002). Risk Aversion and Incentive Effects. *The American Economic Review.*, 92(5), 1644-1655.
- Hommen, L. (2009). Public procurement and innovation: Towards a taxonomy. *Journal of Public Procurement.*, 9(1), 17.
- Hovland, K. M., (19.09.2017). Sjøpelselskapets nedtur: Dette gikk galt for RenoNorden. *E24*. Retrieved from: <https://e24.no/boers-og->

[finans/renonorden/soeppelselskapets-nedtur-dette-gikk-galt-for-renonorden/24144725](#)

Hoyt, J., & Huq, F. (2000). From arms-length to collaborative relationships in the supply chain. *International Journal of Physical Distribution & Logistics Management.*, 30(9), 750-764.

Jacobsen, Buysse, & Gellynck. (2013). Cost comparison between private and public collection of residual household waste: Multiple case studies in the Flemish region of Belgium. *Waste Management*, 33(1), 3-11.

Jensen, M. and Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Johannessen, S. Ø., (21.09.2017). Advarer om ensidig prisfokus. *Dagens Næringsliv*. Retrieved from:  
<https://www.dn.no/nyheter/2017/09/21/0650/RenoNorden/advarer-om-ensidig-prisfokus>

Karlsen, J. (2017). *Prosjektledelse: Fra initiering til gevinstrealisering*. Oslo: Universitetsforlag (4th ed.).

Kashiwagi, D., & Kashiwagi, J. (2011). Case Study: Performance Information Procurement System (PIPS) in the Netherlands. *Malaysian Construction Research Journal*, 8(1).

Kirkebøen, S E., (21.02.17). Veireno-sjefen har slått selskapet konkurs. *Aftenposten*. Retrieved from: <https://www.aftenposten.no/osloby/i/3aE1q/Veireno-sjefen-har-slatt-selskapet-konkurs>

Knight, L., Harland, C., Telgen, J., Thai, K. V., Callender, G., & McKen, K. (Eds.). (2012). *Public procurement: International cases and commentary*. Routledge.

Kolltveit, B. J., Lereim, J., & Reve, T. (2009). *Prosjekt: strategi, organisering, ledelse og gjennomføring* (3 utg.). Oslo: Universitetsforlaget.

- Kommunerevisjonen. (2018). Renovasjonsetatens anskaffelse av avfallsinnhenting. Retrieved from: <https://fido.nrk.no/6eaaf1e8848d142a756c3001d5e074211df5c1ee5cd7413b2559aa7089128d7d/Rapport%20om%20Renovasjonsetatens%20anskaffelse%20av%20avfallsinnhenting%20.pdf>
- Konkurrensverket. (2014). Offentlig Upphandling och Innovation. *Swedish Competition Authority, 2014*. Retrieved from: [http://www.konkurrensverket.se/globalassets/publikationer/uppdragsforskning/for\\_sk\\_rap\\_2014-5.pdf](http://www.konkurrensverket.se/globalassets/publikationer/uppdragsforskning/for_sk_rap_2014-5.pdf)
- Legge, S., & Klett, T., (26.04.2018). *How to build a business in the circular economy*. World Economic Forum. Retrieved from: <https://www.weforum.org/agenda/2018/04/how-to-build-a-business-in-the-circular-economy/>
- Logan, M. (2000). Using Agency Theory to Design Successful Outsourcing Relationships. *The International Journal of Logistics Management.*, 11(2), 21-32.
- Matthews, D. (2005). Strategic procurement in the public sector: A mask for financial and administrative policy. *Journal of Public Procurement.*, 5(3), 388.
- Mæland, M. (2017). Veileder til reglene om offentlige anskaffelser (anskaffelsesforskriften). Nærings- og fiskeridepartementet. Retrieved from: <https://www.regjeringen.no/no/dokumenter/veileder-offentlige-anskaffelser/id2581234/>
- Nidumolu, R. (2009). Why sustainability is now the key driver of innovation. *Harvard Business Review*, 87(9), 56.
- Nordic Competition Authorities. (2016). Competition in the waste management sector - preparing for a circular economy: *Report from the Nordic Competition Authorities*. Retrieved from: <http://www.konkurransetilsynet.no/nb-NO/publikasjoner/nordiske-rapportar/konkurransproblemer-i-avfallsmarkedet/>
- The Norwegian Environment Agency. (2016). Waste. Retrieved from: <http://www.environment.no/Topics/Waste/>

The Norwegian Environment Agency. (2017). Waste generation increases more than GDP. Retrieved from: <http://www.environment.no/waste-gdp>

The Norwegian Government (2012). Offentlige anskaffelser i WTO.GPA-Avtalen. Retrieved from:  
<https://www.regjeringen.no/no/tema/naringsliv/handel/ud---innsiktsartikler/innsikt/wto---doha-runden/offentlige-anskaffelser-i-wto-gpa-avta-2/id708717/>

The Norwegian Government. (2015). Competition Policy. Retrieved from:  
<https://www.regjeringen.no/en/topics/european-policy/areas-cooperation/competition/id685970/>

The Norwegian Government. (2017a) Offentlige anskaffelser. Nærings- og fiskeridepartementet.  
Retrieved from: <https://www.regjeringen.no/no/tema/naringsliv/konkurransopolitik/offentlige-anskaffelser-/id2511781/>

The Norwegian Government. (2017b). Kommunereform. Retrieved from:  
<https://www.regjeringen.no/no/tema/kommuner-og-regioner/kommunereform/kommunereform/id2548377/>

The Norwegian Government. (2017c). Vill ha flere grønne innkjøp. Retrieved from: <https://www.regjeringen.no/no/aktuelt/vil-ha-fleire-grone-innkjop/id2550261/>

The Norwegian Government. (2018). Vil styrke innovasjon i offentlige innkjøp. Retrieved from: <https://www.regjeringen.no/no/aktuelt/vil-styrke-innovasjon-i-offentlige-innkjop/id2598417/>

O'Reilly, K (2012). *Ethnographic methods*. Routledge (2th ed.).

Osei-Kyei, R., & Chan, A. (2015). Review of studies on the Critical Success Factors for Public–Private Partnership (PPP) projects from 1990 to 2013. *International Journal of Project Management*, 33(6), 1335-1346.

Oslo Economics (2017). Gevinstanalyser av grønne anskaffelser. *Utredning for Direktoratet for forvaltning og IKT og Miljødirektoratet*. Retrieved from:

<http://www.miljodirektoratet.no/no/Publikasjoner/2018/Februar-2018/Gevinstanalyser-av-gronne-anskaffelser/>

Plata-Díaz, Zafra-Gómez, Pérez-López, & López-Hernández. (2014). Alternative management structures for municipal waste collection services: The influence of economic and political factors. *Waste Management*, 34(11), 1967-1976.

Porter, M. (2000). Location, Competition, and Economic Development: Local Clusters in a Global Economy. *Economic Development Quarterly*, 14(1), 15-34.

Prabhu G.N., (1998). Implementing university – industry joint product innovation projects, *Technovation* 19 (1999) 495-505, *Elsevier Science Ltd*.

Price, J.L., and J. B. Joseph. (2000) Demand management – A basis for waste policy: A critical review of the applicability of the waste hierarchy in terms of achieving sustainable waste management. *Sustainable Development* 8 (2): 96-105. Doi 10. 1002/(Sici) 1099-1719(200005) 8:2<96::Aid-Sd 133>3.3.Co;2-A.

Prosman, E., & Sacchi, R. (2018). New environmental supplier selection criteria for circular supply chains: Lessons from a consequential LCA study on waste recovery. *Journal of Cleaner Production*, 172, 2782-2792.

Raymond, J. (2008). Benchmarking in public procurement. *Benchmarking: An International Journal*, 15(6), 782-793.

Reno Norden (2018). About us. Retrieved from:

<http://www.renonorden.no/om/var-historie/>

RenoNorden (18.09.2017). RenoNorden ASA og RenoNorden AS begjærer oppbud. Retrieved from: <http://www.renonorden.no/category/uncategorised/>

RfD (2017). Annual Report. Retrieved from: <https://www.rfd.no/om-rfd/arsrapport>

ROAF – Annual report (2017). Fremtiden er ombruk. Retrieved from:

[https://www.roaf.no/wp-content/uploads/2018/05/ROAF\\_arsrapport\\_2017\\_bladbar.pdf](https://www.roaf.no/wp-content/uploads/2018/05/ROAF_arsrapport_2017_bladbar.pdf)

- Roman, A. (2014). The politics of bounded procurement: Purists, brokers and the politics-procurement dichotomy. *Journal of Public Procurement.*, 14(1), 33.
- Rønning, M., (14.06.2018). Sjøppelkonkurs ga stopp for private. *Dagbladet*. Retrieved from: <https://www.dagbladet.no/nyheter/soppelkonkurs-ga-stopp-for-private/69898819>
- Saunders, M., Lewis, P., Thornhill, A. (2016). *Research Methods for Business Students*. Pearson Education Limited (7<sup>th</sup> ed.).
- Schapper, P., Veiga Malta, J., & Gilbert, D. (2006). An analytical framework for the management and reform of public procurement. *Journal of Public Procurement.*, 6(1/2), 1-26.
- Shane, J., Gransberg, D., Molenaar, K., & Gladke, J. (2006). Legal Challenge to a Best-Value Procurement System. *Leadership and Management in Engineering.*, 6(1), 20-25
- Simões, P., Cruz, N. F., & Marques, R. C. (2012). The performance of private partners in the waste sector. *Journal of cleaner production*, 29, 214-221.
- Soukopová, J., Struk, M., & Hřebíček, J. (2017). Population age structure and the cost of municipal waste collection. A case study from the Czech Republic. *Journal of Environmental Management*, 203(Pt 2), 655-663.
- SSB (2018a). *Waste Accounts*. Retrieved from: <https://www.ssb.no/en/natur-og-miljo/statistikker/avfregno>
- SSB (2018b). *Waste from households*. Retrieved from: <https://www.ssb.no/en/natur-og-miljo/statistikker/avfkomm>
- SSB (2018c). *Less recycling – more waste to landfill*. Retrieved from: <https://www.ssb.no/en/natur-og-miljo/artikler-og-publikasjoner/less-recycling-more-waste-to-landfill>
- Strauss, A., & Corbin, J., (1990). *Basics of Qualitative Research; Grounded Theory Procedures and Techniques*. CA: *Sage Publication Inc*.



Sørensen, R. J. (2007). Does dispersed public ownership impair efficiency? The case of refuse collection in Norway. *Public Administration*, 85(4), 1045-1058.

Tate, W. L., Ellram, L. M., & Brown, S. W. (2009). Offshore outsourcing of services: A stakeholder perspective. *Journal of Service Research*, 12(1), 56-72.

Teddle, C., & Yu, F. (2007). Mixed Methods Sampling: A Typology with Examples. *Journal of Mixed Methods Research*, 1(1), 77-100.

doi:10.1177/2345678906292430

Thai, K. (2001). Public procurement re-examined. *Journal of Public Procurement*, 1(1), 9.

Triantis, G. G. (2012). Improving contract quality: modularity, technology, and innovation in contract design. *Stan. JL Bus. & Fin.*, 18, 177.

Tømmerås, O., (17.11.2015). Nykommer dunderer inn i avfallsmarkedet. *Fri Fagbevegelse*. Retrieved from: <https://frifagbevegelse.no/nyheter/nykommer-dunderer-inn-i-avfallsmarkedet-6.158.312833.49d8ece978>

Tømmerås, O., (28.03.2017). Norske kommuner presser prisen til bunn som før. *Fagbladet*. Retrieved from: <https://fagbladet.no/nyheter/norske-kommuner-presser-prisen-til-bunn-som-for-6.91.456202.967de2168b>

Uyarra, E., & Flanagan, K. (2010). Understanding the Innovation Impacts of Public Procurement. *European Planning Studies*, 18(1), 123-143.

Van Duren, J., & Dorée, A. (2008). An evaluation of performance information procurement system (PIPS). *Journal of Public Procurement*, 10(2), 187-210.

Van Weele, A. J., (2014). *Purchasing and supply chain management* (6ed.): Cengage Learning.

VESAR “Den magiske fabrikken”. (2018). Retrieved from: <http://kampanje.vesar.no/den-magiske-fabrikken/>

Ward, G. (2008). *The Project Manager's Guide to Purchasing: Contracting for Goods and Services*. Gower Publishing, Ltd..

- Wen, Q, Qiang, M., & Gloor, P. (2018). Speeding up decision-making in project environment: The effects of decision makers' collaboration network dynamics. *International Journal of Project Management* 36(5), 819-831.
- Westnes, P., & Gjelsvik, M. (2010). The linkages of firms, universities and research institutions in innovation processes: a conceptual framework. In *Energy and Innovation: Structural Change and Policy Implications*. Purdue University Press West Lafayette (Indiana).
- Wicks, P., & Reason, P. (2009). Initiating action research. *Action Research : AR*, 7(3), 243-262.
- Williamson, O. (1999). Public and private bureaucracies: A transaction cost economics perspectives. *The Journal of Law, Economics & Organization*, 15(1), 306-342.
- Witjes, S., & Lozano, R. (2016). Towards a more Circular Economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resources, Conservation, and Recycling*, 112, 37-44.
- Zurbrugg, C., Gfrerer, M., Ashadi, H., Brenner, W., & Küper, D. (2012). Determinants of sustainability in solid waste management—The Gianyar Waste Recovery Project in Indonesia. *Waste management*, 32(11), 2126-2133.

# Attachments

## Attachment 1: Overview, municipalities suffering from the RenoNorden bankruptcy

*Appendix 1: Overview. Norwegian municipalities suffering from the bankruptcy of RenoNorden.*

**Nordland:** Rana, Hemnes, Nesna, Lurøy, Rødøy, Træna.  
**Sør-Trøndelag:** Åfjord, Bjugn, Rissa, Ørland.  
**Møre og Romsdal:** Giske, Haram, Norddal, Sandøy, Skodje, Stordal, Stranda, Sula, Sykkylven, Vestnes, Ørskog, Ålesund.  
**Sogn og Fjordane:** Askvoll, Fjaler, Førde, Gauler, Hyllestad, Jølster, Naustdal, Aurland, Balestrand, Høyanger, Leikanger, Luster, Lærdal, Sogndal, Vik, Gulen, Solund, Bremanger, Gløppen, Hornindal, Selje, Stryn, Vågsøy.  
**Hordaland:** Askøy, Fusa, Kvam, Osterøy, Samnanger, Sund, Vaksdal, Etne, Austrheim, Fedje, Lindås, Masfjorden, Meland, Modalen, Radøy.  
**Rogaland:** Karmøy, Finnøy, Forsand, Hjelmeland, Kvitsøy, Rennesøy, Strand, Suldal, Haugesund, Bokn, Tysvær, Vindafjord, Hå, Klepp, Stavanger.  
**Vest-Agder:** Kristiansand, Songdalen, Søgne, Vennesla, Farsund, Lyngdal, Lindesnes, Mandal, Marnardal.  
**Aust-Agder:** Arendal, Froland, Grimstad, Bygland, Bykle, Valle, Evje og Hornes, Iveland, Lillesand, Birkenes.  
**Akershus:** Fet, Gjerdrum, Sørum, Bærum.  
**Oppland:** Gjøvik, Nordre Land, Søndre Land, Østre Toten, Gran, Lunner, Jevnaker.  
**Hedmark:** Åsnes, Grue, Våler, Hamar, Løten, Ringsaker, Stange.  
**Buskerud:** Kongsberg, Hole, Ringerike, Drammen, Hurum, Lier, Røyken, Modum, Nedre Eiker, Øvre Eiker.  
**Vestfold:** Sandefjord, Svelvik.  
**Østfold:** Askim, Eidsberg, Hobøl, Marker, Skiptvedt, Spydeberg, Trøgstad, Halden, Eidsberg  
 Retrieved from: <https://e24.no/boers-og-finans/renonorden/disse-kommunene-rammes-av-soeppelkonkursen/24144467>

## Attachment 2: Waste Hierarchy

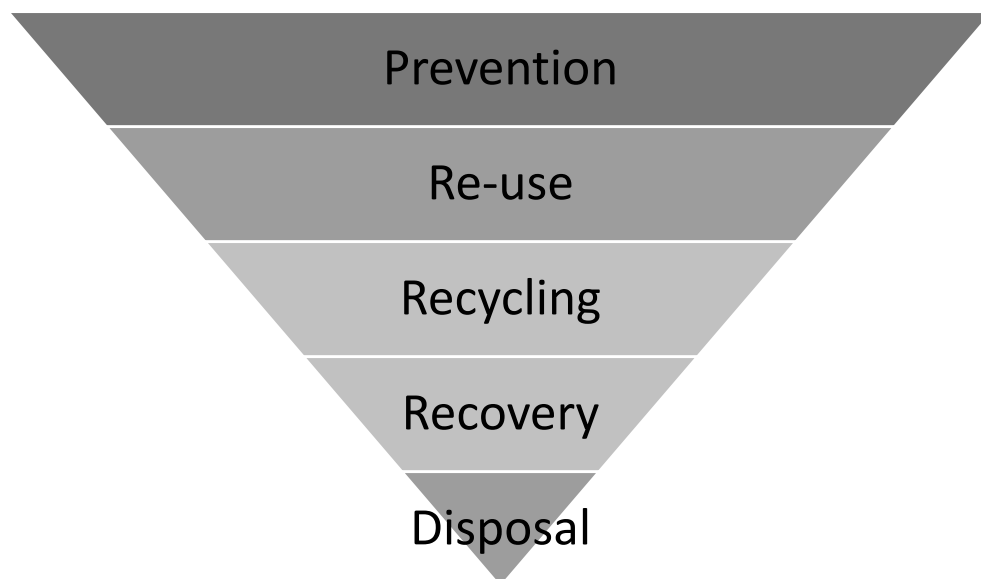


Figure 5 The Waste Hierarchy. Source: Adapted from The European Commission, Waste Framework Directive 2008/98/EC, 2008

## Attachment 3: Circular Economy

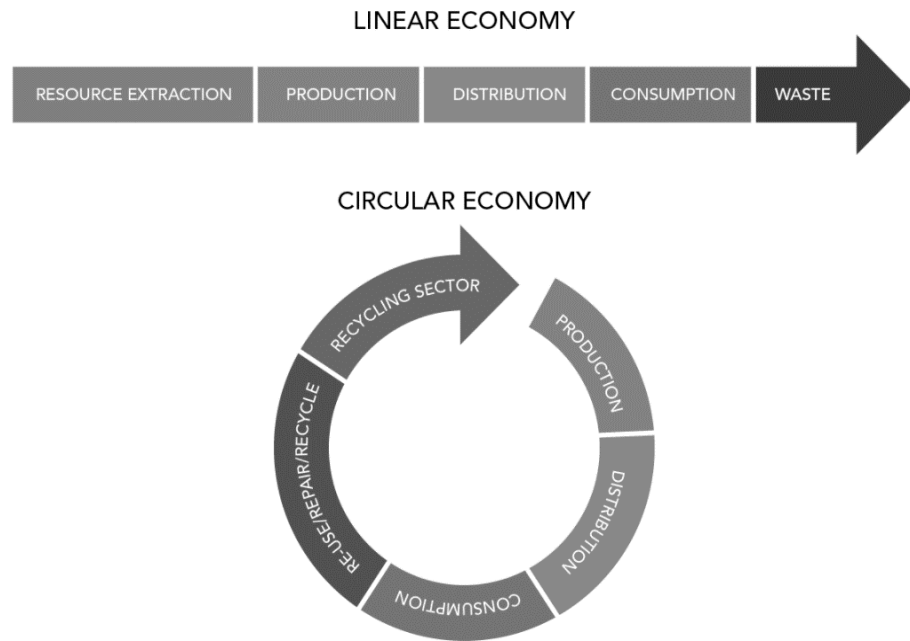


Figure 6 Circular Economy. Source: Legge & Klett (2018). Retrieved from: <https://www.weforum.org/agenda/2018/04/how-to-build-a-business-in-the-circular-economy/>

## Attachment 4: Total waste amounts and recycling rate

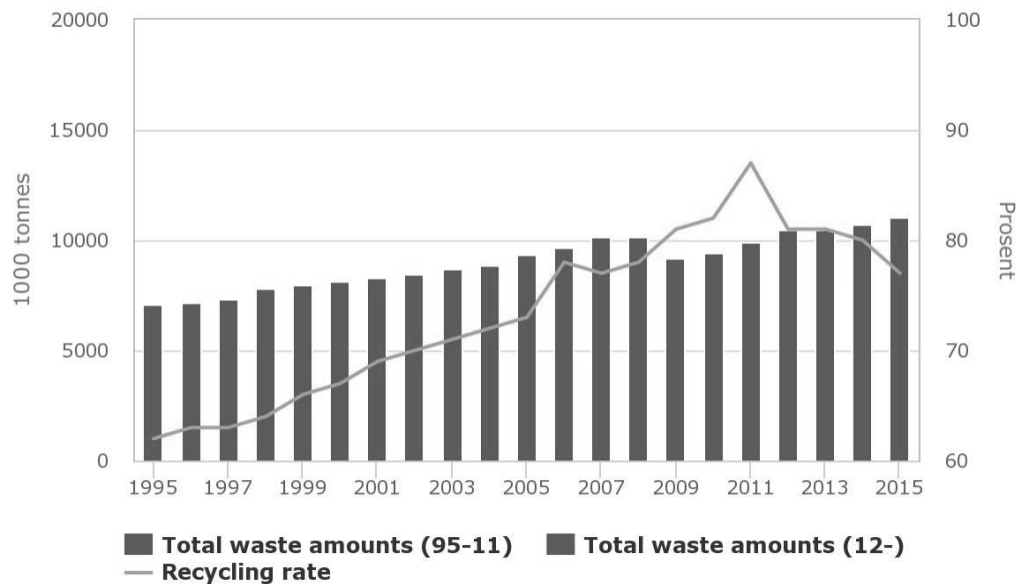


Figure 7 Total Waste Amounts and Recycling Rate. Source: SSB 2018c, cited in the Norwegian Environment Agency. Retrieved from: <http://www.environment.no/Topics/Waste/>

## Attachment 5: Trends in waste generation and GDP

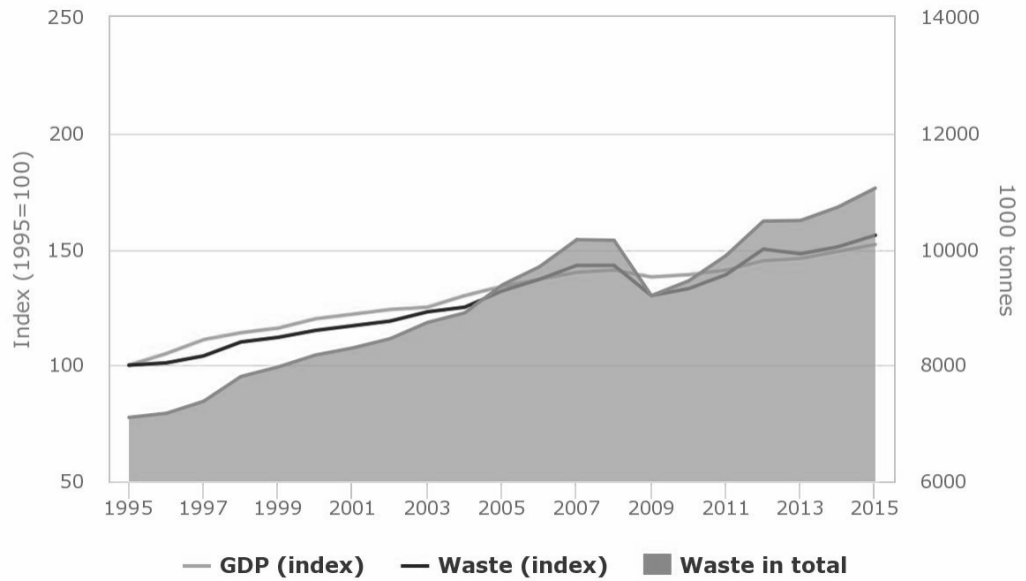
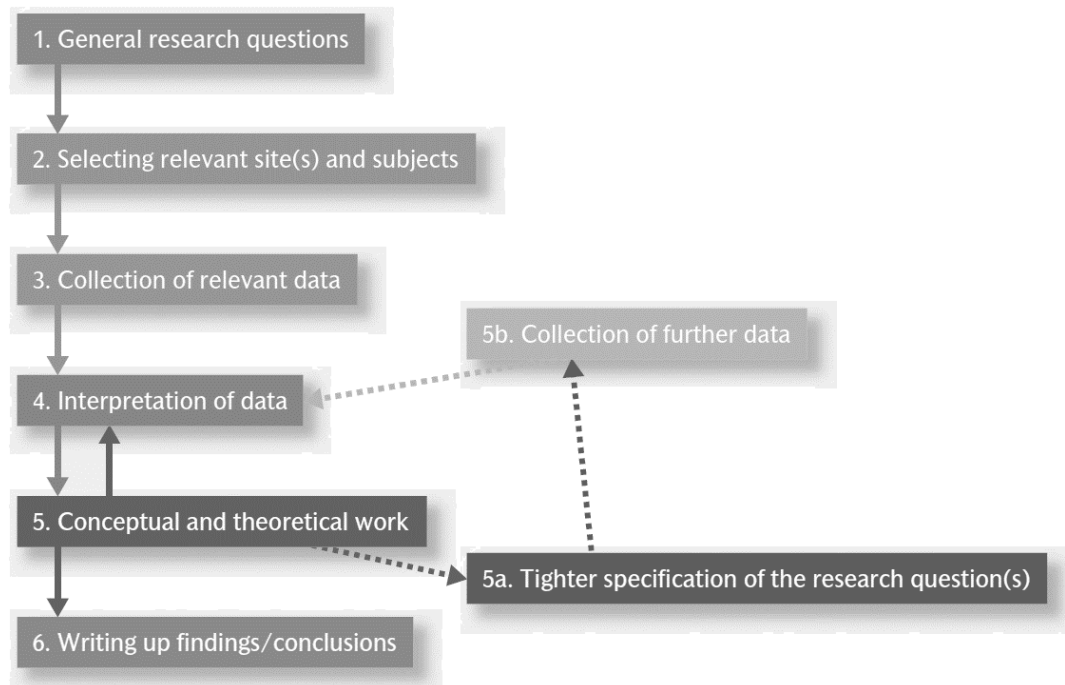


Figure 8 Waste and GDP. SSB, 2016. Sited in the Norwegian Environment Agency. Retrieved from: <http://www.environment.no/Topics/Waste/>

## Attachment 6: Steps in Qualitative Research



Qualitative Research, Bryman & Bell (2015) p. 390

## Attachement 7: Interview Guide

---

### Intervjuguide, Kommuner og IKS

\*Kommunal avfallshåndtering: transport og innsamling av husholdningsavfall

\*Spørsmål knyttet til nyligste kontraktsinngåelse og aspekter ved denne

\*Semi-strukturert intervju. Åpent for å stille oppfølgingsspørsmål

#### 1.0 Nøkkelinformasjon

Kommune:

Anskaffelse:

Kontraktsverdi:

Kontraksperiode:

Konkurrans (tidsrom publisering-leveringsfrist):

Hvor lenge har kommunen outsourcet transport/innsamling av husholdningsavfall?

Eier kommunen egne avfallsanlegg?

#### 2.0 Kravspesifikasjon/kvalifikasjonskrav og Tildelingskriterier

*Hvilke kravspesifikasjoner ble brukt? - sammenheng mellom tildelingskriterier og kravspekk?*

Hvilke tildelingskriterier ble brukt?

Hvordan ble tildelingskriteriene vektlagt?

Hvordan defineres de ulike tildelingskriteriene som ble benyttet?

Hvilken skala ble benyttet for å gi poeng til leverandørene for ovennevnte tildelingskriterier?

Ble det brukt spesialkompetanse (intern/ekstern) i utformingen av tildelingskriteriene?

Ble det brukt spesialkompetanse i poengsettingen av leverandørene?

Ved ekstern/innleid kompetanse; hva sitter kommunen igjen med av kompetanse etter kontraktsinngåelsen?

Hvordan oppnå en balanse mellom spesifikasjoner og sunn konkurranse?

#### 3.0 Leverandørrelasjon

Hvordan føler dere at tildelingskriteriene har påvirket/påvirker forholdet med renovatørene?

Foreligger det noe fokus på leverandørutvikling innen kommunen? Hvordan?  
Hvordan følger dere opp leverandøren i kontraktperioden?  
Hvilke kontraktskrav er benyttet? (kontraktsoppfølging)  
Hvor ofte foreligger det direkte kontakt med renovatøren?  
Hvor ofte har dere ansikt-til-ansikt kommunikasjon med ansvarlige for renovasjonstjenesten?  
Benytter dere noen KPI'er i oppfølgingen av kontrakten?  
Hvem har ansvar for og måler KPI'er?

## 4.0 Innovative kontrakter

I hvilken grad tilrettelegger dere for at renovatørene kan finne egne løsninger på avfallsinnsamlingen? På hvilken måte påvirker dette fordelingen av ansvar og risiko?  
Når ble renovatører involvert i operasjonelle valg/beslutningstaking?  
Hvordan tilrettelegger kommunen for samarbeid og innspill fra leverandørene? Hvor fleksible er kontraktene?

Har renovatørene dere har per dags dato funnet noen innovative løsninger på avfallsinnsamlingen utenfor det som er fastsatt i kontrakt?  
Foreligger det noen insentiv- eller sanksjonsordninger i dagens kontrakt?  
Hvordan kan tildelingskriterier utformes for å fremme innovative løsninger blant leverandørene?  
Hvem av partene (kommune vs renovatør) burde ta på seg merkostnaden for nye og innovative løsninger?  
Hvilke tiltak eller investeringer har gjort fra deres side for å fremme innovative løsninger?

## 5.0 Informasjonsdeling

### 5.1 Informasjonsdeling mellom kommuner

Forekommer det informasjonsdeling mellom dere og andre kommuner i anskaffelsesprosessen generelt?  
Er det noen kunnskapsdeling mellom kommunene når det gjelder utsetting av avfallsinnsamling og renovasjonstjenester?  
Forelå det noen kommunikasjon med andre kommuner, hva gjeldende kunnskap- og informasjonsdeling som videre ble benyttet i forarbeidet med kontrakten?

## 5.2 Informasjonsdeling mellom kommune og renovatør

Hvordan så informasjonsdelingen ut mellom dere og renovatøren i anskaffelsesprosessen?

Forelå det noe tilbakeholdelse av informasjon fra renovatøren ved kontraktsinngåelse?

I hvilken grad brukes markedsdialog i forkant av anbudsrunde?

Hvordan kan kommuner benytte skjønn i vurderingen av tilbud uten å bli for subjektive?

Har dere tilgang på data fra renovatørens flåtestyringssystemer? (ref KPI)

Ble slik data benyttet i beregningen av transportkostnader knyttet til forrige kontrakt?

Kunne dataen ha blitt brukt til beregning av prising for transporttjenesten ved neste kontrakt?

Hvordan prisformat benyttes i kontrakten?

## 6.0 Risikofordeling

Foreligger det noen spesifikasjoner som omhandler risiko i kontrakten?

På hvilken måte kommunen vurderer risiko under kontraktsperioden?

Hvor stor beslutningsmyndighet har blitt tildelt renovatøren i kontrakten?

I hvilken grad vektlegges kommunen og renovatørens felles mål og visjoner i utvelgingsprosessen?

Foreligger det stor tillit til renovatøren i forhold til kommunens langsiktige målsetting?

## 7.0 Avslutning

Hvordan synes dere anskaffelsesprosessen innen offentlig- privat sektor kan effektiviseres?

Hva gjør deres kommune for å hindre at krisen i Oslo og Bærum skal skje hos dere også?

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# Attachment 8: Consent Form

## Forespørsel om deltakelse i forskningsprosjektet

### ”Sammenhengen mellom tildelingskriterier og leverandørrelasjon”

#### Bakgrunn og formål

Masteroppgave, Handelshøyskolen BI, Oslo.

Masteroppgaven er et selvstendig studium uten ekstern oppdragsgiver.

Formål med oppgaven er å kartlegge bruken av kravspesifikasjon og tildelingskriterier ved offentlig anskaffelse av logistikk- og transporttjenester. Spesielt bruken av ikke-økonomiske tildelingskriterier og hvordan bruken av disse påvirker leverandørrelasjonen vil stå i fokus. Oppgaven er avgrenset til avfallsbransjen og kommunal innsamling av husholdningsavfall.

I grove trekk er målet med oppgaven å

- Sammenligne *vektlegging* av ikke-økonomiske tildelingskriterier/fordeling i oppdragsbeskrivelse
- Sammenligne *definisjonen* av tildelingskriteriene blant kommunene
- Se på hvordan kommunen vektla bruken av tildelingskriterier i *valg av leverandør*
- Se på *utfallet* av inngått kontrakt - Hvordan påvirker kriteriene *samarbeidet og relasjonen* med leverandøren?
- *Fra fokus på pris → større vekt på ikke-økonomiske tildelingskriterier → innovative anskaffelser og endret leverandørrelasjon*

Intervjuobjekter utgjør kommuner og IKS som benytter åpen anbuds konkurranse i konkurranseutsetting av husholdningsavfall. Intervjuobjekter som vektlegger og definerer tildelingskriterier i ulik grad vil spesielt være av interesse for å få et dypere innblikk og sammenligningsgrunnlag i hvordan leverandørrelasjonen påvirkes av dette.

#### Hva innebærer deltakelse i studien?

Deltakelse i studien innebærer et engangsintervju med varighet i ca. 1 time. Intervjuet er semi-strukturert, noe som betyr at intervjuer kan stille oppfølgingsspørsmål på relevante områder. Opplysninger som innhentes vil omhandle kommunens bruk av tildelingskriterier, leverandørrelasjon som foreligger med renovator per dags dato, risikofordeling og innovative anskaffelser. Lydopptak benyttes under intervju for å tilrettelegge for senere transkribering. Lydopptak blir deretter slettet. Noen notater vil også bli tatt under intervjuet.

#### Hva skjer med informasjonen om deg?

Alle personopplysninger vil bli behandlet konfidensielt. Kun prosjektgruppen, bestående av Linn Bergström og Anna Julie Brattlien Hopfer, vil ha tilgang til personopplysninger. Navn, stillingstittel o.l. vil ikke bli oppgitt i masteroppgaven, og vil bli unnlatt ved transkribering av lydopptak. Opptak lagres på mobil låst med passord, og vil bli slettet kort tid etter opptak. Deltakere personlig vil ikke bli kunne gjenkjent i publikasjon, men navn på kommune vil bli oppgitt. Prosjektet har offisiell leveringsfrist 03.09.18.

#### Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert. Dersom har spørsmål til studien, ta kontakt med Anna Julie Brattlien Hopfer (45767278) eller Linn Bergström (45223058). Veileder i prosjektet er Eirill Bø (46410460).

Studien er meldt til Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

## Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

-----  
(Signert av prosjektdeltaker, dato)

- Jeg samtykker at lydopptaker kan benyttes under intervju  
 Jeg samtykker at navn på kommune oppgis i masteroppgaven  
 Jeg samtykker at eventuell dokumentasjon utgitt til studenter kan brukes i masteroppgaven

## Attachment 9: Literature Search Matrix

<i>Parameters</i>	<i>Restrictions</i>	<i>Specifications</i>
<i>Language</i>	English	Norwegian, Swedish
<i>Methodology</i>	Qualitative, Quantitative	
<i>Subjects/Search term</i>	Public Procurement Public Private Procurement Public Procurement for Innovation Waste Management Project Management Agency Theory	Supplier selection criteria Weighting factors Contract Management Waste collection services Transport economy
<i>Business sector/Industry</i>	Private sector Logistics and transport Project-Based Industries	Waste Industry
<i>Literature type</i>	Academic Journals, Business Research, Academic reports, Financial reports, daily newspaper, books Databases	International Journal of Logistics Management, Journal of Public Procurement, International Journal of Project Management,
<i>Geographical Area</i>	Scandinavia, Worldwide	
<i>Publication period</i>	1950-2018 Classical frameworks	2000- 2018

## Attachement 10: Master Thesis Preliminary

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### *-Specifications and their effect on tender evaluation decisions and the future buyer-supplier relationship-*

*Master of Science (MSc) in Business*

*Major: Logistics, Operations and Supply Chain Management*

*Supervisor: Eirill Bø*

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## Executive Summary

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The master thesis aims to investigate the connection between contractual specifications and the future buyer- supplier relationship in a public private partnership. By analyzing the Norwegian municipalities and their tender evaluation process of municipal waste collection and transport companies, important aspects of the contractual phases and how it affects the future relationship is investigated. The researchers aim to cover aspects connected to the tender evaluation services; who gets the contract, what is the decision based upon from the buyer's perspective, and how is the specification affecting the total outcome of the agreement. The research question is; *How does municipalities use specifications in the evaluation processes of public logistics and transportation service providers, and how does the contract impact the format of the future contract relationships?*

By using a cross- sectional research design, the researchers are enabled to compare several situations characterized by similar characteristics through social surveys. Norwegian municipalities will serve as interview objectives, as they are operating as the buyer of the logistic/transportation services. Semi-structured interviews and questionnaire will work as primary data. Secondary data will consist of existing research on the field. Due to the nature of the research question, a qualitative method is used. A focus on criteria for establishing and assessing quality throughout the entire process is crucial for accurate findings.

The authors wish to highlight that this is a master thesis proposal, and that changes and adaptations will occur during the work towards a final master thesis.

# The Research Problem

---

## Introduction

Oslo, 2016: The bins are filled up with household waste, and tens of thousands of complains are received from unsatisfied inhabitants. The waste management company hired from the municipality is unable to fulfill their task due to lack of capacity. Overflowed trucks, illegal working hours and lack of payroll payments are some of the consequences facing the private renovator. After a short term of internal and external crisis, the municipality and private actor are breaking the contract. What started as cost savings of 82 million NOK caused by choosing the lowest contract price in the tender evaluation process, evolved to become a costly affair for the municipality (Johnsen & Matre, 2017).

Bærum, 2017: Just after the waste crisis in Oslo occur, the neighbor municipality Bærum enters into a contract characterized by several similarities. The initial price of the chosen renovator is millions below the second lowest bid. The municipality's goal was to achieve the lowest possible price, and the history gets repeated.

## Background

Waste collection and transport services has become a complex task during the recent years (Andersson & Norrman, 2002; Bel & Warner 2008). New technology, population growth, environmental concerns, and a generally higher level of municipal waste are factors that has increased the uniqueness of the services. The differentiation between the suggested operative solutions given by the waste collection and transport providers has increased the complexity. The changes in role caused by uncertainty and risks involved in outsourcing of such tasks, has affected the tender evaluation process, as well as the usage of specifications and requirements in the contracts provided by the municipalities.

According to the Norwegian law, the municipalities retains responsibility for a sustainable collection of household waste (jmf. Forurensningsloven (forurl.) av 01.10.1983 §30). The waste collection- and transportation service is in most cases outsourced to a private company within the Norwegian municipalities. Hence, the municipalities act as the public buyer of the services, while the private waste collection- and transportation service provider act as the supplier.

Even though the complexity has increased, the tender evaluation process is still somewhat not adopted to the recent contextual changes. Price is still regarded as the most important criteria for selection of logistic service providers, while the supplier's ability and capacity to fulfill the services is not emphasized in a satisfying level in the tender evaluation.

## Motivation

The motivation for our research is the increased importance of waste management and the lack of research and definition of the contractual phases in the municipalities' tender evaluation processes. The contractual phase is crucial for a successful project, and thereby a critical factor distinguishing between success and failure in public private procurement (Karlsen, 2017).

Price is often regarded as one of the most important criteria in tender evaluations (Assaf et al., 1998; Karlson, 2017). A trend we have seen in the Norwegian municipalities recently is that price is the main criteria for selection of transportation service providers. The collection and treatment of household waste and comparable waste from other sources is a complex task within a heavily regulated environment. As the focus on price is best suited for standardized tasks with a detailed description and specifications, the selection process used by the municipalities today may lead to operational inefficiency and high total costs (Karlsen, 2017).

The researchers aim to cover aspects connected to the tender evaluation services; *who* gets the contract, *what* is the decision based upon from the buyer's perspective, and *how* is the specification affecting the total outcome of the agreement. By highlighting the processes used today, and map where the pitfalls are, recommendations could be provided to increase the supplier selection efficiency and achieve optimal contracts for the parts involved.

## Research Question

Contracts, specifications, tender evaluations, and waste collection service providers are in the center of the study. As the research aims to map how the selection of the service provider is affected by specifications, and the effect of the future relationship between the actors, following research question is proposed:

*How does municipalities use specifications in the evaluation processes of public logistics and transportation service providers, and how does the contract impact the format of the future contract relationships?*

Several hypotheses have been defined to provide the researchers more concrete areas to investigate. The hypotheses are presented in the theoretical framework. The research question and hypothesis serve as drafts and will most likely be changed during the project. Data collection may provide other aspects that may be relevant for the final master thesis.

## Thesis Contributions

The aim of the master thesis is to provide recommendations to increase the operational efficiency by achieving optimal contracts for the parts involved in private public purchasing/municipal waste collection and transport contracts. The thesis is twofold. First, the relationship between specifications and the supplier selection is of great relevance. By mapping how the specifications are weighted and formulated today, researchers will be able to provide relevant insights in how the process is conducted today, and where the contractual pitfalls are located. Second, the relationship between the buyer and supplier in such situations will be of great interest to be able to see the entire picture, as well as how specifications and the supplier selection process form the outcome and total costs involved in the decision. The results found may offer helpful guidance for future contract signing between municipalities and transportation- and logistic service providers. Guidelines could also be adapted to similar cases where a public company outsource a logistic service to a private company by using tender evaluations.

## Literature Review

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Since the thesis aims to analyze and investigate the buyer- supplier relationship in municipal waste collection by using a qualitative approach, the suggested theoretical framework is based upon existing literature and theory on the field. The theoretical background includes literature and research within public procurement, public private partnerships, project management, principal agent theory, and contract management. Previous literature regarding waste collection has further been studied to discover gaps and areas with lack of literature. A literature search matrix was conducted to get a concrete and structured overview of data collection and research areas (appendix 1).

### Public Private Procurement

To explain the relationship between a private logistic service provider and a public owner, literature regarding public private procurement is of high relevance. The transformation within public private procurement has developed rapidly in the last decades. Initially public procurement focused on the purchasing process and the different steps involved for purchasing goods, with respect to legal rules (Telgen & Thai, 2008). The transformation of public procurement in the last 50-60 years has developed because of change in demand. Abramson and Harris (2003) describes the change in demand moving from purchasing goods towards purchasing services as a dominant transformation driver. This is mainly caused by the change of the governmental role, which has evolved from being a *provider of goods* to become the *manager of the providers of goods and services*.

Another reason for the transformation towards more privatization is the rising pressure and expectations of cost efficiency within public services. Jacobsen et al. (2013) discusses in a more specific matter how waste collection can be provided and distinguish between three ways; (1) pure private service, (2) pure public service, and (3) a hybrid strategy. Public private partnerships (PPP) is a hybrid strategy, characterized by a private service provider which is regulated by the public sector (Bel & Warner, 2008; Jacobsen et al. 2013).

There are several factors differentiating public and private procurement processes. Since a lot of public services are heavily regulated, the procurement processes are



time consuming and costly (Brynhildsvoll, 2011). Documentation are required in all the process steps, and the evaluation and decision regarding supplier are carefully completed. Due to the heavy regulations and bureaucratic structure of the public sector, the process needs to be precisely conducted.

Several researchers emphasize how the costs are affected by the choice of public or private suppliers. Many studies compare and analyze potential differences in costs related to private and public ownership. Studies shows that reduced costs can be achieved through private service compared to public service (Jacobsen et al., 2013; Plata-Díaz et al., 2014; Bel & Warner 2008). Bel & Warner (2008) present an empirical study where they compare public and private production of services with respect to cost savings over several years. Their results show that simple privatization systematically does not lead to least cost service delivery, but that privatization under regulation improves quality and have positive effects on operational efficiency. Dijkgraaf and Graadus (2003) takes on the discussion regarding potential cost savings related to contracting out services. further the authors address the local institutional structure and the impact of additional or liberated taxes when differentiating between public and private production.

## Purchasing of Third Party Logistics

The purchasing process for logistic services can be divided in two broad areas differentiating between basic and advanced logistics services (Andersson & Norrman, 2002). Further the authors address the transformation of future business trends and the importance of the purchasing process of logistic services to adapt to this with respect to competence, resources, and new routines, hence not make purchase decisions based on price of service as a single criterion. The development and the more common use of third party logistics opens for higher complexity regarding the purchasing process (Andersson & Norrman, 2002). Another important impact factor for the public owners to contracting out is the potential achievement of reduced service costs (Plata-Díaz et al. 2014).

Outsourcing of non-core activities and privatization of public services has grown and become more common (van Weele, 2014). Outsourcing tasks like waste collection and transportation services enables higher focus and resources on core activities and improves the flexibility in the organization.

Selecting the right suppliers in the procurement process is crucial. Chen (2000) mentions pre-qualification, evaluation, and contract negotiations as key factors to successfully select the right suppliers.

The total cost approach will further be of relevance for the research. This approach focuses on the total cost of the purchased service, in contrast to the initial price that used to be considered as the most important criteria for selecting logistic service providers. The approach highlights important aspects and considerations the municipalities should include in the supplier selection decisions (Bhutta & Huk, 2002). Ellram (1995) shows that the selection of suppliers is partly determined by its total costs. However, the calculations and approach of total costs is complex and contains a lot of uncertainty and should thereby include several important principles in the calculations.

Risks and disadvantages related to third party logistics is loss of control, loss of competitive knowledge, and conflicting objectives between parties (Chopra & Meindl, 2016). The conflicts could make it hard to achieve an increased value creation in society by ensuring the most efficient use of resources. The quality of a public private procurement should thereby not be measured by the economic results itself, but in what manner the whole process was successful (Brynhildsvoll, 2011). To reduce the risks and disadvantages, criteria such as service quality, stability, innovation, and citizen engagement should be included in addition to the initial price in the supplier selection tenders (Jacobsen et al., 2013).

## Principal Agent Theory

There is a lot of uncertainty and risk connected to the transaction of a waste collection services. The contract regulates the business relationship between the parties and is directly affected by the specifications (Kolltveit et al., 2009). The municipality operates as the principal, while the waste collection and transport company operate as the agent. Due to different objectives and interests between the parts, and the potential for asymmetry is high. This phenomenon is described as the agency problem (Eisenhardt, 1989).

Bel and Fageda (2006) discusses the transaction costs developing from incomplete contracts between buyer and supplier. The authors point out the information asymmetry occurring when the agent has greater knowledge about the specific

task than the public owner. This in turn leads to that future eventualities are difficult to predict accurately, which lead to rent-seeking behavior. Unforeseen events, risks and administrative costs, these are factors pointed out as main problematics when it comes to public delivery of local services (Brown and Potoski, 2003; Bel and Fageda 2006).

An opposite discussion serves that transaction costs can be reduced and limited through complete contracts, using more detailed specifications and supplementary logistics services (Hoek, 2000). In the light of complete contracts and transaction costs, privatization is also analyzed as a potential service delivery to reduce costs (Bell & Warner, 2008). Thus, on the contrast, transaction costs through public ownership in that setting is often costs related to bureaucracy (Williamsson, 1999).

Another aspect that is central in the decision making about contracting out and privatization of services, is the factors involved to determine the degree of transaction costs (Bel & Fageda, 2007). The authors states that privatization and the degree of success depends upon the level of transaction costs, high transaction costs lower the benefits of service privatization.

## Project Management

Theory from project management will be of relevance for the master thesis due to the many similarities between the characteristics of a project and the nature of outsourced waste collection and transportation services. Karlsen (2015) describes a project by following five characteristics: (1) The contractual period has a specific time frame, defined in the contract, (2) limited resource access caused by a financial budget (3) the task is unique, (4) cross- sectoral work, and (5) a specific goal. Due to the fact that waste collection and transportation services has evolved to be a highly complex task the last decade, the uniqueness of the transportation service has become of greater relevance than previously.

The process steps regarding the contractual phase of the project implementation will mainly be of interest for the research due to the focus on the relationship between specifications and the waste collection and transport service provider. The common cause for project failure is failure to define what one wants (Ward,

2008). Thus, it is crucial that the contract is well formulated to give the supplier insight in the demanded results.

The initial steps of a project are crucial for the implementation and result (Karlsen, 2017). The contract strategy and specifications have several direct and indirect effects on the buyer-supplier relationship, and the total costs involved. Ward (2008) defines a contract strategy as *the contracting means to achieving the project objective* (Ward, 2008, p25).

There are several factors that influence the outcome of a project. A well-structured supplier selection process and a procurement strategy clearly defined towards the specific project is critical element that many leads to project success or failure (Chen, 2000). One evaluation criterion when selecting supplier is to choose the lowest price (Assaf et al., 1998). When the tender is clearly specified, the price often serves as the only criteria (Karlsen, 2017). On the other side, researchers have found evidence of brutal consequences when the selection of logistic service provider is based on the lowest bid (Hartman, 2000). Situations like lack of capacity and competence, financial problems, bankruptcy and costly re-evaluation of the contract may cause higher total costs, as discussed in previous section.

## Contract Management

The contractual design can be divided into the pre-contractual phase, the contracting phase, the contract administration phase (Ruparathna & Hewage, 2015) (figure 2). Contract management can be defined as “deciding on the right type of contract for the product, service or project to be delivered” (van Weele, 2014; Bolton & Faure-Grimaud, 2010). Specifications

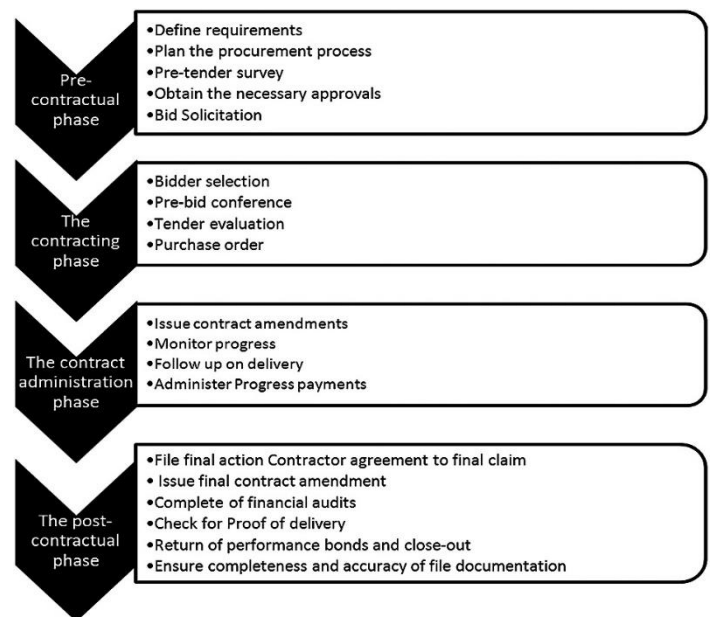


Figure 2: The contractual phase

and certain requirements in an optimal formulated contract will be further discussed in the section below.

With regards to the asymmetry of information that can occur between the parties involved in a contract, also taken into account the received transaction between the parties based on their individual rationality and perspectives. their own individual perspectives and rationality (van Weele, 2014). This situation is further known as bounded rationality, which explains the contractual parties' information and knowledge limitations that prevents them from specifying all actions in the contract. This points out the complexity of contracts, though some aspects of complexity can be prevented from added clauses, regarding the potential of future changes of the contract and take height for unforeseen events.

The associated complexity of contracts often makes itself known through contract failures, often resulted by contract pitfalls developing from gaps in the specifications, due to limited knowledge or resources from the managers (people responsible for the contract). Suggestions of increased investments in contracting activities and contract management capacity within municipalities, is presented as a solution preventing contract failure (Brown & Potoski, 2003). Further the authors states that contracts are not a "one-size-fits-all proposition", but instead it need to be suited and developed for the specific cause, and that the outcome of the contract depends on the management of the complete contract process.

## Specifications

Specifications are defined as the specific details of the items or service requested (Prince & Harrison, 2014). Technical specifications (specs) can be divided into four different aspects; technical evaluation, project execution plan, commercial evaluation, and risk (Chen, 2000; Karlsen, 2017). The specifications work as a description of the features of the solutions, as well as technical definitions and details about the contractual requirements.

Ward (2008) separates two aspects in the definition process; the scope of the service to be supplied, and the specifications, defined as details of the features of the service. The scope describes the boundaries of the macro level, whereas the specifications describe the micro-level details or performance aspects of the service being purchased.

Karlsen (2017) defines technical specifications as a detailed and precise description of what to deliver. By drawing up technical specifications, the client/principal takes on responsibility for the purchased solutions. De Vries et al., (2014) states that contractual specifications communicate distrust by setting the boundaries and

preconditions of the relationship. The process from a need arises to the specification is formulated are shown in figure 1 (Karlson, 2017, p. 80).

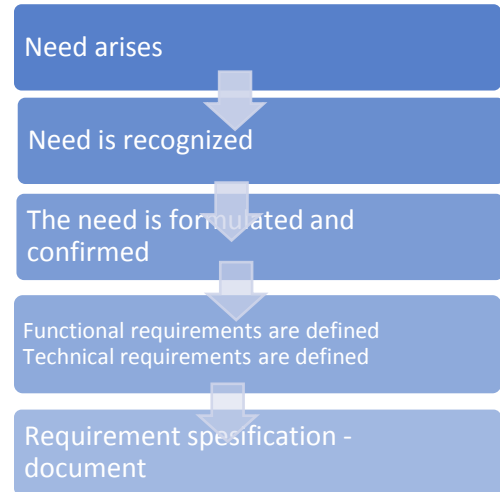


Figure 9 Definition of Specifications

A research conducted by de Vries, van Weele and van der Valk (2014) showed a clear connection between outsourcing relationships with clearly specified boundaries (specs) and the level of knowledge sharing. The relationship of contract specifications and knowledge sharing is positive, something that will affect the hypothesis proposed in the theoretical framework suggested in later sections. Other researchers on the field has stated that unclear specifications may prevent optimal knowledge transfer between the buyer and supplier (Zhao & Lavin, 2012).

The length of the specifications is another factor that needs to be evaluated (Ward, 2008). If the definition of requirement is too short, they might be incomplete result in an unsatisfactory tender. If too many specifications are included, the tender could be put off due to the work involved.

## Previous Research

Relevant articles related to public private procurement and the process of contracting out logistic (transportation) services are mapped to get an overview and provide relevant insight. Waste management has especially been weighed in the process to find gaps in the research and useful information that could be adapted to our research.

Jacobsen et al., (2013) presents a study comparing costs within public and private collection of household waste. The multiple case study compares twelve municipalities in the Flemish region of Belgium. As a result of research, the authors point out that an indication can be made towards privatization of collection service generates a lower cost compared to public services. However, the stated reason for the relatively unfinished conclusion of the research, are derived from lack in data collection and several assumptions, which further affected the cost calculations.

Teixeira et al., (2014) presents their development of a methodological tool that later has been conducted through a case study made in Porto, Portugal. The tool takes on an operational, environmental and economic assessment solid waste collection within municipalities. To evaluate independent impact of operational and economic efficiency and performance of practice within municipalities and their solid waste collection, key performance indicators are used.

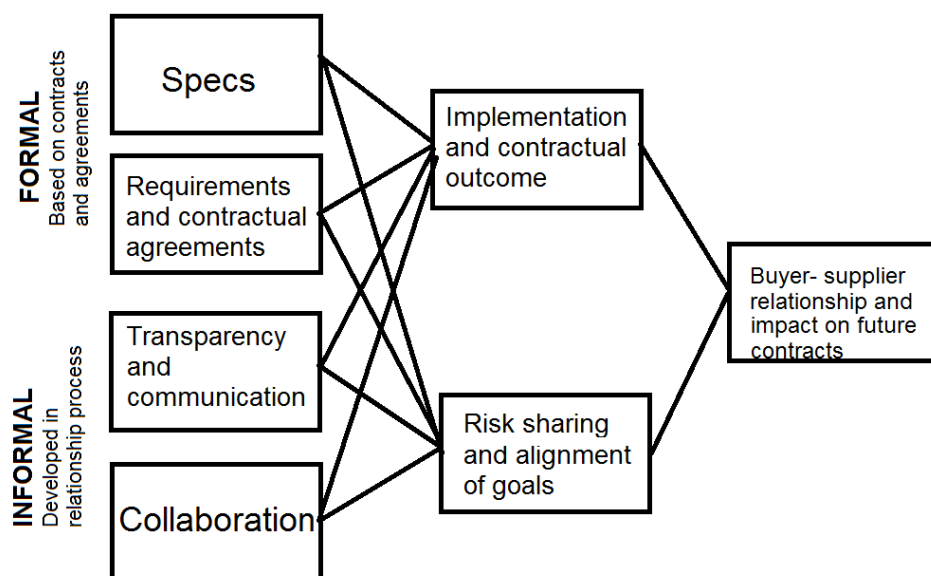
In the evaluation of contracts and the determination of costs and further specifications, important impact factors need to be mapped initially. Operational activities and other relevant impact factors must be included in the calculations. There is established a gap in knowledge within the development of solid waste management system due to no clear and stated definition of waste collection systems. Rodrigues et al., (2016) presents a classification of waste collection systems through an established taxonomy. The researchers conduct a case study made in Lisbon, Portugal, applying this taxonomy. The result of the established taxonomy makes it possible to generate relevant information to managers selecting the right equipment for their waste collection system.

Ohlsson (2003) presents a study made in Sweden consisting of 170 firms within 115 municipalities, comparing costs and production performance in public and private ownerships. The author criticizes earlier studies on public private ownership and the statement about achieving reduced costs of privatization of services. The author criticizes earlier cost functions using only one dummy variable to capture the differences between public and private ownership which will give incorrect results. Further, the author points out that few studies address the actual determination factors included in the choice of public or private production.

## Theoretical Framework

Based on previous literature review, several hypotheses were formulated to achieve a structured data collection phase. The hypothesis simplifies the formulation of a theoretical framework and provides the researcher some concrete areas to investigate. The hypothesis suggested will somewhat be adapted and aligned to relevant findings during the data collection phase but serves as clear guidelines for initial investigation.

The output of the framework will provide relevant results regarding the buyer-supplier relationship, covering both a financial (the total cost of the purchased service) and non-financial (the relationship between the parties involved and the impact future contracts) aspect. The following theoretical framework is proposed:





## Hypothesis

**H1:** Specs has a direct effect on the supplier selection decision, which affect the contractual outcome

**H2:** Carefully selected specs have a positive effect on the risk sharing between the parties involved in a public private procurement.

**H3:** Increased degree of transparency has a positively effect on the implementation and contractual outcome.

**H4:** Informal transparency and communication provide a clear risk allocation between the parties involved, as well as a positive alignment of goals.

**H5:** Early supplier involvement increase the level of collaboration, which affect the implementation and contractual outcome in a positive manner.

**H6:** Implementation of collaboration in an early stage improves the risk allocation and the degree of aligned goals.

**H7:** The implementation of the contract has a direct impact on the buyer-supplier relationship.

**H8:** Clear risk sharing will affect the total cost of ownership in a positive manner.

**H9:** Increased contract management capacity in the municipalities improves the formulation of contract

## Research Methodology

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The research methodology provides an overview of how data will be collected and analyzed, and how the structure of the thesis will be. This section deduces the research strategy and design, how the data will be collected, and lastly an analyze of the quality of future results.

## Research Strategy

A research strategy can be defined as “*a plan of how a researcher will go about answering his or her research question*” (Saunders et al., 2012, p.173). The strategy involves which method data is collected, and how it is analyzed. Bryman & Bell (2015) distinguish between a qualitative and quantitative research strategy. The quantitative strategy mainly examines relationships between variables measured numerically, whereas the qualitative method uses observation and interviews as a source for data collection and analyses of business relationships.

A qualitative method is identified as the most appropriate strategy for this thesis due to the nature of the research question. The process described by Bryman & Bell (2015) will be adopted in order to conduct the research (appendix 2 p 395). To be able to generate in what manner the municipalities emphasize contractual requirements, a deeper understanding of the contractual phase is essential. Thus, interviews will be conducted to map the direct and indirect effects of contractual requirements and the future relationship between the buyer and the supplier.

## Research Design

The research design provides a framework for collection and analysis of data used to answer the research question. Bryman & Bell (2015) distinguishes between five prominent research designs: (1) experimental design, (2) cross-sectional design, (3) longitudinal design, (4) case study design, and (5) comparative design.

Since the thesis aims to investigate contractual specifications and consequences by interviewing several Norwegian municipalities about similar events, a cross-sectional design is applied. Data will be collected from more than one case, and more or less simultaneously due to the time constraints of the research. A cross-sectional design enables us to investigate and find similarities and dissimilarities between the Norwegian municipalities and provides an insight in the managers way to use specifications when evaluating and selecting suppliers.

## Data Collection and Analysis

Primary data will be collected through interviews and questionnaires with the buyers of waste collection and transportation services. Experienced managers in the Norwegian municipalities will serve as interview objects, as they operate as buyers of public transportation services. Their knowledge will provide insights regarding the development of specifications, and the tender evaluation decisions from the buyer's perspective.

Semi-structured interviews will serve as a source to develop insights into the buyers' evaluation process. Semi-structured interviews are characterized by a series of questions that are in the general form of an interview schedule, but with a less strict frame than structured interviews. This gives the interviewer the possibility to respond and ask questions outside of the interview guide (Bryman &

Bell, 2015). Since a semi-structured interview takes use of a preformulated interview guide, answers collected are comparable, and at the same time provide the interviewer a possibility to ask further questions to get a deeper insight.

The interviews will be performed face-to-face with nearby municipalities. Open-ended questions should be structured to give the interviewer to answer open and unbiased about the subject (Bryman & Bell, 2015). Further, a tape-recorder will be used to simplify transcribing and ensure that data are captured as accurately as possible. Skype- interviews with municipalities located further away could also be of relevance.

Data will also be collected through relevant questionnaires. The nature of questionnaires will enable a basic understanding of the development and weighting of contractual specifications, with a high degree of comparability between the municipalities. Questionnaires will be distributed per e-mail to relevant municipalities. A large number of respondents will provide a higher degree of quality of the research. Clustered analysis could be relevant to find similarities and dissimilarities between municipalities characterized by similar geographical locations, population size and operational performance.

## Quality of Research

Bryman and Bell (2015) distinguish between several criteria to establish and assessing the quality of a qualitative research. Due to the subjective nature of the data collection, trustworthiness and authenticity are proposed as alternative criteria for validity and reliability. Trustworthiness is made up of four criteria, based upon the criteria for quantitative research, while authenticity concerns the wider political impact of research.

*Credibility* is adopted from what is known as validity in quantitative research and is based on what manner the findings are true and accurate. By using several sources of data in the study, the credibility of the research increases. As the master thesis aims to use both semi-structured interviews and questionnaires for data collection, the findings should be credible. Since the data is collected from several municipalities by more than one researcher, the threat of personal/subjective opinions affecting the findings is avoided.

*Transferability* measures to what extent the results are applicable to other contexts and is adopted from external validity. As the master thesis goes in-depth of the relationship between contract, specifications, and the contractual parts in public waste collection services, the transferability to similar situations are high. The findings could be of great interest for public private procurement, especially where municipalities and other public companies are outsourcing a logistic service to a private company using tender evaluations.

*Dependability* corresponds to reliability and is defined as the degree of neutrality in the research findings. The authors aim to use a neutral attitude when conducting interviews and analyze data. The use of tape-recorder when the semi-structured interviews is conducted increases the dependability due to a more correct transcription that is not affected by the authors perception.

*Confirmability* is based upon objectivity, and measures to what extent the study could be repeated by other researchers and give consistent findings. Since the dataset only contains interviews with a relatively few municipalities characterized by several similarities, it is reasonable to think that some population aspects could be missing. In that case, the results could be affected by selection bias, which gives a low confirmability. On the other side, it is reasonable to think that the municipalities have several similarities with the rest of the population regarding the contractual phases and the supplier selection decisions. Hence, the results should be representative for the population and replicable. Further, the usage of questionnaires increases the quality of findings.

*Authenticity* consists of several subgroups described by Bryman and Bell (2015). *Fairness* enlightens the importance of a well and fairly distributed collection of data. As our research is going to include several interview objectives, the criterion of fairness is fulfilled. Further, authenticity enlightens if the researchers have conducted the data collection and analyzes using an honest approach targeted to find the true results without emphasizing a desired result. As the researchers are using a neutral attitude in the project, the criterion is fulfilled.

# Project Plan

In order to achieve a good structure and complete overview of our thesis research project, we have created a Gantt chart to continuously schedule the working process. The Gantt chart clarify our progress in terms of settled milestones, deadlines, and other relevant details during our project (Karlsen, 2017).

The specific dates shown in the chart will work as a guide and help us finish our project, master thesis on time. First phase will consist of submitting the preliminary thesis proposal, develop questions and material for interviews, and prepare for the thesis presentation. Second phase will include research, writing and interviews with relevant objectives. The third phase will include analysis of collected data, finishing of writing, and responding to feedback from supervisor.

The collection of primary data, such as interviews and conduct a compilation of the questionnaires, handed out and responded by managers within several municipalities, requires some processing time. We will take height for some unforeseen events and delays, especially regarding data collection, therefore are expected periods of slack accounted for in the project plan. Our goal is to be finished with the first draft of our thesis by the end of July 2018, where remaining time is accounted for reading, rewriting and respond to potential feedback from supervisor.

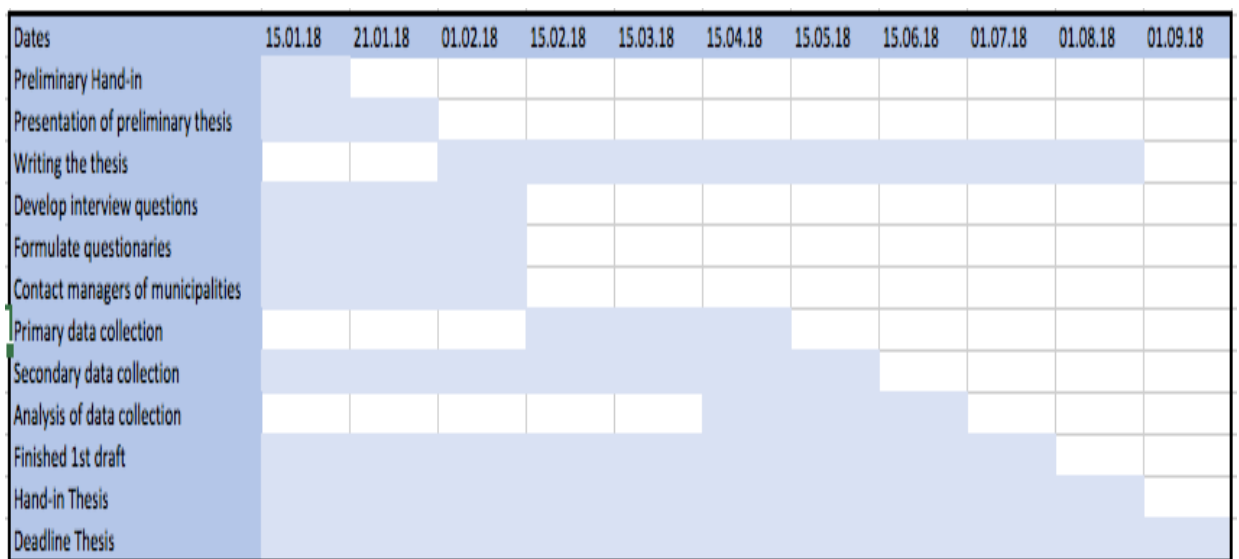


Figure 3: Project plan presented in a Gantt chart

## References

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- Abramson, M., & Harris, R. (2003). The procurement revolution, (p. 3-11) *Rowman and Littlefield Publishers Inc.*
- Andersson, D., & Norrman, A. (2002). Procurement of logistics services—a minutes work or a multi-year project? *European Journal of Purchasing & Supply Management.*, 8(1), 3-14.
- Assaf, S., Bubshait, A., & Aitah, R. (1998). Bid-awarding systems: An overview. *Cost Engineering*, 40(8), 37-39.
- Bel, G., & Fageda, X. (2006). Between privatization and intermunicipal cooperation: Small municipalities, scale economies and transaction costs<sup>1</sup>. *Urban Public Economics Review*, (6), 13-31.
- Bel, G., & Warner, M. (2008). Does privatization of solid waste and water services reduce costs? A review of empirical studies. *Resources, Conservation, and Recycling*, 52(12), 1337-1348.
- Bel, G., & Fageda, X. (2007). Why do local governments privatize public services, a survey of empirical studies? *Local Government Studies*, 33 (4) (2007), pp. 517-534
- Bhutta, K., & Huq, F. (2002). Supplier selection problem: A comparison of the total cost of ownership and analytic hierarchy process approaches. *Supply Chain Management: An International Journal*, 7(3), 126-135.
- Bolton, P., & Faure-Grimaud, A. (2010). Satisficing Contracts. *The Review of Economic Studies.*, 77(3), 937-971.
- Brown, T., & Potoski, M. (2003). Contract-Management Capacity in Municipal and County Governments. *Public Administration Review.*, 63(2), 153-164.
- Bryman, A., & Bell, E. (2015). *Business Research Methods*: (4th ed.). Oxford: University Press.
- Brynhildsvoll, I., & Abrahamsen, T. (2011). *Prinsipper for Bedre Innkjøp*. (2. utg. ed.). Bergen: bokforlag.
- Chen, M. (2000). Selecting the right engineer, contractor, and supplier. *AACE International Transactions*, P7A-P7.7.
- Chopra, S., & Meindl, P. (2016). *Supply chain management: Strategy, planning, and operation* (6th ed., Global ed.). Harlow: Pearson.
- Dijkgraaf, E., & Gradus, R. (2003). Cost Savings of Contracting Out Refuse Collection. *Empirica*, 30(2), 149-161.
- Ellram, L. (1995). Total cost of ownership. *International Journal of Physical Distribution & Logistics Management.*, 25(8), 4-23.
- Eisenhardt, K. (1989). Agency Theory: An Assessment and Review. *The Academy of Management Review.*, 14(1), 57-74.

- Hartman, Francis T. 2000. Don't Park Your Brain Outside. Project Management Institute.
- Hoek, R. (2000). The Purchasing and Control of Supplementary Third-Party Logistics Services. *The Journal of Supply Chain Management: A Global Review of Purchasing and Supply*, 36(3), 14-26.
- Jacobsen, Buysse, & Gellynck. (2013). Cost comparison between private and public collection of residual household waste: Multiple case studies in the Flemish region of Belgium. *Waste Management*, 33(1), 3-11.
- Johnsen, A. B., Matre, J., (2017). Derfor ble det søppelkaos i Oslo. VG. Retrieved from <https://www.vg.no/nyheter/veireno/derfor-ble-det-soeppekao-i-oslo/a/23984532/>
- Karlsen, Jan Terje. 2017. *Prosjektledelse – fra initiering til gevinstrealisering*. (4. utg. ed.). Oslo: Universitetsforlaget.
- Kolltveit, B. J., Lereim, J., & Reve, T. (2009). *Prosjekt: strategi, organisering, ledelse og gjennomføring* (3 utg.). Oslo: Universitetsforlaget.
- Lovdata: Om avfall, chapt. 5. §30. Kommunal innsamling av husholdningsavfall m.v. (1983). Retrieved from: [https://lovdata.no/dokument/NL/lov/1981-03-13-6/KAPITTEL\\_5?q=avfall#KAPITTEL\\_5](https://lovdata.no/dokument/NL/lov/1981-03-13-6/KAPITTEL_5?q=avfall#KAPITTEL_5)
- Ohlsson, H. (2003). Ownership and Production Costs: Choosing between Public Production and Contracting-Out in the Case of Swedish Refuse Collection. *Fiscal Studies.*, 24(4), 451-476.
- Plata-Díaz, Zafra-Gómez, Pérez-López, & López-Hernández. (2014). Alternative management structures for municipal waste collection services: The influence of economic and political factors. *Waste Management*, 34(11), 1967-1976.
- Prince, P.M., & Harrison, N.J., (2014). *Fundamentals of purchasing and supply management*. Access Education.
- Rodrigues, Martinho, & Pires. (2016). Waste collection systems. Part A: A taxonomy. *Journal of Cleaner Production*, 113, 374-387.
- Ruparathna, R., Hewage, K., (2015). *Review of Contemporary Construction Procurement Practices*. Journal of Management in Engineering. Volume 31 Issue 3.
- Saunders, Mark, Philip Lewis and Adrian Thornhill. 2012. Research Methods for Business Students. 6. England: Pearson Education Limited.
- Teixeira, C., Russo, M., Matos, C., & Bentes, I. (2014). Evaluation of operational, economic, and environmental performance of mixed and selective collection of municipal solid waste: Porto case study. *Waste Management & Research*, 32(12), 1210-1218.
- Telgen, J., & Thai, K. (2008). SYMPOSIUM INTRODUCTION. *Journal of Public Procurement*, 8(3), 303-309.

de Vries, J., Schepers, J., van Weele, A., & van der Valk, W. (2014). When do they care to share? How manufacturers make contracted service partners share knowledge. *Industrial Marketing Management*, 43(7), 1225-1235.

Weele, Arjan J. van. (2014). Purchasing and supply chain management (6ed.): *Cengage Learning*.

Ward, G. (2008). *The project manager's guide to purchasing: Contracting for goods and services*. Aldershot: Gower.

Williamson, O. (1999). Public and private bureaucracies: A transaction cost economics perspectives. *The Journal of Law, Economics & Organization*, 15(1), 306-342.

Zhao, Y., & Lavin, M., (2012). AN EMPIRICAL STUDY OF KNOWLEDGE TRANSFER IN WORKING RELATIONSHIPS WITH SUPPLIERS IN NEW PRODUCT DEVELOPMENT. *International Journal of Innovation Management*, 16(02), 1250013.



## Appendix 1 – Search Matrix

<i>Parameters</i>	<i>Subject terms, synonyms Restriction</i>	<i>Broader alternatives if relevant</i>
<i>Language</i>	English	Norwegian, Swedish
<i>Methodology</i>	Qualitative, Quantitative	
<i>Subjects / search term</i>	public procurement, Public-private partnership, 3PL, Project management, Agency theory, Contract management, Specifications	Total cost of ownership Transaction costs
<i>Business sector / Industry</i>	Private sector Public organisations Logistics and transport	
<i>Geographical area</i>	Scandinavia, Worldwide	
<i>Literature type</i>	Academic articles, previous reviews, data search, journals, literature theories.	
<i>Publication period</i>	1950 - 2018	2000 - 2018

## Appendix 2 – Main Steps of Qualitative Research

