GREEN PUBLIC PROCUREMENT WITHIN COPENHAGEN MUNICIPALITY'S CONSTRUCTION SECTOR

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Completion Date: September 19, 2013

Number of Total Pages: 133

Number of Pages*: 117

*Excluding Cover, Declaration, Acknowledgements, Bibliography & Appendix

Number of Characters*: 263,143 (average/page: ~2249)

*Including Spaces; Excluding Tables, Figures & Illustrations

Copenhagen Business School 2013

Acknowledgements

The thesis in front of you is the result of hard work, endless discussions, small arguments, fun and curiosity. However, nothing is ever accomplished alone.

We would like to express our thanks to everyone that have supported us throughout the process.

A particular thank you to our supervisor, Merrill Barradale, for being encouraging, inspiring and patient in her guidance. We would also like to express our gratitude towards Bersant Hobdari, for giving us good advice in the starting phase of this thesis. Furthermore, we would like to thank all the individuals that agreed to be interviewed. Thanks for taking the time to meet with us and for sharing your thoughts and opinions.

We would also like to thank our family and friends for being supportive and understanding.

Synnøve Berntsen & Jeffrey Manner

ABSTRACT

This thesis conducts an in-depth investigation into the implementation of Green Public Procurement (GPP) within the construction sector of Københavns Kommune (KK). We take on Grounded Theory as our research strategy, with the aim of developing a model suited for the specific empirical case of GPP in KK's construction sector.

The combination of GPP as a tool for achieving sustainable development, the magnitude of Danish public procurement and KK's ambitious climate targets, immediately captured our attention. However, it was the surprising results of a major GPP study from 2009 that solidified our further investigation and eventually this thesis. The study, *Collection of statistical information on Green Public Procurement in the EU*, by PricewaterhouseCoopers (PWC et al., 2009), revealed that Denmark is lagging considerably behind the other Green-7 nations (Austria, Finland, Germany, The Netherlands, Sweden and the United Kingdom) on GPP progress in the construction sector. The consequences of Denmark's lack of GPP progress within the construction sector are magnified by the sector's unique financial and environmental GPP potential.

With these realizations in mind, we set out on a research journey with the purpose of explaining the discrepancy between GPP's progress and potential within the construction sector of KK.

Through analysis of the European Union's tender database and a series of semi-structured interviews with stakeholders, we gain significant insights into the current progress and practices of GPP in KK's construction sector. Our findings support those of PWC et al. (2009) and we determine that a GPP discrepancy is still present in KK. Furthermore, these insights allow us to identify barriers that can explain this discrepancy.

Through our analysis, barriers to GPP progress are observed on three distinct levels: political, organizational and practical. Additionally, we identify external influences that have indirect negative impacts on GPP's progress in KK. These realizations led to our development of the Berntsen-Manner Model, which addresses barriers at the different levels, as well as external influences. To further strengthen our analysis, we apply Hydén's Norm-Model as a complementary analytical tool to highlight the importance of values and motivation to GPP's progress. Following these findings, we outline some recommendations meant for KK's public procurement authorities.

KEY WORDS: Green Public Procurement (GPP), Københavns Kommune, Grounded Theory, Multi-Level Analysis, the Berntsen-Manner Model, Hydén's Norm-Model, Barriers to GPP, Municipal GPP Practices.

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1. Introduction and Motivation

This thesis conducts an in-depth investigation into the implementation of Green Public Procurement (GPP) within the construction sector of Copenhagen Municipality, which will be referred to as Københavns Kommune (KK) throughout this thesis. Identified as a key tool for promoting sustainable development, the promotion of GPP is a major policy initiative of the European Commission.

> European public authorities spend the equivalent of 16% of the EU Gross Domestic Product on the purchase of goods…services…and works. Public procurement can shape production and consumption trends and a significant demand from public authorities for "greener" goods will create or enlarge markets for environmentally friendly products and services. By doing so, it will also provide incentives for companies to develop environmental technologies (Commission of the European Communities 2008).

The inclusion of environmental considerations into the procurement of European Union (EU) public authorities has significant potential for promoting sustainability and green solutions. This is due to the sheer size of public procurement in Europe. In other words, European public authorities hold significant market power through their demand. They have the potential to influence a shift in supply towards increasingly green solutions by demanding such products and services. Within Scandinavian markets, a large part of this market power is at the municipal level, as individual municipalities have high procurement autonomy and control. Like neighboring Scandinavian nations, public procurement in Denmark is a significant driver of the economy, totaling 294.5 billion Danish Kroners (DKK) in 2011 (up 21.3 billion DKK or 7.8% from 2008). Of this, public procurement at the municipal level equaled 82.8 billion DKK in 2011 (Konkurrence og Forbrugerstyrelsen 2012).

Denmark is largely viewed as an environmental leader for environmental technologies and policies. Furthermore, a high level of public support exists for environmental responsibility. The political landscape is similarly shaped with Denmark having world-leading climate plans and targets. Exemplifying this, KK aims to be Carbon dioxide (CO2) neutral by 2025, with an interim goal of 20% reductions by 2015 (compared to 2005 levels). According to former Mayor Bo Asmus Kjeldgaard, Copenhagen also wants to be the “the capital city with the best urban environment, thus demonstrating that environmental concern adds an extra dynamic to urban development” (Københavns Kommune 2010). To meet these ambitious goals, KK requires a comprehensive strategy that includes utilizing the power of its procurement function. Therefore, the reevaluation of its procurement processes is listed as a key milestone goal in the CPH 2025 Climate Plan. Considering that emissions from public

procurement in Denmark are estimated to equal 20 million tons of CO2 equivalents/year, even small levels of improvement can have significant effects (Chrintz, 2011).[1]

Our attention was immediately captured by the combination of GPP as a tool for promoting sustainability, the magnitude of Denmark's public procurement and Copenhagen's climate targets. However, it was the surprising findings of a major GPP study from 2009 that solidified our further investigation and eventually this thesis. The study, *Collection of statistical information on Green Public Procurement in the EU*, by PricewaterhouseCoopers (PWC et al., 2009), revealed that Denmark is lagging considerably behind the other Green-7 nations when it comes to GPP progress in the construction sector.[2] The consequences of Denmark's minimal GPP progress within this sector are magnified by the construction sector's unique ability to simultaneously achieve both cost and emission reductions through GPP efforts.

Intrigued by the findings of the PWC et al. (2009) report, we were motivated to investigate GPP in Denmark's construction sector further. Due to both geographical limitations and KK's ambitious climate goals, we designed this research paper to investigate GPP within KK's construction sector exclusively.

1.1 Research Question

How do we explain the discrepancy between GPP's progress and potential within the construction sector of Københavns Kommune?

This discrepancy refers to the fact that construction sector GPP has significant environmental and financial potential, yet Denmark seems to be lagging considerably behind the Green- 7 nations in this sector.

Following our scope and delimitation in section 1.2.1, we will further explain our motivation for investigating this discrepancy by outlining the findings from the PWC et al. (2009) report. We will introduce findings pertaining to the progress of GPP in Denmark's construction sector, as well as the sector's financial and environmental potential. As already mentioned, we believe KK is a reasonable geographical limitation. Therefore, the findings of the PWC et al. (2009) report are of relevance when investigating GPP in KK, despite its focus on Denmark as a whole. Based on PWC et al.'s (2009) findings, we assume that GPP has significant potential in KK's construction sector (following Section 1.2.2, this will not be investigated further).

[1] A CO2 equivalent is a metric measure used when comparing emissions from different greenhouse gases based on their global warming
[2] The Green-7 nations are Austria, Denmark, Finland, Germany, The Netherlands, Sweden and the United Kingdom. They were identified by the European Commission's (EC) TAKE 5 study as the EU Member States with the greatest GPP adoption up to 2005.

To investigate and answer our research question, we will have a two-folded approach. We will start by presenting our own account regarding the progress and current practices of GPP within KK's construction sector. This is done for two reasons: First, there are strong reasons to believe that GPP in KK's construction sector has not reached its full potential, however the findings from the PWC et al. (2009) report are from 2009 and are focused at the national level. Therefore, we want to assess whether recent developments indicate any significant change in the progress of GPP, or whether KK has significantly better GPP progress than Denmark has in general. Second, we want to gain an in-depth understanding of how GPP is currently practiced and implemented in KK's construction sector.

Once we have investigated how GPP is currently practiced in KK's construction sector, we will have our own evidence regarding the GPP discrepancy. Consequently, we will then be in a position to address and answer our research question by identifying barriers that are inhibiting GPP progress in KK's construction sector.

1.1.1 Scope and Delimitations

We define KK's construction sector as all construction related activities within the municipalities' borders where KK is the direct recipient and funding authority of a project or indirectly supports private projects with funding. Types of works projects include new buildings, renovations of existing buildings, townscape projects and infrastructure. Only public procurement projects that are fully or partially paid by KK will be considered. This excludes public procurement projects that are fully funded at the regional or state level. In terms of industry actors involved, we define the construction sector as including architecture, construction, engineering and consultancy firms.

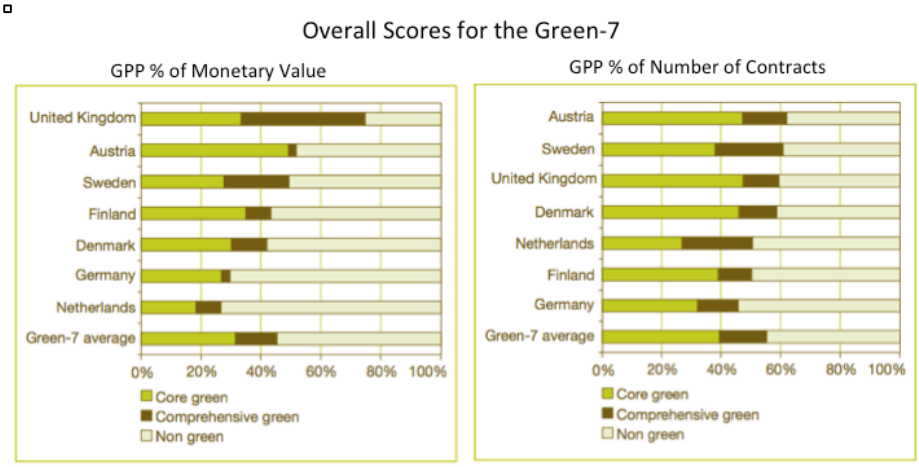
Our scope is to identify the barriers and influences with the greatest impact on GPP progress in KK's construction sector. We will focus on barriers and influences identified through our designed interview process. Once the key barriers are identified, we will put forward some general recommendations intended for KK's procurement authorities. However, the aim of this paper is to identify the key barriers, not to come up with comprehensive solutions to overcome them. Lastly, it should be noted that certain barriers originate largely from political considerations. As this is not a political science thesis, we will not go extensively into depth on political systems or governance models. These will instead be addressed adequately to establish an understanding of how GPP is restricted by political factors.

1.2.2 The Discrepancy Between GPP's Progress and Potential in Denmark's Construction Sector

We will now further present the discrepancy between the progress and potential of GPP in the construction sector in Denmark.

The European Commission (EC) has encouraged EU Member States to adopt GPP action plans since 2003. The EC's 2008 communication, *Public Procurement for a Better Environment*, specifically outlined goals including a target of 50% GPP for priority sectors by 2010. The EC originally identified 10 priority product and service groups for GPP.[3] Within each group, a set of "core" and "comprehensive" criteria was chosen. "Core" criteria address key environmental issues while minimalizing additional costs or verification requirements. "Comprehensive" criteria are intended for those authorities wanting the best environmental products available despite increased costs and verification requirements (European Commission Website 2008).

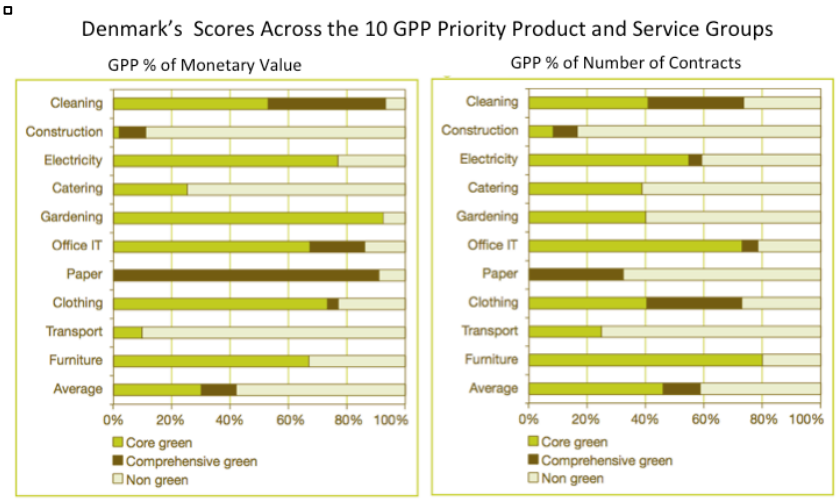
The study, *Collection of statistical information on Green Public Procurement in the EU,* by PWC et al. (2009), examined GPP uptake compared to total public procurement in terms of monetary value and number of contracts. The overall scores for GPP efforts across the Green-7 were relatively comparable in terms of number of contracts, including Denmark with an average of 55% (Figure 1b). However, when based on the total monetary value, a range emerged with Denmark falling below the 45% Green-7 average (Figure 1a).



Figures 1a & 1b – Overall Scores for Green-7. First by monetary value (1a). Second by number of contracts (1b). Source: PWC et al. (2009).

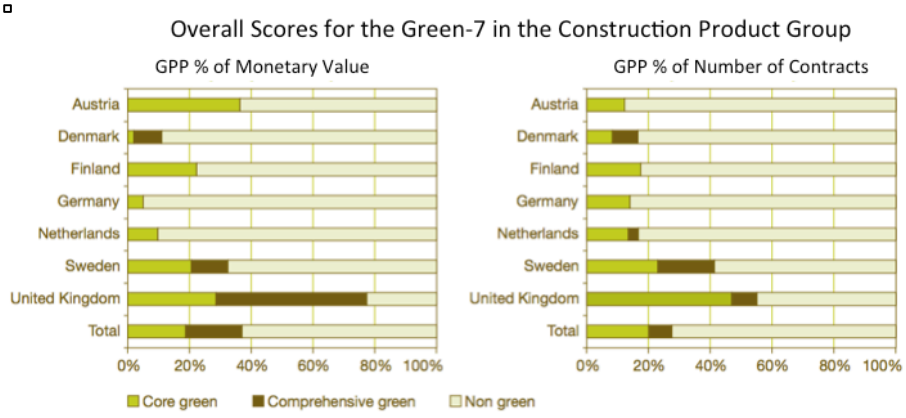
[3] The ten priority product and service groups are cleaning products and services, construction, electricity, catering services and food products, gardening services and products, office IT equipment, copying and graphic paper, textiles, transport and furniture.

The distribution of Denmark's GPP scores across the ten product groups helps to explain the difference between its results in terms of monetary value and number of contracts (Figures 2a & 2b). While achieving good results in cleaning, gardening, office IT and paper, Denmark scored very poorly in Construction. Subsequently, this weakness within the Construction product group is especially significant due to its high levels of procurement value and greenhouse gas emissions (Chrintz, 2011).



Figures 2a & 2b - Denmark's Scores Across the 10 GPP Priority Product and Service Groups. First by monetary value (2a). Second by number of contracts (2b). Source: PWC et al. (2009).

Comparing the Green-7 based exclusively on the construction product group, it is easy to see that Denmark is lagging behind (Figures 3a & 3b). With the Green-7's construction product group accounting for 57% of total procurement value and 31% of total CO2 emissions across all 10 product groups, Denmark's weakness in this sector has a significant negative impact on its overall GPP progress.



Figures 3a & 3b – Overall Scores for the Green-7 in the Construction Product Group. First by monetary value (3a). Second by number of contracts (3b). Source: PWC et al. (2009).

The consequences of Denmark's lack of GPP progress within the construction sector are magnified by the construction product group's unique ability to simultaneously achieve both financial cost and emission reductions through GPP (Figure 4). Of the 10 product groups, only cleaning supplies had a similar ability. However, construction accounts for a significantly higher portion of procurement value and emissions.

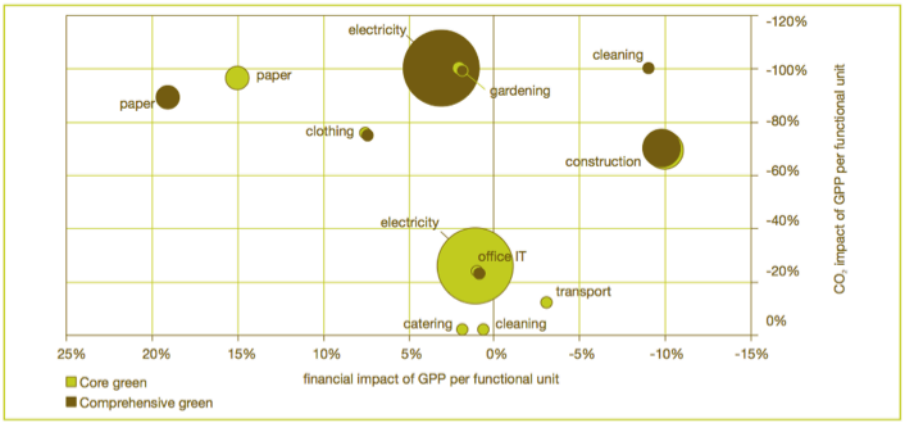


Figure 4 - Financial and CO2 Impact of GPP per Functional Unit.[4] Negative values imply lower costs or emissions. Positive values imply higher costs. The size a circle indicates the average CO2 emissions of a product group. Source: PWC et al. (2009).

The potential environmental impact of GPP within the construction sector is emphasized in the PWC et al. (2009) report. As can be seen in Figure 5, GPP within this product group achieved an average CO2 reduction of approximately 70%.

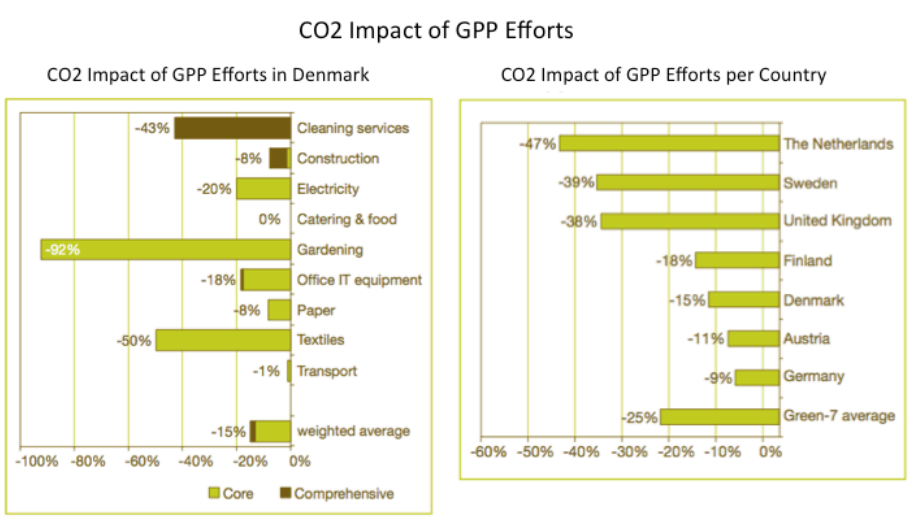
CO2 Impact of GPP per Functional Unit

Product group	unit	core	compre-hensive
Cleaning services	m^2 cleaned	0%	-100%
Construction	building	-69%	-70%
Electricity	kWh	-26%	-100%
Catering & food	lunch prepared	0%	
Gardening	m^2 garden	-100%	-100%
Office IT equipment	computer	-24%	-24%
Paper	kg paper	-97%	-89%
Textiles	kg textile	-76%	-76%
Transport	vehicle	-12%	

Figure 5 - CO2 Impact of GPP per Functional Unit. Negative numbers imply CO2 emission reductions. Source: PWC et al. (2009).

[4] "Per functional unit means for example per vehicle for the product group transport or per m2 floor cleaned for cleaning services" (PWC et al., 2009: 53).

Despite Figure 5 clearly showing that emission reductions can be achieved by all but one product group through GPP, Denmark's overall emission reduction from its GPP efforts was estimated at only 15% (Figure 6b). This can largely be attributed to its lack of performance within the construction sector (Figure 6a).



Figures 6a & 6b - CO2 Impact of GPP Efforts in Denmark (first-6a) and the Green-7 (second-6b). Negative numbers imply CO2 emission reductions. Source: PWC et al. (2009).

As can be seen in Figure 7, GPP efforts within the construction sector have clear financial advantages. On average, construction GPP efforts provide roughly 10% cost savings within the Green-7 nations. This has added significance considering the financial magnitude of construction procurement for most public authorities. For example, the construction sector in Denmark accounts for 160,000 jobs and an average annual turnover of 240 billion DKK (North Denmark EU Office, 2011).

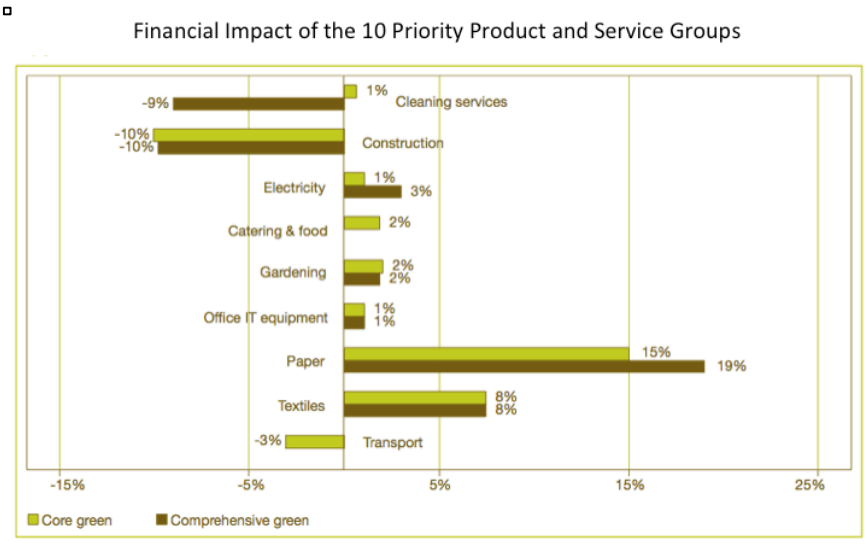


Figure 7 - Financial Impact of the 10 Priority Product and Service Groups. Negative values imply lower costs. Positive values imply higher costs. Source: PWC et al. (2009).

Investments into construction sector GPP are particularly valuable due to the high cost-intensity of its projects, as well as its ability to achieve fiscal cost reductions. As a result, Denmark was the only nation of the Green-7 to experience a cost increase from its GPP efforts (Figure 8).

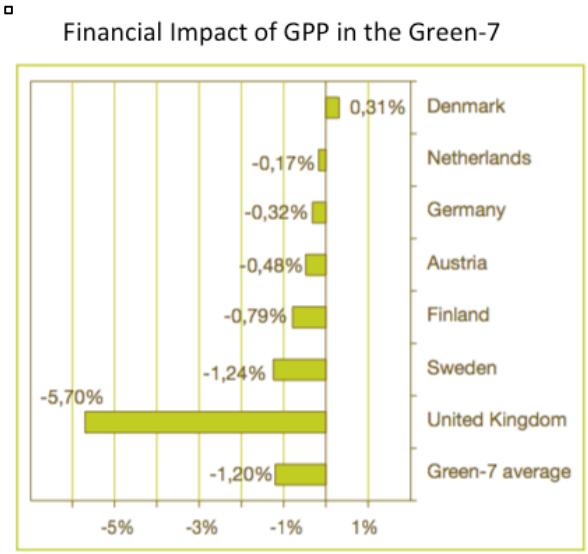


Figure 8 – Financial Impact of GPP in the Green-7. Negative values imply lower costs. Positive values imply higher costs. Source: PWC et al. (2009).

The purpose of this section was to present an initial overview of the discrepancy between the current progress and potential of GPP within Denmark's construction sector. These realizations motivated us to commence on our research journey, with the purpose of investigating why this is the case.

1.2 Thesis Structure Guide

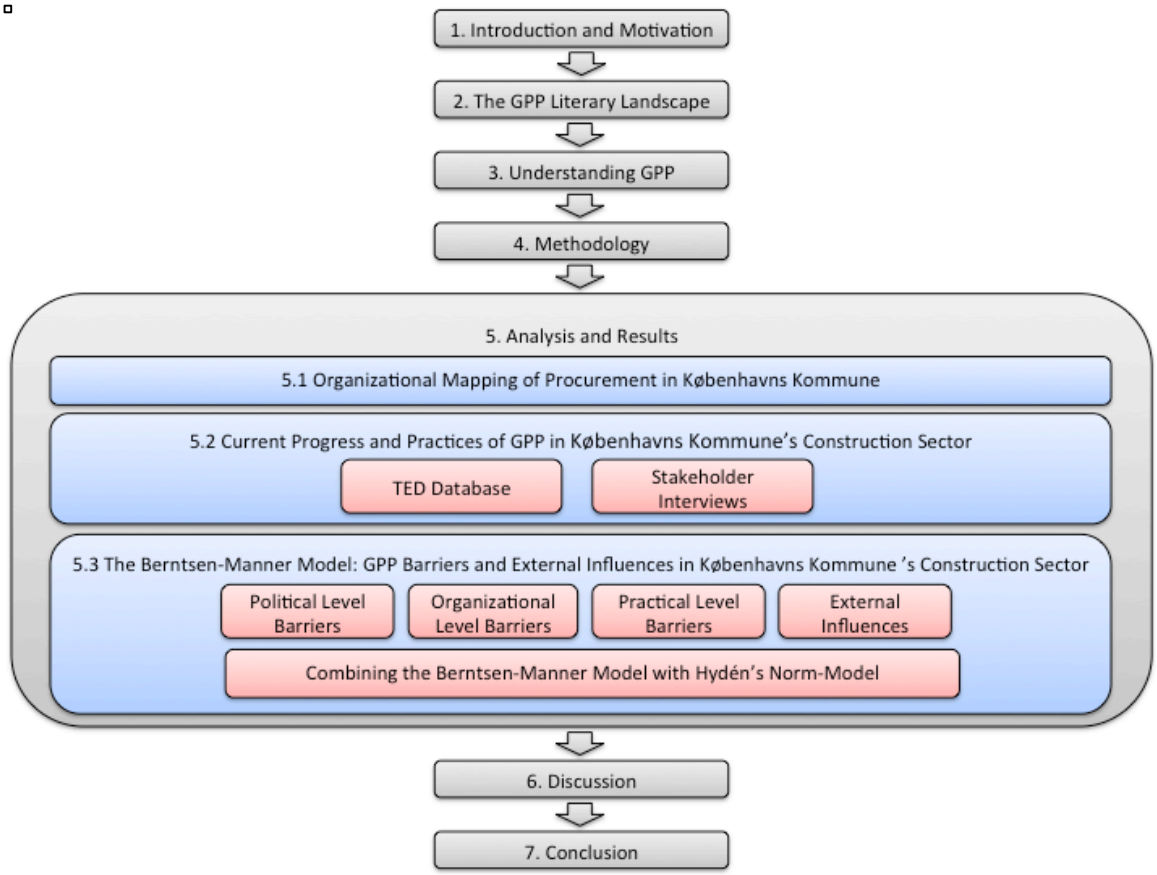


Figure 9 – The Structure of Our Thesis.

In Section 1, *Introduction and Motivation*, we have presented our motivation for investigating GPP in KK's construction sector. Furthermore, we have outlined our research question. The scope and delimitations of our research has also been presented.

Section 2, *GPP Literary Landscape*, presents an overview and discussion of previous research on GPP. In this section, we focus on the scope and methods used in previous research.

Section 3, *Understanding GPP*, provides a general introduction to GPP. This section allows the reader to gain insights and an understanding of public procurement and GPP.

Section 4, *Methodology*, outlines our methodological journey. We start with a discussion around our research philosophy, purpose and strategy. We then continue by explaining our data collection process. Lastly, we

introduce our main analytical framework, the Berntsen-Manner Model, and a complementary analytical tool, Hydén's Norm-Model.

Section 5, *Analysis and Results*, is the main part of this thesis. First, we will start by introducing an organizational mapping of procurement in Københavns Kommune (KK). Second, we will investigate the current progress and practices of GPP in KK's construction sector by both analyzing tender documents from the EU's Tender Electronic Daily (TED) database and by conducting a series of qualitative interviews. Utilizing the results of this research, we will continue by attempting to explain why there is a discrepancy between the current progress of GPP and its potential. We will achieve this by identifying barriers on three primary levels – political, organizational and practical. Furthermore, we will identify external influences (local, national and European) that are negatively impacting GPP progress. Combining our three barrier levels with the external influences, we will apply the Berntsen-Manner Model to help explain the GPP discrepancy. Lastly, we will combine the Berntsen-Manner Model with Hydén´s Norm-Model for additional insights.

In Section 6, *Discussion*, we present an overview of our main findings and put forward recommendations for KK. Additionally, we will reflect on our use of methods and our contribution to the literature on GPP. Lastly, we will put forward suggestions for further research.

Section 7, *Conclusion*, will wrap everything up and conclude our research on GPP in KK's construction sector.

2. The GPP Literary Landscape

The following section will present an overview of the most significant research done in the area of GPP. It will primarily identify trends in scope and methods used in previous research on GPP. As the research field of GPP is relatively new, the literature introduced dates from 2001 to 2012, with an increasing amount of research in recent years.

Research on GPP Focused at the European Level

In 2001, green procurement practices were not an entirely new concept, but no common GPP frameworks or strategies were yet established. Furthermore, procurement authorities were unaware of how GPP was being achieved by authorities elsewhere. This realization led to the initiation of the RELIEF[5] project by ICLEI[6] in 2001.

[5] Environmental relief potential of urban action on avoidance and detoxification of waste streams through green procurement.
[6] International Council for Local Environmental Initiatives.

This research project was the first effort to quantify the environmental potential and benefits of GPP in Europe and was funded by the European Commission (EC). Within the framework of RELIEF, a survey on procurement practices in leading European countries was performed. Additionally, GPP experiences by authorities outside the EU were incorporated into the final report. The main conclusion of this research was that no common GPP approach existed at that time.

Following the RELIEF project, the TAKE 5 study was the first step in the EC´s GPP initiative. It was commissioned to develop a GPP measurement tool and set baselines for current levels of GPP in EU Member States. The study utilized 860 online questionnaire responses and over 1000 tender documents. The primary findings included GPP performance on a per country basis, identified barriers to GPP adoption and differences between GPP criteria across product groups. The study identified the Green-7 nations with the greatest GPP adoption up to 2005 (Austria, Denmark, Finland, Germany, Netherlands, Sweden and UK). The main barriers identified were perceived increased costs for green alternatives and limited environmental knowledge, tools and training. A lack of managerial and political support was also highlighted. The conclusion of the study highlighted that GPP targets across Europe are feasible and Member States should follow current practices of the Green-7 (Bouwer and Jonk et al., 2006).

Research focusing specifically on tools for GPP has also been performed. The EC's Directorate General for Enterprise and Industry commissioned the study, *Life cycle costing (LCC) as a contribution to sustainable construction: a common methodology,* to analyze national approaches to LCC across Member States in 2006. Utilizing this research, a common EU framework for LCC in construction projects was developed for the first time. Objectives of the study included improving the competitiveness of Europe's construction sector and its awareness of environmental goals (Davis Langdon Management Consulting, 2007).

Following the TAKE 5 project, another study, *Costs and Benefits of Green Public Procurement in Europe,* was commissioned by the EC. This study put forth recommendations for the implementation of GPP in the EU. This implies that the scope was at the European level (without explicit references to individual countries). Some key recommendations included the use of LCC, promoting functional-orientated procurement, driving innovation through procurement demand, supporting national political commitments, inventing new procurement procedures and providing support through GPP monitoring and management tools (Öko-Institut e.V. & ICLEI, 2007)

Following the PWC et al. (2009) report (outlined in section 1, *Introduction and Motivation*), another GPP monitoring study by the Centre of European Policy Studies was initiated in 2012. This report did not go into detail on an individual country or product group basis but did measure the level of GPP uptake across the entire EU27 (rather then just the Green-7 nations). The method used was that of an extensive survey. Overall, the study reports considerable progress made across the EU27. However, it also reported considerable variation across the Member States with some still failing to meet the EC's GPP target of 50%. Causes for Member States not reaching the target have been addressed in other GPP literature. These causes include a lack of support at the political level, focus on purchase price, incompetence among procurement officers, high complexity of legislation, a will to simplify the procurement process and the fear of tendering disputes (Walker and Di Sisto et al., 2008; PWC et al., 2009; Varnäs and Balfors et al., 2009; Palmujoki and Parikka-Alhola et al., 2010; The Swedish Environmental Protection Agency, 2009).

Research on GPP Focused at the National Level

Several authors have analyzed the use and creation of environmental criteria in calls for tenders at the national level, but not Denmark specifically. Palmujoki and Parikka-Alhola et al. (2010) assessed the use of environmental criteria in Swedish and Finnish calls for tenders and public procurement contracts. Their methodology was to analyze 156 sets of tender documents, all above the EU-threshold value. The study evaluated both the frequency and formulation of environmental criteria within the tender documents. On a general level, their findings indicate that environmental aspects have repeatedly been considered not important. Consequently, the formulation of such criteria has also had a low priority.

Bratt and Hallstedt et al. (2013) assessed the development of GPP criteria at the national level in Sweden. Through participation studies, the authors analyzed the GPP criteria development processes of transport fuel and indoor lighting. Their investigation reveals that the criteria development process is well documented, transparent and that it incites a high degree of participation. However, their research also highlights several weaknesses including a lack of clearly defined goals and a limited view of possible impacts. Consequently, these weaknesses result in the development of criteria that does not take long-term objectives and impacts into account.

Testa and Iraldo et al. (2012) examined which factors affect the incorporation of environmental criteria in public procurement in Italy. The data was collected through a survey of 156 public organizations based in three different Italian regions. They specifically investigate whether variables such as access to toolkits, usage of outside expertise and usage of environmental management systems have an impact on local governments

promoting GPP. Their most statistically significant finding is that knowledge about GPP initiatives and tools is directly linked to GPP progress.

Research on GPP Focused at the Municipal Level

Some researchers have taken a narrower scope by addressing GPP at the municipal level. Michelsen and de Boer (2009) investigated the degree of implementation of GPP in municipalities of Norway. These authors primarily utilized extensive questionnaires but some semi-structured interviews were also included. The size of the municipalities that responded to the questionnaire ranged from 525 to 250,000 inhabitants, meaning all are smaller than KK. They investigated the frequency that procurement officials in municipalities put environmental demands on suppliers in the procurement process. Additionally, they assessed whether information on environmental performance has an influence in the selection process. The authors find that GPP is more established in larger municipalities.

Clement and Plas et al. (2003), based on a study of six European cities, argues that municipalities are in a good position to introduce environmental considerations into their procurement. Compared to national authorities, the authors argue that municipalities have more room to be pioneers in the use of green procurement practices. However, it has also been argued that municipalities cannot capture all advantage of GPP due to their smaller size. Brander and Olsthoorm et al. (2003) believe municipalities are often too small to effectively promote innovative new products.

Research on GPP Focused at the Sector Level (Product Group)

As mentioned before, PWC et al. (2009) performed a comprehensive study on GPP in the EU's Green-7. The analysis was based on a questionnaire delivered to 2907 contracting authorities with 38% responding. In contrast to earlier studies, this report was the first to assess GPP progress across 10 individual product groups. Additionally, the results were broken down into each Green-7 nation.

Chrintz (2011) specifically examines Denmark's GPP progress utilizing the PWC et al. (2009) report, Danish media sources and his own research. In his analysis, he acknowledges the importance of the construction sector and identifies potential barriers. These barriers include political reluctance and a lack of LCC usage. This report highlights some important issues related to GPP in Denmark but the author's focus is primarily at the national level, not the municipal level.

Varnäs and Balfors et al. (2009) investigated GPP in Sweden's construction sector by using both a survey and interviews. In line with our own argumentation, the authors state that the interview method is applied in order to gain a deeper understanding of the GPP practices. The authors analyzed the use of environmental criteria in awarding contracts by both public and private players. The study concludes that environmental considerations are included in the procurement process. However, their findings also indicate that environmental criteria seldom appear in the evaluation of tenders. Instead, demands are on the capabilities of contractors to perform environmental work, primarily their environmental management systems (EMS).

Situating Our Research within the GPP Literary Landscape

Previous research has analyzed and identified success factors and barriers to GPP progress, however, the majority of current research assesses GPP at the European or national level, and rarely has the focus been on specific sectors or product groups. Specifically, not a single sector-and-municipality-specific study has been identified in our research of existing literature.

From a methods standpoint, trends exist in existing research to analyze tender documents and use extensive surveys. This implies that our methodology utilizing mainly semi-structured interviews can provide new and alternative findings.

To summarize, this review of GPP literature indicates that performing an in-depth interview-based investigation of GPP in KK's construction sector can offer new insights.

3. Understanding GPP

In the following section, an overview of Green Public Procurement (GPP) will be presented. Topics include GPP's history, legal frameworks and procedures. Furthermore, functional tendering and Life-Cycle Costing (LCC) will be covered.

3.1 A History of GPP

Public procurement is the purchase of goods and services by public purchasing authorities, guided by laws and political decisions. GPP is an evolutionary concept of this practice with an emphasis on sustainability and environmental protection. For the purpose of this thesis, we will use a definition for GPP that was put forward by a consortium including a working group from the EC's Environmental Technologies Action Plan and the Directorate General for the Environment:

> Green Public Procurement is the approach by which Public Authorities integrate environmental criteria into all stages of their procurement process, thus encouraging the spread of environmental considerations and the development of environmentally sound products, by seeking and choosing outcomes and solutions that have the least possible impact on the environment throughout their whole life-cycle (Virage Milieu & Management 2005, p.16).

We will also note that GPP indicates procurement that goes beyond legal regulations, such as building codes. The basic principal of GPP is to steadily achieve greater environmental sustainability through public procurement's demand function. Minimum legal regulations are to be met regardless of GPP efforts.

3.1.1 GPP in the European Union (EU)

The Organization for Economic Cooperation and Development (OECD) first adopted a Recommendation on GPP in 2002. Within the EU, the potential of GPP was first recognized in 2003 when Member States were encouraged to produce National Action Plans (NAPs) for GPP by the end of 2006. Later, the EU's Sustainable Development Strategy of 2006 set an objective for the average level of EU GPP in 2010 to equal the best performing Member States of 2006. This target was made more specific with the European Commission's Communication, *Public procurement for a better environment*, setting a 50% GPP target for each Member State to reach by 2010 (Commission of the European Communities 2008).

The EC identified an initial set of common GPP criteria for priority product and service groups.

> The priority sectors for implementing GPP were selected through a multi-criteria analysis including: scope for environmental improvement; public expenditure; potential impact on suppliers; potential for setting an example to private or corporate consumers; political sensitivity; existence of relevant and easy-to-use criteria; market availability and economic efficiency (European Commission Website 2008).

The development of the criteria was based on a life-cycle approach and utilized existing eco-label schemes. The established criteria are split into "core" and "comprehensive" components. The original 10 priority product and service groups were construction, food and catering services, transport, electricity, office IT equipment, textiles, paper, furniture, cleaning products and services and gardening products and services.[7]

As of June 2010, 21 Member States had NAPs or equivalent documents adopted (the remaining 6 Member States' NAPs are listed as in progress). Furthermore, GPP is now legally binding in Portugal, Germany (wood and LCC) and the Czech Republic (IT) (European Commission Website GPP NAPs 2003).

[7] Has since been expanded to 19 product and service groups.

3.1.2 GPP in Denmark

Environmental considerations have been required for state procurement officers in Denmark since as early as 1991. Furthermore, Denmark's first GPP NAP was in 1994. Between 1997 and 2005, GPP guidelines (Miljøvejledninger) for 46 product groups were developed. Given the developments of GPP at the European level, an updated NAP, *Strengthened efforts to enhance green procurement in 2008-2009*, was published by the Danish Environmental Protection Agency (EPA). A second action plan, *Action Plan for Corporate Social Responsibility 2008,* was also produced to promote sustainable private sector procurement. These two action plans are considered central to GPP efforts in Denmark at the state level (European Commission Website GPP NAPs 2012).

Denmark has adopted a political target of 50% GPP and mandatory environmental criteria has been incorporated into the purchasing agreements of 20 product groups for central government authorities. Furthermore, the Ministry of Environment has declared a strategic focus on the sustainable procurement of transportation, buildings and food products (Open House 2012, p. 13).

3.1.3 GPP in Københavns Kommune (KK)

With the goal of becoming the world's first carbon-neutral capital city in 2025, the *CPH 2025 Climate Plan* is ambitious, yet progress is being made (CO2 emissions have been reduced by 21% in 2011, compared to 2005). The use of procurement (GPP) is stated as a primary strategy for the achievement of five major goals for 2025:

- Reduce energy consumption in city administration buildings by 40% compared to 2010.
- New municipal buildings up to 2015 must meet 2015 building code requirements and new buildings between 2015-2020 must meet the requirements of the 2020 classification.
- All city administration vehicles must run on electricity, hydrogen or biofuels.
- Energy consumption for street lighting in Copenhagen should be 50% compared to 2010.
- A total of 60,000 square meters of solar cell panels on municipal buildings have to be installed (Københavns Kommune 2012).

The *CPH 2025 Climate Plan* also states a desire to reevaluate KK's tendering processes with methods including Life-Cycle Costing (LCC) and functional tendering being incorporated. The construction sector has been identified as a key area to achieve both the above goals and the implementation of new tendering processes.

> The procurement strategy for 2011- 2014 defines a framework for actively promoting the issues of green growth and climate through procurement. Green growth will, in the future, be a primary consideration in the City Administration procurement policies - with regard to quality, the environment and the economy. The City Administration's procurement policies will increasingly focus on initiatives, which will lead to CO2 reductions and green growth being a direct consequence of these policies. Initiatives will concentrate on transport, energy consuming products and the construction sector (Københavns Kommune 2012).

KK's council first adopted a set of sustainable construction guidelines in 1998 with *Sustainability in Construction and Civil Works (Miljø i Byggeri og Anlæg (MIBA))*[8], which has been regularly updated (most recently in 2010). Intended to limit the environmental impact of KK's construction and civil works activities, the guidelines are expected to influence both public and private sector decision-making.

3.2 The Legal Framework for GPP

The following section will show that the legal ability for GPP exists. A number of avenues for the inclusion of environmental criteria into public procurement processes are available.

3.2.1 EU Procurement Directives

The awarding of public procurement above a set threshold is strictly guided by laws within the EU for the purpose of protecting contracting parties and ensuring the fundamental principles of trade equality and freedom. Their ultimate intention is to open up the public sectors of EU Member States for international competition. The EU's public procurement directives and regulations apply to all public tenders above set contract values (Table 1). These corresponding tenders must be published on the EU's Tender Electronic Database (TED).

Table 1 - EU Tender Value Thresholds. Source: Simap - Information about European public procurement (n.p.).

Type of Contract	Threshold
Public works	5 000 000 EUR
Service contracts	200 000 EUR
Supplies contracts	200 000 EUR
Supplies in the sectors of water, energy and transport	400 000 EUR
Supplies in the telecommunications sector	750 000 EUR
Contracts falling under the GATT agreements	130 000 EUR

[8] For the purpose of this paper, we will refer to this publication using its Danish abbreviation, *MIBA*.

Within the EU, a modernized legal framework for public procurement was defined by the European Parliament and Council in the 2004 EU Public Procurement Directives 2004/18/EC and 2004/17/EC. In contrast to previous procurement directives, the 2004 Directives specifically permit the inclusion of environmental considerations in tender awarding processes.

Following the success of the 2004 Directives, the EC adopted proposals for again updating these public procurement directives in December 2011. "These proposals are part of an overall programme aiming at an in-depth modernization of public procurement in the European Union" (European Commission Website - The EU Single Market 2011). Related to GPP, an important element of the proposed new directive is the authorizing of preliminary market consultations. The current lack of ability for procurement authorities to work closer with suppliers has been identified as a barrier to GPP.

3.2.2 Danish Procurement Legislation

The two directives introduced above have both been incorporated into the national Danish legal system. The implementation of the directives on procurement at the national level is the responsibility of The Danish Competition Authority. The directives apply to all contracts above the EU threshold value. Alternatively, the *Danish Act on Tender Procedures for Public Work Contracts* governs contracts below this threshold (Euro Info Centre Viborg, 2006).

3.2.3 Public Procurement Principles and Procedures

Basic Principles of Public Procurement

Public sector procurement authorities are guided by two primary principles, "value for money" and "acting fairly". "Value for money" is an obligation to ensure that taxpayers are getting the most value for their tax contributions. Procurement authorities are considered to be "acting fairly" through non-discrimination, equal treatment, transparency and proportionality (the tendering process should be proportionally appropriate to the objectives being pursued) (European Commission 2011, p.16).

Procurement Procedures

The four available procurement procedures are open, restricted, negotiated and competitive dialogue. Depending on the procedure, environmental criteria can be applied at different stages.

In an open procedure, all interested contractors are allowed to submit a tender and the winning operator is selected directly from the bids. This procedure offers the opportunity for many environmental solutions to be evaluated. However, it does not prescreen those invited to tender based on their environmental technical capacity.

A restricted procedure is a two-stage process where interested contractors express their interest but only some are invited to submit tenders. This process requires the evaluation of suppliers with criteria that includes their environmental/technical capacity. In our analysis of tender processes in KK's construction sector, the use of restricted procedure was most common.

In a negotiated procedure, the terms of a contract are determined through negotiation. Negotiated procedures are seldom used and only in special cases where overall costs cannot be predetermined due to performance risks or imprecise specifications.

Competitive dialogues are utilized for particularly complex projects. This procedure invites suppliers to a dialogue in hopes that the authority can identify a solution. The flexibility of this procedure may help the inclusion of environmental criteria, however competition issues exist as preliminary market consultations are currently not authorized (European Commission 2011).

3.2.4 How Environmental Criteria is Included

This section will examine how environmental criteria can be included in the procurement process through both tendering and contracting.

Definition of the Contract's Subject Matter

Contracting authorities define the contract's subject matter with the freedom to include environmental criteria. By doing so, they directly state their desire for a green solution which meets environmental considerations and their needs.

Technical Specifications

Technical specifications are obligatory characteristics that tender bids must meet and environmental criteria can be included. These criteria can be based on technical standards, Eco labels, performance requirements, production methods and material/chemical content (Nissinen and Parikka-Alhola et al., 2009).

Selection Criteria

The restricted procedure allows for criteria to be used in the selection of potential suppliers. This process evaluates whether suppliers have the capacity or track record to perform the contract (Francesco, 2011).

Award Criteria

The two permissible criteria for awarding a tender contract are lowest price and Most Economically Advantageous Tender (MEAT). Lowest price award criteria is based solely on price. MEAT is defined as the bid that best meets all purchasing criteria, not only price, from the perspective of the contracting authority. Additional criteria can include auxiliary costs, quality, aesthetics, technical capability, performance and environmental characteristics (Martineau, 2010). Life-Cycle Costing (LCC) can also be used to determine MEAT award criteria (Francesco, 2011).

Contract Clauses

Contract clauses are an important source for the inclusion of environmental conditions. Contractors can be obligated to meet specific levels of environmental protection in the execution of a contract. However, the clauses must be nondiscriminatory and follow the principle of proportionally (Palmuljoki and Parikka-Alhola et al. 2010). For KK, *MIBA 2010* is a way of achieving GPP by requiring its use in contract clauses.

3.2.5 Key GPP Tools

As both functional tendering and total costs are included in the *CPH 2025 Climate Plan,* we will explain these terms in more depth.

Functional Tendering versus Specification-based Tendering

Tenders can be divided into two main types: functional tenders and specification-based tenders. In Copenhagen, specification-based tenders are most common, however, the *CPH Climate plan 2025* includes a goal of using increased functional tendering.

In specification-based tenders, "the customer closely specifies the services required, thus defining the scope of the contract as well as the quality standards requested" (Austrian Energy Agency, 2007). Alternatively, in

functional tenders, "the customer has decided only on the function required, not which specific solutions should fulfill the function. These are developed by the contractor" (Austrian Energy Agency, 2007).

Life-Cycle Costing (LCC)

Vital to the concept of sustainable construction and buildings, LCC is fundamental to construction sector GPP initiatives. LCC "is a tool which evaluates the costs of an asset throughout its life-cycle" (European Commission Website LCC 2007). Motivation for LCC usage is based on cost savings that can be achieved when financial requirements for initial capital, operations, maintenance and decommissioning are valuated together. Often higher initial capital costs for environmental technologies (that increase efficiency) can be covered by lower operational, maintenance and decommissioning costs. This results in lower financial requirements over an asset's lifespan. Additionally, LCC efforts result in an asset having reduced energy, water and disposal requirements (which makes it a key GPP tool) (European Commission Website LCC 2007).

4. Methodology

In this section, we will take you through our methodological journey. Starting with an interest in sustainable urban development, our initial research resulted in the discovery of Green Public Procurement (GPP) as a tool for achieving sustainable development. Soon after, we came across the PWC et al. (2009) report where Denmark's construction sector GPP efforts scored particularly poorly. These intriguing realizations were our starting point, allowing us to narrow our research and commence our methodological journey.

4.1 Our Research Philosophy, Purpose and Strategy

We have adopted a critical realist philosophical position. Such a position implies that we assume that we can generate knowledge by applying a scientific approach. However, we do not believe that the reality of knowledge can be understood independent of the social actors involved. This implies that the process of public procurement in KK cannot be assessed from the "outside"; rather we need to talk to those actors that form the social structure around this specific practice. Furthermore, as critical realists, we acknowledge the importance of adopting a multi-level research approach (Saunders and Lewis et al., 2009).

Our overarching research purpose is to explain how and why certain barriers have a negative impact on GPP progress in KK's construction sector. In order to reach such an explanatory level, we will go through phases. The exploratory phase of our thesis pertains to both understanding GPP and investigating procurement processes

within KK. Therefore, our exploratory sections are used as a basis for our investigation into barriers hindering GPP's progress (Saunders and Lewis et al., 2009).

Our journey has taken on Grounded Theory as a research strategy. On this research strategy, Glacer and Strauss (1967: 3) state, "Our basic position is that generating grounded theory is a way of arriving at theory suited for its supposed uses." This relates to our own experience. At the beginning, we did not know where our research would take us. Instead, we needed to determine what was actually happening by talking to the individuals involved in the public procurement process. In view of this, the Grounded Theory approach made sense, as it is a way of solving problems by taking the perspective of human agents in order to understand what is happening (Haig 1995). According to Haig (1995), this implies that one starts by focusing on a specific area of study, in our case GPP in KK's construction sector. After gathering data and information from the real world, the next step of Grounded Theory is to generate theories in order to explain and systematize findings. In our case, we do not intend to come up with our own full-fledged theories. However, we do intend to highlight patterns that can be conceptualized in a model, more specifically we will introduce our Berntsen-Manner Model that will be applied in the *Analysis and Results* section.

Despite our results being based on GPP practices in KK's construction sector, the insights do not necessary only pertain to KK or the construction sector. Our hope is that our findings can prove useful to decision-makers and researcher in other municipalities, both in Denmark and abroad. This implies that our Grounded Theory strategy is also a case study. More specifically, it is a case of identifying barriers to GPP progress at the municipal level.

4.2 The Data Collection Process

In line with our Critical Realist position, we see no limitation in adopting mixed methods for our data collection. Therefore, we decided to use both quantitative and qualitative data, as well as, both primary and secondary data sources.

As we displayed in our *Introduction and Motivation* section, we began with the idea that a discrepancy exists between the progress and potential of GPP in KK's construction sector. We then wanted to discover why. In order to discover why, we realized that we had to start by developing an understanding of both GPP's progress and its practices in KK's construction sector. Additionally, we wanted to make our own judgment whether a discrepancy exists in KK, and not only at the national level (as was put forward in the report by PWC et al. (2009)).

Unaware of what we would specifically uncover, we began by diving into available literature on the topic. In doing so, an early realization was the need to understand how procurement processes work in KK specifically. In other words, we needed to "map the pipes" and determine how these "pipes" link to environmental objectives. This, however, proved to be more difficult than we first imagined. We were unable to fully map the decision-making process solely based on secondary data sources. Consequently, mapping the process became part of our interview data collection process and results. Our process of mapping out the decision-making structure of KK's construction sector is just one example of how our research strategy was a process in constant change and development (our Grounded Theory strategy).

4.2.1 Collection of Secondary Data

For secondary data, we utilized a wide variety of reports, academic papers and books. Initially, we conducted a review of the existing literature on GPP to understand the realm of knowledge on the topic and place our own research within the literary landscape. The Grounded Theory approach implies that we did not know what we were going to discover prior to collecting our data. More specifically, our identified barriers to GPP progress in KK's construction sector were not hypothesized prior to the review of this literature. This means that our literature review gives a general overview of previous GPP research by focusing on scope and methods used, rather than on barriers. However, in our result section we will link our empirical findings on each barrier level to previous research.

In evaluating our sources, it is important to note that most of our secondary data sources are published by established European institutions, or in collaboration with such institutions. This adds credibility to these sources. Furthermore, academic papers included in this thesis are published in peer-reviewed academic journals. This effectively reduces the likeliness of incorrect information and extreme bias (Saunders and Lewis et al., 2009).

4.2.2 Collection of Primary Data

Both quantitative and qualitative primary data were collected. By doing so, we aimed to collect the necessary data to analyze and present a holistic view of the progress and practice of GPP in KK's construction sector, and later on potential barriers.

Quantitative Data From the Tenders Electronic Daily (TED) Database

As a starting point, we performed a study of the TED database, which we later developed further into our quantitative data analysis. To define the population of tenders for our analysis, we applied the following delimitations:

- Timespan: 01-01-2012 to 31-12-2012.
- Level of authority: Regional or local level, municipality level.
- CPV[9]: Construction and real estate: Codes 45000000, 71000000 and 90000000.
- NUTS[10]: DK011 (excluding one tender from Frederiksberg Kommune as our scope is KK).

These delimitations gave us an initial population of 84 tenders. However, some were not applicable to our study. We decided to exclude tenders for cleaning services (7), painting services (1), graffiti removal services (2) and waste treatment (1). Furthermore, tender documents with very limited information (10) were excluded. Additionally, tenders at the regional level (3) were excluded, as well as incomplete procedures (6). After these exclusions, we had a final population of 54 tenders (Appendix 1).

Following the creation of our tender population, we organized the tender data into a spreadsheet with the aim of codifying each tender with a "level of green". To do this, we created a three-level "greenness" scale including Not-Green, Semi-Green and Green (Table 3, Section 5.2.1, p. 39).

Our collection of data from the TED database was part of our introductory research into the current state of GPP in KK's construction sector. However, we were aware of the significant limitations of exclusively utilizing TED for our primary data. First, the definitions of many terms on TED are unclear.[11] Consequently, there is significant room for interpretation among those using the database. Second, the database only includes projects over the EU threshold. One could assume that more effort is put into tender documents above the EU threshold, resulting in a higher frequency of green criteria in such tenders (Kippo-Edlund and Hauta-Heikkilä et al., 2013). Third, solely analyzing tender documents fails to identify process specific drivers for GPP. Due to these concerns, we deemed it necessary to complement our TED data with qualitative interviews.

[9] CPV codes standardize product and service groups for public procurement.
[10] NUTS codes are European regional codes.
[11] We contacted those responsible for TED but no documents clarifying terminology exist.

Qualitative Data - Interviews

The TED database findings revealed that the progress and potential of GPP are not aligned. However, our analysis of tender descriptions gave little insight into what could be the reason for this. Therefore, the next stage of our data collection process was to conduct semi-structured interviews. Our belief was that significant findings on GPP exist throughout the entire procurement process and not just in the tender descriptions.

The individuals we interviewed were not a completely random sample. Through the process of arranging interviews and determining who to speak with, we were often referred from one person to another. Despite some frustration, this organic process resulted in the discovery of individuals we were not originally aware of. The process took on an approach termed as snowball sampling, or chain referral sampling. According to Biernacki and Waldorf (1981, p.141), it can be defined in the following manner: "[Snowball sampling] yields a study sample through referrals made among people who share or know of others who possess some characteristics that are of research interest." This approach implies that our group of interviewees is not a statistically random sample. However, as our research progressed we chose to partially control the referral chains. We wanted to ensure that our sample included a representation of the population we were investigating (in qualitative terms) (Biernacki and Waldorf, 1981). Inspired by the Triple Helix concept[12], we aimed to interview public officials, industry members and researchers linked to GPP. Such a three-folded approach gave us a degree of control over the referral chains.

Our interview process started by cold calling procurement officials listed as contact points in our population of tenders from the TED database. In parallel, we contacted industry members who won the tenders and researchers identified in reports and publications. Of the three groups, individuals from industry proved to be the most difficult to arrange interviews with. After establishing contact and arranging meetings, we conducted semi-structured interviews with selected individuals from KK, industry and research (Table 2).

[12] The Triple Helix concept is a theoretical framework for innovation that focuses on public-private relationships and a position of industry-government-research collaboration. The Copenhagen Cleantech Cluster is based on this model.

Table 2 – Table of Conducted Interviews in Chronological Order. KK is green, research is red and industry is blue. All interviews were conducted in-person with the exception of Nikolai at Niras, who we spoke with by phone. All real names have been substituted for aliases. Source: Own development.

Interview #	Name	Group	Organization	Role	Length of Interview (min)
1 & 5	Jone	Københavns Kommune (KK)	Technic and Environmental Administration (TEA) -Center for Anlæg	Project Leader (roads, townscape and bridges).	60 & 32
2	Lasse	KK	Copenhagen City Properties (CCP)	Project Leader.	63
3	Mons	KK	CCP	Project Leader.	63
4	Olav	KK	CCP	Project Leader.	70
6	Carl	KK	Finance Administration (FA) - Center for Urban Development	Head of Center for Urban Development. Previously worked on Green Growth Team.	37
7	Tore	Research	Concito (Green Think Tank)	Knowledge Officer.	78
8	David	KK	TEA - Center for Urban Design	Project planning, architect.	91
9	Johan	KK	FA - Center for Finance/ economics, team procurement and contracts	Makes strategies and goals for procurement. Buys common products/ services that go across all the administrations.	110
10	Tim	Industry	Accenture (Consulting Firm)	Head of smart city engagements - Nordic. Energy, utilities team.	112
11	Andreas	Industry	Accenture (Consulting Firm)	Public sector group. Procurement (construction, building maintenance).	112
12	Dina	KK	TEA - Center for Anlæg	Supervises Project Leaders. Has been part of the three last *Sustainability in Construction and Civil Works (Miljø i Byggeri og Anlæg (MIBA)* editions, was in steering group of *MIBA 2010*.	68
13	Sunniva	KK	TEA - Center for Anlæg	Project Leader. Will be part of working group in *MIBA 2014*.	68
14	Nikolai	Industry	NIRAS (Consulting Firm, specialized in infrastructure, construction, planning and environment)	Energy, climate change, sustainability department.	49
15	Petra	Industry	MT Højgaard A/S (Construction and Civil Engineering Company)	Sustainability Officer.	85
16	Grete	Research	Copenhagen Business School	Associate Professor. Research area: EU public procurement law.	69

As our interviews were semi-structured, we had a pre-prepared list of questions and themes to be covered. We started with an initial set of questions and topics (Appendix 2a) that we used in our first interviews. As we gained new insights through this process, we chose to develop a second set of questions and topics to be covered in our interviews (Appendix 2b). This allowed us to gradually direct our attention towards important issues that were raised in our initial interviews, but that we did not consider beforehand (effectively exploring deeper into potential barriers).

The questions for each group were similar for the purpose of comparing findings and developing our results. However, conducting interviews in a semi-structured manner meant that each conversation was unique and topics were not covered in identical ways. The flow of the conversation determined which questions and topics were covered and to what degree (Saunders and Lewis et al., 2009: 320).

In constructing our questionnaires, we discussed potential biases and weaknesses of using semi-structured interviews. In a non-standardized interview, the main issues relate to reliability including interviewer bias and response bias (Saunders and Lewis et al., 2009: 326).

Interviewer bias relates to whether the comments, tone or non-verbal behavior of the interviewers results in the interviewees altering their responses. There was always a danger of unconsciously imposing our own beliefs and opinions. We believe we minimized this by having a set list of questions. Additionally, we utilized open-ended questions wherever possible. There is also the bias related to how we as researchers interpret responses and answers, and how the interviewees interpret our questions. To some degree, this bias was likely more prominent due to the fact that we conducted our interviews in English. Some English terminology was unclear to our interviewees and we do not know whether our interviewees always used the correct English terminology for what they wanted to communicate. To overcome this challenge, it was helpful that one of us speaks Danish, allowing interviewees to switch to Danish when they were uncertain about specific English terms.

The next bias that must be addressed is response bias. The perception our interviewees had of us may have affected their answers. It is in human nature to want to be liked, meaning that their answers could have been shaped by what they believed we wanted to hear. We attempted to limit this bias by initially introducing our topic as public procurement, not GPP. However, some interviewees only agreed to be interviewed after an explanation of our topic or if we agreed to send them a list of questions in advance. Supplying such information could have influenced those interviewees to assume that we have a certain environmental stance, resulting in corresponding answers. On the other hand, supplying such information can also improve the validity of results by allowing interviewees to collect information prior to the interview. In order to ensure that our interviewees were willing to share their personal thoughts, we made it clear that we would protect their identity. To achieve this, all names in this research paper have been substituted for aliases.

4.3 Our Analytical Framework: The Berntsen-Manner Model

Once our data was collected, the next step was to make sense of it all. We categorized and systemized our findings to analyze what they actually showed in terms of barriers to GPP. We made several figures and models,

extensively discussing the forces influencing the progress of GPP in KK's construction sector. Our aim was to conceptualize a model that effectively includes and systemizes the issues identified as having the greatest negative impact on GPP progress. This process led to the realization that barriers and external influences negatively affecting GPP are prevalent at different levels.

The analysis of our data led to our development of the Berntsen-Manner Model (Figure 10). This model is the basis of our analytical framework and is applied throughout Section 5, *Analysis and Result*. Specifically, we utilize the Berntsen-Manner Model as an analytical tool to explain why a discrepancy exists between the progress and potential of GPP in KK´s construction sector. In line with our Grounded Theory research strategy, we did not hypothesize this model prior to the collection of data. Instead, this model was created to explain our empirical findings.

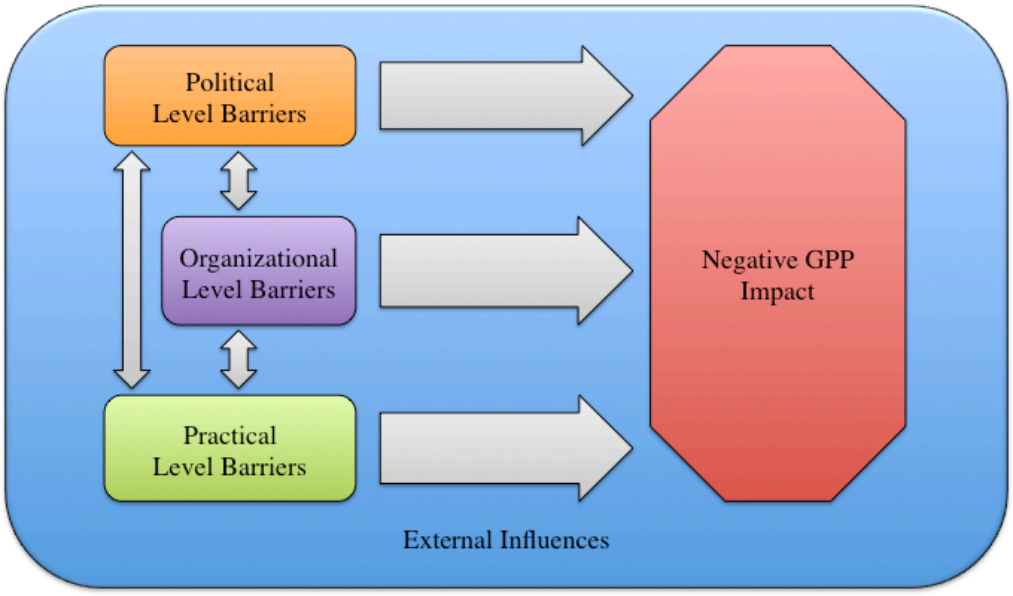


Figure 10 - Overview of Berntsen-Manner Model. Includes our three barrier levels and external influences. Source: Own development.

In our *Analysis and Results* section, we will present and analyze our empirical findings pertaining to barriers at three distinct levels: political, organizational and practical. Additionally, we will analyze external influences.

4.4 A Complementary Analytical Tool

After identifying specific barriers inhibiting GPP progress, we discovered a theoretical model that could be combined with our Berntsen-Manner Model to offer further insight. This model is the Norm-Model developed

by the Swedish professor Håkan Hydén. In this section, the theory and key elements of Hydén's Norm-Model will be outlined.

4.4.1 Hydén´s Norm-Model

GPP efforts in KK's construction sector are directed, shaped and performed by humans, implying that many components of GPP research can be termed as "soft" or intangible variables. These variables are socially determined within human systems. Therefore, they are affected by human behavior and agency. Within this human system, one finds established norms and the factors that determine these norms.

There is no single definition of the concept of norms, but Hydén (2002) offers an understanding of norms that allows the inclusion of both individual and system level determinants of actions. According to Hydén, norms can be understood as "guidelines for behavior generated within the frames of different action-oriented systems" (Hydén, 2002, p. 270, own translation). Hydén's model involves the deconstruction of norms into three elements: will, knowledge and opportunities. All three elements can either give rise to norms supportive of GPP or norms that hinder GPP action. The elements reflect determining factors in the formation of norms, namely will (values), knowledge (cognitive aspects) and opportunities (systemic conditions) affecting GPP actions (Figure 11). Not mutually exclusive, these three dimensions are interrelated, influencing each other in the formation of norms and action patterns. Consequently, the actions of procurement officials do not exclusively depend on the knowledge they possess or their values. Additional factors, such as systemic conditions, affect the ease at which they can perform GPP action.

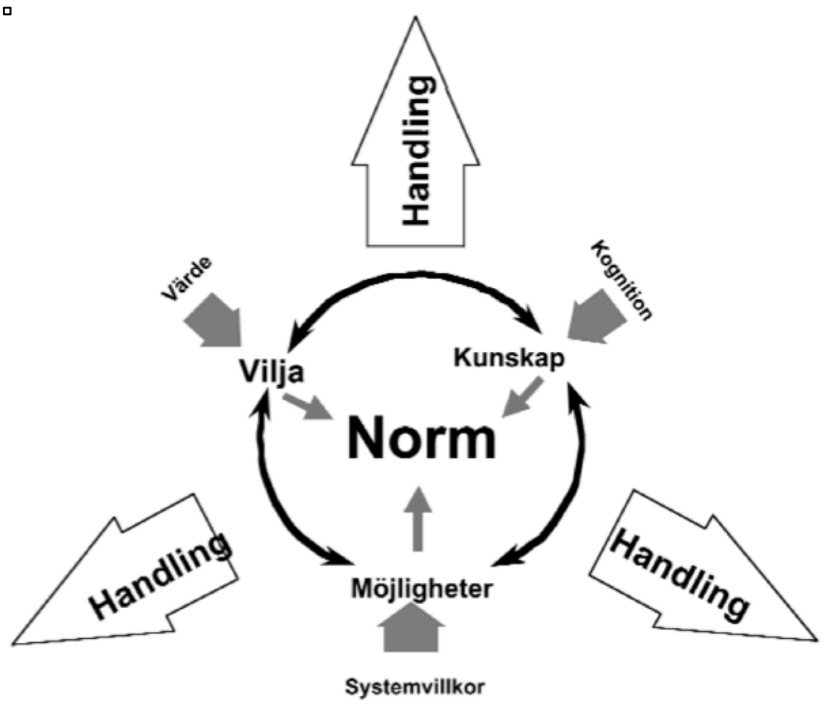


Figure 11 – Hydén's Norm-Model. Translation of components: Norm=Norm, Handling=Action, Vilja=Will, Kunskap=Knowledge, Möjligheter=Opportunity, Värde=Values, Kognition=Cognition, Systemvillkor= Systematic Conditions. Source: Hydén (2002).

A Combined System and Actor Approach

Our findings, indicating that barriers exist at both the actor and system levels, further strengthens the applicability of Hydén's Norm-Model as a complementary analytical tool. Our Berntsen-Manner Model also includes both the system and actor levels, allowing us to effectively combine the two approaches.

The implementation of environmental considerations is largely achieved at the practical level in KK. For example, individual procurement officers choose to act in certain ways. The will (largely determined by motivation and intrinsic values) and knowledge of procurement officials, as well as the opportunities they are presented with, directly impact the progress of GPP in KK. In Section 5.3.6, *Combining the Berntsen-Manner Model with Hydén's Norm-Model*, we apply Hydén's Norm-Model as a complementary approach to assess barriers to performing GPP action. This implies that our focus needs be more directed towards the actors. However, analyzing what determines the action opens up possibilities for including systemic factors inhibiting GPP. These include political level barriers, organizational level barriers and external influences.

Hydén´s Norm-Model in particular allows for reflection on the importance of values and motivation for GPP. This implies that we use Hydén's Norm-Model as a tool to strengthen our analysis by engaging discussion

around hidden elements. The motivation and values of individuals are difficult to uncover in interviews. Therefore, we cannot simply state that the interviewees hold certain values or motivations. Instead, we can discuss the potential effect that values and motivation can have on GPP, exposing the importance of these elements.

5. Analysis and Results

This section includes three primary components. First, we will introduce an organizational mapping of procurement in KK's construction sector. This allows us to understand which public actors are involved.

Second, we will assess the current progress and practices of GPP in this sector. As outlined in our *Introduction and Motivation* section, there are strong reasons to believe that GPP in KK's construction sector has not reached its full potential, however the findings from the PWC et al. (2009) report pertains to the national level and are from 2009. Therefore, we want make our own inferences and assess whether recent developments indicate any major change in GPP's progress, or whether KK has significantly better GPP progress than Denmark in general. Doing this allows us to present our own evidence on a GPP discrepancy in KK specifically. Additionally, it provides insights that are the basis for explaining why a discrepancy is present.

In the third and largest component, we will explain the discrepancy between current progress and potential in KK's construction sector by applying the Berntsen-Manner Model. The model will address barriers at three levels (political, organizational and practical), as well as external influences on GPP efforts in KK's construction sector. Lastly, we will combine the Berntsen-Manner Model with Hydén's Norm-Model to offer additional insights.

5.1 An Organizational Mapping of Procurement in Københavns Kommune (KK)

We will now outline the organizational makeup of procurement in KK's construction sector, as well as the most important political and administrative entities.

5.1.1 KK's City Council

The City Council is the highest political authority of KK, with 55 members elected for four-year periods. The head of the City Council, the Lord Mayor, summons the meetings, organizes the discussions and determines the agenda at city council meetings. Under the City Council, one finds the Finance Committee and six standing

committees, all with their own mayor. The members of the City Council make up the committees, implying that they are all politicians. The council is responsible for defining the tasks and responsibilities of the different committees.

5.1.2 KK's Committees

The political parties in the City Council elect both the members and mayors of KK's individual committees. This election follows a proportional representation, so the members of each committee reflect the political representation in the City Council. The 55 members of KK's City Council hold 79 positions/seats in the seven committees. This implies that several elected members of the City Council hold more than one committee seat. This especially pertains to the smaller parties (Johan KK-FA)[13]. The seven committees are:

- The Finance Committee.
- The Culture and Leisure Committee.
- The Children and Youth Committee.
- The Health and Care Committee.
- The Social Services Committee.
- The Technical and Environmental Committee.
- The Employment and Integration Committee.

Each committee has a specific area of responsibility. The individual committees make decisions in closed meetings within their area of expertise and responsibility. The City Council, on the other hand, makes decisions that pertain to overarching issues in open meetings. As the City Council is the highest political authority, it can choose to address any case where responsibility is on the municipality. In reality, the City Council delegates most responsibilities and gives the individual committees significant autonomy (Københavns Kommune: Sådan styres København 2013).

The overarching committee is the Finance Committee. This committee plans and coordinates the running of Københavns Kommune (KK). The Lord Mayor is the chairperson of the Finance Committee and the committee consists of 13 elected members. In addition to the Lord Mayor, the Finance Committee includes the six mayors of the standing committees and six other members from the City Council. Each of the other committees has 11 members, with the chair of the standing committees being the mayor of the corresponding administration. Each

[13] For an explanation of the codification of interviewees for in-text references see Table 5, Section 5.2.2, pg. 42.

committee has their adjoining administration that is responsible for the tasks covered by that specific committee. For example, the Finance Administration (FA) manages the Finance Committee's area of responsibility. We will now continue by introducing the administrations.

5.1.3 The Seven Administrations and Their Procurement Responsibilities

First, we would like to identify a key difference between the Committees and Administrations. The Committees consist of politicians elected for four-year terms, while the administrations consist of full time employees. KK practices a form of divided administrative leadership with the Lord Mayor and the six other administrative mayors sharing administrative leadership (this is also referred to as the seven-mayor governance model). This is evident with each mayor having the highest authority within his or her administration (Københavns Kommune: Borgmestre 2013).

The administrations in Figure 12 are linked to each of the committees introduced above. Each administration specifically deals with issues related to their standing committee. As evident in the figure, there are seven administrations in the municipality, each with their own committee and mayor. This illustrates the high degree of independence among the administrations.

Figure 12 - Organizational Map of KK. The figure shows that the City Council has ultimate authority before the seven committees and the seven administrations. The administrations highlighted in red boxes are central to GPP in KK's construction sector. Source: Own development based on interviews.

In relation to public procurement in the construction sector, three public entities are of high relevance, namely the Finance Administration (FA), Copenhagen City Properties (CCP) within The Culture and Leisure Administration and The Technical and Environmental Administration (TEA).

The Finance Administration (FA)

In terms of procurement, the FA is responsible for common products and services that are needed across all administrations. Johan, an interviewee from the FA (KK)[14], gave us some specific examples such as electricity, office supplies and light bulbs. According to Johan, his administration procures "the [services and goods] that no other administration feels bad about the FA taking care of." Alternatively, administrations are responsible for procurement in areas where they have expertise.

The Centre for Urban Development is under the FA and is responsible for green growth strategies within the municipality. Additionally, the Center for Finance and the team for procurement and contracts are under the FA umbrella. The team for procurement and contracts is responsible for the overarching procurement strategies and procurement activities. In our interview with Johan (KK-FA), he stated, "We are the center that makes the strategies and goals. The politicians tell us what they want and we try to make it happen."

The Culture and Leisure Administration (CLA)

Copenhagen City Properties (CCP) can be found under the CLA. As the property company of KK, CCP's main services are the operation, maintenance and leasing of municipal buildings, as well as new building projects. According to Johan (KK-FA), CCP is responsible for "any building or facility that citizens in the municipality can use." Examples of projects include cultural centers, administration buildings, libraries, and school facilities.

The Technical and Environmental Administration (TEA)

The TEA is responsible for construction works projects. Additionally, they have the responsibility for producing the *Sustainability in Construction and Civil Works 2010 guidelines (Miljø i byggeri og anlæg* (*MIBA*)) together with the Culture and Leisure Administration (CCP division) (Københavns Kommune 2013). When compared to CCP, the TEA is responsible for more extensive projects, often infrastructure related. Examples of projects are parks, outdoor areas, bridges, roads and new urban areas (Johan, KK- FA; Dina, KK- TEA & Sunniva KK-TEA).

[14] For an explanation of the codification of interviewees for in-text references see Table 5, Section 5.2.2, pg 42.

5.1.4 Important Takeaways Regarding the Organizational Structure of KK's Procurement

This section has provided an introduction to the organizational structure of KK. Additionally, it has presented the divisions of authority and key administrations related to GPP in KK's construction sector. From our findings, it is evident that the procurement function has a high degree of decentralization, with every administration being responsible for part of KK's total procurement.

In 2009, the FA held a conference regarding the governance model of KK, with the pros and cons of having a committee model with seven mayors being discussed. A repeated concern during this conference was that the governance system complicates and restricts the successful implementation of strategies and initiatives across the administrations. KK was criticized for being less efficient and more resource intensive than other big municipalities in Denmark. According to Johan (KK-FA), only four other Danish municipalities have a similar system with divided administrative leadership (more than one mayor). He additionally explained that KK could save 150 million DKK a year if KK went to a single mayor system. However, it was also pointed out, both at the conference and by our interviewees, that the current governance model secures a high degree of balance/parity in decision-making, which is seen as an advantage from a democratic standpoint (Københavns Kommune, Økonomi Forvaltningen 2009; Johan, KK-FA; Dina, KK-TEA & Andreas, I-Accenture).[15]

5.2 Current Progress and Practices of GPP in Københavns Kommune's (KK) Construction Sector

The following sections will present our findings related to the current progress and practices of GPP in KK's construction sector. First, an analysis of tender documents from the Tender Electronic Daily (TED) database will be presented. This analysis will help establish the current level of GPP while also indicating where environmental considerations are included in procurement processes. Following our examination of tender documents, the current state of GPP will be further analyzed utilizing a series of interviews. The insights gained in this section will allow us to present our evidence on the GPP discrepancy in KK's construction sector.

5.2.1 TED Database Analysis

Our analysis of the TED database is based on a population of 54 tenders from the 2012 calendar year.[16] Our examination for environmental considerations in the tenders included their description of contract, technical

[15] For an explanation of the codification of interviewees for in-text references see Table 5, Section 5.2.2, pg. 42.
[16] For specifics on the population of tenders, see Section 4.2.2 and Appendix 1.

specifications, other contractual conditions and award criteria. Identified methods used by procurement authorities to incorporate environmental considerations included requirements for certifications or standards and environmental capability demands for bidding suppliers. Additionally, some tenders included a link to the construction guidelines *Sustainability in Construction and Civil Works 2010 (Miljø I Byggeri og Anlæg 2010*, *MIBA 2010*). The *MIBA 2010* guidelines have been identified as a central tool to GPP in KK's construction sector.

Table 3 outlines our justification for classifying individual tender descriptions as Not Green, Semi-Green or Green. Furthermore, Table 4 presents examples of environmental considerations in Green and Semi-Green tenders.

Table 3 - Justification For Classifying Tender Descriptions as Not Green, Semi-Green and Green. Source: Own development.

Classifications of Tender Descriptions from TED Database		
Not Green	**Semi-Green**	**Green**
The tenders with no mentioning of environmental criteria fall within this category. Some tasks are "green" in themselves, such as building bike roads, however such project would still be considered as Not Green unless environmental demands are specifically included. Tenders with lowest price selection criteria automatically fall within this category.	Tenders with some vague mentioning of environmental aspects are considered Semi-Green. Such tenders include those that state that certifications and or standards are required, yet without specifically mentioning which ones. Furthermore, the tenders with no environmental aspects except a link to the webpage where the *MIBA 2010* guidelines are available are within this category.	The tenders that explicitly include environmental considerations fall within this category. In such tenders, specific demands are outlined. Furthermore, the tenders that include environment as weighted award criteria are deemed Green.

Table 4 - Examples of Environmental Considerations in Green and Semi-Green Tender Descriptions. Source: TED database.

Examples of Environmental Considerations in the Tender Descriptions

1. Green: Link to *MIBA 2010* (Sustainability in Construction and Civil Works 2010). Asks for experience with energy renovation and informs that minimum levels of standards can be required.
2. Green: Functional tender, refers to the climate goals. Asks for energy efficient solutions; competitive dialogue to develop best possible solutions.
3. Green: Link to Bygningsreglementet 2010 (Rules for Construction and Civil Works 2010). References showing experience with energy efficient solutions and technology will be weighted.
4. Green: Asks for Life Cycle Costing (LCC) and bids must be in line with low energy class 2015 in Bygningsreglementet 2010 (Rules for Construction and Civil Works 2010).
5. Semi-Green: Suppliers have to show experience with environmental considerations and asks for information about certifications.
6. Semi- Green: Consultant is to prioritize between different projects based on environment; goal is to save energy.

Out of our population of 54 tenders, none included environmental impact as specific award criteria. Overall, our analysis identified limited environmental considerations and requirements. In fact, only 15 of the 54 tenders can be categorized Semi-Green or Green. Furthermore, only four met our requirements to be categorized as Green (Figure 13). Of the four Green tenders, one included a Life-Cycle Costing (LCC) requirement, while another was written as a functional tender. This is interesting as both LCC and functional tenders are mentioned as focus areas within the *CPH 2025 Climate Plan*, indicating limited progress implementing these procurement climate policy tools. Furthermore, both LCC and functional tendering are core GPP tools. The additional two Green tenders mention sustainability requirements and link to either Bygningsreglementet 2010 (Rules for Construction and Civil Works 2010) or *MIBA 2010* (Table 4).

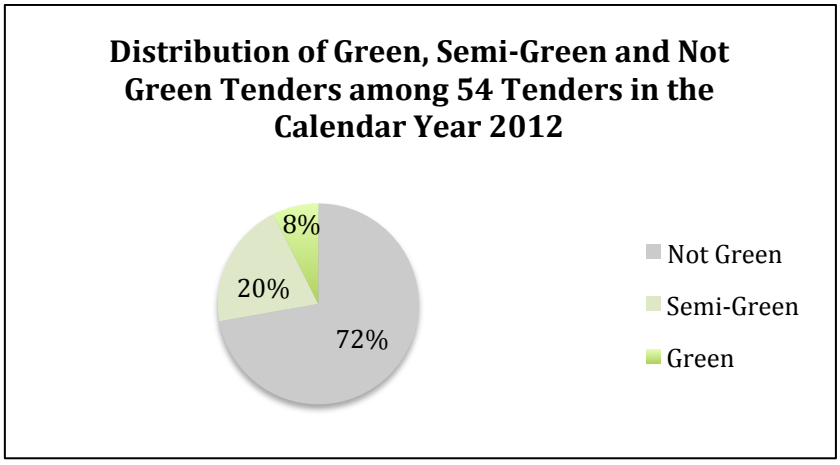


Figure 13 – Distribution of Green, Semi-Green and Not Green Tender Descriptions. Total tenders: 54. Tenders are from the calendar year 2012. Source: TED database.

Among the 11 tenders we categorized as Semi-Green, seven did not specify environmental demands. Instead, they simply included a link to a webpage with a link to the *MIBA 2010* guidelines. Procurement officers in Copenhagen City Properties (CCP) wrote all these seven tenders. Figure 14 indicates that CCP outperforms the Technical and Environmental Administration (TEA) in including environmental considerations in their calls for tenders. However, this difference is mainly due to the inclusion of a link to *MIBA 2010* in CCP's tenders. In order to identify such tenders as being "green", the companies wishing to place bids must already be aware of the existence of the *MIBA 2010* guidelines. If not, the link (and guidelines) could easily be missed as there are a variety of other publications on the same website. Nevertheless, through our interview process we discover the key role of the *MIBA 2010* guidelines for GPP in KK (therefore, we deem it relevant in determining a tender's level of green).

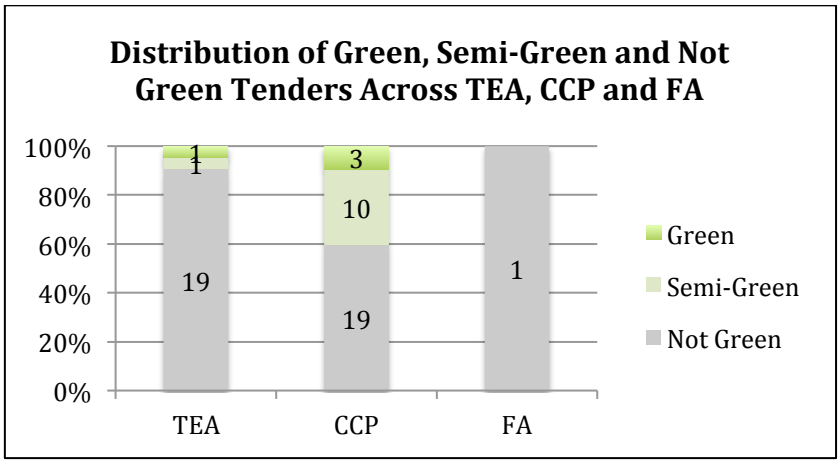


Figure 14 - Distribution of Green, Semi-Green and Not Green Tender Descriptions across TEA (The Technical and Environmental Administration), CCP (Copenhagen City Properties) and FA (The Finance Administration). Values are given in absolute numbers. Total tenders: 54. Tenders are from the calendar year 2012. Source: TED database.

Figure 15 illustrates the distribution of award criteria (MEAT versus lowest price) in our three categories of green. The results show that it is common practice to use Most Economically Advantageous Tender (MEAT) award criteria. Only 10 tenders used lowest price as award criteria, automatically falling within the Not Green category. MEAT award criteria, in contrast to lowest price, allows for the inclusion of considerations beyond simply the price. This finding is positive in relation to GPP, as it indicates that the opportunity for including environmental considerations is present.[17]

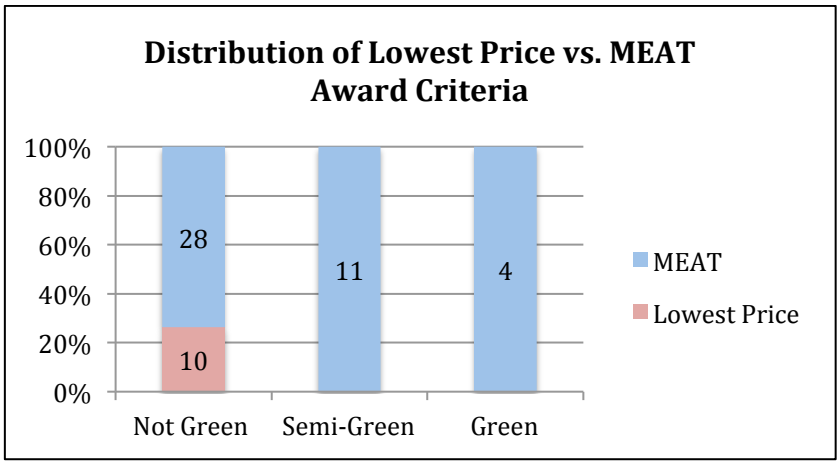


Figure 15 - Distribution of Lowest Price vs. Most Economically Advantageous Tender (MEAT) Award Criteria Across our Three Levels of Green (Not Green, Semi-Green and Green). One tender was excluded due to unspecified award criteria. Total tenders: 53. Tenders are from the calendar year 2012. Source: TED database.

[17] With Lowest Price award criteria, suppliers compete solely on price. In contrast, Most Economically Advantageous Tender (MEAT) award criteria includes aspects such as quality, performance and functionality. Additionally, clearly defined environmental criteria can be included, resulting in suppliers competing on environmental aspects.

5.2.1.1 Takeaways From the TED Database Analysis

In conclusion, our analysis found a significantly low level of GPP effort and progress in KK's construction sector when solely examining tender descriptions in our population.[18] This finding is in line with the preliminary research and interviews we performed when developing our research topic. Here, the idea that considerations for the environment are largely in the procurement process (and not necessarily in tender descriptions) was first presented. Therefore, our findings from the TED database support further research using alternative methods.

5.2.2 Empirical Evidence from a Series of Stakeholder Interviews

We will now focus on the results of our qualitative interview process to examine the current progress and practices of GPP in KK's construction sector. We have chosen to codify our interview groups and public administrations as outlined in Table 5 below.

Table 5 - Codification of Interview Groups for In-Text References. Interview subjects will be referenced according to both their organization and interview group. Source: Own development.

Interview Group	Interview Group Code	Organizations
Københavns Kommune	KK	Finance Administration (FA).
		The Technical and Environmental Administration (TEA).
		Copenhagen City Properties CCP).
Industry	I	Accenture: Consulting firm.
		MT Høygaard: Danish construction and civil engineering firm with leading position in the Nordics.
		NIRAS: Consulting firm specialized in infrastructure, construction, planning and environment.
Research	R	CBS: Copenhagen Business School.
		Concito: Green think tank and independent organization that specializes in climate and environmental issues.

5.2.2.1 Interviewees' Perceptions of KK's Construction Sector Procurement Processes

In this section, we will introduce our interview subjects' perceptions of how well procurement processes work in KK's construction sector. The aim of this section is not to go in-depth on the issues presented by our interview subjects. Instead, we want to highlight the general opinions of our interviewees regarding procurement in KK's

[18] Another interesting finding was that no tender document was completely available in English, despite all meeting the threshold requiring EU wide distribution (via TED). This could potentially have an effect on the competitiveness of the tender process with suppliers discouraged from bidding due to this language barrier. We believe this would be an interesting area for further research. However, our analysis will not be looking further into this effect.

construction sector. The specific concerns raised by interviewees will be addressed in-depth in Section 5.3, *GPP Barriers and External Influences in KK's Construction Sector*.

12 interviewees were questioned regarding how well they believe the procurement process works in KK's construction sector. From Figure 16, it is evident that a majority of our interviewees see some issues with current procurement processes.

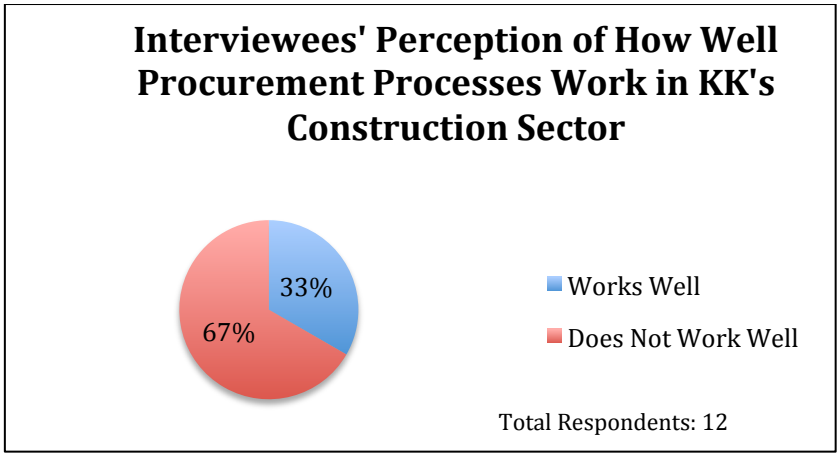


Figure 16 – Interviewees' Perception of How Well Procurement Processes Work in KK's Construction Sector. Source: Own development based on interviews.

Four of our interviewees were supportive of procurement processes in KK's construction sector. They mentioned that "it works well" (Lasse, KK-CCP), that "it is good" (Jone, KK-TEA), that it is "professional compared to other municipalities" (Olav, KK-CCP) and that the "process is better than other places" (Petra, I-MT Højgaard). Additionally, Lasse, Jone and Olav stated that the process fulfills its primary objectives of meeting policy requirements, legal frameworks and competition levels. Interestingly, three of the four interviewees with a positive view of KK's procurement processes are KK employees. However, out of eight interviewees working for KK, the majority (5) expressed concerns about procurement processes in KK. This implies that there is not a dominant bias with KK's employees viewing KK in a favorable light.

In total, eight interviewees believe that KK's procurement processes do not work well. Four out of the five KK interviewees in this group pointed to the fact that they find the procurement function too complicated. Sunniva (KK-TEA) mentioned that it is complicated and Dina (KK-TEA) agreed by stating that it is "rather complicated…things could [be] done much faster." David (KK-TEA) had a similar opinion, "I do not think it works that well, it is too hard to have an overview." Carl (KK-FA) additionally indicated that complexity is an issue. He believes that there are too many requirements and regulatory layers included in the procurement

process. Furthermore, he was concerned that including environmental considerations in KK's procurement would add complexity to an already complicated process. Johan (KK-FA) agreed with the concerns of his fellow KK employees. However, he primarily identified a different issue causing the procurement function to work ineffectively:

> [KK's public procurement] is not that good. As a civil servant, I can see that we waste a lot of money, but it is all about politics. It is a very democratic system. The political agenda is to spread out power.

Here Johan is referring to the fact that spreading out power is good from a democratic standpoint but that it can also complicate the procurement process. In particular, it can make coordination difficult, as each administration is largely independent with its own areas of responsibility.

Our two interviewees from research, Grete (R-CBS) and Tore (R-Concito), stated that the procurement process currently does not work that well. Grete explained how Denmark's strict interpretation of EU procurement regulations has a negative effect on its public procurement function. She further explained how the strict interpretation is likely the result of the unique complaints board process in Denmark for procurement disputes. The Danish complaints board process is very efficient (low cost and time requirements) compared to other EU Member States. The outcome is that public officials are hesitant of disputes and therefore avoid creative procurement processes. Andreas (I-Accenture) also stated that that the procurement process could work better if public officials were less risk-averse and dared to employ more creative procurement processes.

5.2.2.2 GPP Practices in KK's Construction Sector

This section will first outline three ways in which environmental considerations can be incorporated into KK's procurement processes according to our interviewees. These include the two-stage restricted procedure, MEAT award criteria and the technical specifications in calls for tenders. We will then introduce the role of KK's *Sustainability in Construction and Civil Works 2010* (Miljø i Byggeri og Anlæg - *MIBA 2010*) guidelines. In our series of interviews, these guidelines were identified as a primary GPP tool in KK's construction sector. Lastly, we will introduce the interviewees' perceptions of who is the decision maker for the promotion and implementation of GPP in KK.

How Environmental Requirements are Incorporated

Through our interview process, we were able to gain an overview of how the procurement process works in KK's construction sector, as well as how GPP is currently being implemented. As was suspected from our analysis of the TED database, the procurement process itself holds many key procedures and opportunities for the inclusion of environmental criteria that are not immediately obvious from only analyzing tender descriptions.

Tendering within KK's construction sector is most commonly a two-stage restricted procedure process. This consists of an initial qualification screening of interested suppliers before allowing four to six official bids to be submitted. The two-stage restricted procedure process, utilizing a pre-screening phase, allows the environmental capabilities and track records of firms to influence the tendering outcome. This is due to the elimination of bidding suppliers without certain capabilities or negative environmental track records.

Our interviewees confirmed our findings from the TED database that most tenders are awarded according to Most Economic Advantageous Tender (MEAT) award criteria versus lowest price. Through our interview process, the specifics of how MEAT is interpreted and practiced were presented. Dina (KK-TEA) said that the switch from using lowest price to MEAT has created an opportunity for the inclusion of environmental considerations in the tender process. This is because MEAT is not exclusively focused on price; instead, aspects such as quality, performance and functionality can be included.[19]

Several interviewees, who are project leaders (writing tenders on a daily basis), insisted that it is possible for them to include environmental requirements in the technical specifications of tenders. From Dina's (KK-TEA) perspective, environmental considerations are mainly built into the technical specifications and not necessarily included as part of the criteria weighting. However, overall it was unclear to what extent this possibility is utilized in reality. Furthermore, Andreas (I-Accenture) questions this method's effectiveness by stating, "Material listed as best-in-class is fluffy." Here, Andreas is referring to his belief that the impact of including environmental considerations in technical specifications is constrained by the abilities of the procurer. Procurers may request materials that are "best-in-class" because they do not have specific knowledge on the options available. Consequently, this lack of knowledge will also prevent them from judging whether the provided solution is indeed the best option.

[19] MEAT can include environmental criteria that is clearly defined, related to the subject matter, weighted compared to the other award criteria and quantifiable (European Commission 2011).

The Role of the MIBA 2010 Guidelines

Not obvious from our initial analysis of the TED database, the most significant tool for promoting GPP in KK's construction sector is the internally produced *MIBA 2010* guidelines. For KK, *MIBA 2010* is a way of achieving GPP by including environmental considerations in contract clauses. KK achieves this by linking their *MIBA* guidelines to tendering contracts and thus suppliers have an obligation to meet these guidelines. Noted as an obligation under "Other Contractual Conditions" within tender descriptions, the *MIBA* guidelines are almost universally known and utilized among our interview subjects.

The 2010 version of the *MIBA* guidelines is the 3rd edition after first being developed in 2002 and updated in 2006. An obligation to meet the *MIBA* guidelines exists for any construction sector project where a public authority provides part or all of the funding and public officials oversee the project. As David (KK-TEA) explained, this includes their own building stock (managed by CCP), as well as social housing projects across Copenhagen (20% of total housing in Copenhagen), private rental properties, cooperatives (andelslejlighed) and condominiums.

The guidelines are politically agreed environmental demands for construction sector procurement within KK and it is accepted that these demands should be met to the greatest extent possible. While not legally binding, these guidelines are politically binding and widely used at the practical level. However, no sanctions exist if these guidelines are not complied with (Olav, KK-CCP). Contrarily, all construction works within KK have a legal obligation to meet minimum regulatory standards, which *MIBA* typically exceeds. Olav explained how this was especially true when *MIBA 2010* was introduced with suppliers often citing the guidelines as too difficult and ambitious. However, suppliers overcame this resentment within a year and legal regulations have now caught up with some of the *MIBA 2010* objectives. For this reason, the administrations are currently discussing the development of a 4th edition of the *MIBA* guidelines for 2014. David (KK-TEA) is in charge of evaluating support for the project and he expects support for this new edition to exist because "much has happened since 2010." Additionally, he noted that the *MIBA* guidelines address certain sustainability issues that regulations simply cannot be made for.

Decision-Makers for GPP

As part of our research, we wanted to determine where ultimate decision-making power and influence for the promotion of environmental initiatives (including GPP) lies. Overall, most interviewees placed this key decision-making authority in the hands of politicians. Tore (I-Concito) summarized this opinion with "it depends on the

standards and regulations used, and the politicians have the power to change [these]." Johan (KK-FA) alluded to how this process works in a practical sense: "The politicians pass on messages to us on how to spend the budget." Despite some consensus on the importance of political support for the promotion of GPP, the responses we received regarding decision-making authority from other interview subjects varied extensively. Additional opinions placed the decision-making power with the National Ministry of Climate and Energy (Andreas, I-Accenture), the procurement office of KK's FA (Lasse, KK-CCP; Mons, KK-CCP & Olav, KK-CCP) and in the hands of private and public companies (Nikolai, I-Niras).

This split in opinions is an interesting observation. When we tried formulating our question differently, asking who is the GPP decision-maker at the project level, our interviewees placed this responsibility on project leaders. It is interesting that our interviewees initially placed the responsibility on politicians and other individuals rather than on themselves. It is clear that politicians are important decision-makers when it comes to GPP, but so are project leaders and other public officials working in KK's procurement functions. This is particularly true if one considers the importance of the *MIBA 2010* guidelines to KK's GPP efforts. The interviewees agreed that it is the responsibility of project leaders to implement the guidelines outlined in *MIBA 2010*, implying that they are also influential decision-makers.

5.2.2.3 The State and Progress of GPP Implementation in KK's Construction Sector

When assessing the extent of GPP implementation in KK, two GPP tools (the *MIBA* guidelines and Life-Cycle Costing (LCC)) caught our attention, but for different reasons. Our interviewees often mentioned the *MIBA 2010* guidelines, with the general opinion being that it is the central GPP tool in KK. On the other hand, LCC has significantly less usage in KK, despite being a fundamental GPP tool in the construction sector. These realizations resulted in us exploring the usage of these specific tools further. Furthermore, focusing on LCC and the *MIBA* guidelines offers an opportunity for specific analysis and evaluation. Therefore, we will now analyze the state of GPP in KK's construction sector using these two GPP tools. Additionally, we will address the interviewees' perceptions of how "green" they believe procurement processes are in KK's construction sector.[20]

The Implementation of the MIBA 2010 Guidelines

Given the environmental significance of the *Sustainability in Construction and Civil Works 2010 (Miljø i byggeri og anlæg (MIBA 2010))* guidelines, one could argue that the success of this initiative may reflect the

[20] By "green" we mean the inclusion of environmental considerations and criteria in the tender process.

overall progress of GPP in KK's construction sector. However, over the course of our interviews, distinct and varied opinions regarding the impact validity of the *MIBA* guidelines emerged.

From the perspective of interviewees working at the practical level within the Technical and Environmental Administration (TEA) and Copenhagen City Properties (CCP), the *MIBA 2010* guidelines have largely been implemented and achieved. Both Olav (KK-CCP) and Sunniva (KK-TEA) suggested that 90% of the guidelines are reached on average (also stating that 100% is impossible). Jone (KK-TEA) agreed that most projects reach the criteria outlined in "the bible" (referring to *MIBA 2010*). It was even suggested by David (KK-TEA) that it is possible for project leaders to go beyond *MIBA 2010* but that it seldom happens. Overall, these interviewees have quite positive opinions towards the *MIBA 2010* guidelines. However, the same interviewees also expressed concerns regarding the availability of adequate knowledge, manpower and financial resources for its successful implementation. Additionally, among our interviewees from industry and research, a common concern was regarding the ability of project leaders to ensure that the sustainability objectives of the guidelines are achieved. Additionally, our interviewees from KK stated that they had not had any training or courses on the implementation of the *MIBA* guidelines.

Currently working for the construction firm MT Højgaard (I), Petra previously worked for Niras (I) and also participated in developing the *MIBA 2010* guidelines. Having this intimate and multiple-aspect view of the *MIBA* guidelines, Petra's concern regarding a lack of follow-up by project leaders is significant. In her opinion, there is a clear need for reviewing which *MIBA* objectives projects achieve and to what extent. Contrary to Petra, Dina (KK-TEA), who oversees a number of Technical and Environmental Administration (TEA) project leaders, insisted that project leaders are responsible for following up and ensuring that suppliers meet the guidelines. However, the reality of this statement was immediately questionable when she further explained, "If they do not follow up, I cannot do anything about it, but I would call them in for a talk." Beyond following up on *MIBA's* objectives, Petra also believes it would be advantageous for *MIBA* guidelines to be ranked and prioritized. In her opinion, the pick-and-choose nature of the guidelines leaves too much room for interpretation and choice, when in reality not everything can be achieved.

The Implementation of Life-Cycle Costing (LCC)

The extent of GPP implementation in KK's construction sector is significantly limited by a lack of LCC usage. A key component of GPP, LCC is core to any strategy for the inclusion of environmental criteria into public procurement. Within the *MIBA 2010* guidelines, the promotion of a life-cycle approach to construction projects

is only mentioned once: “Sustainable project design comprises a life-cycle perspective for materials, structures, piping and wiring, and the project as a whole, from extraction to removal” (Københavns Kommune 2010).

Overall, our interview subjects indicated that LCC usage has only been established to a small degree. When questioned about LCC usage within the Finance Administration (FA), Johan (KK-FA) was aware of a single example where they used LCC for the purchase of light bulbs. He also mentioned that the FA is focusing on LCC in a trial and error format, as it is a new tool to them. His belief is that the use of LCC will be mandatory by all public authorities with the upcoming new EU directives.

Our interviewees’ specific opinions on LCC as a tool and issues related to LCC usage will be addressed in Section 5.3.4, *Practical Level Barriers*. This section only illustrates that LCC usage is currently very limited.

Interviewees’ Perceptions of the “Greenness” of KK’s Construction Sector Procurement

Our interviewees’ perceptions on how “green” KK’s construction sector procurement is varied a large degree. Nikolai at Niras (I) stated, “It is very rarely København Kommune has a focus on green procurement, [it is] very very low, and not that obvious.” Other opinions included Petra (I-MT Højgaard) stating, “We include sustainability in almost every bid,” and Mons (KK-CCP) explaining, “We have to include [environmental criteria], the politicians say so.” Others stated that the procurement process is green as project leaders have to use the *Sustainability in Construction and Civil Works 2010* (*Miljø I Byggeri of Anlæg 2010 - MIBA 2010*) guidelines (Jone, KK-TEA; Sunniva, KK-TEA & Sunniva, KK-TEA). Additionally, Dina (KK-TEA) said that environmental considerations are included in the procurement process. To exemplify this, she identified their shift from using lowest price award criteria to using MEAT (Most Economically Advantageous Tender). According to Dina, this is where environment considerations come in.

Tore from the research organization Concito had a particularly negative view regarding the level of GPP within KK:

> Price is still the dominant factor. This is a problem. In order to achieve green growth you need the procurement process to focus on green aspects. It should be 50/50 [price and environment] (Tore, R-Concito).

Several interviewees in KK agree with Tore that price is still a significant factor. According to these interviewees, price remains a large component of the awarding process, but it was emphasized that quality

aspects of bids are also considered. Project leaders in KK's Technical and Environmental Administration (TEA) (Lasse, Mons) and Copenhagen City Properties (CCP) (Olav) said that a 50/50 split between price and quality aspects is common. However, these quality aspects range from project planning and management to historic preservation, with environmental considerations being just one of many qualities. Johan (KK-FA) spoke about the difficulties of balancing historic preservation with improving the energy efficiency of existing buildings. Referring to KK's Rådhus (City Hall), Johan stated, "This building is very hard to do anything about because there are so many regulations." Opinions regarding the extent to which environmental quality is weighted (when included) were fairly consistent. Nikolai from Niras (I) placed this figure as 10% at most, while Sunniva (KK-TEA) put it between 10-30% (again, when included). Sunniva further explained that despite utilizing MEAT award criteria, price still largely dominates the decision process, with little (if any) quality aspects. Olav, at KK's CCP, supported this claim by stating that awarding a tender to the lowest price bid that reaches the required technical specifications is common practice.

The variation in opinions regarding the "greenness" of KK's construction sector was mostly consistent with the interview subject's point of view, representing research, industry or KK. Interviewees from research-based organizations like Niras and Concito were more critical of KK's current state of GPP (relative to what they believe is possible). Alternatively, those working with procurement within industry and KK were generally more positive regarding the state of GPP and the inclusion of environmental criteria into their work. This degree of separation in opinions can be expected and was a consideration in designing an interview process that is holistic, incorporating the differing opinions of stakeholders.

5.2.2.4 Takeaways from a Series of Stakeholder Interviews

The interviewees' perceptions of how well KK's procurement processes work indicates that there is room for improvement. A majority of our interviewees stated that procurement processes do not work well, raising concerns pertaining to specific issues having a negative impact on the procurement function. These concerns were raised in relation to procurement and not specifically GPP. However, these concerns are highly relevant to GPP as it is by definition a part of procurement processes. Additionally, we have identified the main avenues for the inclusion of environmental considerations in KK's procurement process. These were highlighted by the importance of the *MIBA* guidelines in KK's GPP efforts. Furthermore, we have reflected around the key decision-makers in relation to GPP. The general stance among our interviewees was that municipal politicians have the most influence.

We have additionally assessed the current progress of GPP by investigating the usage of *MIBA 2010* and LCC. The *MIBA* guidelines are claimed to be an important avenue for green considerations, which can indicate successful GPP implementation. However, several concerns related to the guidelines were also raised. As far as LCC, the very limited usage of this tool indicates that current GPP progress is less than satisfactory. Lastly, interviewees from KK indicated that price is still the most common and important determining factor in awarding tenders.

5.2.3 Current Progress and Practice of GPP: Takeaways

Bringing our findings together from both the TED database and our series of semi-structured interviews, it is evident that a discrepancy exists between the progress and potential of GPP in KK's construction sector. Our findings from the TED database indicate that the reality of GPP progress is significantly weak, solely based on analyzing written tender descriptions. Our follow-up process of in-depth interviews with relevant stakeholders confirmed these findings. More specifically, there does not appear to be any basis for claiming that GPP progress in KK is significantly better than Danish GPP progress, nor that recent developments indicate that a significant change in GPP progress has taken place since the report by PWC et al. in 2009. Therefore, we have now confirmed that a discrepancy is present also in KK specifically (and not only at the national level as put forward in PWC et al., 2009).

This section also exposed significant findings regarding how current procurement processes work in KK. These insights will be utilized when identifying potential explanations behind the discrepancy in the following sections.

5.3 The Berntsen-Manner Model: GPP Barriers and External Influences in Københavns Kommune's (KK) Construction Sector

The Berntsen-Manner Model

We will now attempt to explain the discrepancy between the progress and potential of GPP within the construction sector of KK. The *Berntsen-Manner Model* (Figure 17) has been developed to explain the GPP discrepancy. Through our analysis, barriers to GPP progress were observed on three distinct levels: political, organizational and practical.

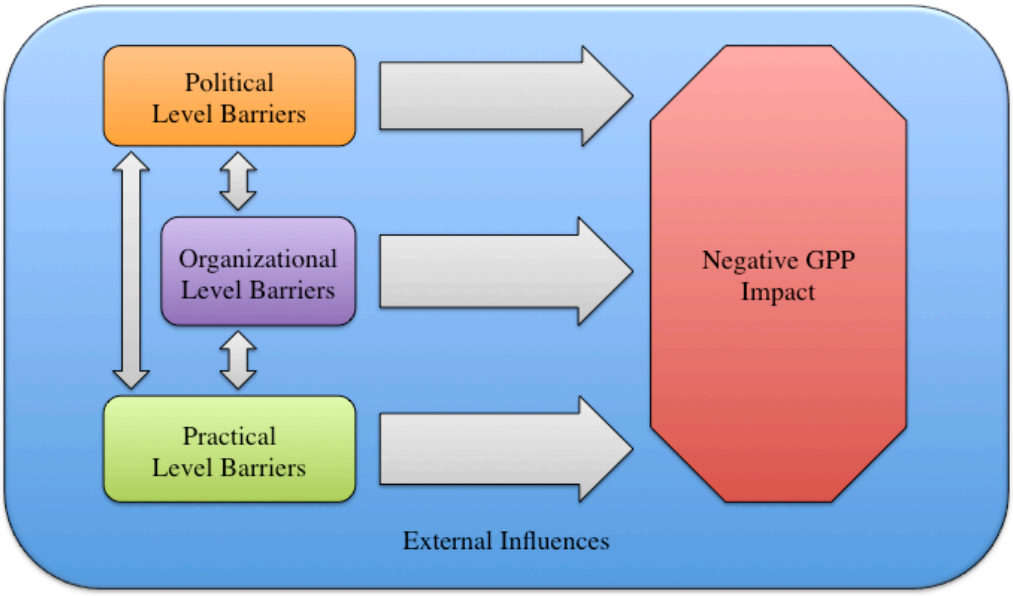


Figure 17 - Overview of Berntsen-Manner Model. The model shows the levels at which barriers to GPP progress are prevalent. These levels are political, organizational and practical. Additionally, external influences have an indirect effect on GPP progress. Source: Own development.

The political level is limited to the municipality itself and is defined as the level where local politicians operate. These politicians are essentially the individuals that have a seat in KK's City Council. The organizational level is defined as the organizational structure of KK, including entities such as administrations, sub-units and centers. The practical level is defined as the level where public officials involved in procurement operate on a daily basis when performing their tasks, implying that this is at the actor level.

Each level contains unique barriers that have direct negative impacts on GPP's progress in KK's construction sector. Furthermore, we have identified external influences that have negative effects (Figure 17).

Interconnected Nature of Barriers and External Influences

In developing the *Berntsen-Manner Model*, it was apparent that our barrier levels have interacting influences on one another. Figure 18 and accompanying Table 6 both visualize and exemplify these interactions.

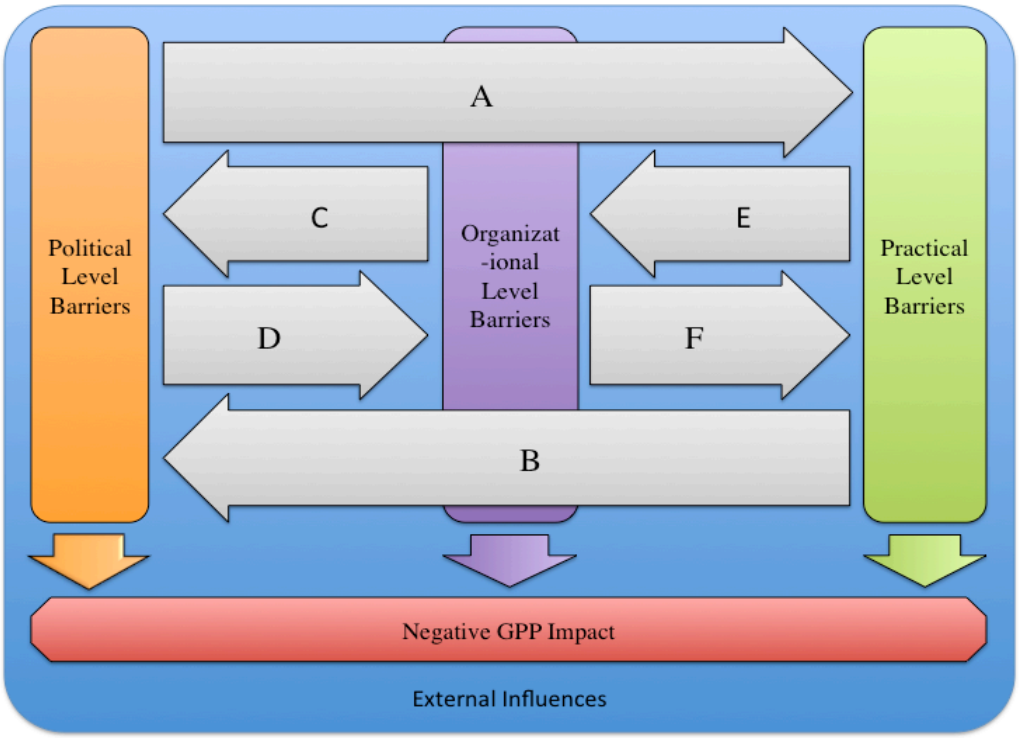


Figure 18 - Interaction Influences of Berntsen-Manner Model. Source: Own development.

Table 6 – Table of Berntsen-Manner Model Interactions Including Examples. Source: Own development.

Examples of Interactions Between Barrier Levels of the Berntsen-Manner Model		
Interaction	**Influence Direction**	**Examples of Interactions**
A	Political to Practical	Resource allocation towards GPP including project budgets and training for actors at the practical level. Political goals and agendas have a direct effect on practical implementation ability.
B	Practical to Political	Concerns for increased procurement complexity due to GPP implementation. Competing procurement recommendations and objectives from practical level actors. Resource requests including project budgets and training.
C	Organizational to Political	Organizational Complexity affects implementation ability of GPP policies. Organizational complexity makes it hard for politician to communicate a coherent GPP message to all entities within the organization.
D	Political to Organizational	Lack of political will to improve the organizational structure. Democracy argument used to avoid changes in organizational structure. Seven-mayor governance model results in lack of unified organizational culture.
E	Practical to Organizational	Will and knowledge at the practical level affect the ability to make organizational changes. Resistance by those at practical level to organizational changes (maintenance of status-quo).
F	Organizational to Practical	Organizational complexity negatively impacts practical level knowledge transfers. Organizational structure may hinder practical level GPP implementation.

We have chosen to include this section to illustrate how our three identified barrier levels are not mutually exclusive. These examples offer insights into the interactions between the three barrier levels but are certainly

not the only examples. An unknown number of diverse interactions likely occur. As evident by the model in Figure 18, these interactions are contributing factors to the origins of our barriers. This means that the origins of barriers at one level can be partially traced back to another barrier level. Therefore, identifying and acknowledging these interactions is crucial for any effort to improve KK's GPP. While there is opportunity for further analysis into examples of these interactions and their influence on GPP progress within KK's construction sector, we have chosen to focus our analysis on our three primary barrier levels and external influences.

In the following sections, we will break down the Berntsen-Manner Model to individually address each barrier level. We will then link our findings on each barrier level to existing research on GPP. We will also analyze how external influences have indirect effects on GPP within KK's construction sector. For external influences, no section linking to existing literature will be introduced because these findings are very specific to the case of KK's construction sector. Lastly, we will combine the Berntsen-Manner Model with Hydén's Norm-Model to offer further insights. Each part of our model will be introduced by reporting our empirical findings. The empirical findings are based on interviews, which again are codified according to Table 5 in Section 5.2.2 (pg. 42).

5.3.1 Political Level Barriers

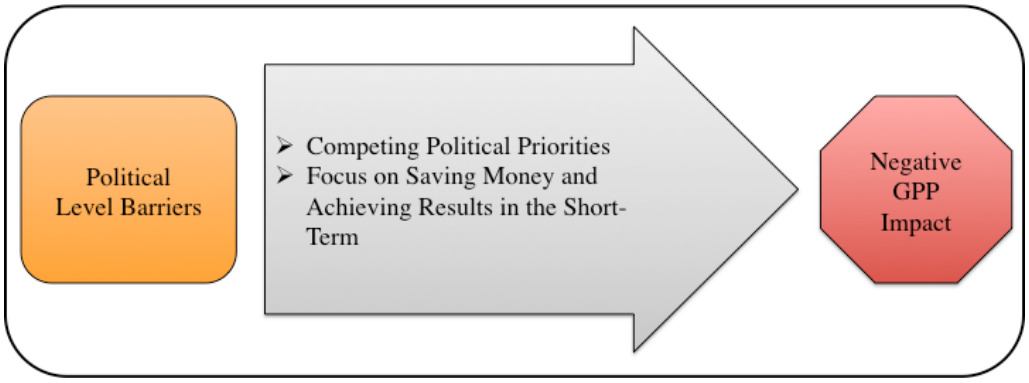


Figure 19 - Political Level Barriers of Berntsen-Manner Model

This section explores the political level barriers of the Berntsen-Manner Model. Figure 19 outlines the two key political level barriers we have identified to help explain the discrepancy between GPP's progress and potential:

- Competing Political Priorities.
- Focus on Saving Money and Achieving Results in the Short-Term.

These two key political level barriers translate into a low level of local political will in support of GPP in KK's construction sector. In our interviews, we defined political will as support for GPP from elected local politicians within KK.[21] All interviewees spoke about local politicians without mentioning specific names. Furthermore, we will use political will, commitment and support interchangeably.

We will start this section by addressing the role of local politicians and the autonomy of KK (and other municipalities in Denmark). By doing so, we justify our focus on political will at the local level.

5.3.1.1 Empirical Findings on Political Level Barriers

Before diving into the barriers identified at the political level, we must first explain the role of local politicians and autonomy of municipalities in Denmark.

The Role of Local Politicians and the Autonomy of Municipalities

Support by municipal politicians is crucial to GPP progress, as it both determines the granting of resources (financial, time, tools, training and expert knowledge) and the formation of procurement strategies. According to Grete, a law professor specializing in procurement law at CBS, local politicians have more power than national politicians when it comes to shaping procurement practices in their municipalities. She said the following about the relationship between local and national politicians:

> National rules and legislation can limit, or promote, the use of green purchasing. However, the EU does not limit the use of GPP. In respect to EU law, there are not any barriers hindering the use of GPP – so from a procurement law perspective the local political authorities can do as they want, as long as they stay within the frames of European law. It is clear that the local politicians, in charge of the purchasing, in practice have greater power than the national politicians. This because the national politicians first have to agree about something and then they have to get the local politicians on board (Grete, R-CBS).

Johan at the FA (KK) supports Grete's opinion. According to Johan, a municipality largely decides how it wants to use and prioritize resources to secure the best possible outcome for taxpayers' money.[22] The best possible outcome can be the cheapest product, the most environmentally friendly product or a procurement practice that displays the municipality as a "model indkøber" (Model Procurer) such as fair-trade. According to Johan,

[21] Referring back to our section on the organization of KK, elected politicians are the 55 members of the city council. They hold 79 seats in KK's committees with each committee defining the responsibilities of its adjoining administrations.
[22] Within the given frameworks defined by "forvaltningsloven" (*The Public Administration Act*) and "uskrevne kommunal fuldmakt" (*The Unwritten Municipality Mandate*). These together define the authority given to the municipality in shaping their own procurement practices.

"model indkøber" is particularly important to GPP as it gives a municipality the right to act in a way that they believe all others should act. This implies that by acting as a "model indkøber", KK could extend its right to demand more use of GPP. "Model Indkøber" or the right of the municipality to consider environmental and social responsibility in its procurement is not explicitly stated in *The Public Procurement Act*, nor can it be interpreted from *The Unwritten Municipality Mandate*. However, it can be derived based on the latest development in the case of Aarhus as a fair-trade city. Aarhus Municipality, on the 10th of May 2010, decided that they wanted to be a fair-trade city. This included targets for procuring fair-trade products, meaning that they wanted to act as a "model Indkøber". Statsforvaltningen Midtjylland (State Administration Midtjylland) assessed this decision in 2012 and it was concluded that Aarhus municipality could not include fair-trade consideration as it is outside the municipality's mandate. In 2013 however, the Økonomi og Indenriksministeriet (Ministry for Economic Affairs and the Interior) went against the previous ruling by making a statement in favor of municipalities acting as "model indkøbere". The Ministry for Economic Affairs and the Interior found that a municipality legally could - and still can - use fair-trade considerations in their procurement practices. This decision, made at the Ministry level, overrules the previous conclusion reached at the regional level (Grete, R-CBS). This means that Aarhus Municipality has legal basis when choosing to include fair trade considerations in their procurement practices. In relation to the Aarhus case, The Economic Affairs and the Interior Minister, Margrethe Vestager, said:

> Last summer, doubt was raised as to whether municipalities can undertake fair trade considerations in their undertakings. This doubt is no longer present due to thorough juridical investigations. I am pleased that there now is clarity around the juridical basis for municipalities to take on responsibility for the society (Økonomi og Indenrigsministeriet 2013, own translation).

Grete (R-CBS) referred to the above case as proof that municipalities have a high degree of autonomy and power when it comes to shaping procurement practices. This case from Aarhus and the statement made by the Ministry for Economic Affairs and the Interior demonstrates the significant role of local politicians in the promotion of procurement strategies, including GPP in KK's construction sector.

Extent of Political Will in Support of GPP

Our interviewees' opinions regarding support from local politicians are of great significance, especially for the interviewees working in the municipality. This is because they are working with KK's procurement on a daily basis and are directly exposed to the effects of political decisions and support regarding GPP. Political support needs to be both visible and clearly communicated in order to motivate KK's employees to improve their GPP efforts. Invisible support would naturally limit the effects of GPP efforts and progress. Besides procurement

officials, clear political support has a significant impact on industry players. If political will to promote GPP is strong and consistent, industry players can react accordingly and improve their solutions to enhance their competitiveness. If political will and procurement strategies are unclear, industry players will be hesitant to invest in greener solutions (new and riskier), as possible rewards of doing so would be uncertain.

Figure 20 displays the opinions of our interview subjects regarding the level of political will that exists within KK for construction sector GPP. Overall, less then a quarter (3/13) believe high political will exists, and more than three quarters (10/13) disagree to different extents.

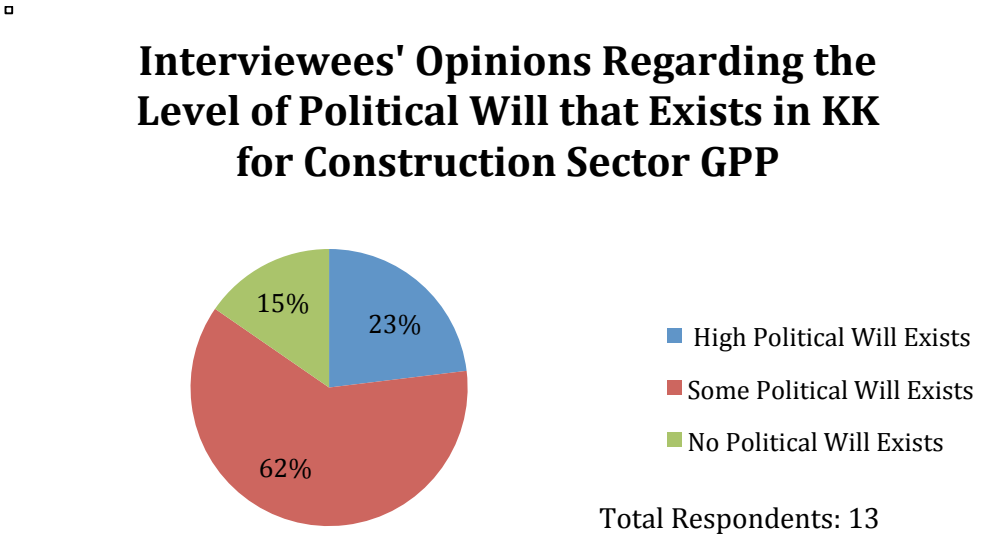


Figure 20 - Interviewees' Opinions Regarding the Level of Political Will that Exists in KK for Construction Sector GPP (Political Will Among Local Politicians). Source: Own development based on interviews.

Out of the 13 interviews where the topic of political will for GPP in KK's construction sector was addressed, three interviewees indicated that high political will for construction sector GPP exists. Another eight were reluctant to categorize the political will in support of GPP as either "high" or "low", instead concluding that "some" political will exists. Factors reducing the view of political will from "high" to "some" included a prioritization for time and budgets, a political belief that GPP will increase costs and a tendency for sustainability budgets to be cut first. The remaining two interviewees stated that very little or no political will for GPP exists (Figure 20).

The inconsistency between the interviewees' opinions on the level of political will is interesting. One explanation could be that some interviewees may have referred to more general political support for environmental initiatives, rather than GPP in particular. This would have taken place despite us explicitly

questioning if they believe political will for GPP exists. Another possible reason can be that our interviewees are not aware of the political stances on GPP, instead associating it with other examples of political will in support of the environment. Additionally, our interview subjects naturally see the world through "different lenses", both due to individual differences and their professional roles (public officials, industry players and research professionals). All interviewees who stated that political will clearly exists are public officials in KK. With first-hand knowledge from their roles within KK, their perspectives could imply credibility. However, their stance could also reflect solidarity with their workplace. It is unclear to us if their opinions were honest beliefs or if they felt the need to promote KK and its GPP initiatives to us as students.

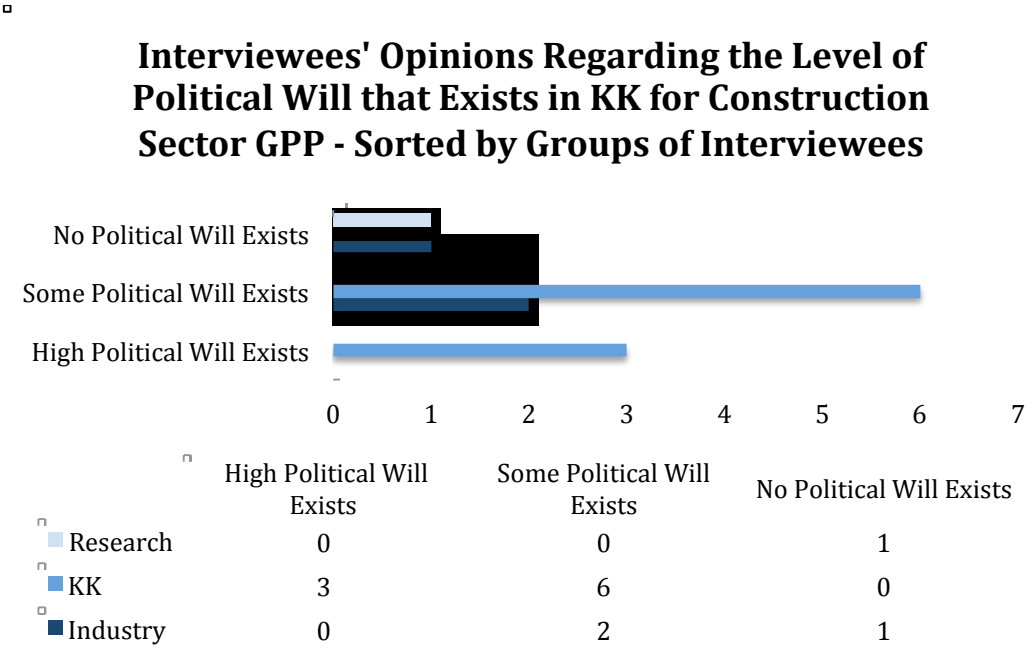


Figure 21 - Interviewees' Opinions Regarding the Level of Political Will that Exists in KK for Construction Sector GPP. Sorted by groups of interviewees (research, KK and industry). Source: Own development based on interviews.

Figure 21 presents our interviewees' opinions on political will for construction sector GPP in KK, sorted by professional role group (KK, industry and research). Of the nine public officials interviewed, three indicated that high political will for GPP exists. Lasse (KK-CCP) for example stated, "It is a very big priority, it is formulated by routines, procedures and rules on how to react in different situations." Both Mons and Olav (KK-CCP) agreed that high political will exists. The remaining six public officials displayed concerns related to political priorities.

Copenhagen's *CPH 2025 Climate Plan* was a common example used by our public sector interviewees (from KK) to show that some degree of political will exists for GPP. However, the same interviewees indicated that the

climate plan is seldom (if ever) spoken about in reality. Furthermore, GPP is only briefly mentioned in the climate plan. Carl (KK-FA) brought this issue up by stating that the *CPH 2025 Climate Plan* at least puts LCC and functional tenders on the agenda.

Johan (KK-FA), working in the Finance Administration (FA) (the administration responsible for municipality wide strategies), stated that GPP is not very high on the political agenda. The fact that this particular administration works the closest with politicians adds credibility to his opinion. Reinforcing Johan's position, Carl (KK-FA) agreed that the political will for GPP is low. According to Carl, the climate goals of KK and political will disconnect. He believes the goals put forward in the *CPH 2025 Climate Plan* are ambitious, however, the political commitment to actually reach them is not there. Furthermore, he stated that many politicians are concerned that adding another "layer of environment" to the public procurement process would increase complexity. This complexity pertains to those implementing procurement strategies at the practical level and not necessarily politicians. However, less complexity in a big municipality, characterized by lengthy bureaucratic processes, seems to also be in the interest of politicians.

None of our interviewees from research or industry believe that political will for GPP is high. Describing a disconnect between political intentions and practical reality, Tore (I-Concito) said, "They love to talk about it, but there is little action." In our interview with David from TEA (KK), we addressed this issue brought up by Tore. However, David disagreed stating, "I do not think it is just talk and not action, as they do put money into it". Two interviewees associated the high level of environmental regulations in Denmark to some political will for GPP (David, KK-TEA & Petra, I-MT Højgaard). However, a high general level of environmental regulation does not necessarily mean that local political support for GPP exists. This is because the environmental regulations being referred to are determined at the national level.

While there was a general lack of support for the existence of local political will for GPP, two interviewees (one from research and one from industry) had particularly strong opinions. "The politicians think that green growth will happen by making [guidelines] and giving clean tech financial support, but this is not enough. I believe that KK's support for green growth is 90 percent marketing" (Tore, R-Concito). Additionally, Nikolai (I-Niras) stated that the political will is "very very low" and that it is "very rare that KK has a focus on GPP." According to Nikolai, "Politicians just want results, overnight if possible. They want to put forward goals and have the administrations figure out how to implement them without realizing how difficult this can be."

Nikolai continued by drawing a comparison to the UK where political pressure has successfully driven the broad implementation of GPP within its construction sector. Tore (R-Concito) had a similar opinion, emphasizing the

fact that the UK has binding LCC regulations. The success in the UK shows that political support is an important success factor for GPP implementation.

The lack of consensus among the public officials, and the fact that 2/3 believe that political will is not good enough, is particularly worrisome. These public officials are responsible for implementing any GPP strategy. Therefore, it is important that they perceive GPP as a priority at the political level. Olav (KK-CCP) indicated that although there is some political will for GPP, its implementation would be easier if political ambitions were higher. Furthermore, interviewees from both industry and research believe that political will is lacking, or that it is not good enough. This negatively affects the supply side of the procurement process. If KK wants to ask for greener products and services, industry must be prepared to meet these demands. Political support can effectively incentivize the supply side to provide this support.

We will continue by addressing the two specific barriers identified as having a negative impact on the political will for promoting GPP in KK's construction sector.

Competing Political Priorities

Several interviewees brought up the issue of competing political priorities. Interviewees emphasized job creation, organizational efficiency and alternative procurement initiatives as competing with GPP for finite resources.

When addressing the topic of political will for GPP, Johan (KK- FA) stated that the primary political priority has been fiscal efficiency. "The main agenda the last six years has been on improved efficiency as the goal is to save 250 million Danish Krone" (Johan, KK-FA). In continuation, he confirmed that GPP has also been prioritized but to a smaller degree. However, he also expressed that political will for social-based procurement (technically referred to as Socially Responsible Public Procurement (SRPP)) is greater than that of environmental considerations or Green Public Procurement (GPP). Examples of SRPP include promoting employment opportunities, supporting social inclusion and minimizing social dumping.

"The public sector appreciates sustainable solutions, but if it is more costly than the traditional solution, it is often the first to be cut. This is because it can be hard to justify the increased costs [at political level]" (Petra, I-MT Høygaard). Speaking from an industry perspective, Petra refers to the fact that alternative projects and initiatives (with assorted objectives) compete for finite procurement resources. She claimed that it is particularly hard for green construction initiatives to compete with social-based construction initiatives. She exemplified this line of reasoning by stating, "It is hard to justify spending money on promoting GPP if this is set up against

additional resources to schools for special needs children." This is in line with Johan's (KK-FA) earlier opinion regarding political will for SSRP.

Focus on Achieving Results in the Short-Term and Saving Money

Another common issue brought up by our interview subjects is the time discrepancy between the long-term life cycle of construction projects and short-term politically elected positions. Politicians are elected for a period of four years, and in the short-term they want to reduce costs, see clear results and be reelected. This is not necessarily in line with the characteristics of the construction sector. More specifically, upfront construction costs need to fit budgets under the control of current politicians, with future politicians receiving the benefits of cost savings through efficiency improvements. Therefore, budgets that favor cost savings now will result in higher costs (and resource demands) down the road, the opposite of Life Cycle Costing (LCC) and GPP.

Four interviewees stated that politicians often believe green alternatives are more expensive, negatively affecting their support (Sunniva, KK-TEA; Petra, I-MT Høygaard; Johan, KK-FA & Jone, KK-TEA). This fear of increased costs must be seen in relation to the time frame of politicians. If only short-term costs are considered, then the green alternative tends to be more costly. Jone (KK-TEA) supported this line of thought by indicating that even though there is political priority for environmental goals, their primary concerns are the budget and time. Tore (R-Concito) further reinforced this by stating, "[A] high environmental profile is not acceptable if you also have high costs." This concern for increased costs is directly linked to a lack of LCC usage in Denmark, which will be later discussed in-depth in Section 5.3.4, *Practical Level Barriers*. Here we will just note that green solutions are not necessarily more expensive than conventional solutions, however, one must take the whole life-cycle of the solution into consideration (LCC).

This focus on saving money and realizing results in the short run directly affects political support for GPP. Furthermore, two additional issues reflecting a focus on saving money and achieving results in the short run intensify the negative effect on political will:

1. The long-term benefits of promoting GPP are difficult to measure and demonstrate.
2. The "low hanging fruit" has already been tackled, with further progress more costly and complicated.

We will first address point 1: *The long-run benefit of promoting GPP is difficult to measure and therefore to demonstrate*. An inability to accurately measure the long-term positive effects of directing resources towards GPP was a common concern that came up in our interviews. Interviewees stated that this inability has direct

negative effects on political will in support of GPP. At the political level, it is hard to justify targeting resources towards GPP if the outcome cannot easily be measured.

According to Carl (KK-FA), justification for policies and investment is simply easier when you have the numbers to back them up. According to Nikolai (I-Niras), this problem of "how to measure GPP" is shared by all Danish municipalities. Additional public officials, Carl (KK-FA) and Johan (KK-FA), also pointed out the difficulty in measuring green growth. Carl was previously part of the green growth team and was involved in the creation of a GPP strategy publication: *Flere grønne indkøb – mere grøn vækst. Strategi for brug av kommunens indkøb til å fremme grøn vekst 2012 – 2014*[23]. According to Carl, the main takeaway from working on this publication was how difficult it is to measure green growth. When asked about the outcome of the publication, Carl explained how it was handed over to the seven mayors but nothing more has happened to his knowledge. This can indicate that politicians have not prioritized continued work on a GPP strategy.

We will now continue by addressing point 2: *The "low hanging fruit" has already been tackled, and further progress is more costly and complicated*. Several interviewees specifically indicated that political support for the advancement of GPP in KK might be negatively affected by increased costs and complexity now that the easier initiatives (low hanging fruit) have been tackled. "A while back, everything green was very hip, all good green ideas got money. Now it is a bit less, maybe we have chosen the low hanging fruit and the next step is more costly" (David, KK-TEA).

Interviewees often contrasted the successful progress of sustainability within new building projects versus the difficulties of applying the same techniques to existing buildings. Several interview subjects said that KK has reached a very good level when it comes to new buildings. As, David (KK-TEA) pointed out,

> Energy usage for new buildings [is] about 27 kwh/m2 and this is [better than] regulations, [but] new housing is only 2 % of emissions. It is more interesting to focus on the old building stock. Here energy use is 200 kwh/m2. If we can get this down, it would make a big difference. The greenest buildings are those that are already there (David, KK-TEA).

In saying, "The greenest buildings are those that are already there," David refers to the fact that the environmental impacts from constructing existing buildings are essentially sunk costs. Specifically, the emissions from the construction of the buildings (including the production and transportation of materials) have already occurred in the past. Yet the useful lifetime of these buildings' primary structures is far into the future.

[23] English translation: "More Green Procurement – More Green Growth. Strategy to use the municipality's procurement to promote green growth 2012-2014." The publication was made in collaboration between several centers in the Finance Administration.

Rather then tear down old buildings to make way for new ones, a focus should be on adapting new technologies and solutions to existing structures.

Olav (KK-CCP) supported David's opinion regarding a switch in focus towards existing building stock by stating, "In new buildings we are ahead and it is not that problematic, renovation of old buildings is more interesting and this is where the problem lays." In continuation, he indicated that further improving the efficiency of new buildings would be very expensive and little political will exists for this.

As it is more costly, more complicated and less certain to tackle the "higher hanging fruit", it is rational for politicians to lower their efforts. It can be assumed that a primary goal of politicians is to be reelected, and therefore their perspectives are short-term. This implies that politicians naturally want to draw attention to the progress made in new buildings, rather than pointing to the difficulties experienced in the renovation of old buildings. Focusing efforts and resources on areas where the payoff is most certain, rather than more difficult and risky, is likely a smart political move. However, further progress of GPP within KK's construction sector is going to require politicians taking on the increased risk. For those that do, the payoff may be equally rewarding.

Political Level Barriers: Main Takeaways

The opinions of our interviewees regarding political will are diverse, however, only a few interviewees clearly state that political will to promote GPP within KK's construction sector is present and adequate. Overall, the conclusion of our findings is that political will in support of GPP is low, or at a medium level at best. We also note that KK's politicians do not effectively communicate their political stance on GPP. This is reflected by a wide variety of opinions on the topic.

We identified two main factors that together result in the low political will in support of GPP. First, political priorities to achieve organizational efficiency, employment and alternative procurement initiatives (including social-based ones) compete with GPP for finite resources. Second, there is a focus on saving money and achieving results in the short-term. This is worsened by the fact that the life-cycle effects of GPP are difficult to measure and that the "low hanging fruit" has been tackled. In turn, the next steps to further GPP progress will be more costly and complicated.

5.3.1.2 Link to Research Community

Other researchers have identified barriers to GPP at the political level. However, it is important to highlight that a limited amount of previous research touches upon local political will as a barrier to GPP. In terms of defining political will, the trend in existing literature is vague definitions. Furthermore, political will is often treated as an "add on" (as a barrier second to other barriers). Additionally, previous literature has either focused on political will at the national level, or failed to identify political with a specific level.

Clement and Plas et al. (2003) examined public procurement in six European cities and found the existence of a green purchasing strategy as criteria for success. In the case of KK, such a strategy exists. However, our interviews revealed that public purchasers are not aware of such a strategy. The *CPH 2025 Climate Plan* also briefly includes a reference to GPP but again public purchasers are mostly unaware of this. This implies that the authors have a valid point, but the existence of such a strategy is not necessarily enough. The politicians must communicate the importance of the strategy and show that there is political commitment for GPP.

Bouwer and Jonk et al. (2006) completed a study at the European level, finding political will as a main barrier to GPP progress. According to their study, 35% of procurement officers complained about a lack of GPP promotion policies and limited organizational resources. In a Communication from the European Commission (EC), it is highlighted that a lack of political support is a main barrier to GPP progress in Europe (Commission of the European Communities, 2008). In our interviews with employees of KK, the issue of limited resources to promote GPP was touched upon. However, some interviewees stated that more resources would not necessarily result in greener procurement. Political commitment and resource support must be accompanied by clear communication on how these resources should best be utilized to promote GPP.

Based on a survey among the GPP community in the EU, political commitment is found as being important to the success of GPP. More specifically, Brander and Olsthoorm et al. (2003: 236) state: "Procurement decisions that require political consent will be greener the higher environment is on the political agenda." However, according to this survey, political commitment ranks below obstacles such as the availability of green alternatives, information on green products, transparency of legal rules and public awareness. In addition, the authors touch upon which stakeholders (procurement officers, politicians and suppliers of green products) are the most important to GPP. Their results reveal that procurement officers and politicians were judged to be of the same importance for the development of GPP. In our own research, we separated between identifying the driver for including green criteria at the practical level (project leaders) and the primary driver for GPP within KK (politicians). This allowed us to acknowledge the crucial importance of local political will.

Erdmenger (2003) emphasizes that political support at the European, national and local level is key to GPP implementation in the concluding chapter of his book, *Buying into the Environment*. According to Erdmenger (2003: 255), "Although political documents…often refer to green purchasing, the implementation is often left to the administrations. But political support is crucial to the systematic implementation of green purchasing." He states that even though there is high political awareness of GPP at the European level, this does not necessarily translate into political commitment at the national and local levels:

> Political awareness processes still happen mostly at [the] national level: there are no European parties, there is hardly any European media and also NGOs work mainly at [the] national level. Any European movement for green purchasing needs matching structures in the Member States (Erdmenger 2003: 255).

This view is in line with our own findings. Not a single public official interviewed had knowledge regarding European level GPP efforts, tools or strategies. This emphasizes the importance of making the European efforts more visible at the municipal level in Member States.

Within literature on sustainable procurement, findings supporting our conclusions have also been identified. Powell and Tinch et al. (2006) assessed sustainable procurement activities in both private organizations and public authorities.[24] The geographical boundaries of the study included Europe, New Zealand and North America. The report revealed a lack of political will, central policy and support as main barriers to sustainable procurement. Findings also indicated that public procurers demand consistency and clarity on new policies and demands. Additionally, the need for the government to take a consistent lead was emphasized. This report concluded that a success factor at the local level is political support that is integrated throughout the whole organization.

GPP research on Nordic countries has identified that low political will inhibits GPP progress. In a report by the Swedish Environmental Protection Agency (2009), the importance of involving political decision makers is emphasized. The report assesses GPP in Sweden where political will is underlined as a key success factor. The report gives some specific advice to governments by stating that support and control can be achieved by legislative tools, but also by softer motivational measures (dialogue and information).

Chrintz (2011) also points to political will as a potential barrier. His report is the only one we identified that specifically touches upon barriers to GPP in Denmark, however, it does not exclusively focus on KK. According

[24] This is not directly GPP research, as sustainable procurement addresses additional issues besides just the environment. Additionally, the study was not exclusively focusing on public procurement.

to Chrintz, the current political reluctance can be traced back to the use of the Expanded Total Balance Principle, which states that individual regions and municipalities receive compensation if national legislation results in additional costs (for the municipality). The author argues that this is a key political obstacle for the adoption of formal national GPP requirements. A lack of accountability for externality costs in Denmark is also highlighted as hindering the promotion of environmental procurement criteria. This can be linked to our findings on the difficulty of measuring the full impact potential of GPP. Chrintz' findings pertain to political will at the national level, while we have focused on political will at the municipal level. We acknowledge the importance of political action at the national level due to trickle down effects on KK. However, given the significant autonomy and power granted to local political authorities in Denmark, we believe Chrintz fails to acknowledge local level political will as an important determinant of GPP's success.

How our Findings Offer New Insights

Current literature only minimally links measurability difficulties and a fear of higher costs to political will. In our own research, these were identified as key issues making it hard for politicians to justify the promotion of GPP policies. Additionally, existing literature does not touch upon the effects of lower political will for GPP implementation following the elimination of the "low hanging fruit". KK's focus is now switching from efficiency achievements in new buildings to the renovation of the existing building stock. This new focus is typically more complicated and involves higher costs, which affects political commitment. These findings pertain to KK, but that does not mean that they could not offer insight into the political barriers inhibiting GPP in other municipalities and cities in Denmark and abroad.

The importance of political will at the municipal level has only minimally been identified in existing literature. Previous literature has not dealt with political will at the municipal level as a separate issue. Rather the trend has been to focus on national political will. If local political will is included, it is under an umbrella of political will including both national and local. The trend in existing literature is vague definitions of political will and a lack of focus on political will at specific levels. Considering the significant power and size of procurement controlled by large municipalities (especially in Scandinavia), the role of politicians in these large municipalities needs to be addressed in research. Referring back to Grete's (R-CBS) and Johan's (KK-FA) comments regarding the autonomy of municipalities in Denmark, local politicians in practice have more power than national politicians when it comes to promoting GPP.

5.3.2 Organizational Level Barriers

Figure 22 - Organizational Level Barriers of Berntsen-Manner Model. Source: Own development.

This section explores the organizational level barriers of our Berntsen-Manner Model. Figure 22 outlines the four key organizational barriers identified to help explain the discrepancy between GPP progress and potential in KK's construction sector. The four barriers are as follows:

- Confusion Regarding the Division of Responsibility and Authority.
- Lack of Communication Across Administrations.
- Lack of a Unified Organizational Culture and Power Struggles.
- Distribution of Budgets Between Entities.

These barriers together translate into organizational characteristics that are not supportive of changing current practices to improve GPP progress in KK's construction sector.

5.3.2.1 Empirical Findings on Organizational Level Barriers

Confusion Regarding the Division of Responsibilities and Authority

In addressing the organizational characteristics of KK's procurement, a consensus emerged among our interview subjects. All interviewees believe that it is difficult to have an overview of responsibilities. Our interviewees described KK's organizational structure as highly complex, which creates confusion and an unclear division of procurement responsibilities. David stated, "I do not know what people are doing and thinking in other administrations and centers" (David, KK-TEA). Not only did interviewees from KK have an impression of organizational confusion, Tim (I-Accenture) agreed by saying, "The efforts in the administrations do not seem to

be coordinated." Additionally, interviewees linked the seven-mayor organizational structure of KK directly to the confusion and complexity. Describing KK, Johan (KK-FA) and Andreas (I-Accenture) said:

> It is a very big complex machine, which makes it into a daily challenge, but it is all about politics. Administratively it is not a good system, but it is a political agenda. The political agenda is to spread out power to everyone. In KK, we have municipalities within municipalities. This can be directly linked to the seven-mayor organizational structure (Johan, KK-FA).

> It is a complex organization…[It] would be easier with only one administration overseeing instead of seven. However, with seven administrations, policy implementation may be easier in some cases compared to a mixture of interests if it was only under one (Andreas, I-Accenture).

Here, both interviewees refer to the fact that each administration has a lot of autonomy within their policy area. In some cases this is an advantage, namely in cases where it is clear that an issue only pertains to one administration. However, in cases where the same issues and difficulties are experienced across administrations, it could be more advantageous to have a less fragmented organizational structure.

Our own experience in contacting KK and attempting to set up interviews collaborated this complexity. In our snowballing sampling process, the complexity of the municipality was evident. We initiated our interview process by going to City Hall, with the hope that someone could help us get an initial overview. We met a nice lady there who told us she would look into the matter and get back to us with information about who would be good to contact in relation to GPP. Unfortunately, after a couple of weeks, she said she could not get to the bottom of this topic and therefore could not help us. Following this, we contacted several individuals within KK who were identified in publications, reports and tenders. We presented a short version of our thesis topic and asked if they would agree to meet with us. Throughout this process, we faced great difficulty, being passed around from center to center and administration to administration. A majority of public officials indicated that they would not mind talking to us, but that they were the wrong people to talk to. They would then forward us to someone they believed was a better match. Unfortunately, in a majority of cases, this second person would claim he or she could not offer us any insights on PP and GPP. Interestingly, the Finance Administration (FA) and Technical and Environmental Administration (TEA) receptions both initially stated that they do not work much with procurement in the construction sector (and definitely not with GPP). When contacting the FA they referred us to the TEA and vice versa. The same issues were prevalent when contacting Copenhagen City Properties (CCP). All this confusion clearly illustrates the lack of clarity regarding procurement responsibilities. It was clear to us that the different administrations do not know what other administrations are working on. Consequently, this has negative implications for efforts to implement GPP.

To follow up on these initial findings (or non findings), we were interested in exploring who, if anyone, has an overview of KK's procurement policies and the specific responsibilities of the different administrations. When directing this inquiry towards our interviewees, most believed that no one had such an overview. However, David (KK-TEA) stated that the Finance Administration (FA) would likely have the best overview. This proved to be correct, as our interviews with Johan and Carl at the FA offered us the most insights into the organizational structure of the municipality. The FA works closer with the politicians than the other administrations and this is likely why the FA was the administration offering us the most insight into the seven-mayor organizational structure. Additionally, from Section 5.1.3*, The Seven Administrations and Their Procurement Responsibilities*, it is clear that the FA has the responsibility for overarching procurement strategies that pertains to all the administrations in KK. However, our interviews revealed that even the FA does not see the organization clearly in reality. When speaking about power struggles within KK, Johan (KK-FA) stated, "I do not believe we step on someone's feet, because we need to have an overview in order to know if we step or not step [on someone's feet]." This illustrates that the administration identified as responsible for having the best overview also finds the organization of procurement in KK very complicated.

It quickly became clear, that a consequence of KK's seven-mayor organizational structure is that individuals working in different administrations are largely disconnected. Additionally, a general lack of overview of KK's procurement processes and objectives among public officials was identified.

Lack of Communication Across Administrations

Communication within administrations was discussed with seven of the public officials we interviewed, including representatives from the Finance Administration (FA), Technical and Environmental Administration (TEA) and Copenhagen City Properties (CCP). Despite small differences in opinions, the general consensus was that dialogue between internal centers and teams is frequent and of good quality (Olav, KK-CCP; Lasse, KK-CCP; Carl, KK-FA; Dina, KK-TEA; Sunniva, KK-TEA; Jone, KK-TEA & David, KK-TEA). However, our interviewees found cross-administration communication more challenging.

It is important to address cross-administration communication for several reasons. First, CCP and the TEA often work on similar projects, as they are both deeply involved with the management of construction works projects within KK. Second, CCP and the TEA both utilize the *Sustainability in Construction and Civil Works 2010 (Miljø i byggeri og anlæg* (*MIBA 2010))* guidelines (and will likely be involved with *MIBA 2014*). Third, the FA works across administrations and is responsible for overarching procurement tasks and strategies, implying that

having an overview is particularly important. Lastly, the barriers we identify in this paper are relevant for all three administrations. Overcoming these issues could possibly be simplified by collaborating across administrations. As cross-administration communication is fundamental to coordinating GPP activities, this topic was prioritized in our interviews. Naturally, public officials have first-hand knowledge and experience. Therefore, we were particularly interested in their opinions on this issue.

Early in our interview process, it became clear that strong opinions regarding communication across administrations exist among public officials. From Figure 23 below, it is clear that communication across administrations is at a low level. The responses from the 8 public officials were either that there is some communication or that there is barely any.

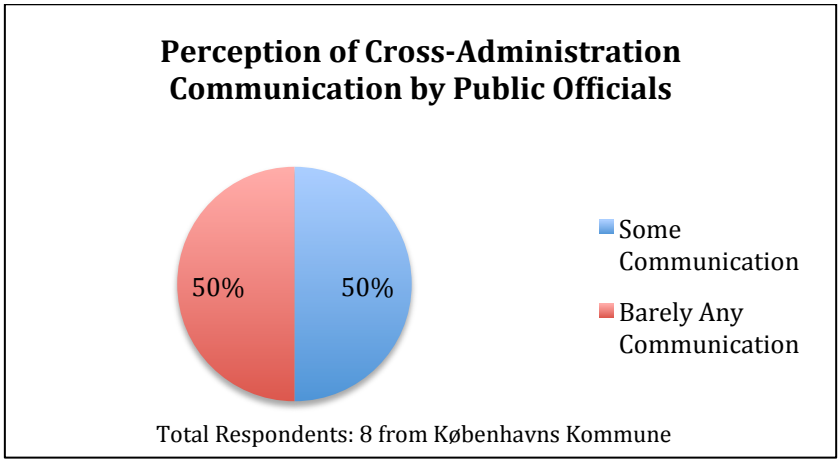


Figure 23 - Perception of Cross-Administration Communication by Public Officials. Source: Own development based on interviews.

Four public officials stated that there is some communication across administrations (Olav, KK-TEA; David, KK-TEA; Carl, KK-FA & Johan, KK-FA;). Two of these public officials cited the collaborative development of the *MIBA* guidelines as an example of cross-administration communication. Olav (KK-TEA) said,

> There is a lot of communication across departments when redoing the *MIBA* booklet every four years. It would be great if we could have such a dialogue more of the time. However, this is a priority question.

Furthermore, David (KK-TEA) referred to the development of the *MIBA* guidelines as an example of how administrations communicate. "Since I am in charge of *MIBA 2014,* I have sent out a letter to all the administrations and centers. In this way we communicate and collaborate in determining whether an update is necessary."

These quotes illustrate the central importance of *MIBA*, not only as sustainable construction guidelines, but also as a tool to promote collaboration across administrations. Petra (I-MT Høygaard) has previously been involved in the creation of the *MIBA* guidelines as an industry specialist. This shows that the *MIBA* guidelines also functions as a tool for reaching out to industry and potential suppliers. However, it cannot be understated that our two interviewees from the Finance Administration (FA) had not even heard about the *MIBA* guidelines, illustrating a significant lack of communication between administrations. This is further significant considering that the FA is responsible for making municipal wide procurement and GPP strategies. The fact that public officials within Copenhagen City Properties (CCP) and the Technical and Environmental Administration (TEA) refer to *MIBA 2010* as the "bible", while the FA is unaware of its existence, is a strong finding representing the communication barriers within KK's organization.

Both Johan (KK-FA) and Carl (KK-FA) agreed with Olav (KK-CCP) and David (KK-TEA) that there is some cross-administration communication occurring.

> When we formulate overarching strategies, we communicate with other administrations. We always try to cooperate with someone from each administration that knows something about, for example, procurement (Johan, KK-FA).

Johan's point of view is interesting considering our findings regarding the FA's attempt at developing a GPP strategy for the period 2012 - 2014. The strategy document, *Flere grønne indkøb – mere grøn vækst. Strategi for brug av kommunens indkøb til å fremme grøn vekst 2012 – 2014*[25], conceptualized how KK could use its purchasing as a tool for promoting green growth and was published by the FA in 2012. Not only were Carl (FA) and Johan (FA) both unaware of any follow-up to this strategy, our interview subjects within the other administrations (TEA and CCP) had no knowledge of its existence. The following comment exemplifies this:

> I do not think the FA has a central role in procurement in KK, but I know that some projects are born there. I was not aware that FA is responsible for making overarching strategies for PP and GPP, and I have never seen the doc on GPP strategy that they sent out to the seven heads of the administrations (Dina KK-TEA).

Four public officials believe that there is barely any communication across administrations (Lasse, KK-CCP; Jone, KK-TEA; Sunniva, KK-TEA & Dina, KK-TEA)."There is communication within administrations, but not much across, we normally go to other centers in TEA when we have questions" (Jone, KK-TEA). In Jone's opinion, there is adequate internal TEA communication, as well as external communication with industry.

[25] Own translation: "More Green Procurement – More Green Growth. Strategy to use the municipality's procurement to promote green growth 2012-2014." The publication was made in collaboration by several centers in the Finance Administration.

However, he would like to see more communication with other administrations. Sunniva (KK-TEA) and Dina (KK-TEA) agreed with Jone on the low level of communication across administrations.

> [There] is barely any communication across departments. This is related to the political silo system where each administration has its own mayor. Furthermore, the administrations work in different areas so there is not any need for communication. We do not communicate with CCP, however, or I think our law people sometimes do (Dina, KK-TEA).

Sunniva (KK-TEA) had a similar opinion, "Currently there is very limited communication, and the administrations work on different things so it is not really necessary." Dina and Sunniva's responses were slightly different from the rest. The general trend was that the interviewees would like to see more communication across administrations. However, in Dina and Sunniva's opinion, such communication is not even necessary. In contrast to this view, research indicates that cross-administrative communication allows for knowledge transfer and cooperation around problem solving. By sharing knowledge through effective communication, solutions to overcoming GPP barriers in one administration can be transferred to another. Additionally, administrations could combine resources to overcome challenges.

In addition to opinions regarding the frequency of communication across administrations, some interviewees mentioned specific communication relationships between the administrations. From Table 7 below, it is evident that the level of communication across the three administrations in question is low.

Table 7: Interviewee Opinions Regarding Frequency of Communication Across Specific Administrations. Source: Own development based on interviews.

Interviewee Opinions Regarding Frequency of Communication Across Specific Administrations		
Between Copenhagen City Properties (CCP) and the Finance Administration (FA)	**Between CCP and the Technical and Environmental Administration (TEA)**	**Between TEA and FA**
Lasse: "Very little communication between CCP and the procurement office in FA. The way KK is organized obviously matters."	Jone: "Little contact between CCP and TEA, but we talk on some issues." Dina: "We [TEA] do not communicate with CCP, or I think our law people sometimes do." Sunniva: "As far as I know, we [TEA] do not communicate with CCP."	Carl: "Communication between TEA and FA is difficult." Jone: "No communication between us [TEA] and FA. We only go to them for money."

Lack of a Unified Organizational Culture and Power Struggles

In several interviews, issues related to the organizational culture were brought up. A consensus emerged among the KK interviewees that an overarching organizational culture does not exist, instead organizational culture varies from administration to administration. David (KK-TEA) stated this quite specifically, "The different administrations have different cultures, different education and even a different language." Dina (KK-TEA) agreed, but was not as explicit in her opinion, "I do not think different administrations share the same culture and values… this reflects back to our political system." Here Dina links the lack of a unified culture to the seven-mayor organizational structure of KK. Sunniva (KK-TEA) believes that organizational culture is linked to goals and objectives, implying that a shared culture requires a common goal. According to Sunniva, goals are specific to each administration (and thus a common culture is impossible).

Johan from KK-FA took a less critical stance:

> Sometimes [the] organizational culture is different. We in the FA are focusing on efficiency and mostly we are generalists, people in, for example, TEA want to get the best contracts and they are experts in a small area. So sometimes we have differing goals.

The fact that there does not seem to be an organizational culture that spans the municipality is not particularly surprising considering the decentralized nature of KK (each administration has a high degree of autonomy). Furthermore, we have also established that there is limited communication and collaboration across the administrations.

Beyond a lack of a unified organizational culture, it also became evident that a degree of power struggles are present. When questioned about this, some interviewees were hesitant to answer. However, the more outspoken ones gave us their opinions on the issue. "There are clear power struggles among the different administrations. For example, better roads that lead to less accidents versus more energy efficient buildings" (Olav, KK-CCP). "The common ground in this municipality is that no one wants to give away control of something they in the past could decide for themselves. This means that everything is a small battle" (Johan, KK-FA).

Additionally, Johan (KK-FA) stated, "Everyone is thinking about their own projects and their own problems. Everyone wants to be prioritized." The consequences of this are that these power struggles can easily transfer into struggles for budgetary resources or expertise. In relation to GPP, administrations may be less encouraged to share knowledge and best practices if they see themselves competing with one another.

Distributed Cost Responsibilities Between Entities

The separation of financial responsibilities across administrations was brought up as another barrier having negative implications for GPP at the organizational level. More specifically, initial construction costs are covered by one administration while operation costs usually accrue to another. In relation to Life-Cycle Costing (LCC), this implies that capital costs are a part of one budget while the benefits of efficiency improvements accrue to another. This distribution of budgets between entities results in low motivation towards choosing more resource efficient (energy, water, etc.) solutions in the construction phase. Olav (KK-TEA) highlighted this separation between capital costs and operating costs in our interview. Additionally, Lasse (KK-CCP) had a good example of how this works in practice:

> Copenhagen City Properties is responsible for building schools, but another administration is responsible for the daily operation of the school buildings, meaning that if we [CCP] incur additional costs by investing in energy efficient schools, it would have a negative impact on our budgets without giving us anything in return.

Summary of Empirical Findings

A consequence of the KK's seven-mayor organizational structure is that individuals working in the different administration are largely disconnected and lack an overview of KK's procurement functions. The three involved administrations (FA, CCP, and TEA) experience the same difficulties and barriers to GPP progress, implying that collaboration and communication across administrations would be advantageous. However, our findings indicate that communication across administrations rarely takes place. Additionally, several interviewees said that they do not talk with the other administrations identified as central to GPP in the construction sector. The separation between administrations has resulted in the lack of a unified organizational culture and power-struggles among administrations. Lastly, the separation of budget responsibilities for construction and operation costs is a significant barrier to LCC and GPP progress. This is because the costs of choosing more efficient alternatives pertain to one administration, while the long-term benefits accrue to another.

5.3.2.2 Link to Research Community

When compared to practical and political level barriers, organizational barriers have been less prominent in existing literature. Still, some authors have touched on administrative structures, bureaucracy and organizational culture as potential obstacles to GPP. However, none have specifically referred to organizational barriers in Denmark or the Nordic countries. The scope of these studies has mainly been international or European.

Powell and Tinch et al. (2006) assessed sustainable procurement activities in private organizations and public authorities in Europe, New Zealand and North America.[26] The authors point out that time consuming bureaucracy at the organizational level can complicate the procurement process. Our use of the snowballing sampling method allowed us to experience this confusion and lack of overview first-hand. Additionally, the authors state that it can be difficult to determine divisions of responsibilities. Furthermore, the "need for cultural change" is identified as a barrier. It can be hard to change norms, practices and habits, as there is a tendency of being engrained within established routines and practices. This need for cultural change is further complicated in the case of KK, as our findings indicate that there is no shared culture among the three administrations involved in construction sector GPP. Changing an organization with an engrained but unified culture is difficult enough, however, changing an organization with a variety of engrained organizational cultures is even harder. The authors additionally point to the importance of communication by stating that internal and external communication aid in motivating employees. The authors note that internal communication can both put a general focus on sustainability concerns and help promote sustainable procurement specifically. However, they emphasize external communication with suppliers as a key success factor.

The European Commission (EC) has stated that collaboration and coordination between local authorities and regions are key to successful GPP implementation. A lack of such practices is one of the main barriers to GPP progress (Commission of the European Communities, 2008). Additional authors have found collaboration between different units in municipalities as an important success criterion. By having such collaboration, knowledge within the municipality is brought together. However, this alone is not necessarily enough, as it is also clear that municipalities themselves need a certain degree of knowledge on environmental and purchasing issues (Clement and Plas et al., 2003 & D'Amato 2007). We will establish this need for GPP related knowledge in our barriers at the practical level.

Previous research has addressed the consequences and potential difficulties related to having a decentralized procurement function. This is certainly the case in KK, with each administration having its own area of expertise and procurement responsibilities. Clement and Plas et al. (2003), through research focused on six European cities, point out that successful GPP implementation is harder in municipalities with a decentralized procurement function. In continuation, the authors also state that the training of procurers on environmental issues is harder when purchasing authority is spread across the municipality. The authors, however, also allude to some dangers of having a centralized system. They state that a centralized procurement structure would be the best option in an

[26] This is not directly GPP research, as sustainable procurement addresses additional issues besides just the environment. Additionally, the study was not exclusively focusing on public procurement.

ideal world, but in reality it can be questioned. One issue is that centralized units hold significant power and this power can be used to hinder GPP. Additionally, we have already identified that KK's distribution of authority is intended to promote democratic leadership and parity in decision-making.

RELIEF[27], a research program started by the International Council for Local Environmental Initiatives (ICLEI), offers some interesting insight related to organizational structures as potential barriers to GPP. According to RELIEF, there are several levels within procurement (the municipality level being one of these). At each level, a complex structure exists, involving a variety of administrations, centers and purchasing agents. This realization supports our approach of examining GPP barriers at different levels. Performing GPP requires that administrations, internal units and purchasers cooperate and exchange ideas, views and opinions. In continuation, the RELIEF report identifies a tendency to decentralize purchasing responsibility and authority as a means to secure supply according to the needs of individual administrations. According to this report, the danger of such a decentralized system is that GPP practices could end up not being systematically implemented in all departments (Erdmenger and Eri et al., 2001). It appears that such a systematic implementation has not taken place in KK.

How Our Findings Offer New Insights

The fact that organizational level barriers are addressed in research focused on non-Scandinavian regions illustrates that the barriers and issues identified in KK are relevant to municipalities in other countries.

Other authors have identified a decentralized procurement function as a potential barrier to GPP's implementation. However, these authors do not specifically perform an in-depth sector-and-municipality-specific analysis. When compared to previous research, we deeply explore the effect of such decentralization. One example is how our snowball-sampling process allowed us to experience the confusion and lack of overview first-hand.

Other authors acknowledge the importance of communication and coordination between municipal level entities. However, the trend is to focus on several countries or at the national level. The result is that the authors do not identify specific municipal governance models as drivers of organizational level barriers (as we did with the seven-mayor governance model). Furthermore, previous literature largely emphasizes external communication with suppliers or communication across municipalities or regions as the key barriers to overcome. We, however, have identified a lack of cross-administrative communication as a key obstacle. This illustrates how our narrow

[27] Environmental relief potential of urban action on avoidance and detoxification of waste streams through green procurement.

approach has allowed us to identify organizational barriers pertaining to decentralized municipalities in particular. Additionally, the importance of organizational culture has been addressed. However, the increased difficulty of organizational change for municipalities lacking a unified organizational culture has not been explicitly examined.

Lastly, the barrier of having budgets distributed between entities has not been identified in previous GPP specific literature. With attention previously focused at the national level, or at several municipalities in combination, the outcome seems to be a failure to identify this specific issue.

5.3.3 Practical Level Barriers

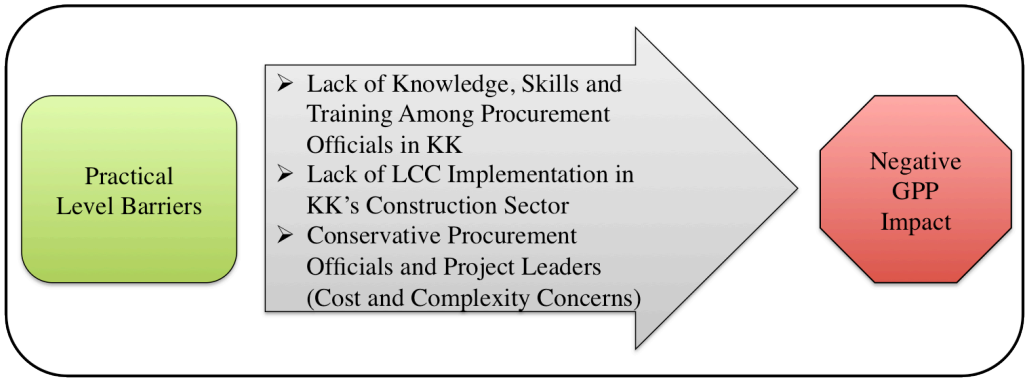


Figure 24 - Practical Level Barriers of the Berntsen-Manner Model. Source: Own development.

This section explores the practical level barriers of the Berntsen-Manner Model. Figure 24 outlines the key practical level barriers we have identified to help explain the discrepancy between GPP's progress and potential in KK's construction sector. The three barriers are as follows:

- Lack of knowledge, skills and training among procurement officials in KK.
- Lack of LCC implementation in KK's construction sector.
- Conservative Procurement Officials and Project Leaders (Cost and Complexity Concerns).

Again, we have identified and chosen to explore these barriers further based on our qualitative data collection process of interviews. These three barriers negatively influence the practical implementation of GPP in KK's construction sector.

5.3.3.1 Empirical Findings on Practical Level Barriers

Lack of Knowledge, Skills and Training

The first barrier identified at the practical level is an overall lack of GPP-related knowledge, skills and training for project leaders and other public officials within the procurement divisions of KK. Out of our 15 interview subjects, we discussed individual opinions regarding this barrier with 11. In response, all 11 interview subjects responded negatively, focusing on different deficiencies. While there was unanimous agreement that a lack of knowledge and skills is a problem, the specifics of where this deficiency was located varied.

Nikolai at Niras (I) spoke about the difficulty procurement authorities have in incorporating environmental criteria into tenders as well as measuring their impact. However, from his perspective, the problem was not necessarily a lack of knowledge among project leaders. He emphasized that it would be impossible for project leaders to have a complete understanding of technologies and solutions in the ever-changing field of environmental construction practices. Instead, he believes that project leaders lack adequate access to those with expertise in environmental parameter such as energy, material and transport. He made this point clear by saying, "People sitting in procurement are not experts in green parameters, they need expertise." In his opinion, those working with procurement must be better trained in where to find information. He continued by explaining, "[Project leaders] are economists, even the experts don't agree what's sustainable or not sustainable," alluding to the challenge faced by procurement officials who, in his opinion, are typically economically minded and focused on functionality. For this reason, Nikolai finds it hard to believe that project leaders are able to make proper judgments regarding competing bids and options. To substantiate the effects of the lack of expertise, he explained how an inability to accurately measure and compare tender bids inhibits public purchasers from placing demands and pressure on suppliers. If project leaders were better able to measure impacts (utilizing tools including LCC), Nikolai believes they would be able to compare tenders and put pressure on suppliers for better solutions.

As both a research institution and supplier to KK, those working for Niras (Nikolai currently, Tore and Petra previously) have possible knowledge advantages and biases. However, our interview with David (KK-TEA) confirmed many of Nikolai's opinions: "It is difficult for a planner like me to get knowledge on what is the right thing to do, I do not know who to ask. I think the knowledge is out there, but it is hard to get access to it." Beyond confusion over access to the necessary knowledge, David also spoke about the ever-changing nature of the sustainable construction field. He explained "maybe knowledge changes and you realize you have focused on the wrong thing…where am I in this game?" David's response of, "Where am I in this game?" clearly shows a

degree of confusion due to the continuous change of environmental technologies. It also displays a need for supporting structures to ensure knowledge and skill levels keep pace with technology advancement, a significant challenge for the implementation of GPP.

Dina (KK-TEA) also spoke about how project leaders and managers are challenged by the ever-changing nature of environmental technologies. Dina alluded to the challenge of choosing between tender bids by suggesting that in reality they focus more on the capabilities of suppliers then the specifics of bids. Sunniva (KK-TEA) also spoke about the difficulty of comparing bids with numerous environmental impact aspects, likening it to "comparing apples and bananas." Although a simplistic explanation of the process, the clear challenge of comparing technical bids is evident. Andreas at Accenture (I) also indicated a lack of technical knowledge regarding what is possible and what is not among procurement authorities as a key challenge. He exemplified this by highlighting the use of vague and flexible language in the technical descriptions of tenders.

Tore (R-Concito) believes that KK simply does not have the necessary environmentally focused human resources to implement GPP. Furthermore, he attributed this lack of knowledge to a gap between GPP research and those who actually work with procurement on a daily basis. Rather pessimistic, he believes the problem is worsened by an inability of procurement officials to close this gap and take further GPP action. By this, Tore indicated that he dismissed the possibility of procurers dramatically improving their abilities to implement GPP without political and organizational commitment (which he strongly does not believe exists).

With the impact of any GPP strategy largely dependent on its practical implementation, a lack of knowledge at the practical level is a key barrier to the promotion of GPP. This includes the *MIBA 2010* guidelines, which are directly dependent on the abilities of project leaders, consultants and suppliers. Petra (I-MT Højgaard) mentioned that a lack of knowledge and expertise among human resources at the practical level was a concern discussed by the steering committee when developing the *MIBA 2010* guidelines. In general, the guidelines are broad goals and recommendations that are designed to be elastic with room for interpretation (Olav, KK-CCP). According to Dina (KK-TEA), the general nature of the guidelines is due to the extensive resource demands that would be required to make them more specific, and the ever-changing field of sustainable construction best practices. Nikolai (I-Niras) spoke about the difficulty in determining the correct specificity of guidelines. He refereed to the guidelines as being two-sided, where the need to be specific must to be balanced with ease of implementation. More broad guidelines are easier to implement but they are also easier to overrule and overlook.

Inseparable from the issue of knowledge is training. Along with our interview subjects' consensus that a lack of knowledge and skills is a barrier, they clearly stated that training deficiencies exist. Best exemplifying this is the

total lack of training on the implementation of the *MIBA 2010* guidelines. Despite *MIBA 2010* acting as the key GPP tool in KK's construction sector, project leaders have resorted to discussing its guidelines informally with fellow colleagues. While this "water cooler" knowledge sharing has likely improved the ability of project leaders to implement *MIBA 2010* (through the pooling of knowledge), the identified lack of knowledge would limit this. Most interviewees agreed that they would have welcomed and benefited from some accompanying training with the guidelines. To Johan, working within KK-FA, the lack of overall training was a serious concern. In his opinion, the Finance Administration (FA) (KK) employees would sincerely like to upgrade their skills, particularly focused on Life-Cycle Costing (LCC). On the more positive side, some interview subjects discussed the availability of general short courses on sustainable procurement and even a "15 minute e-learning course" (Johan, KK-FA). David (KK-TEA) also spoke about five individuals within his center at the Technical and Environmental Administration (TEA) that have completed two-year university programs at regional institutions. However, he quickly noted that these programs are very expensive and therefore very limited opportunities exist.

Lack of Life-Cycle Costing (LCC) Tools and Usage

Fundamental to GPP, LCC implementation was a primary area of investigation. It also turned out to be an interesting topic due to a lack of consensus. Figure 25 illustrates the sentiment of our interviewees regarding the current degree of LCC implementation in KK's construction sector. The accompanying table (Table 8) presents an overview of our interviewees' opinions regarding the current degree of LCC implementation within KK's construction sector.

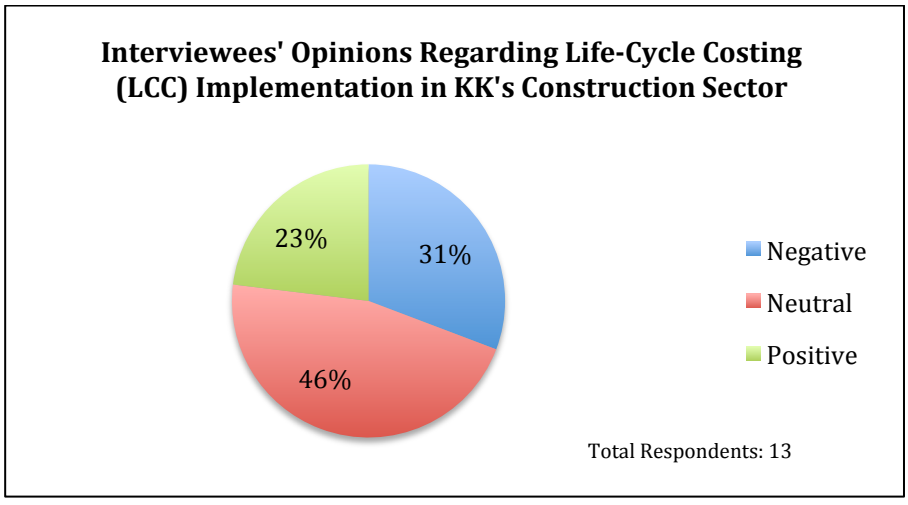


Figure 25 – Interviewees' Opinions Regarding Life-Cycle Costing (LCC) Implementation in KK's construction sector. Negative sentiment indicates that the interviewee is unaware of LCC usage. Positive sentiment indicates that the interviewee is aware of LCC currently being used and implemented. Source: Own development based on interviews.

Table 8 – Opinions of Interviewees Regarding Life-Cycle Costing (LCC) Implementation in KK's Construction Sector. Negative sentiment indicates that the interviewee is unaware of LCC usage. Positive sentiment indicates that the interviewee is aware of LCC currently being used and implemented. Source: Own development based on interviews.

Opinions of Interviewees Regarding Life-Cycle Costing (LCC) Implementation in KK's Construction Sector		
Negative	**Neutral**	**Positive**
Lasse (KK-CCP): Does not use LCC and no one is working on it. Tore (R-Concito): No Danish companies know how to calculate LCC because it is not a requirement of the tendering process. Furthermore, there is little scientific research into LCC in Denmark. David (KK-TEA): We do not have the tools to perform LCC. Dina (KK-TEA): Does not use LCC and does not think it would make a difference.	Mons (KK-CCP): Does not yet use LCC, but people are working on it. Jone (KK-TEA): Does somewhat consider the life and decommissioning of projects. Johan (KK-FA): Wants to be trained on LCC because placing demands on suppliers requires an ability to ensure control and accountability. Sunniva (KK-TEA): Believes LCC training would make it easier to choose among competing bids. Nikolai (I-NIRAS): Recommends all clients to utilize LCC but admits they are not yet good at applying it. Carl (KK-FA): Believes GPP in construction does not make sense without LCC but questions abilities to measure.	Olav (KK-CCP): It has just been implemented. Petra (I-MT Højgaard): Uses LCC quite often for a competitive advantage but seldom includes externalities associated with cradle-to-cradle. Andreas (I-Accenture): LCC is performed for new buildings and written into the contract, however almost never for old buildings.

As can be seen from Figure 25 and Table 8, when it comes to LCC, there is simply no consensus regarding its usage. As a fundamental foundation of GPP, this finding reflects negatively on GPP in KK's construction sector. Considering the importance of the *MIBA 2010* guidelines at the practical level, one might expect LCC objectives to be prominent within the publication. However, LCC is only referenced a single time in *MIBA 2010*: "Sustainable project design comprises a life-cycle perspective for materials, structures, piping and wiring, and the project as a whole, from extraction to removal" (Københavns Kommune 2010). David (KK-TEA) referred to this reference in *MIBA 2010* by stating, "*MIBA 2010* says we shall use [LCC], but we do not have the tools to do so. So far I think we [KK] just want private construction companies to think about it."

Representing a construction company, Petra from MT Høygaard confirmed that LCC is quite often used by private industry. However, she explained that its use is not a requirement but instead a strategy to achieve a competitive advantage. This is obviously a good sign for GPP in KK; however, we cannot generalize based on the point of view of one employee from one firm. Tore (R-Concito), in contrast, had the opinion that in reality very few Danish firms perform LCC calculations. He stated that Danfoss is the only Danish firm with a dedicated LCC department. He further explained that Danfoss created this department out of pressure from

Italian purchasers demanding that such calculation were performed. Therefore, the improved LCC abilities of the company were actually the result of foreign pressure, not domestic.

From Nikolai's perspective, LCC is a "much more logical way to look at [construction projects]" versus traditional methods. For this reason, he always recommends the use of LCC to his clients. However, he noted that his clients are "not that good at applying it." He additionally said that there is more willingness to use LCC on more expensive and less frequent purchases than on everyday goods. Nikolai (I-Niras) explained that, from an industry perspective, increased environmental demands including LCC are often seen as unnecessary, painful, and annoying, while acknowledging that "some companies are smart enough to use it to market themselves as a greener alternative." As we discussed in the political barriers section, Nikolai (I-Niras) further identifies the separation between short-term politics and the lifespan of construction works projects (50 years+) as a key barrier to the further adoption of LCC. He argues that political short-term thinking regarding initial construction budgets can trump long-term financial savings from LCC.

In one of our earliest interviews, Lasse and Mons at Copenhagen City Properties (CCP) (KK) described current LCC usage within the Technical and Environmental Administration (TEA) as "theoretical". They were referring to a general perception within TEA that efficient buildings are a good idea in principal, without economic and environmental effects actually being calculated. Lasse further referenced the fiscal separation that exists between capital and operational expenditures.

Despite KK being responsible for both cost areas, capital and operational funding responsibilities are distributed. In reality, this distribution is further complicated with the responsible departments located in different administrations. This separation ultimately creates difficulties for the justification of increased capital costs for more efficient solutions, despite lower lifetime operational costs. Consequently, the uptake of LCC is significantly hindered as it is a financially incentivizing tool for the promotion of GPP. Despite a positive outlook on LCC usage, Olav (KK-CCP) described the separation between themselves (capital costs) and operations as a challenge because LCC initiatives need to fit traditional budgets. Olav simply stated, "It is expensive to be poor." With this statement, Olav was referring to the increased capital requirements of efficient solutions that still need to fit existing budgets, despite lower operational costs and long-term cost savings. Essentially, Olav's comment indicates that the current lack of LCC usage in KK's construction sector will directly result in higher long-term costs.

Andreas (I-Accenture) attributed the lack of support for LCC in Copenhagen City Properties (CCP) to a lack of knowledge of the energy statistics for assets under its umbrella. According to Andreas, the operational

responsibilities of KK's building stock is so decentralized that it is impossible for CCP to have an overview. However, he described a new monitoring system currently being implemented to monitor the energy usage statistics of KK's buildings. Looking forward, the successful implementation of this system will dramatically improve the justification for LCC. Interestingly, no other interviewees referred to the development of this new monitoring system.

Among our interview subjects, Tore at Concito was perhaps the most outspoken critic of LCC usage in Denmark. Tore attributed the lack of LCC usage to very limited demand and a fear of disappointing results. According to him, "[In Denmark,] the fact that a building looks sustainable is more important then doing calculations." Throughout our interview he repeatedly compared Denmark's lack of LCC progress to the UK where Life-Cycle Analysis (LCA) legislation has been implemented, which includes the usage of Life-Cycle Costing (LCC).[28]

> The UK has both an official overseeing body, the Carbon Trust, and law, the Carbon Law, that require companies to perform LCA on their products and services. Consequently, the UK now has a significant LCA knowledge base and industry established that Denmark could learn from (Tore, R-Concito).

Tore also referred to a general lack of life-cycle research within Denmark by stating, "There is not much scientific research on LCC in Denmark, the only university with a unit for LCC is Aalborg University."

When discussing LCC, both Olav (KK-CCP) and David (KK-TEA) made reference to the transition of focus from new building projects to the renovation of existing infrastructure. David expressed some concern for this transition towards renovations due to increased complexities of applying new construction methods to existing structures. However, a shift towards the renovation of existing buildings would be positive for LCC, as efficiency improvements (lower operational costs) can help justify renovation expenses. With this in mind, the current lack of LCC utilization within KK negatively affects the pace of this switch towards renovations (further GPP progress).

All interviewees, with the exception of Dina (KK-TEA), had positive opinions about LCC in general. Alternatively, Dina did not see any advantage in using LCC. She said that it would make more sense for Copenhagen City Properties (CCP) to use it, indicating that the Technical and Environmental Administration's (TEA) projects are simply too big. According to her, using LCC would not make a difference because it is not applicable to the projects she is in charge of. Interestingly, Jone from CCP also said that LCC is not really

[28] For the purpose of this paper, we are only focusing on LCC usage in Denmark. LCA is a more comprehensive analysis of a product or services' life-cycle impacts beyond financial considerations. LCC is effectively a basic version of LCA that focuses only on costs.

applicable to the projects he is working on, despite his colleagues in similar roles stating otherwise. This illustrates that there is confusion around LCC, its benefits and its applications.

Irrespective of their opinions on current LCC implementation in KK's construction sector, 12 of 13 interviewees believe that LCC usage is a good idea and would offer advantages. This is obviously a positive indicator for LCC implementation (and GPP) in KK's construction sector.

Conservative Procurement Officials and Project Leaders (Cost and Complexity Concerns)

The final barrier we identified hindering GPP progress at the practical level is a general conservative approach by procurement authorities and officials. By conservative approach, we are referring to procurement officials being risk averse and reluctant to change (sticking to the traditional and proven methods).

Tore (R-Concito) described the construction sector as "extremely conservative." Andreas (I-Accenture) agreed by stating, "The construction sector is generally conservative." Both Tore and Andreas were referring to a tendency for construction sector procurers to maintain the status quo and avoid risks of increased costs and complications. "Procurement officers are too risk adverse… that is a problem. They just say that adding another layer of environment is not possible" (Andreas, I-Accenture). While this issue was attributed to political level influences by some interviewees, others place responsibility in the hands of those working with procurement at the practical level. Petra (I-MT Høygaard) stated that this conservative nature has a direct negative influence on industry's willingness to put forward innovative solutions: "If a tender is ambitious and creative, we will be ambitious."

The overwhelming usage of Most Economically Advantageous Tender (MEAT)[29] award criteria reported by our interviewees positively indicates that aspects of quality, including environmental considerations, are being considered. However, the same interviewees stated that emphasis is put on controlling costs and accepting the bid with the lowest price. While public authorities have a responsibility to use taxpayers' money effectively, there is little incentive for suppliers to invest in sustainable solutions if demand exclusively prioritizes price over environmental considerations. "Price is still the most important factor… price is 95% and environment is 5%" (Tore R-Concito). While most interview subjects did not indicate a price prioritization to this extent, the general consensus was that price still rules the awarding process. Both Olav and Jone, who work as project leaders

[29] MEAT award criteria allows for considerations other than just price. When lowest price award criteria is used, suppliers compete solely on price. MEAT allows for clearly defined environmental criteria that suppliers compete on.

within CCP, emphasized that time and budgets are their primary concerns. More specifically, Olav (KK-CCP) stated, "Practitioners [procurement officials] have to be done within money and time… not invent new ways to build." Also a project leader, David (KK-TEA) believes price is a major determining factor but he also brought up quality aspects in our discussion. Nikolai (I-Niras) believes price and environmental considerations need to be better balanced. Additionally, he believes clear criteria for how financial and environmental tender objectives are weighed in the awarding process is required to make a sustainable change. By clearly outlining the balancing of objectives, Nikolai believes that industry will respond accordingly. Therefore, clear and ambitious environmental targets will be met by ambitious solutions.

Similar to the political reluctance to increase complexity by implementing GPP initiatives, procurement officials and their project leaders indicated a reluctance to complicate their existing "way of doing business". Several Interviewees pointed to numerous objectives competing with environmental considerations in procurement processes. These include safety, functionality, chemical composition and the preservation of historic buildings. This variety of objectives complicates the work of procurement officials and can result in an unwillingness to consider additional environmental objectives. In particular, Dina and Sunniva (KK-TEA) emphasized the challenge of meeting numerous and diversified objectives through the procurement process. Dina (KK-TEA) oversees project leaders and stated that their primary concern should be design and functionality (meaning how well a solution works, not to be confused with functional tendering). Referring to a project for a new bike path, Sunniva (KK-TEA) exemplified the conflicting objectives of procurement and preference for functionality over GPP. She explained how they attempted to utilize a white rock pavement surface for a bike path that would increase light reflectivity and therefore reduce the lighting requirements. However, this idea was eventually terminated due to functionality concerns with black traditional pavement being sturdier and longer lasting. Nikolai (I-Niras) also stated that functionality is typically KK's primary objective.

In addition to complexity concerns caused by competing objectives, a reluctance to change current "ways of doing business" also includes efforts of incorporating alternative and creative procurement processes. Examples of such processes include increased communication with industry, competitive dialogues and functional tendering, all of which could progress GPP. The *CPH 2025 Climate Plan* includes a focus on the promotion of functional tendering versus traditional specification-based tendering.[30] In Andreas's (I-Accenture) opinion, "Functional tenders are the way to go." While not yet widely used within KK's construction sector, he did have an example of a recent functional maintenance contract for KK owned buildings. Not only was the contract

[30] In a functional tender, the municipality would simply ask for a service or product that fulfills a specific function or need. In a specification-based tender, KK would give a detailed description of the product/service needed.

written in a functional manner, but stages of environmental impact reductions were also included. Without other examples, he admitted that this was quite unusual. Sunniva (KK-TEA) and Lasse (KK-CCP) also mentioned that functional tendering is used in some circumstances. Additionally, our interviewees from industry were positive about using such a tendering format: "I think we should go more towards functional tenders" (Petra, I-MT Højgaard).

Summary of Findings at the Practical Level: Main Takeaways

At the practical level, three main barriers have been identified. The first barrier at the practical level is an overall lack of GPP-related knowledge, skills and training for project leaders and other public officials within the procurement divisions of KK. The second barrier is a lack of LCC usage and knowledge in KK's construction sector. As a central tool of GPP, this finding is significant, indicating a deficiency that needs to be overcome for further GPP progress. However, some fragmented attempts to incorporate LCC do exist within KK and the trend is at least positive. Additionally, 12 out of the 13 interviewees were positive towards more usage of LCC. Lastly, the third barrier identified is a conservative attitude among procurement authorities and officials, including a focus on lowest price and complexity avoidance. Despite utilizing MEAT award criteria, the general consensus was that lowest price still rules the tender awarding process.

5.3.3.2 Link to Research Community

Other researchers have identified barriers to GPP at the practical level. Compared to political and organizational level barriers, practical level barriers have been further explored in existing research. This confirms that there is little doubt regarding the importance of addressing barriers at the practical level. While some of our empirical findings have common ground with the work of other researchers, our research additionally offers new and unique insights.

Previous work identifying barriers at the practical level has primarily been focused on the Nordic countries, however European GPP practices have also been addressed. Among the reports and papers that address issues related to our own findings, the trend has been to highlight a lack of skills, tools and training, often referred to simply as a lack of knowledge around GPP. Furthermore, among these researchers, the preferred methods have been surveys, questionnaires and tender document analysis, with interviews applied only as a secondary data-collection method.

Ottander and Søderstrøm (2005) performed a survey on public procurement in Sweden. Half of the respondents identified a lack of knowledge on environmental issues as the greatest obstacle to GPP progress. Some degree of uncertainty regarding regulations was also identified, with 27% indicating unfamiliarity with current regulations on the use of environmental criteria in procurement. This study was followed by another questionnaire-based survey of GPP in Sweden that also found knowledge among public procurement officers as the main barrier to green purchasing (The Swedish Environmental Protection Agency, 2009). Additionally, Varnäs and Balfors et al. (2009) state that a lack of knowledge is a key issue in the implementation of GPP in Sweden.

Michelsen and de Boer (2009) asked procurement officers in Sweden whether they felt they had the necessary knowledge to derive and formulate environmental demands. Only 5.6% of respondent believed they had sufficient knowledge, 69.3% believed they had some degree of competence and 32.2% believed they completely lacked the necessary skills. Additionally, the authors found a clear correlation between an individual's own perceived level of competence and the inclusion of environmental information.[31] Our interviewees unanimously indicated that they lacked the necessary knowledge and skills. Irrespective of whether they are just critical of their own level of knowledge, the clear correlation identified by Michelsen and de Boer (2009) indicates that this belief will have negative effects on GPP progress within KK.

Bouwer and Jonk et al. (2006) completed an extensive survey and tender document analysis at the European level. Their findings revealed that 25% of respondents believed they had a lack of tools, both informational and operational. The authors also found that 35% of procurement officers thought there was a general lack of competence on environmental issues and ways of formulating environmental criteria. Confusion around formulating environmental criteria was also identified by the authors when analyzing tender documents. Here, it became clear that the environmental criteria were vague and not specific. This supports our findings when analyzing the TED database. Vague and unclear environmental considerations and criteria in tender documents indicate a lack of competence and technical knowledge among those writing tenders.

In another study on GPP in Europe, public officials were asked about their perceived difficulty of incorporating green criteria into the procurement process. According to this study, the average difficulty among respondents was 3.06 on a scale from 1 to 5, with 5 being the most difficult (Centre for European Policy Studies, 2012).

[31] Inclusion of environmental considerations: In the qualification of suppliers, in the selection of suppliers and also whether environmental considerations have resulted in a rejection of the lowest price.

In a GPP study on the Nordic countries, the difficulty of identifying the most important environmental aspect of a specific product or service was pointed out. This was followed by the challenges of how to successfully include these environmental aspects as criteria in tender documents (TeamNord 2005).

In relation to competencies among purchasers, Bowen and Cousins et al., (2001) point out that there is a difference between asking for information about environmental issues and actually having the knowledge and skills to derive conclusions based on this information. This is an important point that was also brought up in our interviews. Johan (KK-FA) emphasizes his opinion that to put stricter demands on suppliers, KK must be able to assess this information and choose among alternatives. He went further by stating that it is in the interest of KK to have expertise on tools including LCC before imposing such requirement on suppliers. In other words, KK must be capable of giving advice on how to do LCC calculations. This finding illustrates how our in-depth interview approach allowed for deeper investigation at the practical level.

The necessity and importance of training has been pointed out in several studies (Bouwer and Jonk et al., 2006; Powell and Tinch et al., 2006; Carter and Ellram et al., 1998 & The Swedish Environmental Protection Agency 2009). This is in line with our own findings, where it was clear that KK procurers had very limited access to training. However, we chose to focus more on the skills needed, specifically on LCC. The lack of LCC skills has to a smaller degree been addressed in previous research on barriers at the practical level.

In a study by the Centre for European Policy Studies (2012), it is evident that purchasing costs are the dominant factor in awarding contracts. This study assesses the implementation of GPP in the EU27. In the study, 64% of respondents indicated that they prioritize lowest price as the deciding criterion. According to the study, only a small fraction employed LCC methods in the evaluation of alternative bids. Additionally, a European Commission (EC) Communication from 2008 identified GPP barriers relating to limited information on LCC and the costs of choosing environmentally friendly services and products. In the same document, the EC also stated a concern about the awareness of the advantages of choosing such products (Commission of the European Communities, 2008). Bouwer and Jonk et al. (2006) touched upon this same issue. The authors found that the main obstacle to GPP progress was the belief that using environmentally friendly products would be more expensive than conventional solutions. Additional research emphasized that a fear of increased costs from applying environmental preferences hindered GPP progress (Varnäs and Balfors et al., 2009).

Michelsen and de Boer (2009) found that 50% of Swedish municipalities have never favored environmental considerations if this meant not choosing the cheapest offer. This finding is in line with Nykvist and Nilsson (2009), who concluded that cost effectiveness (and not environmental considerations) is the ruling principle. The

fact that price still rules tender award criteria is also evident in other works on public procurement (Ochoa and Führ et al., 2003; D'Amato, 2007; Parikka-Alhola and Nissinen et al., 2007). Overall, our findings regarding cost concerns and lowest priced bids winning tenders are supported by previous findings.

How our findings offer New Insights

The practical level cognitive barrier to GPP is well documented. However, previous research does not equally address concerns about access to knowledge. In our interviews, the issue that adequate knowledge exists but procurers need training in how to access and utilize it was brought up. This also relates to the low LCC utilization in Denmark. Considering the GPP success that the UK has had by implementing LCC usage, the competence and knowledge exists. Moreover, when compared to previous research, the central importance of LCC to successful GPP implementation at the practical level is emphasized.

Previous research has also failed to acknowledge conservative attitudes among procurement officers as a barrier. A fear that more creative procurement processes and environmental consideration increases complexity was evident in our empirical findings. This concern, and the fact that procurement officers are hesitant to change the way they currently do things, would be difficult to capture if another method than interviews was employed.

Lastly, we offer some new insight by focusing our research on KK at the municipal level. Our findings clearly identify deficiencies of the *MIBA 2010* guidelines, highlighted by a lack of accompanied training, low LCC focus and no prioritization of the environmental objectives. In our opinion, these deficiencies complicate the work of the public purchasers, limiting GPP progress. These findings are valuable insights for the steering committee currently working on *MIBA 2014*. Additionally, these learning points are relevant to the production of similar guidelines in other Nordic municipalities or elsewhere.

5.3.4 External Influences

Throughout our research process, certain trends and topics emerged that did not necessarily fit our three identified barrier levels. Furthermore, these issues were different from our previously established barriers at our three primary levels (political, organizational & practical). They do not hinder GPP directly but instead negatively influence its progress through channels including our established barrier levels. Therefore, we decided to categorize these as external influences and include them in our findings. Our findings on external influences include local, national and European considerations.

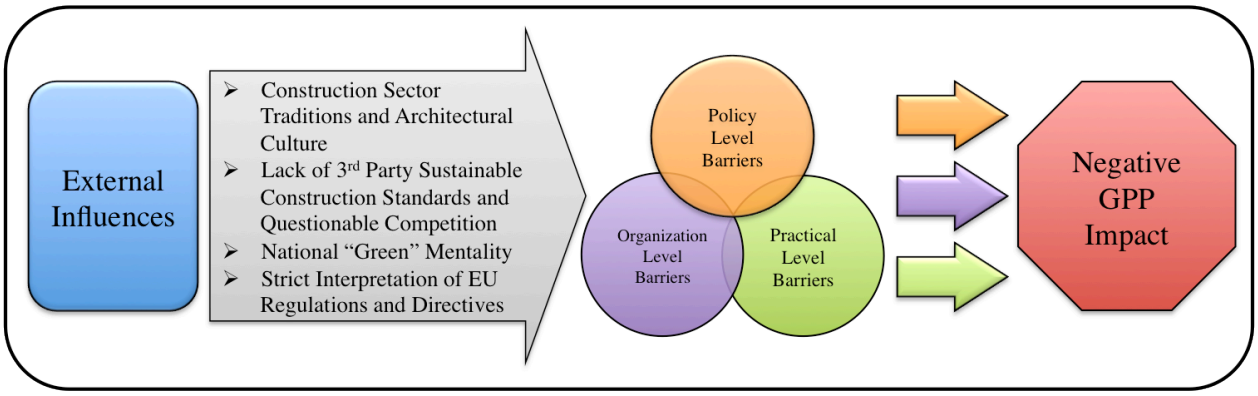


Figure 26 - External Influences of Berntsen-Manner Model. Source: Own development.

This section will explore the external influences of our Berntsen-Manner Model. Figure 26 outlines the key external influences we have identified to help explain the discrepancy between GPP's progress and potential in KK's construction sector. Furthermore, it visualizes the indirect nature of these external influences. Our identified external influences include:

- Construction sector traditions and architectural culture.
- Lack of 3rd party sustainable construction standards & questionable competition.
- National "green" mentality.
- Strict interpretation of EU regulations and directives.

5.3.4.1 Empirical Findings on External Influences

Construction Sector Traditions and Architectural Culture

While it is hard to ignore the trend of globalization in our world today, the construction sector has traditionally been very localized, specializing in the unique needs of regions based on resource availability. Denmark is no exception with significant construction traditions still having strong influences today.

For some of our interview subjects, there is a fundamental problem with how sustainable construction is defined in practice in Denmark. Tore (R-Concito), Nikolai (I-Niras) and Petra (I-MT Højgaard) all believe green construction in Denmark is too focused on consumption (especially energy and water) during the usage phase of a project, with little or no focus on the construction phase and chosen materials. The problem is that "in the construction sector, 80% of emissions are in the production/transport/commissioning phase" (Petra, I-MT Højgaard). To further strengthen her point, Petra argued that even if all buildings could reach zero emission levels for their usage phase, the construction sector would still be responsible for significant emissions if the

other phases continue to be ignored. For this reason, Petra feels the need to educate and influence her clients; "I want to influence [them] so they focus more broadly on sustainability and not just on energy usage." Our interview with Tore at Concito confirmed most of Petra's arguments, as he also focused on the current lack of accountability for emissions beyond usage phase efficiency.

While the promotion of GPP is a demand-based strategy to stimulate the adoption of sustainable solutions, suppliers on the supply side of the equation hold an equal responsibility according to some interviewees. In Nikolai's (I-Niras) opinion, this is especially true for architects who have a "huge, huge impact" on the sustainability of the construction sector. In addition to Nikolai, David (KK-TEA), Petra (I-MT Højgaard) and Tore (R-Concito) also shared general concern for the design stage of construction works and buildings projects. All four interviewees emphasized that a project's environmental impact is largely locked into its design, a direct result of the architect's will, creativity and knowledge. The two main areas of concern for these four interviewees were material selection and the balanced integration of sustainable solutions with design.

The issue of material selection is connected to the traditional use of brick in Denmark, as well as, the modern design preference for concrete, glass and metal. The preference for using these materials makes the Danish tradition of construction "very CO2 intensive," according to Tore (R-Concito). Nikolai (I-Niras) associated this material selection issue to a lack of focus and knowledge within the architectural sector regarding sustainability and the life-cycle impact of materials. He continued by noting that the architectural community within Denmark is largely composed of "artists and expressionists" who prioritize the virtual infinite formability of concrete over its weak environmental profile. Energy intensive to produce and transport, concrete is one of the highest emission emitting materials used in the construction sector according to Nikolai (I-Niras). Tore (R-Concito) also highlighted the extensive incorporation of glass as having a significant emissions impact. In addition to being energy intensive to produce and transport, Nikolai (I-Niras) noted that glass has a relatively low energy performance rating (and that practical applications of glass rarely meet this low performance rating in reality). Therefore, he ultimately questioned both the functionality and sustainability focus of some modern architects. Despite these concerns, Nikolai (I-Niras) does not see the preference for these building materials changing any time soon. He emphasized that a change would require dedicated clients putting environmental considerations ahead of design. He acknowledged that this is further complicated as clients seldom really understand the life-cycle impact of material selection. Petra's (I-MT Højgaard) comments about needing to educate her clients beyond the usage phase support this claim. David at KK's Technical and Environmental Administration (TEA) agreed with Tore, Nikolai and Petra regarding a lack of focus on the life-cycle impact of material usage, admitting that he and his colleagues do not know the emission levels for different materials.

The second architectural culture issue brought up by our interview subjects is the uncoordinated integration of sustainability and design features into construction works projects. Tore's (I-Concito) conclusion was that architects typically first design the "look and feel" before trying to make a project sustainable. David (KK-TEA) also spoke about the need for design and sustainability to be more closely integrated. In his opinion, many members of the architectural community have both the knowledge and desire to achieve better results but a lack of demand exists.

With a long and proud tradition of architecture in Denmark, the somewhat negative view of Danish architectural culture was a surprise initially but made sense once it came to our attention.

Lack of 3rd Party Sustainable Construction Standards & Questionable Competition

The development of standards to incentivize environmental sustainability within the construction sector has been a primary tool in many countries. This is also true in KK with the development of the *Sustainability in Construction and Civil Works 2010 (Miljø i byggeri og anlæg* (*MIBA 2010))* guidelines. However, issues relating to the lack of a 3rd party controlled set of standards were brought up by some interviewees.

According to Tore (R-Concito), there are two major problems with current construction sector standards in Denmark. The first problem is a lack of Danish standards similar to Leadership in Energy and Environmental Design (LEED) in the U.S. or Building Research Establishment Environmental Assessment Method (BREEAM) in the U.K. In his opinion, Denmark needs its own set of standards that reflects the unique characteristics of Denmark and its needs. "We cannot just use another country's system, we need to make our own" (Tore, R-Concito). He exemplified this need by focusing on the transportation infrastructure differences (cars and public transit) between Denmark and the U.S. Second, he believes these standards need to be different from existing standards including the *MIBA* guidelines. This is because he is adamant that a need exists for purely objective standards that only support Danish solutions if they are the best in the world (global benchmarks). In Tore's opinion, the *MIBA* guidelines are questionably supportive of solutions by Danish industry regardless of whether these are the best solutions or not.

Nikolai (I-Niras) also spoke about the issue of standards, however, he was positive towards what he calls a common practice in Denmark of adapting LEED or BREEAM to Danish circumstances. Additionally, Petra (I-MT Højgaard) spoke about industry applying a German standard (DGMB, German Sustainable Building Council), however she quickly added that it is only used for office buildings.

Tore (R-Concito) was the first interviewee to bring up issues related to a possible lack of competition within the construction sector of Denmark. He believes industry lobbyism (and government protectionism) is a major problem with current standards, adding that Danish companies have little incentive to change or improve when current standards are designed to support their existing products and solutions. To exemplify lobbyism within the construction sector, he spoke about carbon tax breaks for the concrete industry. In his opinion, reluctance towards completely objective standards is due to fears of raising political tension from industry and unions (if they are unable to adapt). However, he believes this would only be a temporary issue in the transitional phase. His belief is that standards based on global competition (rather than national) would reap significant medium and long-term benefits for Danish Industry's competitiveness.

Johan at KK's FA confirmed Tore's (R-Concito) argument that lobbyism exists within KK but disagreed that government protectionism is also occurring. Instead, he insisted that it is their intention to incorporate industry expertise, knowledge and opinions when developing standards: "A lot of companies influence us, but we ask them to influence us." He also insisted that while he and his colleagues welcome dialogue with the industry, they do not listen to threats.

Andreas and Tim (I-Accenture) supported Tore's (KK-Concito) claim that a lack of competition exists within the Danish construction sector. However, they disagree that the influence of lobbyism on standards is to blame. "I don't think [a lack of competition] is related to protectionism" (Andreas, I-Accenture). In their opinion, one needs to examine this topic from a risk perspective for procurement authorities. Andreas continued by stating, "In Denmark, the proven product is probably the Danish product... It has lower risk." Tim (I-Accenture) supported Andreas's reasoning, "When you're buying a huge amount of [smart] meters, you want something you know is going to work. Proven products." Andreas (I-Accenture) further argued that a local market is not a perfect open market from an international perspective because it requires local representation and presence. Supporting him, Tim (I-Accenture) simply stated, "Local bid, local win." Wrapping up their opinions of the level of competition in KK's construction sector, they both largely focused on aspects of risk to explain why Danish solutions are more heavily relied upon within the Danish procurement market.

National "Green" Mentality

An interesting trend started to emerge from the start of our interview process. While not initially a specific focus of our interview questions, some interviewees expressed that a discrepancy exists between actual levels of sustainability achieved in Copenhagen and the public's perception. "We are not as green as we like to think we

are" became a common theme throughout our interview process. To exemplify this, Tore (R-Concito) pointed to research by an associate at Aalborg University that calculated average emission levels for people within Copenhagen versus Denmark as a whole. According to Tore, people living in Copenhagen emit 23 tons CO2e/year versus a national average of 17 CO2e/year in Denmark. He associates this difference to the modern urban lifestyle in Copenhagen including increased air travel.

The national "green" mentality and beliefs around sustainability were also addressed in our interviews. In Tore's (R-Concito) opinion, a national belief that "Denmark is already the best" when it comes to sustainability is a key obstacle. Furthermore, our meeting with Carl (KK-FA) at Copenhagen's City Hall did not last long before he questioned the overall success of Denmark's sustainability initiatives. Referring to the implementation of green initiatives, he stated that Denmark "always has a good image, but when you really look at it [it is not that good]." Supporting this feeling, Tore (R-Concito) stated in our interview, "In the UK they do [environmental initiatives] because it is the right thing. In Denmark [we do it] because it sounds good and makes jobs… It is 90% marketing." While commenting on the UK's utilization of LCC, Tore wanted to also make a cultural distinction between the media in Denmark and the UK, by stating, "UK TV channels have lots of environmental TV shows, this is not present in Denmark." Consequently, he believes this leads to a lower degree of societal participation in environmental issues (which negatively affects the demand for green products and solutions). Tim at Accenture (I) agreed with this opinion by referring to his experience with private developers and investors. He stated that his company sees a lack of demand in the market for increased sustainability (at increased costs).

Strict Interpretation of EU Regulations and Directives

The external influence that the EU has on the progress of GPP in KK's construction sector is significant. GPP is a central procurement and environmental initiative at the EU level. Like all Member States, Denmark (and KK indirectly) is encouraged by the EU to develop and implement GPP policies. However, in addition to promoting GPP adoption, the EU balances a responsibility to maintain a fair, open and competitive tendering market through extensive procurement regulations and directives. Furthermore, "EU procurement rules are meant to promote European growth" (Grete, R-CBS). She further explained how this is not necessarily aligned with the goals of individual Members States to promote their own domestic industry.

Some interviewees (Andreas, I-Accenture; Tim, I-Accenture & Grete, R-CBS) believe Denmark currently has a very strict interpretation and implementation of European procurement rules, which consequently is suppressing alternative procurement processes that could promote GPP. Andreas from Accenture (I) was confident that

Denmark's strict interpretation of tendering rules is partly to blame for lower GPP progress in KK's construction sector. Contrary to Denmark, he described how Germany is loose (compared to Denmark) in its interpretation of EU procurement laws, allowing for more innovative processes. Furthermore, Andreas explained how the UK has an even looser interpretation than Germany, emphasizing this by saying that the UK barely follows the rules at all.

Grete (R-CBS) offered some explanations behind the difference between Danish and UK application of the European rules and regulations. According to Grete (R-CBS), Denmark's strict interpretation of EU procurement laws is due to the relatively inexpensive tendering complaints process that is facilitated by a designated complaint boards. Alternatively, tendering disputes in the UK must be filed and processed through traditional courts. She stated that this process in the UK is not only more expensive but also more time consuming, discouraging the number of complaints and creating greater flexibility. Additionally, she said the outcome is that "procurers in Denmark have a fear of being creative in case suppliers will complain" (Grete, R-CBS).

Despite EU procurement rules having a potential negative impact on GPP's progress in Denmark, Grete is positive regarding the anticipated new procurement directives as a potential solution. An example of the proposed changes is the introduction of innovation partnerships where funding is available for the development of a product. Currently, procurement authorities are not permitted to fund innovation and then purchase the corresponding developed product. According to her, this change would increase the likelihood for innovation funding, as well as allow industry to more freely sell their products. She further explained that another key area of the new proposed directives is the increased opportunity and flexibility to use market consultations. Her belief is that market consultations will be permitted and achieved through an online format. In contrast to traditional meetings, this online format could avoid distorting competition. She additionally mentioned that the proposed new directives would allow for more use of the Restricted Procedure, and also include new certifications and labeling for specific products.

Summary of Findings from External Influences: Main Takeaways

Established local (Copenhagen) and national (Denmark) construction sector traditions, including the use of materials, have a strong influence on any GPP strategy within this sector today. The traditional use of brick and concrete continues despite high emission levels. Furthermore, the increased incorporation of glass has further added to the carbon intensity of materials within building projects. Our interviewees attributed these trends to the

established architectural culture in Denmark, questioning their focus on sustainability and functionality versus design.

The lack of Danish 3rd party sustainable construction standards was also brought up. Some interviewees specifically raised concerns regarding the objectivity of the *MIBA 2010* guidelines. These same concerns brought up questions related to protectionism, lobbyism and competition in KK's construction sector.

Throughout our interview process, "we are not as green as we like to think we are" became a trending topic and issues surfaced regarding the possible influence that this mentality, both present in Copenhagen and at the Danish national level, has on GPP progress. This external influence is so large, diverse and complex that it is essentially impossible for us to properly analyze within the scope of our paper. However, we felt it needed to be mentioned.

The last external influence is the influence that the EU has on its Member States including Denmark (and hence KK). As both a central procurement and environmental initiative for the EU, GPP promotion has strong EU support. However, Denmark's strict interpretation of European procurement rules and regulations is suppressing alternative procurement processes (which could promote GPP).

5.3.5 Combining the Berntsen-Manner Model with Hydén's Norm-Model

In the following section, we will combine our Berntsen-Manner Model with Hydén's Norm-Model to offer further insights. We believe that it is both necessary and fruitful to apply social theory when investigating actions determined by human agency, as is the case with GPP in KK. For this reason, applying Hydén's Norm-Model will expose insights that could be missed by exclusively applying our Berntsen-Manner Model. However, the Berntsen-Manner Model's approach of identifying barriers at different levels offers insights that would be missed if we solely applied a conceptual framework based on Hydén's Norm-Model. Together, Hydén's Norm-Model and our Berntsen-Manner model can more holistically explain the discrepancy between the potential and progress of GPP in KK's construction sector. In particular, combining these two models allows for a discussion around the importance of hidden factors, such as the values and motivation held by the actors involved in GPP in KK.

In this section, we will focus on the determinants of actions at the actor level. However, directing our attention to the actor level opens up for addressing barriers at the system level, as system elements can influence and shape the actions of those working in KK's procurement functions. Through the development of our Berntsen-Manner

model, we touched upon both system and actor level barriers. Table 9 outlines how our Berntsen-Manner model can be linked to Hydén's Norm-Model.

Table 9 – Combining Our Berntsen-Manner Model with Hydén's Norm-Model. Source: Own development and Hydén (2002).

Combining our Berntsen-Manner Model with Hydén's Norm-Model			
Level in Berntsen-Manner Model	**Level in Hydén's Norm-Model**	**Norm Category in Hydén's Norm-Model**	**Explanation of Applied Norm Category**
Political Level	System Level	Opportunity (system and structure)	The barriers identified at the political level result in low political will, implying that they can be combined under one "umbrella", namely that of political will. The degree of political support is part of a structure either supporting or limiting GPP.
Organizational Level	System Level	Opportunity (system and structure)	The organizational barriers identified can be traced back to the seven-mayor organizational structure of the municipality. The organizational structure can either give rise to the inclusion of green considerations or it can increase the difficulty of doing so.
Practical Level	Actor Level	Will (value and motivation) Knowledge (cognition)	At the practical level, we mainly identified cognitive barriers but will and evaluation were also addressed. These directly impact the individual actor's actions.
External Influences (Local, National & European)	System Level	Opportunity (system and structure)	The factors that indirectly affect the progress of GPP within KK are outside the control of the actors involved. This implies that they are part of the system within which the procurement officers operate.

By making the links and inferences outlined in Table 9, we have been able to apply Hydén's Norm-Model to our empirical case of GPP in KK's construction sector. Figure 27 visually represents the combination of the two models. Hydén's definition of norms implies that will, knowledge and opportunity together shape the norms that guide actions in specific directions.[32] In our case, this action is different degrees of GPP effort. Referring to Hydén's Norm-Model, will, knowledge and opportunity can either give rise to norms that are supportive or inhibitive of GPP progress in KK's construction sector. In line with our research question, we will focus on aspects that inhibit GPP progress, or more specifically, GPP action by public officials.

[32] Hydén's definition of norms: "Guidelines for behavior generated within the frames of different action-oriented systems" (Hydén, 2002, p. 270, own translation).

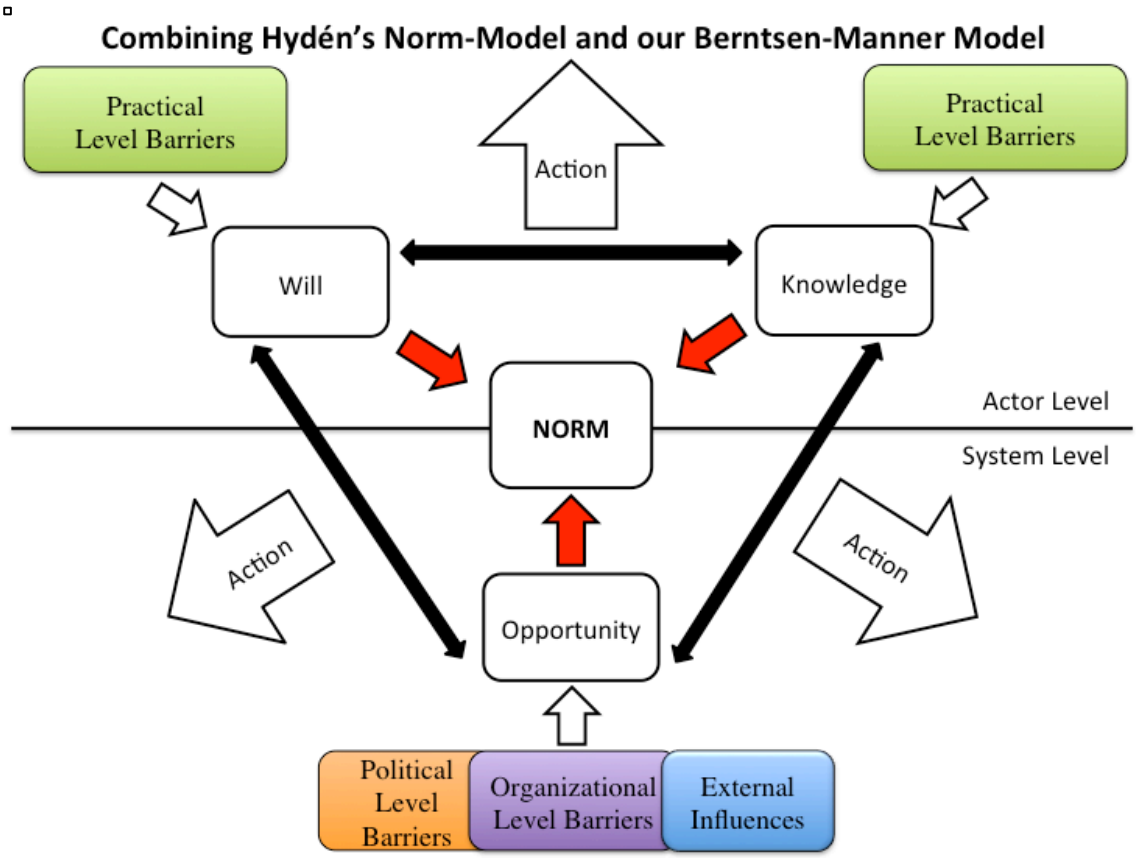


Figure 27 - Combining Hydén's Norm-Model and Our Berntsen-Manner Model. The figure shows how the three barrier levels and external influences in the Berntsen-Manner Model are linked to the three dimensions of Hydén's Norm-Model. Additionally, it visualizes how these three dimensions (will, knowledge and opportunity) shape the norms that guide actions. Source: Own development and Hydén (2002).

Will: Value and Motivation Based Conditions for Action

The will to act in a certain way is to a large degree determined by values and motivation held by the individual actors. It is crucial to understand the motivation behind actions in order to comprehend why individual actors choose to promote, hinder or stay indifferent to GPP practices. The relevant question is: What do the individual actors want to achieve? More concretely, do individual purchasers want to achieve a high level of GPP? According to Hydén, motivation can be traced back to a variety of different "systems of motivation" (Hydén, 2002, p. 285, own translation). These systems of motivation can be anything from the conscience of the individual to moral and ethics, but also external influences such as religion, politics and ideologies. Other driving forces can be economic interests, egoistic motives and solidarity with other individuals. In addition to motivation, the will dimension is related to the values of individuals, but also the collective values that shape the will and motivation of individuals.

In relation to GPP, willingness of individuals to promote GPP depends on trust, communication and the rewards of one's efforts. However, in order to reward employees based on GPP efforts, such efforts must be measured and assessed. Unfortunately, such practices are limited. In KK today, GPP is largely implemented through the *MIBA 2010* guidelines. At the same time, the municipality does not know how often these guidelines are followed, nor to what extent. Furthermore, there are currently no sanctions for those that do not act in accordance with *MIBA 2010*. The Finance Administration (FA), which is responsible for making overarching municipal strategies for procurement and GPP, has not communicated their efforts to the individual administrations. Therefore, purchasers in the Technical and Environmental Administration (TEA) and Copenhagen City Properties (CCP) are unsure regarding the degree of importance given to GPP. This uncertainty, as well as confusion regarding new policies, regulations and standards, can affect the willingness of those within these administrations to promote GPP.

The possibility exists that value or moral based motivation would drive procurers to include green considerations in their procurement processes. It is hard to identify specific values that individuals hold, but we can make general inferences by stating that individuals with "green mindsets" have an inherently higher willingness to implement GPP. KK as an organization has the possibility of influencing its employees through its internal culture, by putting an emphasis on sustainability and the environment.

Knowledge: Cognition Based Conditions for Action

Knowledge is part of the actor level, meaning that it relates to the knowledge of individual procurers at the practical level. The influences for developing knowledge can come from both the will and opportunity components, meaning that norms can develop in each of these components. In particular, those working in KK's procurement functions must be motivated toward absorbing new knowledge. Additionally, knowledge can be developed as a result of politicians directing more resources towards training.

The knowledge component depends on how public officials see and experience the world. Furthermore, knowledge is necessary if the prevalent norms are to be translated into action, implying that competence, experience and training become important success factors for GPP. Referring to the will component, individual willingness is not enough if the procurers do not know how to perform GPP. This justifies knowledge as a prerequisite for action.

A relevant question is whether priority is given to environmental awareness and knowledge on how to perform GPP. However, our findings revealed a variety of cognitive barriers within the administrations responsible for

KK's construction sector procurement. This indicates that the necessary priority is not given to the development of GPP related knowledge. In our practical level findings, it was evident that the level of knowledge, competence and skills related to GPP was rather low. In particular, skills in LCC were lacking. The application of LCC is a central component of GPP and the lack of LCC knowledge within KK implies that action patterns are less supportive of GPP. Furthermore, interviewees found choosing between tender bids from a sustainability perspective difficult due to the complexity of evaluating environmental impact. This implies that knowledge within the environmental field is increasingly complex and that access to expert knowledge is lacking.

It was both an interesting and alarming finding that some interview subjects directly shared their belief that they do not have the necessary competences to perform GPP action. Irrespective of whether they actually have the competence or not, the belief that they do not is enough to disturb and shape norms that lead to actions not supportive of GPP.

Opportunity: System and Structure Based Conditions for Actions

In order to act in a way that promotes GPP, knowledge and will are not necessarily enough. The system and structure can itself hinder or support GPP progress. More specifically, one must address whether it is possible for the actors to perform GPP promoting actions. The opportunity dimension involves different conditional factors depending on the area being investigated. In our case, conditional factors of importance are the organizational structure of the municipality, the political will to promote GPP and external influences (local, national and European) that have effects on GPP progress. These elements can directly hinder GPP progress, however they can also do so in a more indirect way. More specifically, the system and structures can affect and influence the values and motivation held by employees in KK's procurement functions.

This component of Hydén's Norm-Model relates to having the opportunity to act (including green considerations), not considering whether the individual has the necessary knowledge or will. If a purchaser wants to perform GPP, simply having knowledge is not necessarily enough. The system must be supportive of the specific action. In the case of GPP in KK's construction sector, we found that certain factors at the system level hinder GPP implementation at the practical level.

The seven-mayor organizational structure of KK makes the inclusion of GPP difficult, as strategies are not clearly and uniformly communicated. Furthermore, procurers in the different administrations largely do not communicate or share knowledge. We found that public officials across administrations, despite facing similar

challenges in relation to GPP, do not communicate with one another. Collaborating and pooling knowledge would perhaps allow KK's procurement authorities to overcome some cognitive barriers.

Besides communication issues, political will and support for GPP was found to be low. Higher political will would have resulted in more resources (financial, time and access to knowledge) towards promoting GPP. This implies that political will is an important system factor that can either inhibit or promote GPP implementation at the practical level. Laws and regulations can also promote or inhibit GPP. In the case of KK, we found that the strict interpretation of EU procurement rules possibly stifles GPP progress.

Combining the Berntsen-Manner Model with Hydén's Norm-Model: Takeaways

Hydén's definition of norms implies that will, knowledge and opportunity together shape the norms that guide GPP action in a specific direction. Hydén's Norm-Model directs attention towards these three components. However, to know where to look in the case of KK, one must combine Hydén's insights with our own model. While Hydén acknowledges that his model does not point to a particular analysis (instead it highlights the importance of norms when analyzing social systems), the Berntsen-Manner model effectively outlines a specific analysis at several specified levels. This implies that by combining these two models we can effectively add further insights to the discrepancy between GPP's progress and potential in KK's construction sector.

Combining our model with Hydén's to explain the GPP discrepancy gives attention to the importance of the effect that motivation and values have on the willingness of public officials to perform GPP actions. The motivation and values held by the procurer are of crucial importance to further GPP progress. However, these factors are highly personal and difficult to uncover with accuracy in interviews. Despite us guaranteeing our interviewees anonymity, we could not expect unbiased answers on questions addressing these issues. However, it is important to acknowledge and reflect around the importance of being motivated to perform GPP action and around whether the employees hold environmental values. In Section 5.2.2.3, *State and Progress of GPP Implementation in KK's Construction Sector,* we found the general trend among our interviewees in KK to be a belief that GPP would have a positive impact. This can give rise to motivation among the procurement officials. Additionally, this could indicate that the employees have an environmental mindset. We will utilize these realizations when giving advice in Section 6.1 *Key Findings and Recommendations*.

Hydén has a fruitful way of showing how the three elements, will, knowledge and opportunity are interlinked. Will and knowledge among procurement officials is not enough if the opportunity for procurement action is limited by system factors such as political support, the organizational structure and external influences.

Additionally, influences to develop knowledge can come from both the opportunity and the will components. As the development of knowledge can be traced back to the will component, the importance of motivation and values is further strengthened. We have identified a general lack of GPP related knowledge as a practical level barrier. Therefore, to increase the level of knowledge, employees in KK must be motivated towards gaining new knowledge. Furthermore, the opportunity component at the system level can directly affect the will component at the actor level. Higher political support could motivate procurement officials to improve their GPP efforts. This interlinked nature is also true for our three barrier levels and external influences, which we acknowledged in Section 5.3, *The Berntsen-Manner Model: GPP Barriers and External Influences in Københavns Kommune's (KK) Construction Sector*.

6. Discussion

Following Section 5, *Results and Analysis*, we would like to summarize both our empirical findings and research journey by presenting the primary outcomes of our investigation into the discrepancy between the progress and potential of GPP in KK's construction sector. We will first present our key empirical findings, allowing us to then make recommendations for KK's public procurement authorities. Following our recommendations, we will take a look back at our research journey, reflecting on our methods and identifying what contributions our research has made to the research community. Lastly, we will suggest areas for further research within the exciting and developing field of GPP.

6.1 Key Findings and Recommendations

This section will summarize our empirical findings, which attempt to explain why there is a discrepancy between the current progress and potential of GPP in KK's construction sector. Utilizing our primary empirical findings, we will put forward recommendations for KK's public procurement authorities.

Following our investigation into the current progress and practices of GPP in KK, we had our own evidence regarding the existence of a GPP discrepancy. Bringing our findings together from both the TED database and our series of semi-structured interviews, our findings support our initial belief that a discrepancy exists between the potential and progress of GPP within KK's construction sector. Our findings from the TED database indicated that GPP progress is significantly weak based on KK's tender descriptions. Our interview process with relevant stakeholders confirmed our findings from TED, while also exposing significant findings regarding how the current procurement process works and how GPP is implemented. Consequently, we were now in a position to address and answer our research question by identifying barriers that inhibits GPP progress in KK.

Table 10: Summary of Key Empirical Findings from the Berntsen-Manner Model and Hydén's Norm Model as a Complementary Analytical Tool. Source: Own development based on interviews and Hydén (2002).

<table>
<tr><th colspan="3">The Berntsen-Manner Model</th></tr>
<tr><th>Political Level Barriers</th><th>Organizational Level Barriers</th><th>Practical Level Barriers</th></tr>
<tr>
<td>The opinions of our interviewees on political will were diverse. However, overall, the conclusion of our findings is that local political will in support of GPP is low, or at a medium level at best.

We identified two main barriers that together result in the low political will in support of GPP.
• Politicians often prioritize organizational efficiency, employment development and social-based procurement initiatives over GPP (GPP must compete for finite resources).
• Politicians are largely focused on saving money and achieving results in the short-term. Two issues reflecting this focus intensify the negative effects on political will. First, the long-term benefits of promoting GPP are difficult to measure and demonstrate. Second, the "low hanging fruit" is already tackled, with further progress being more costly and complicated.</td>
<td>At the organizational level, we identified four main barriers:
• Confusion regarding the division of responsibility and authority. Quickly it became clear that a consequence of KK's seven-mayor organizational structure is that individuals working in different administrations are largely disconnected and lack an overview of KK's procurement functions.
• A lack of communication across administrations. The Finance Administration (FA), Copenhagen City Properties (CCP) and the Technical and Environmental Administration (TEA) experience the same barriers to GPP progress, implying that collaboration and communication would be advantageous.
• A lack of a unified organizational culture and power struggles between administrations.
• Distribution of budgets between entities. The decentralized nature of procurement has a negative impact on GPP with budgets for the initial construction costs and operations of projects often separated between administrations.</td>
<td>At the practical level, three main barriers have been identified.
• An overall lack of GPP-related knowledge, skills and training among project leaders and other public officials within the procurement divisions of KK. This was identified as making the practical implementation of MIBA 2010, KK's main GPP tool, difficult.
• A lack of LCC usage and knowledge within the construction sector of KK. As a central tool of GPP, this finding is significant.
• A conservative attitude among procurement authorities and officials, implying a focus on lowest price and complexity avoidance.</td>
</tr>
<tr><th colspan="3">External Influences</th></tr>
<tr><td colspan="3">• Established local (Copenhagen) and national (Denmark) construction sector traditions, including the use of materials, have a strong influence on any GPP strategy within this sector today. Our interviewees attributed these trends to the established architectural culture in Denmark, questioning their focus on sustainability and functionality versus design.
• The lack of 3rd party sustainable construction standards is seen as having a negative impact on GPP. Questions regarding the objectivity of the MIBA 2010 guidelines were brought up.
• Throughout our interview process, "we are not as green as we like to think we are" became a trending topic and issues surfaced regarding the influence that the Danish national "green" mentality has on GPP progress.
• As both a central procurement and environmental initiative of the EU, GPP promotion has strong support. However, procurement laws and regulations exist and Denmark's strict interpretation of these rules suppresses alternative procurement processes (which could promote GPP).</td></tr>
<tr><th colspan="3">Hydén's Norm-Model as a Complementary Analytical Tool</th></tr>
<tr><td colspan="3">Hydén's Norm-Model highlights the potential effect that values and motivation held by individual actors (procurement officials) can have on the implementation of GPP.
• Motivation and values of individuals are difficult to uncover in interviews. This indicates that we cannot simply state that the interviewees hold a certain set of values or motivation. However, this does not limit the importance of motivation and values to GPP progress in KK's construction sector. Applying Hydén's Norm-Model allows us to address these hidden elements.</td></tr>
</table>

Following this, we developed the Berntsen-Manner Model to explain the GPP discrepancy. Through our analysis, barriers to GPP progress were observed on three distinct levels: political, organizational and practical. Furthermore, we identified external influences that indirectly have negative impacts on GPP progress. In the last section of our results, we applied Hydén's Norm-Model as a complementary analytical tool, allowing us to add further insights. Table 10 outlines our key empirical findings, both for the Berntsen-Manner Model and for Hydén's Norm-Model as a complementary analytical tool.

6.1.1 Recommendations for Public Procurement Authorities

It is important for us to note that the primary purpose of our research was to examine and explain the discrepancy between GPP's progress and potential in KK's construction sector. Therefore, it was not our intention to put forward extensive recommendations. However, we would like to utilize our insights and findings to put forth some basic recommendations that could aid in closing the discrepancy between GPP's progress and potential. These recommendations are intended for KK procurement authorities within the construction sector, however we believe that they can also be relevant to procurement authorities in other municipalities in Denmark and abroad. The following section will address and discuss potential solutions to the GPP issues that are most practical and realistic to do something about.

Utilizing Life-Cycle Costing (LCC) to Address Barriers at the Political Level

At the political level, barriers are directly related to the political system. Issues pertaining to the contradicting timeframes between political terms and the lifespan of construction projects are established conditions that cannot easily be changed. However, by emphasizing and promoting the use of Life-Cycle Costing (LCC), greener alternatives could pose as more attractive solutions, effectively limiting the barrier of competing political priorities. Politicians have a duty to justify their decisions to their electorate and LCC usage could be a suitable avenue for such justification. Increased LCC usage would result in construction sector projects that have both lower emissions and financial costs over the lifespan of the projects, despite potentially higher initial costs. Any realistic success strategy to improve LCC usage would require a clear strategy on how to implement LCC on KK´s projects. The *MIBA 2014* working group (composed of individuals from all relative administrations) could potentially accomplish this. Closely integrating LCC requirements into the next set of *Sustainability in Construction and Civil Works (Miljø i byggeri og anlæg* (*MIBA))* guidelines would be a good way of rolling out LCC policies as the *MIBA* guidelines are already widely known and followed. To further improve the uptake of LCC usage, KK could actively attempt to adopt best practices from municipal procurement authorities in the UK (where LCC is well established and practiced). We suggest that a team of KK´s employees (from different

administrations) travel to the UK to attend courses and workshops on LCC. Following this, all project leaders in KK's construction sector should be offered training on how to practically utilize and implement LCC in accordance with requirements in *MIBA 2014*.

Increasing Cross-Administration Communication and Coordination to Address Barriers at the Organizational Level

The dominant organizational level barriers we identified all pertain to the overall complex nature of the KK organization. This complexity is a direct result of KK's seven-mayor governance model. Addressing the root cause of this issue is largely unrealistically as it is part of the fundamental strategy of the political system to ensure democracy and parity in municipal decision-making. Despite this realization, solutions exist to address some of the negative consequences of this organizational structure.

One of the primary issues identified is a lack of communication across the KK's administrations involved in GPP within the construction sector. Furthermore, individuals within the different administrations are largely unaware of the responsibilities and activities of other administrations. To improve cross-administrative communication, we suggest utilizing more cross-administrative teams. With all administrations having some offices in Copenhagen's City Hall, possibilities exist for increased contact and communication (including issues pertaining to GPP). The ongoing development of the *MIBA 2014* guidelines could also be a basis for a continued forum involving employees from the Finance Administration (FA), the Technical and Environmental Administration (TEA) and Copenhagen City Properties (CCP). A key barrier to focus on through increased communication would be the current division of budget responsibilities. KK should come together and assess whether it is possible to more closely align budgetary responsibilities. The fact that upfront construction costs pertain to one administration, while another is responsible for the operational costs, significantly weakens the applicability of LCC.

We also identified a lack of a unified organizational culture across the KK organization. This is a difficult issue to tackle as it has become engrained through the seven-mayor organizational structure. However, we believe that improved communication efforts could be the first step towards creating a more unified organizational culture. To further achieve this, the municipality could encourage and facilitate team-building activities across administrations. Here we refer to cross-administration activities related to fitness, sport and culture.

Developing Training and a GPP Knowledge Database to Address Barriers at the Practical Level

KK is currently in the process of developing the *MIBA 2014* guidelines. When doing this, the municipality should ensure that concerns related to the current version are taken into consideration. First off, we identified a lack of GPP related knowledge among procurement authorities. With the *MIBA* guideline identified as the main GPP tool, it is crucial that KK's employees receive corresponding training in the use of these guidelines. No such training is offered today; instead, procurers rely on getting the necessary knowledge through talking with their coworkers (who could be in a similar situation of confusion). This results in a belief among our interviewees that it is difficult to choose between alternative tendering bids based on their environmental profiles. Additionally, the new *MIBA* guidelines could offer a prioritized list of environmental impacts. Providing training on the interpretation and implementation of the *MIBA* guidelines could make it easier for public procurers to choose between bids.

Our interviews also revealed that access to knowledge, more specifically knowledge on where to search for information, is an obstacle to further GPP progress. To address this issue, we suggest the creation of a KK database where public procurers could upload their justification (in line with the *MIBA* guidelines) for choosing specific tendering bids. The aim of such a database would be to develop a "crowd-sourced" database where procurers could find information on previous projects similar to the one they are currently working on. The database would require additional effort in the starting phase but would provide an easy and accessible source of GPP information once established. We suggest creating a standardized schema for data input to maximize the efficiency of the database. Furthermore, the development of this database should be a collaboration between FA, TEA and CCP.

Leveraging KK's Demand Function and Educating KK's Procurement Authorities to Address Difficulties Caused by External Influences

The external influences related to the architectural culture in Denmark are difficult issues to change for KK´s procurement authorities. However, the basic principles of supply and demand should hold. By improving their GPP efforts and continuously demanding better solutions, KK could positively impact the focus of the architectural community through its demand. This certainly would not be achieved overnight, but instead as a gradual process.

The external influence of the EU´s procurement rules and regulations is something that more realistically can be addressed in the short-run. A general trend in our interviews was a lack of knowledge on European level GPP efforts. If KK's procurement authorities better understood both the European Commission's (EC) focus on GPP and the specifics of European procurement rules, procurers would possibly be more comfortable engaging in creative procurement processes.

Promoting "Green" Motivation and Values to Progress GPP - Based on Hydén's Norm Model

Both values and motivation are personal and specific to individuals. This makes it a difficult area to address for KK´s procurement authorities. On the other hand, small changes could have significant positive results (motivation perhaps more then values) with minimal disturbances to the existing "way of doing business". For example, the implementation of our recommendations could have additional positive effects through increased engagement and motivation for those working in KK's construction sector procurement.

KK can try to influence their employees towards developing increasingly green mentalities. An increased focus on sustainability, recycling and the use of public transportation (or bicycles) within KK could all contribute towards this goal. Additionally, those employees that already have an environmental mindset could function as "green ambassadors" at their workplaces.

Hydén emphasizes that will (motivation and values) can stem from both the knowledge and the opportunity components. In particular, increasing GPP related knowledge among procurement officials could increase their motivation towards improving GPP efforts. Furthermore, higher local political will for GPP can motivate employees to engage in GPP promoting action. System factors outside of the municipality's borders can also have an impact on its GPP efforts. Exemplifying this, the strict interpretation of EU rules and regulations has a negative effect on employees' willingness to engage in creative procurement processes. As already mentioned, this can be addressed by increasing the knowledge level on this topic.

6.1.2 Our Recommendations Summarized

We have identified how KK's procurement authorities can address specific barriers and issues that have negative effects on GPP's progress. Our recommendations are only meant as suggestions. This implies that this is not an exhaustive list. Our recommendations are based on empirical findings pertaining to KK, however, other municipalities can learn from our findings. Table 11 provides an overview of our recommendations.

Table 11 - Summary of Recommendations for KK´s Public Procurement Authorities. Recommendations are linked to both the model and the specific component of the model that identifies the barrier or issue.[33] Source: Own development based on interviews and Hydén (2002).

The Berntsen-Manner Model		
Barrier Level	***Barrier***	***Recommendation***
Practical Barrier Level.	Lack of knowledge, skills and training.	• Training in the use of the *MIBA* guidelines. • Prioritized list of environmental considerations in *MIBA 2014*. • Development of a database where procurers list justification behind choosing a specific bid (in line with the *MIBA* guidelines).
	Lack of LCC implementation.	• LCC requirements incorporated into *MIBA 2014*. • Collaboration with UK procurement authorities. • Training on LCC usage among procurement officials.
Political Barrier Level.	Competing political priorities.	
Organizational Barrier Level.	Lack of communication (and coordination) across administrations.	• More use of teams across administrations (particularly for the development of *MIBA 2014*). • Team-building activities across administrations.
	Lack of a unified organizational culture and power struggles.	
	Distribution of budgets between entities.	• Assess whether there is an alternative to the current distribution of budgets.
External Influences.	Strict interpretations of EU`s procurement rules and regulations.	• Procurement authorities should communicate the EU's GPP efforts. • Training for procurement officials in the European rules.
	Danish architectural culture (including the use of materials).	• Improving GPP efforts and continuously demanding better solutions in order to influence the architectural community through Københavns Kommune's (KK) demand function.
Hydén´s Norm model		
Norm Component	***Issue***	***Recommendation***
Will.	Need to promote intrinsic values that encourage GPP action.	• Actively influence employees towards a green mentality (focus on sustainability, recycling and so on).
	Need to secure motivation among procurement officers.	• Increasing GPP related knowledge among public procurers.
Knowledge.	Lack of GPP related knowledge, which is a prerequisite for action.	
Opportunity.	Low motivation toward engaging in creative procurement processes due to the current strict interpretation of EU rules and regulation.	• Training in how to interpret European procurement rules and regulations.
	Low political will to promote green alternatives have a negative effect on motivation among procurement officials.	• Training on LCC usage among procurement officials can make the benefits of GPP visible to politicians.

[33] As evident in the table, some recommendations address more than one barrier and/or issue.

6.2 Our Research Journey

6.2.1 Reflection on Methodology

In our review of GPP literature (and when linking our specific barrier findings to existing literature), it was evident that this is a rather new research topic. Particularly in Denmark's research community, there has been very limited focus on GPP. Furthermore, there is a tendency to apply a common set of data collection methods. It is clear that the trend is to apply surveys and/or the analysis of tender documents. We, however, chose to utilize in-depth semi-structured interviews as our main data source. Throughout our research, it became evident that utilizing interviews would provide insights that otherwise could be missed. An example is that we discovered both the central importance of *MIBA 2010* as KK's key GPP tool and issues related to these guidelines. We would have missed this if we did not use interviews as our TED database analysis failed to identify the importance of MIBA. Furthermore, by mapping the practice and processes of GPP we were able to identify potential barriers. This fact indicates that our inclusion of a qualitative interview approach was particularly suitable. On the other hand, our choice of methods was time consuming. This means that it is not possible to collect the opinions and viewpoints of a large sample through in-depth semi-structured interviews. However, we believe that this weakness is more than made up for by the additional insights revealed.

When identifying our interviewees, we applied the snowball sampling approach. This allowed us to interview individuals that we initially did not know were central to GPP in KK. Furthermore, this process supported our findings by allowing us to experience the complexity of KK first hand. We believe that the snowball sampling approach is particularly useful when investigating an area characterized by high organizational complexity and vast stakeholders. This tends to be the case for most large municipalities all over the EU. By applying this sampling method, we did not limit our potential findings prior to commencing our research process. In the case of GPP in KK's construction sector, we found that it was not possible to map the organization of procurement (or decision-making authority) prior to conducting interviews and collecting primary data. Therefore, identifying key stakeholders should be and was an ongoing process.

After performing our interviews and collecting all our data, we wanted to make sense of the information collected. Instead of defining a theoretical framework prior to collecting data, we chose to first collect the data and then formulate a model based on our empirical findings. Additionally, we did not hypothesize around potential barriers with the aim of collecting data either confirming or rejecting these. Instead, we wanted to develop a model that reflected our empirical findings. By applying Grounded Theory as a research strategy, we could effectively build our findings into a model suited for this particular use. The Berntsen-Manner Model

reflects the real world of GPP in KK's construction sector. We believe Grounded Theory as a research strategy is particularly useful when conducting research in areas that are somewhat novel or with limited previous research.

6.2.2 Contributions to the Research Community

This thesis performs an in-depth study of GPP in a specific sector at the municipal level. Previous research has largely taken on a less narrow scope, focusing either on several countries or at the national level. Additionally, only a limited amount of previous academic work has been sector specific.

The construction sector has great GPP potential, both in terms of cost savings and environmental impact, indicating that research specifically focused on this sector is a valuable contribution. Additionally, limited research has been done on GPP in Denmark. This means that we contribute to existing GPP research, both by mapping the current progress of KK's GPP in 2012 and by investigating barriers and external influences inhibiting further GPP progress. In effect, our thesis offers valuable insights to academics interested in learning more about the practice of construction sector GPP in KK specifically. However, we also believe that our findings can offer valuable advice on the topic of GPP outside the geographical borders of KK. More specifically, KK is not a unique case. There are reasons to believe that other cities and municipalities resembling KK (in size, economic strength, organizational structure, etc.) can learn from our findings. This pertains especially to municipalities in the Nordics and the EU, but also other cities abroad. Additionally, our findings on GPP in the construction sector are of relevance to other sectors with similar GPP potential. This will be further addressed in our suggestions for further research.

We have developed a model, the Berntsen-Manner Model, which includes the barrier levels and external influences we found in the case of KK. We see the development of this specific model as a valuable contribution, as we believe future research based on this model can offer fruitful insights. Particularly our findings on the three barrier levels can be of relevance to research in other countries and sectors. On the other hand, our findings on external influences are mostly specific to KK. However, we believe that these can be of relevance to GPP research focusing on other Danish municipalities.

Table 11 provides examples of how we have contributed to existing literature on our three barrier levels (political, organizational and practical). In effect, this table summarizes how our focused scope (municipal level and sector specific) adds value to existing research as it allows for the identification of barriers previously overlooked, or barely touched upon (Table 11).

Table 11 – Summary of Our Contributions to Research on GPP. Source: Own development.

Political	*Organizational*	*Practical*
The significance of local level political commitment. In previous literature, political will at the local level has not been treated as a separate issue. Instead, the trend has been to focus on political will at the national level. Additionally, in the few cases where it has been addressed, it has been under an overarching umbrella of "political will", including both national and local political will. **Establishing a link between the elimination of the "low hanging fruit" and reduced political will to promote GPP.** Currently KK is changing its focus from efficiency improvements in new construction projects to renovation projects. This second type of projects typically involves higher complexity and higher costs, which again has an impact on political will. There are reasons to believe that the same development is taking place in other municipalities across Denmark and abroad.	**The seven-mayor governance model as a driver for barriers at the organizational level.** Previous research has tended to focus on several different countries, and also a variety of organizations – both public and private. The outcome of this is that specific governance models have not been linked to GPP barriers. **Internal cross-administration communication as a key obstacle to further GPP implementation.** Previous literature has tended to emphasize external communication with suppliers or across municipalities. This effectively shows how our narrow scope has allowed for identifying organizational barriers that particularly pertains to decentralized municipalities. **The negative GPP implication of one public entity being responsible for upfront capital costs, and another for the operational costs.** In order to uncover this barrier, one must perform an in-depth study focused at municipality level. As attention previously has been given to several municipalities in combination, or in most cases at the national level, the outcome appears to be a failure of identifying this specific barrier.	**Deficiencies of the *MIBA 2010* guidelines.** By focusing on KK at the municipal level, we offer some new findings not previously identified. Our findings on the *MIBA* guidelines can offer valuable advice to the steering committee currently working on the 2014 guidelines. Furthermore, these learning points can offer valuable advice to the creation of similar guidelines in other municipalities, in the Nordics or elsewhere. **Concerns related to access to GPP knowledge.** A general lack of GPP knowledge has been addressed. However, previous academic works to a smaller degree address concerns pertaining to access to knowledge. Our empirical findings indicate that procurers need training and knowledge on how to access and utilize existing knowledge.

6.2.3 Suggestions for Future Research

Through our investigation into GPP in KK's construction sector, certain findings and realizations led to thoughts about areas and topics that would be interesting to explore further.

The most obvious suggestion for future research would be the investigation of GPP practices in other municipalities in Denmark or abroad using a combination of our methods (emphasis on semi-structured interviews). It would be particularly interesting if these other municipalities were either world leading in construction sector public procurement (possibly a U.K. municipality) or had significantly different political, economic and cultural attributes (perhaps U.S. municipalities). By conducting a study utilizing similar methods to our study on KK, one would be able to identify shared barriers and imitable solutions. Alternatively, our

choice of methods could be applied to exploring GPP practices within another sector of KK. In addition to the construction sector, procurement related to transportation or catering services also have significant GPP opportunities. Findings from such a study could offer valuable lessons for overcoming barriers for GPP within the construction sector of KK and vise versa.

Additional realizations through our research process emerged as possible sources of further research. This includes our finding from the TED database. As a significantly large source of procurement data, definite possibilities exist for further research utilizing the TED database. A particularly interesting finding from the TED database was that no tender document in our study was completely available in English (despite meeting the threshold requiring EU wide distribution). Although we do not know if this is a coincidence or normal practice, it would be interesting to research into the potential effects that the language of tender documents has on the competitiveness of the tender process. We put forward the hypothesis that suppliers are discouraged from bidding on tenders with a language barrier, negatively affecting competition.

Beyond our study's investigation into the effects of political will for GPP at the municipal level (KK), existing literature on GPP has yet to investigate the role that politicians at the municipal level have versus their national counterparts. Significant opportunities for further research lay in this relationship between municipal leadership and GPP progress. As cities around the world become increasingly powerful and important due to global urbanization, the urban political environment will become increasingly important in driving sustainable development.

Our investigation into organizational level barriers also presented opportunities for further research. The relationship between GPP and decentralized procurement functions has possibilities for future research. Likewise, the effects that various organizational structures (including KK's seven-mayor structure) have on GPP progress and implementation would make for an interesting investigation.

At the practical level, we identified a lack of GPP related knowledge, tools and skills. This again led us to question the ability of project leaders to implement and apply the *MIBA* guidelines, which are the central GPP tool in KK's construction sector. In particular, further investigation into how to ease the practical implementation of *MIBA* and similar guidelines, would be an interesting avenue for future research.

Our last suggestion for future research would be a follow-up study. As GPP is a relatively new and ongoing initiative by the EU and its Member States (including Denmark), follow up studies on the progress of GPP in KK's construction sector would be appropriate every 3-5 years.

7. Conclusion

This thesis has the aim of answering the following research question:

- **How do we explain the discrepancy between GPP's progress and potential within the construction sector of Københavns Kommune?**

We have explored this discrepancy through mainly interview driven research. Our findings are based on an empirical investigation of KK's GPP efforts in the construction sector, implying that our findings are particularly useful to those within KK and the construction sector of Copenhagen. However, we believe that our findings can provide insight to procurement authorities in other municipalities and sectors. In particular, other Danish and Nordic municipalities, as well as other municipalities abroad, can learn from our findings.

To explain the GPP discrepancy (and our research question), we developed the Berntsen-Manner Model. However, prior to developing this model, we had to gain an understanding of the current GPP progress and practices in KK's construction sector. This was done for two reasons. First, from the start there were strong reasons to believe that GPP in KK's construction sector has not reached its full potential, however, this belief was based on national level findings in 2009 (the PWC et al. (2009) report). Therefore, we wanted to assess whether recent developments could indicate any significant change in the progress of GPP, or whether KK might have significantly better GPP progress than Denmark in general. Second, we wanted to gain an in-depth understanding of how GPP is practiced and implemented in KK's construction sector. This included a need to map the organization of procurement within KK and identify the key public entities involved.

To determine the current progress and practices of GPP, we combined research from both the EU's Tender Electronic Daily (TED) database and a series of semi-structured interviews with relevant stakeholders from industry, government and research. Our approach was different from that used for the PWC et al. (2009) report on GPP progress, yet our results supported its findings. We found that a discrepancy exists between GPP's progress and potential in KK's construction sector. With this established, we could proceed with the development of the Berntsen-Manner Model based on our interview findings.

The Berntsen-Manner Model allowed us to systemize our findings, so that we could address the barriers we identified on three distinct levels (political, organizational and practical), as well as a variety of external influences. This means that by developing and applying this model we explained why there is a discrepancy

between current GPP progress and its potential in KK's construction sector. We will now outline the barriers identified at the different levels and also the external influences.

We established that local political commitment towards promoting GPP is crucial, as local politicians have great influence and autonomy in shaping budgets and procurement strategies. However, the conclusion of our findings is that local political will in support of GPP is low, or at a medium level at best. This led us to identify two political level barriers that inhibit further GPP progress through their effects on local political will in support of GPP in KK. First, politicians often prioritize organizational efficiency, employment development and social-based procurement initiatives over GPP. Second, politicians are largely focused on saving money and achieving results in the short-term. Furthermore, two additional issues reflecting a focus on saving money and achieving results in the short run intensify the negative effect on political will. First, the long-term benefits of promoting GPP are difficult to measure and demonstrate. Second, the "low hanging fruit" has already been tackled, with further progress more costly and complicated. The result of these two barriers (and the two issues reflecting and intensifying barrier two) is low political will for GPP in KK, with politicians also not effectively communicating their political stance on the matter.

We identified four key barriers at the organizational level. Most of these are the result of KK's seven-mayor organizational structure with administrations largely disconnected. The first barrier is significant confusion regarding the division of responsibilities and authority. Administrations are largely unaware of the tasks of other administrations central to GPP in the construction sector. We found that the three administrations central to construction sector procurement experience similar difficulties and challenges to GPP implementation, implying that increased collaboration and communication would be advantageous. However, the second barrier we identified was a lack of communication across administrations. The third barrier is the lack of a unified organizational culture and power-struggles, again largely the result of the organizational structure. If administrations see themselves as competing over resources, they may be less encouraged to share knowledge and best practices. Lastly, the decentralized nature of procurement is having a significant negative impact on GPP by complicating KK's ability to perform Life-Cycle Costing (LCC). This is due to the separation of budgets for the construction and operations of projects (one administration is responsible for the initial capital, while the operational costs are another administration's responsibility).

At the practical level, our research into the implementation of GPP revealed three significant barriers. The first barrier is an overall lack of GPP-related knowledge, skills and training for project leaders and other public officials within the procurement divisions of KK. The effects of this are in particular difficulties in implementing

the *MIBA* guidelines (which were identified as the key GPP tool in KK) as well as a clear challenge in comparing and evaluating competing bids. A lack of LCC usage and knowledge within the construction sector of KK is the second barrier. Fundamental to GPP, the lack of LCC usage was an alarming finding. Lastly, the third barrier we identified is a conservative attitude among procurement authorities and officials, namely a focus on lowest priced bids and complexity avoidance. Despite utilizing Most Economically Advantageous Tender (MEAT) award criteria, the general consensus was that the lowest priced bids still rules the tender awarding process. The complexity avoidance is related to procurement officials not wanting to change and complicate their existing "ways of doing business". Interviewees' hesitations towards incorporating environmental considerations into procurement processes (that are already characterized by numerous and competing objectives) reflect this. Additionally, reluctance towards utilizing alternative and creative procurement processes was present.

In addition to identifying barriers at three distinct levels, four significant external influences having negative impacts on GPP were identified through our research. First, established construction sector traditions and architectural culture, including the use of materials, have a strong influence on GPP today. The traditional use of brick and concrete continues despite high emission levels. Furthermore, the increased incorporation of glass has added to the carbon intensity. Our interviewees attributed these trends to the established architectural culture in Denmark, questioning its focus on sustainability versus design. Second, there is a lack of 3rd party sustainable construction standards in Denmark. Instead the only set of guidelines is *MIBA*, which is internally produced (and concerns regarding its objectivity were raised). Third, throughout our interview process, "we are not as green as we like to think we are" became a trending topic and issues surfaced regarding the possible influence that the Danish national "green" mentality has on GPP progress. Our interviewees expressed a belief that there is a discrepancy between the public's perception of the public sector's sustainability and reality, negatively affecting public pressure for GPP. Finally, Denmark's strict interpretation of EU procurement regulations and directives was emphasized as having a negative impact on GPP progress by suppressing alternative and creative procurement processes.

With the establishment of our Berntsen-Manner Model, we chose to utilize Hydén's Norm-Model as a complementary analytical tool. By combining the two models, we effectively highlighted findings and elements that are normally hidden but that influence GPP's implementation. Specifically, we addressed the importance of motivation and values among public procurement officials. Both high motivation for sustainability and intrinsic environmental values are success factors for GPP's progress in KK's construction sector.

8. Acronyms and Abbreviations

BREEAM – Building Research Establishment Environmental Assessment Method

CBS – Copenhagen Business School

CCP – Copenhagen City Properties.

CLA – Culture and Leisure Administration.

CO2 – Carbon Dioxide

DKK – Danish Krone.

EC – European Commission.

EU – European Union.

FA – Finance Administration.

GDP – Gross Domestic Product.

GPP – Green Public Procurement.

I – Industry.

ICLEI - International Council for Local Environmental Initiatives.

KK – Københavns Kommune (Copenhagen Municipality).

KWH/M2 – Kilowatt Hours Per Square Meter.

LCA – Life-Cycle Analysis.

LCC – Life-Cycle Costing.

LEED – Leadership in Energy and Environmental Design

MEAT - Most Economical Advantageousness Tender.

MIBA – Miljø i Byggeri og Anlæg (Sustainability in Construction and Civil Works).

NAP - National Action Plan.

OECD - Organization for Economic Cooperation and Development.

PWC – PricewaterhouseCoopers.

R – Research.

SRPP – Socially Responsible Public Procurement.

TEA – Technical and Environmental Administration.

TED – Tender Electronic Database.

UK – United Kingdom.

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10. Appendices

Appendix 1 –Tender Population and Analysis from the TED Database

Tender Number	Description	Administration (Authority)	Level of Green	Details of Level of Green	Award Criteria
404661-2012	DK-Copenhagen Architectural and related services	CCP	Semi-Green	Link to *Sustainability in Construction and Civil Works 2010 (Miljø i byggeri og anlæg (MIBA 2010))* guidelines.	MEAT
399938-2012	DK-Copenhagen Construction supervision services	CCP	Not Green		MEAT
382044-2012	DK-Copenhagen architectural and related services	CCP	Semi-Green	Link to *MIBA* and vague green in description.	MEAT
369163-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Green	Link to *MIBA* and explicit in technical requirements Experience with energy renovation and minimum levels of standards possibly required.	MEAT
368529-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Not Green		MEAT
368528-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Not Green		MEAT
365833-2012	DK-Copenhagen works for complete or part construction and civil engineering work	TEA	Semi-Green	Green in tech have to show experience with environmental considerations - asks for information about certifications.	MEAT
360318-2012	DK-Copenhagen architectural and related services	CCP	Green	Asks for total cost calculations and says that it must be in line with low energy class 2015 in BR10.	MEAT
351940-2012	DK-Valby road-maintenance works	TEA	Not Green		Lowest Price
346983-2012	DK-Copenhagen urban planning and landscape architectural services	TEA	Not Green		MEAT
345974-2012	DK-Copenhagen architectural, construction, engineering and inspection services	TEA	Not Green		MEAT
340843-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Not Green		MEAT

Tender Number	Description	Administration (Authority)	Level of Green	Details of Level of Green	Award Criteria
314617-2012	DK-Copenhagen bridge construction work	TEA	Not Green		MEAT
308642-2012	DK-Copenhagen construction work	CCP	Not Green		Lowest price
304873-2012	DK-Copenhagen works for complete or part construction and civil engineering work	CCP	Not Green		MEAT
303748-2012	DK-Copenhagen energy and related services	CCP	Semi-Green	Green in description; consultant is to prioritize between different projects based on environment. Goal is to save energy.	MEAT
296469-2012	DK-Copenhagen street-lighting maintenance services	TEA	Green	Functional tender, refers to the climate goals. Asks for energy efficient solutions, competitive dialogue to develop best possible solutions.	MEAT
279337-2012	DK-Copenhagen reinforced-concrete structures	TEA	Not Green		MEAT
267597-2012	DK-Copenhagen engineering-design services for traffic installations	TEA	Not Green		MEAT
266960-2012	DK-Copenhagen construction work	CCP	Not Green		MEAT
264803-2012	DK-Copenhagen works for complete or part construction and civil engineering work	CCP	Not Green		Lowest Price
250316-2012	DK-Copenhagen advisory architectural services	CCP	Not Green		MEAT
250314-2012	DK-Copenhagen advisory architectural services	CCP	Not Green		MEAT
242702-2012	DK-Copenhagen architectural, construction, engineering and inspection services	TEA	Not Green		MEAT
242599-2012	DK-Copenhagen architectural, construction, engineering and inspection services	TEA	Not Green		MEAT
242199-2012	DK-Copenhagen works for complete or part construction and civil engineering work	CCP	Not Green		MEAT
241531-2012	DK-Copenhagen construction work	CCP	Not Green		Lowest Price
237648-2012	DK-Copenhagen engineering-design services for traffic installations	TEA	Not Green		MEAT
233955-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Not Green		MEAT

Tender Number	Description	Administration (Authority)	Level of Green	Details of Level of Green	Award Criteria
232617-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Green	In description Links to BR 10 - includes environment. In tech - say references showing experience with energy efficient solutions and tech will be weighted.	MEAT
225382-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Semi-Green	Link to *MIBA*	MEAT
224625-2012	DK-Copenhagen supervision of building work	TEA	Not Green		MEAT
216896-2012	DK-Copenhagen construction work for school buildings	CCP	Not Green		MEAT
208524-2012	DK-Copenhagen sports hall construction work	FA	Not Green		MEAT
207900-2012	DK-Copenhagen works for complete or part construction and civil engineering work	CCP	Not Green		Lowest Price
206443-2012	DK-Copenhagen supervision of building work	TEA	Not Green		MEAT
147016-2012	DK-Copenhagen construction work	CCP	Not Green		Lowest Price
136608-2012	DK-Copenhagen supervision of building work	TEA	Not Green		MEAT
133027-2012	DK-Copenhagen urban planning and landscape architectural services	TEA	Not Green		MEAT
125613-2012	DK-Copenhagen energy and related services	CCP	Semi-Green	Link to *MIBA 2010*.	MEAT
122015-2012	DK-Copenhagen urban development construction work	TEA	Not Green	Quality assurance - asks for information about certifications.	MEAT
121903-2012	DK-Copenhagen non-hazardous refuse and waste treatment and disposal services	TEA	Not Green		Not Specified
105873-2012	DK-Copenhagen waterside leisure facilities construction work	TEA	Not Green		MEAT
91246-2012	DK-Copenhagen works for complete or part construction and civil engineering work	CCP	Not Green		Lowest Price
91221-2012	DK-Copenhagen construction work for school buildings. Renovation of buildings.	CCP	Semi-Green	Link to *MIBA 2010*.	MEAT
86223-2012	DK-Copenhagen works for complete or part construction and civil engineering work. Renovation of buildings.	CCP	Not Green		MEAT

Tender Number	Description	Administration (Authority)	Level of Green	Details of Level of Green	Award Criteria
69808-2012	DK-Copenhagen construction work	CCP	Not Green		Lowest Price
57838-2012	DK-Copenhagen construction work for school buildings	CCP	Semi-Green	Link to *MIBA 2010*.	MEAT
48541-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Semi-Green	Link to *MIBA 2010*.	MEAT
40810-2012	DK-Copenhagen architectural, construction, engineering and inspection services	CCP	Semi-Green	Link to *MIBA 2010*.	MEAT
39219-2012	DK-Copenhagen architectural, construction, engineering and inspection services	TEA	Semi-Green	Link to *MIBA 2010*.	MEAT
29752-2012	DK-Copenhagen construction work	TEA	Not Green		MEAT
32184-2012	DK-Copenhagen construction work	CCP	Not Green		Lowest Price
31469-2012	DK-Copenhagen construction work	TEA	Not Green		Lowest Price

Appendix 2a - Original Set of Interview Questions and Topics

1. Initial Introductory Questions

- What is your job/role?
- What is your connection to public procurement in Copenhagen?

2. Neutral General Questions

- How do you see the process of public procurement in Copenhagen Municipality?
    - How could it be improved?
- Are environmental considerations included in this public procurement process?
    - Should it be included? How?
- What impact could the promotion of "green" public procurement have on Copenhagen? Is it positive?
    - Its environmental goals?
    - Its economy (export, innovation)?
    - Society?
- How much of a political priority is the promotion of environmentally friendly public procurement for the Copenhagen Municipality?
- Who is the driver/decision maker for the inclusion of environmental criteria in public procurement? Whose responsibility is it?
- What are the challenges of integrating environmental considerations into the construction sector?

3. Procurement/Tender Specific Questions

	3.1 Government	3.2 Industry	3.2 Research
1.	How does the process of **writing** a tender work?	How does the process of **bidding** for a tender work?	N/A
2.	How does the process for **awarding** a tender work? Most important criteria?	What's your best advice for **winning** a tender from the Copenhagen Municipality? (Their most important criteria?)	N/A
3.	Who is the decision maker in awarding the tender/ contract?	Who is the decision maker in awarding you a contract?	Who is the decision maker in awarding contracts?
4.	How would your dream procurement process be?	How would your dream procurement process be?	How would your dream procurement process be?
5.	Do you see environmental considerations in tender practices in KK?	Do you see environmental considerations in tender practices in KK?	Do you see environmental considerations in tender practices in KK?
6.	Is it possible to include environmental considerations in this process?	Is it possible to include environmental considerations in this process?	Is it possible to include environmental considerations in this process?
7.	Is it easy to include environmental criteria in this process?	Is it easy to include environmental criteria in this process?	Is it easy to include environmental criteria in this process?
8.	Where in the process is most appropriate? (tendering, contract, legal requirements, etc.)	Where in the process is most appropriate? (tendering, contract, legal requirements, etc.)	Where in the process is most appropriate? (tendering, contract, legal requirements, etc.)
9.	Are Life Cycle Costing practices used? (In KK, in DK)	Are Life Cycle Costing practices used? (In KK, in DK)	Are Life Cycle Costing practices used? (In KK, in DK)
10.	Are benefits of environmentally friendly alternatives known/obvious?	Are benefits of environmentally friendly alternatives known/obvious?	Are benefits of environmentally friendly alternatives known/obvious?
11.	Is training available?	Is training available?	Do you think training is available for public officials and industry professionals?
12.	Do you utilize best practices or share knowledge with other **local authorities** (outside of KK or within KK)?	Do you utilize best practices or share knowledge with other **industry professional**?	N/A
13.	Do you think environmental considerations in a tender process are a good idea?	Do you think environmental considerations in a tender process are a good idea?	Do you think environmental considerations in a tender process are a good idea?
14.	How do you think it would affect competition in the tender process?	How do you think it would affect your company's competitiveness? (the likelihood of your company getting tenders)	How do you think it would affect competition in the tender process?
15.	How do you think it would affect the competitiveness of Danish industry?	How do you think it would affect the competitiveness of Danish industry?	How do you think it would affect the competitiveness of Danish industry?

16.	CPH 2025 Climate Plan – "The administration will also be reevaluating its tendering process with new methods including **total costs and functional tenders** being incorporated." Are you aware of these goals? How will these changes affect your procurement process?	CPH 2025 Climate Plan – "The administration will also be reevaluating its tendering process with new methods including **total costs and functional tenders** being incorporated." Are you aware of these goals? How will these changes affect your bidding process?	CPH 2025 Climate Plan – "The administration will also be reevaluating its tendering process with new methods including **total costs and functional tenders** being incorporated." Are you aware of these goals? How do you think these changes will affect the procurement process?

4. Barrier Specific Questions (Government, Industry & Research). To be asked towards end of meeting to avoid influencing other questions.

- What challenges/barriers can you see for the inclusion of environmental considerations into Copenhagen's public procurement?
    - Is there enough **information/knowledge** available?
    - Are **communication** channels effective?
        - Insufficient mechanisms to publicize?
        - How are environmental departments connected to procurement?
    - Does the problem lie in the **implementation**?
    - Will/priority?
    - Economic or human resources?
    - Limited environmental criteria?
- What would it take to make this (successfully integrated environmental criteria) work?

5. Research/Organization Specific Questions

- Do you see a scientific focus on green public procurement?
- Do you see scientific focus on LCC and LCA? In Denmark and Abroad
- Do you know about other researchers/ individuals involved in studies or work on GPP? (Finishing off question).

Appendix 2b - Revised Set of Interview Questions and Topics

Revised Interview Questions and Topics
What is your job/role?
What is your connection to public procurement in Copenhagen?
1 - Mapping out GPP Decision Making in KK's Construction Sector
Who is the driver/decision maker for the inclusion of environmental criteria in public procurement? Whose responsibility is it? POLICY LEVEL
What is the role of the different administrations?
2 - Current State and Practices of GPP in KK in KK's Construction Sector
How do you see the process of public procurement in Copenhagen Municipality? How could it be improved? GENERAL
Impression of public procurement "greenness" by interviewees. Are environmental considerations included in this public procurement process? Should they be included? How?
IMPACT POTENTIAL PERCEPTION - What impact could the promotion of "green" public procurement have on

Copenhagen? Is it positive? Its environmental goals? Its economy (export, innovation)? Society? How do you think it would affect competition in the tender process?
POLITICAL PRIORITY - How much of a political priority is the promotion of environmentally friendly public procurement for the Copenhagen Municipality?
RESOURCES
How is environmental criteria is incorporated into current public procurement?
Where/how is it included?
Tender award criteria and Decision maker
How tender process works?
Who defines the environmental criteria?
Driver of inclusion of green criteria on project level
Current extent of LCC, Total cost and functional tendering (2025 climate plan objective)
To what extent is GPP being fulfilled (transition to barriers)?
Own projects
General
Level of Training
3 - Barriers
Organizational
Complexity
Communication
Sticky Culture/ organizational culture
Power Struggle
Knowledge Transfer/Share best practices/
Lack of knowledge/training
Knowledge/Skills Practical level (project managers)
Policy Level (political)
Training availability
Are Life Cycle Costing practices used?
Standardization
Measurability
Policy Makers
Political will
Measurability
Priorities
Danish Culture, Traditions& Mentality
Sustainability Importance
Perception of 'greenness'
Objectiveness
Architecture and Design
Other
Recommended literature and contact people