

Advancing the Circular Economy:

Exploring landscape and developments for circular public
procurement in Sweden and Scotland

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“Every revolutionary idea seems to evoke three stages of reaction. They may be summed up by the phrases:

1 – It’s completely impossible – don’t waste my time

2 – It’s possible, but it’s not worth doing

3 – I said it was a good idea all along”

- Arthur C. Clarke

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Summer of 2018... has not been a great summer for thesis writing. With the unbearable heat and tropical nights in southern Sweden I would've much rather spent some time cooling off uncountable times in the nearby lakes and seas. But it is also those exact reasons that have provided the push necessary to go through with this thesis at a time we are seeing increasing numbers of, and continuously rougher, weather events. I am proud to be graduating as a master's in environmental management and policy. Thank you to my batchmates for sharing this burden, along with its ups and down. Special thanks to the 'DnTs', without whom this summer's study sessions would not had been the same.

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Abstract

Public procurement and the purchasing of goods, services and works comprises about 14% of the European gross domestic product (GDP). Procurement initiatives, guidance and tools therefore can have significant influence to leverage demands for more sustainable and circular products and services. This study explores the current circular public procurement (CPP) landscape, looking at barriers and opportunities for increasing engagement in CPP in Scotland and Sweden. An additional purpose is looking into what are the priority product- and service group areas in CPP and where uptake is most likely in the near future. Finally, this study also looks into what role the CPP plays in transitioning to a circular economy (CE) with consideration to other supply-side and demand side policy instruments. The study employs an exploratory comparative case study design due to the relatively limited amount of research conducted in the area of CPP, and thus means to lay the groundwork for future research. The study draws on qualitative data in the form of semi-structured interviews and on desk research. Three research questions are formulated in this thesis paper:

- 1. What role can circular public procurement play in realising a transition to a circular economy?*
- 2. How is the landscape for circular public procurement developing in Scotland and Sweden, and what barriers and drivers can be identified?*
- 3. In what categories of products and services do we find a potential to scale up CPP activities?*

The thesis finds that CPP plays an important complementary role as a policy instrument in the transition towards a CE, alongside a broader policy mix in the EU and at Member State level. CPP can help kick-start emerging circular markets and promote circular business models (CBMs) by creating a degree of market certainty and it also has the potential to reduce market fragmentation. The landscape for CPP has been identified to hold a large number of barriers and opportunities. CPP is arguably currently being underutilized, although this is also coupled with the fact that many CBMs are still in the experimental and growing phase, and that public procurers are not yet very experienced with circular procurement, and in many cases are hesitant to procure more circularly due to risks associated with cost and legal uncertainties. In addition there are considerable regulatory and market factors that serve as barriers, but that also hold opportunities for future CPP uptake. Finally, the product group and services with the greatest likelihood to see an uptake and scaling up in CPP in the near future in both Sweden and Scotland are (office/domestic) furniture and ICT equipment, as they are proven concepts to work as CBMs and these groups have seen the greatest progress on procurement guidance through framework contracts and established sustainability criteria.

Keywords: circular economy, public procurement, circular procurement, opportunities and barriers, Sweden, Scotland, circular business models

Executive Summary

Background and problem definition

In a continuously growing global economy within the context of a resource-constrained world, concerns are growing rapidly of the shortage of earth's natural resources. Furthermore, resource extraction and use are both linked to pollutant emissions and waste generation, further aggravating adverse environmental pressures (Hashimoto, Fischer-Kowalski, Suh, & Bai, 2012). Today there is little doubt that humankind is one of the major aggravators for the disparate environmental changes and instability that Earth is currently experiencing (Rockström et al., 2009; Steffen, Crutzen, & McNeill, 2007). A large part of these issues can be attributed to the lasting incumbent linear economic regime, which has been characterised by the “take, make, use, and waste” paradigm, identified to be inherently unsustainable in the long-term within the context of a resource-constrained world (Lieder & Rashid, 2016; Rice, 2007).

One approach to tackling these issues has emerged through the concept of the circular economy, which has become popular both in the private and public sector, and increasingly scrutinised in academia (see more in detail in section 3, literature review) (Ghisellini, Cialani, & Ulgiati, 2016). The circular economy (CE) emphasises a resource efficient and regenerative system in which resource input and waste is minimised by closing, slowing and narrowing material and energy loops (Geissdoerfer, Savaget, Bocken, & Hultink, 2017).

Public procurement and the purchasing of goods, services and works comprises about 15% of the European gross domestic product (GDP). Procurement initiatives, guidance and tools therefore can have significant influence to leverage demands for more sustainable and circular products and services and can work as a first step in leveraging change away from the linear economic paradigm and instead towards a CE paradigm.

Research objectives and research design

This study explores the current circular public procurement (CPP) landscape, looking at barriers and opportunities for increasing engagement in CPP in Scotland and Sweden. An additional purpose is looking into what are the priority product- and service group areas in CPP and where uptake is most likely in the near future. Finally, this study also looks into what role the CPP plays in transitioning to a circular economy (CE) with consideration to other supply-side and demand side policy instruments.

Three research questions are formulated in this thesis paper:

1. *What role can circular public procurement play in realising a transition to a circular economy?*
2. *How is the landscape for circular public procurement developing in Scotland and Sweden, and what barriers and drivers can be identified?*
3. *In what categories of products and services do we find a potential to scale up CPP activities?*

To answer these questions an exploratory comparative case study design has been employed, comprising of qualitative primary data, collected through semi-structured interviews, and literature analysis based on desk research. The main justification for employing an exploratory case study design in this research is that it, through qualitative interviews, enables a deeper understanding of CPP with regards to understanding its potential, limitations, and current developments, than what can be derived from solely researching legislative and policy documents and literature. Given the current knowledge gap in the academic literature, an

exploratory approach lends itself as a fitting choice, as the findings are meant to open up the door for further examination of the phenomenon observed.

Findings RQ1: It was identified that CPP can play an important role for the CE transition in various ways. First, it is a potent policy instrument among a larger policy mix that can work with synergistic effects, leveraging effects (alongside other more ‘target specific’ policy designs) on the main stages of products’ life cycle stages; the production phase, use/consumption phase, and end-of-life/disposal phase. Second, given the significant purchasing power of the public sector, it has the power to kick-start markets for CBMs, and – if aligned properly with strategies – can overcome market fragmentation by sending clear market signals to market actors. Third, it is one of few policy instruments that, through its demand, creates a market pull and incentivises suppliers to provide products and services with overall better impact on the society.

Findings RQ2: Given the large number of findings for RQ, these can be found compiled in Figure E-1 and E-2 seen below, covering CPP barriers and opportunities, respectively.

Circular public procurement barriers		
Organisational	Regulatory/policy	Market
<ul style="list-style-type: none"> • Cost (real and perceived) • Time/effort • Lack of awareness • Risk – legal and economic (real and perceived) • Inadequate human capital – in numbers and competencies • Attitudes towards refurbished products 	<ul style="list-style-type: none"> • Lacking CE legislation • Obstructing laws and regulations • Lacking CE action plan (Sweden) • Lacking mandatory incorporation of sustainability considerations in PP (Sweden) 	<ul style="list-style-type: none"> • High upfront investment costs • Financial obstacles → Limited funding for CBMs • Lack of clear market signals from the public sector → risk and uncertainty for suppliers • Time lag for the market to adjust

Figure E-1 Summary of circular public procurement barriers

Source: Elaborated by author

Circular public procurement opportunities		
Organisational	Regulatory/Policy	Market
<ul style="list-style-type: none"> • Training for CPP • Collaboration and exchange of knowledge & best-practice • Communicating good examples • Functional procurement → procuring performance/function instead of product • Developing standards • Increase use of sustainability tool • Develop circular criteria for all product life cycle stages (production, use/consumption, disposal) 	<ul style="list-style-type: none"> • Implementing CE legislation • Set clearer market direction through legislation (e.g. mandatory Ecodesign or C2C design) • Monitoring framework • Exploit opportunities given for CPP in the PP Directive (MEAT tendering, LCC and TCO, market dialogue) 	<ul style="list-style-type: none"> • Improved market dialogue for communicating future needs and aligning demand & supply → market needs time to change and adapt • Use framework contracts to scale up CPP and scale up suppliers CBMs • CBMs business support and explorations with third party organisations

Figure E-2 Summary of circular public procurement opportunities

Source: Elaborated by author

Some of the main take-aways that were denoted by respondents as being particularly important barriers include public procurers fear over legal disputes, resulting from procuring in novel ways and lacking clarity in legislation and practice. The market for CBMs is currently also growing and thus the available product groups for circular procurement may be limited to specific product areas. Attitudes towards refurbished items is also an organisational and cultural issue identified where people simply prefer to own new products since they perceive refurbished goods to be of lower quality and less desirable. Some of the main opportunities for increasing CPP in the future include using functional procurement to pay for a specific performance or function, instead of a product. Training public procurers in CPP and exchange of best practices in national and international networks are also key for promoting ‘good examples’ to encourage more procurers to procure circularly. Monitoring frameworks have been identified as essential for progressively tracking and better understanding the development of CPP over time. Finally, framework contracts have been identified as holding a potentially important role for achieving critical mass to upscaling CPP, though there are possible weaknesses associated as well.

Findings RQ3: It has been highlighted that the most likely products and services that have a potential to scale up CPP activities are ICT equipment and furniture, in both Scotland and Sweden. In Scotland framework contracts have already been developed for circular considerations in ICT equipment and refurbished domestic furniture. In Sweden there are not yet any framework contracts, although SNAPP has developed circular criteria for computers and monitors, and Kammarkollegiet (The Legal, Financial and Administrative Services Agency) has conducted a pilot on the possibility (and the interest in) for government agencies to procure refurbished office furniture and lease office furniture. While there are other product groups and areas that also have some advancements and potential they have not been identified to be as likely to break through with a high CPP uptake in the short-term. ICT and furniture are both proven concepts that work as a CBM for suppliers and that provides high quality goods for a significantly lower price to customers. The only identified issue here is lack of a supplier presence in Scotland that manages refurbished office furniture, though if demand is signalled clearly the market can be assumed to react in order to cover that demand.

Future venues for research could be done on:

- Quantitative studies looking at the uptake of CPP in specific product groups
- Research on the *effect* of circular procurement for product groups and services, distinguishing environmental benefits between CPP and ‘regular’ SPP
- Merge supply chain management and business model literature with CPP, to see what kind of concrete (circular) effects can be observed farther back in the supply chain

Moving forward there is a need for:

- *Public procurement agencies* to develop a monitoring framework, indicators for measuring CPP uptake and use statistics to guide future progress; and to establish framework contracts encouraging procurement with circular solutions.
- *Public procurers* to increase engagement in market dialogue with suppliers; receive proper training for practicing CPP; and dare to procure more circularly despite risk, as it can lead to setting legal precedent and guiding practice in the future
- *Suppliers* that engage in CBMs to create a database network which procurers can easily find and go through as a reference of what kind of circular solutions are readily available on the market.

Table of Contents

ACKNOWLEDGEMENTS	II
ABSTRACT	III
EXECUTIVE SUMMARY	IV
LIST OF FIGURES	VIII
LIST OF TABLES	IX
ABBREVIATIONS	X
1 INTRODUCTION	1
1.1 AIM AND RESEARCH QUESTIONS	2
1.2 SCOPE AND LIMITATIONS	3
1.3 TARGET AUDIENCE	4
1.4 ETHICAL CONSIDERATIONS.....	4
1.5 OUTLINE OF THE THESIS.....	4
2 LITERATURE REVIEW	5
2.1 INTRODUCTION.....	5
2.2 CIRCULAR ECONOMY	5
2.2.1 <i>Transitioning from linear to circular</i>	8
2.2.2 <i>Business model innovation for a Circular economy</i>	9
2.2.3 <i>Circular economy challenges and limitations</i>	11
2.3 PUBLIC PROCUREMENT	12
2.3.1 <i>Technical specifications vs. Award criteria</i>	13
2.3.2 <i>Characteristics of public procurement</i>	13
2.3.3 <i>Conflicting interests in public procurement</i>	14
2.3.4 <i>Procurement concept definitions and overlap</i>	14
2.3.5 <i>Circular procurement routes</i>	17
2.3.6 <i>Circular procurement research output</i>	18
2.4 PUBLIC PROCUREMENT AS PART OF THE CE POLICY MIX	19
2.5 LITERATURE GAPS	20
3 METHODOLOGY AND METHODS	21
3.1 RESEARCH DESIGN	21
3.1.1 <i>Comparative case study design</i>	21
3.1.2 <i>Selection (sampling) of cases</i>	22
3.1.3 <i>Units of analysis and observation</i>	23
3.1.4 <i>Validity and limitations</i>	24
3.2 DATA COLLECTION	25
3.2.1 <i>Sampling</i>	25
3.2.2 <i>Literature review</i>	25
3.2.3 <i>Semi-structured interviews</i>	26
3.2.4 <i>Ethical and practical considerations</i>	26
3.3 DATA ANALYSIS.....	27
3.3.1 <i>Semi-structured interviews</i>	27
3.4 REFLECTIONS	28
4 LEGISLATIVE AND POLICY LANDSCAPES	29
4.1 EUROPEAN UNION.....	29
4.1.1 <i>Public procurement directives</i>	29
4.1.2 <i>Legislative and strategic policy landscape</i>	31
4.2 SCOTLAND.....	32

4.2.1	<i>Institutional context</i>	32
4.2.2	<i>Procurement structure in Scotland</i>	33
4.2.3	<i>Policy and legislation</i>	34
4.3	SWEDEN	36
4.3.1	<i>Procurement structure in Sweden</i>	36
4.3.2	<i>Policy and legislation</i>	37
5	FINDING AND ANALYSIS	40
5.1	RQ 1: WHAT ROLE CAN CIRCULAR PUBLIC PROCUREMENT PLAY IN REALISING A TRANSITION TO A CIRCULAR ECONOMY?	40
5.1.1	<i>Procurement as demand side policy instrument</i>	40
5.1.2	<i>Complementary to supply side policies</i>	41
5.1.3	<i>Promotes more circular markets</i>	43
5.1.4	<i>Impact on local, regional and worldwide economy</i>	44
5.1.5	<i>Shortcomings/Limitations of public procurement</i>	44
5.1.6	<i>Summary</i>	45
5.2	RQ 2: HOW IS THE LANDSCAPE FOR CIRCULAR PROCUREMENT DEVELOPING IN SCOTLAND AND SWEDEN, AND WHAT BARRIERS AND OPPORTUNITIES CAN BE IDENTIFIED?	45
5.2.1	<i>Landscape (building on results presented in the landscape section + interview data)</i>	45
5.2.2	<i>Barriers</i>	48
5.2.3	<i>Opportunities</i>	55
5.3	RQ 3: IN WHAT CATEGORIES OF PRODUCTS AND SERVICES DO WE FIND A POTENTIAL TO SCALE UP CPP ACTIVITIES?.....	63
6	DISCUSSION & CONCLUSION	67
	BIBLIOGRAPHY	71
	APPENDIX A – INDICATORS MONITORING CE PROGRESS IN THE EU	91
	APPENDIX B – STAGES OF THE PUBLIC PROCUREMENT PROCESS	92
	APPENDIX C – EU GPP CRITERIA LINKING TO CE	93
	APPENDIX D – REQUEST FOR INTERVIEW LETTER	94
	APPENDIX E – LIST OF INTERVIEWEES	95
	APPENDIX F – INTERVIEW GUIDE, PUBLIC SECTOR REPRESENTATIVES (IN SWEDISH)	96
	APPENDIX G – INTERVIEW GUIDE, BUSINESS REPRESENTATIVES	99

List of Figures

Figure E-1	Summary of circular public procurement barrier	V
Figure E-2	Summary of circular public procurement opportunities	V
Figure 2-1	Examples of research topics encountered in the literature review for public procurement and circular economy research.	5
Figure 2-2	the circular economy system	8
Figure 2-3	The four building blocks of CE.....	9
Figure 2-4	Identified definitions of various public procurement concepts.	15
Figure 2-5	Visualised concept overlap, with respective focus areas.	17
Figure 3-1	Hierarchical method approach.....	22

Figure 3-2 Visualisation of units of analysis and observation. Elaborated by author.....	23
Figure 4-1 EU strategic policy and regulatory landscape for GPP and CE	31
Figure 4-2 Organisational public procurement structure in Scotland	33
Figure 4-3 List of tools for sustainable procurement in Scotland	35
Figure 4-4 Key public sector organisations responsible for public procurement (and number of public entities).....	37
Figure 4-5 List of tools for sustainable procurement in Sweden.....	37
Figure 5-1 circular public procurement’s potential influence on each product life cycle stage.....	42
Figure 6-1 Summary of circular public procurement barriers	68
Figure 6-2 Summary of circular public procurement opportunities.....	68
Figure A-0-1 Indicators used by the European Commission to monitor the progress towards a circular economy.....	91
Figure B-1 Schematic of the typical procurement process, from preparatory stage to utilisation stage.....	92

List of Tables

Table 2-1 Five categories of circular business models.....	10
Table 2-2 Categorisation of policy instruments.....	19
Table 4-1 Legislative and policy/strategy drivers in Scotland promoting CE and CPP .	34
Table 4-2 Legislative and policy/strategy drivers in Sweden promoting CE and CPP ...	37
Table 5-1 Identified cases of CPP in Sweden and the relevant CE principles	63
Table 5-2 Identified cases of CPP in Scotland, and the relevant CE principles.....	65
Table C-0-1 Overview of the number of GPP criteria with a link to CE (at product-group and aggregate level).....	93
Table A-E-1.....	95

Abbreviations

APUC – Advanced Procurement for Universities and Colleges

BMI – Business Model Innovation

CBMs – Circular Business Models

CE – Circular Economy

CPP – Circular Public Procurement

EC – European Commission

EMF – Ellen MacArthur Foundation

EPR – Extended Producer Responsibility

EU – European Union

GDP – Gross Domestic Product

GPP – Green Public Procurement

ICLEI - International Council for Local Environmental Initiatives

ICT – Information Communication Technology

IT – Information Technology

MEAT – Most Economically Advantageous Tender

MISTRA – The Swedish Foundation for Strategic Environmental Research [Stiftelsen för Miljöstrategisk Forskning]

MS – Member State

NHS – National Health Service (Scotland)

PP – Public Procurement

PPI – Public Procurement for Innovation

RISE – RISE Research Institutes of Sweden AB

SPP – Sustainable Public Procurement

TFEU – Treaty on the Functioning of the European Union

UK – United Kingdom

WEEE – Waste Electrical and Electronic Equipment

WRAP – Waste and Resources Action Programme

ZWS – Zero Waste Scotland

Organisations

Kammarkollegiet – The Legal, Financial and Administrative Services Agency

Konkurrensverket – Swedish Competition Authority

SKL Kommentus Inköpscentral – Sweden's Municipalities and Counties Purchasing Centre

Upphandlingsmyndigheten – Swedish National Agency for Public Procurement (SNAPP)

1 Introduction

In a continuously growing global economy within the context of a resource-constrained world, concerns are growing rapidly of the shortage of earth's natural resources. Furthermore, resource extraction and use are both linked to pollutant emissions and waste generation, further aggravating adverse environmental pressures (Hashimoto et al., 2012). Today there is little doubt that humankind is one of the major aggravators for the disparate environmental changes and instability that Earth is currently experiencing (Rockström et al., 2009; Steffen et al., 2007). A large part of these issues can be attributed to the lasting incumbent linear economic regime, which has been characterised by the “take, make, use, and waste” paradigm, identified to be inherently unsustainable in the long-term within the context of a resource-constrained world (Lieder & Rashid, 2016; Rice, 2007).

One approach to tackling these issues has emerged through the concept of the circular economy, which has become popular both in the private and public sector, and increasingly scrutinised in academia (see more in detail in section 3, literature review) (Ghisellini et al., 2016). The circular economy (CE) emphasises a resource efficient and regenerative system in which resource input and waste is minimised by closing, slowing and narrowing material and energy loops (Geissdoerfer et al., 2017). A serious political and international recognition on the need for transitioning to a circular economy can be reflected for example in the 2015 European Commission communication (COM (2015) 614final) on an EU action plan for the Circular Economy (European Commission, 2015b).

Currently there is a need for policy and market-based instrument guidance for the practical implementation of circular economy concepts in our socio-economic system. Milios (2018) has identified green public procurement (GPP) and public procurement for innovation (PPI) as important policy intervention areas, among a broader policy mix, for advancing to a circular economy (Milios, 2016). Furthermore, this area has been identified to hold significant potential for “promoting higher resource efficiency throughout the life cycle of a product” (Milios, 2018, p. 874), which is a core tenet in CE thinking (Bocken, de Pauw, Bakker, & van der Grinten, 2016; Ellen MacArthur Foundation, 2013). Businesses innovating to incorporate CE into their business models will require assistance from the policy environment they operate in, in order to scale-up and compete in both national and international contexts (Milios, 2018). It should be possible to consider CPP as an important policy intervention area, alongside a greater policy mix, as it streamlines the focus more towards achieving a circular economy than what SPP/GPP and PPI do on their own.

This research topic is of significance because the public-sector accounts for a large portion of purchases of goods and services, and therefore contributes to increased economic activities. In Sweden public procurement in 2014 comprised €60.4 billion, accounting for 18.3% of Gross Domestic Product (GDP) (Lukkarinen, Larsson, Jönsson, & Morild, 2016), Scotland's public procurement spend in 2015 comprised €12.3 billion, accounting for 7.2% of GDP¹, while the EU spends between €1.3-1.8 trillion², roughly comprising 15% of the EU's GDP (Alhola, Ryding, Salmenperä, & Busch, 2018; Cernat & Kutlina-Dimitrova, 2015; ‘FAQs - GPP - Environment - European Commission’, n.d.). Improving public procurement can yield big environmental and economic gains, for instance a 1% efficiency gain could save €13-18 billion

¹ Based on own calculation with data from:(Scottish Government, 2016e, 2016f): Some procurement statistics including Scotland are only available at the aggregate UK level.

² The figure varies depending on source and whether or not the costs of public works are included.

per year ('Public procurement strategy - Growth - European Commission', n.d.). It is clear the public sector is one of the largest consumers in the economy, therefore it can be assumed to have an impact on business activities through its purchasing power and the market demand it sets (Witjes & Lozano, 2016).

Traditional public procurement does not take into account externalised environmental impacts in its procuring process, rather focusing on product and service quality and the most cost-effective option. Given the significant amount of money spent by public authorities, public procurement has the market power to encourage market penetration of circular products and services (Rizos, Behrens, Drabik, Rinaldi, & Tuokko, 2018). It can do so both by creating markets that are demand-driven from the public sphere, and by promoting more sustainable business models through supporting national strategies, laws and regulations which guide the procurement process, both on EU and national level, with increased circular demand criteria. For example, CPP can promote resource efficient products by demanding improved product life-spans, product design for ease of repair, refurbishing, dismantling and recycling (Alhola et al., 2018). Consequently, this research area holds significant potential as one part of solving the "CE puzzle" in promoting increasingly resource efficient products and services, for a circular economy transition (Alhola et al., 2018).

In the past 2-3 years there has been an increased national and international attention for circular public procurement, recognised as an important pillar and policy instrument (by no means the only one) for kick-starting the transition towards a circular economy (Alhola, Salmenpreä, Ryding, & Busch, 2017; ICLEI - Local Governments for Sustainability, 2017; Jones, 2015; Kirchherr et al., 2018; Rainville, 2017b; Witjes & Lozano, 2016). However, the attention in academia has typically been on single-case studies focusing on the circular procurement process of one specific product-group in a single country context, for example on refurbished furniture and remanufactured computers in Sweden (Crafoord, 2017; Crafoord, Dalhammar, & Milios, 2018; Öhgren, 2017) and on linking public procurement with sustainable and circular business models (Lewandowski, 2016; Rainville, 2017b; Witjes & Lozano, 2016). Other international organisations such as the Ellen MacArthur Foundation, Life+ (includes environment and resource efficiency programmes such as REBus³), and Zero Waste Scotland present and highlight mini-case studies⁴ (or caselets) of circular public procurement conducted in various (typically) European countries.⁷

It appears that currently there are no exploratory or comparative studies mapping out similarities and differences in how CE front-runner countries are working with CPP. Nor is there much attention given to the potential sector- or product-group specific growth areas for CPP. There is a need for more research to highlight the point of view of the procurers in terms of what potential is feasible for CPP and more knowledge on what kind of guidance is needed to realise this potential.

1.1 Aim and research questions

This thesis aims to address the identified knowledge gaps by focusing on mapping out the national landscapes (highlighting similarities and differences), and the opportunities and barriers for achieving an increased uptake of circular procurement in two country contexts. This is done by investigating the perspectives from both supplier groups, procuring public authorities and circular economy/procurement expert groups. The thesis is focused within the EU, specifically in the national context of circular economy front-runner countries Scotland and Sweden

³ Resource Efficient Business models

⁴ Typically presented 2-3 pages in length, or similar length on organisations' websites.

(Dalhammar & Leire, 2017; Scottish Government, 2016d), through an exploratory comparative case study design.

To achieve the above stated aim, the objectives of this thesis is to investigate what role circular procurement can play in the transitioning to a circular economy and identify how Scotland and Sweden are currently working with circular public procurement.

To achieve these objectives, three research questions have been developed:

1. *What role can circular public procurement play in realising a transition to a circular economy?*
2. *How is the landscape for circular public procurement developing in Scotland and Sweden, and what barriers and opportunities can be identified?*
3. *In what categories of products and services do we find a potential to scale up CPP activities?*

To answer these research questions a number of tasks will have to be performed, as presented below. Tasks are divided per research question.

RQ 1:

- a. Providing a sound overview on the circular economy (CE) and circular procurement (CP) concepts and identifying what role circular public procurement can realistically play in the vision for a circular economy. Analysis will primarily be derived from the literature review material // desk study research, and using some complementary interview data
- b. Identifying the reach and the limits of PP as a demand-side policy instrument.

RQ 2:

- a. Mapping the EU and national landscapes that may drive or hinder the uptake of circular procurement in Scotland and Sweden.
 - a. The landscape mapping explores market, organisational, and regulatory factors presenting barriers and opportunities.
 - b. Identifying national circular public procurement priority sectors and product-groups and services
- b. Identifying which actors are driving (or hold the potential to drive) the process towards increasing circular procurement in Scotland and Sweden.

RQ 3:

- a. Exploring the potential for expanding circular procurement product-groups and services, and likelihood of upscaling. Based on interview answers and some desk research.
- b. Identifying where current circular procurement cases fit in with the circular economy principles from a conceptual standpoint.

1.2 Scope and limitations

Given the exploratory nature of this comparative case study, the scope is rather wide in terms of what types of product-groups and services that may be investigated in each country, although the case is bounded in the context of only two countries. The scope of this thesis includes the

EU and national legislative and policy context, and the perspectives from private and public sector, including business representatives, procurement practitioners and procurement and CE experts).

1.3 Target audience

With consideration to the research aim and RQs, the research findings may be of relevance in particular to procurement strategists at public sector organisations, procurement practitioners and researchers focusing on circular procurement and demand-side approaches.

1.4 Ethical considerations

This thesis has required the input from various stakeholders through intensive in depth face-to-face and phone interviews. From this standpoint ethical issues that have been taken into account is obtaining the subjects' informed consent to participate in the study, as well as secure anonymity for the respondent should they prefer it (Kvale & Brinkmann, 2009, p. 63). Furthermore, to ensure fidelity of the interpreted interview statements for the analysis, the respondents were contacted again with the relevant excerpt from the analysis section provided with an opportunity to comment on if there was common understanding in the transcribed interview content, and to provide a chance to rectify in case of miscommunication.

1.5 Outline of the thesis

The remainder of this thesis is outlined as follows:

Chapter 2 presents a literature review focusing mainly on the two core concepts relevant for this thesis: CE and PP, where working definitions of the concepts are presented for the operationalisation of the concepts and put within the context of sustainable development and circular public procurement. In addition, relevant subcategory concepts pertaining to both research fields are presented and discussed. The literature chapter lays the foundation for analysing and answering the first research question.

Chapter 3 presents, justifies and explains the methodology and methods used in this thesis, describing the logic behind the study, a description of the main methods involved and the limitation of both the research design and methods for data collection and analysis.

Chapter 4 presents the case contexts and results based on the EU and national landscapes, which make a part of the material used for the analysis section. It is divided into three parts, covering the EU, Scotland, and Sweden, separately.

Chapter 5 contains an integrated results and analysis chapter, introducing interview data parallel to the analysis and the answering of the research questions. Each research question is answered separately.

Chapter 6 presents a summary of the key findings and learnings from the analysis and contains a short discussion on the implications and relevance of the findings. Identified opportunities and barriers for CPP is tabulated to glimpse a clear overview of what is covered in the preceding chapter. It concludes by reiterating the purpose of the paper, reflects on the challenges and limitations of the thesis, and considers ways forwards through practical recommendations and indicating future relevant research avenues within academia.

2 Literature review

This chapter presents a literature review meant to give an overview and highlight the existing body of knowledge relevant to the stated research aim and RQs. It summarises and critically reflects on both seminal pieces and more recent state of the art contributions to the research fields pertaining to circular economy (3.2), and public procurement and its various procurement concepts (3.3). The chapter concludes (3.4) by summarising the main points of each research area and how their interrelations are of relevance for this thesis paper, and highlights areas of knowledge gaps. In each section key concepts are defined to operationalise the concepts for further analysis in chapter 5 which provides the results, analysis and discussion.

2.1 Introduction

The concepts of Circular Economy (see for example: Ghisellini, Cialani, & Ulgiati, 2016; Geissdoerfer, et al., 2017; Bocken et al., 2016) and Public Procurement (see for example: Brammer & Walker, 2011; Edquist & Zabala-Iturriagoitia, 2012; Knight, Harland, & Telgen, 2012; Edler & Georghiou, 2007) are two broad and largely researched topic areas. However, research on the intersection between the two, specifically on circular procurement, and how public procurement can play a role in achieving circular economy outcomes in business models, is currently emerging and is not yet a fully established academic research area. It has received an impetus of increased attention following the EU Circular Economy Action Plan 2015 (European Commission, 2015b) and changes in the EU Directive for Public Procurement (Directive 2014/24/EU, 2014, p. 24; European Commission, 2018). Figure 2-1 presents some examples of research topics in the area of public procurement and circular economy. Most recently research attention in CE has turned to circular economy and plastics (Ten Brink et al., 2018).

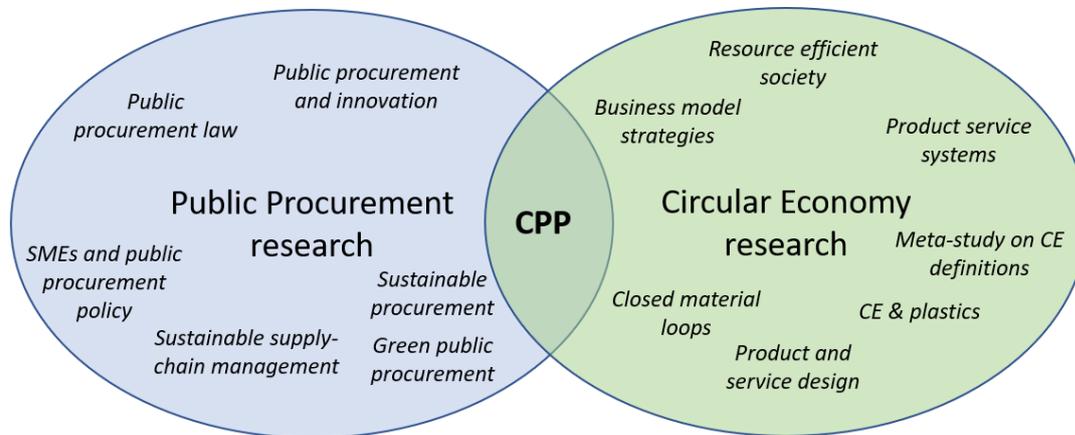


Figure 2-1 Examples of research topics encountered in the literature review for public procurement and circular economy research.

Source: Elaborated by author

2.2 Circular economy

The linear economy

In order to understand why a transition to a circular economy is important, and justified, it is first necessary to glimpse at the problems with a linear economic system. In the current linear system, a material's life cycle begins with natural resource extraction, then a product is manufactured which later is used and disposed of by the consumer when the use-phase is over (Preston, 2012). Furthermore, economic policies have traditionally been designed to maximise

the material flows since economic growth is conventionally measured by GDP, which is dependent on increased consumption of goods and services if the economy is to keep growing (Westblom, 2015). This system is characterised by what has become defined as the “take, make, use, and waste” paradigm, which has been identified as being inherently unsustainable, in the long-term, in a finite and resource-constrained world (Ellen MacArthur Foundation, 2013; Lieder & Rashid, 2016; Rice, 2007). The linear economy results in lost value of materials and products and generates waste and further environmental degradation (Lieder & Rashid, 2016). For example, in the European economy there is still a high degree of resource wastefulness. In 2012, 60% of materials were landfilled in the EU, with only 40% being recycled or reused, leading to significant material and energy loss, and only capturing 5% of original raw material value (Westblom, 2015).

The circular economy

The CE model has been proposed as a response to this conventional economic model, in order to transition to a sustainable and low-carbon society, and it is heavily promoted by the Ellen MacArthur Foundation and the European Commission, among others (Ellen MacArthur Foundation, 2015b, 2015b; European Commission, 2015b). In addition to deriving environmental and economic benefits, societal benefits can be derived from an increase in job creation with flourishing repair and remanufacturing industries, which is estimated at a potential value of 600 billion EUR, may reduce annual greenhouse gas emissions by 2-4%, and create 580 000 jobs in the EU alone (‘Circular economy - European Parliament’, 2015).

Circular Economy is a concept that is distinguished by its characteristics and principles, rather than from any single unified definition. A meta-study by Kirchherr, Reike and Hekkert (2017) on the conceptualisation of CE identified up to 114 different definitions of the concept, indicating a certain conceptual fragmentation pertaining to this research area. The CE is a model of a production and consumption system, characterised by its focus on sharing, leasing, reusing, repairing, refurbishing, and recycling existing products and materials for as long as possible. By doing this the life cycle of products is extended (‘Circular economy - European Parliament’, 2015; Geissdoerfer et al., 2017). Many definitions of the concept highlight a strong focus on resource efficiency and resource management, going beyond conventional waste management, and even suggest a “rethinking of the purpose of the economy itself” (Antikainen et al., 2017, p. 21). The often-quoted definition provided by the Ellen MacArthur Foundation proposes the CE as “an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals that impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models” (Ellen MacArthur Foundation, 2015b, p. 7). Thus, resource efficiency is recognised as a core aspect in the circular economy, with an emphasis on business model innovation for a suitable circular economy transition (Mont, Plepys, Whalen, & Nußholz, 2017). The circular economy model, as is proposed by the Ellen MacArthur Foundation, is built on three main principles (Ellen MacArthur Foundation, 2015b, p. 6; ‘The Circular Economy Concept - Regenerative Economy’, n.d.):

1. Preserve and enhance natural capital:
By controlling finite stocks and balancing renewable resource flows
2. Optimise resource yields (keeping products and materials in use for as long as possible):
By circulating products, components, and materials at the highest utility at all times in both technical and biological cycles
3. Foster system effectiveness:
By revealing and designing out negative externalities

In their paper, Geissdoerfer et al (2017, p. 759) cover a variety of CE conceptual developments in previous literature and propose their definition of the circular economy as “... a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.” This will be the applied working definition of the CE concept in this thesis. This definition is chosen because it is more action oriented and less abstract in its definition, relative to the one proposed by EMF, while maintaining the key characteristics of the concept with regards to slowing, closing and narrowing material and energy loops.

While not explicitly stated in either of the definitions presented above, the concept distinguishes between biological and technical cycles, occurring in what can be defined as the biosphere and technosphere, respectively (Ellen MacArthur Foundation, 2013, p. 1). These can be seen in figure 2-2 which presents a visualised overview of the circular economy conceptual model developed by the Ellen MacArthur Foundation (2013). It presents the material flows of technical and biological materials. In this system “waste” is considered as “food” or “input” for a different stage, which is indicative of a closed loop system. Each looping arrow indicates a cascade of components and materials. The narrower the cascades, the greater the material and energy recovery, and thus also increased value retention. For instance, maintenance or repair of a product extends the product life cycle and is thus a more resource efficient option compared to reusing it for another purpose, remanufacturing it, or recycling the material components from the product (Ellen MacArthur Foundation, 2013; Prendeville & Bocken, 2017). Thus, the inner circles keep most of the material value, while more energy and material value is, progressively, lost in the outer circles. In the technosphere the desirable resource flow is (1) *repair/maintenance*, to extend life cycle as long as possible, (2) *reuse* the product (without intervention), (3) *refurbish/remanufacture* product close to its original quality (or better), and (4) *recycle* the product to recover valuable secondary raw material which may serve as input for new products (Crafoord, 2017; Ellen MacArthur Foundation, 2013). The biosphere is based more on the idea of the regeneration of biological materials with a different process than the technosphere, emphasising retaining and reclaiming the health of ecosystems and of biological resource to the biosphere.

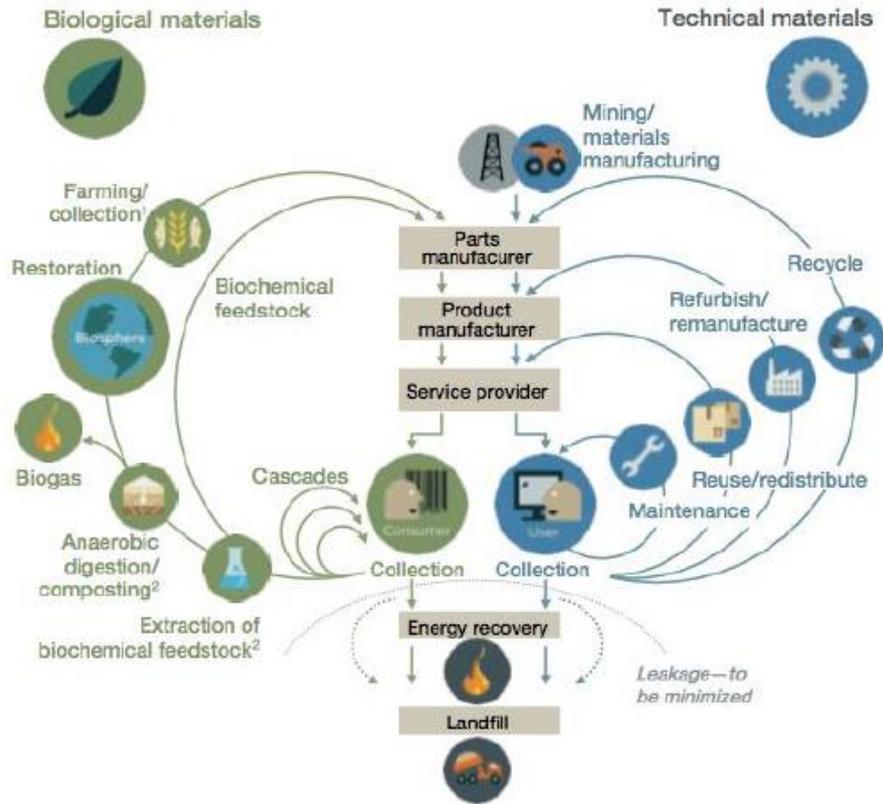


Figure 2-2 the circular economy system

Source: (Ellen MacArthur Foundation, 2015a) (with permission from EMF)

While circular economy has garnered increasing attention in business and the public sector in the past 10 years, the concepts underpinning it have been present since the 1960s in various iterations in different academic disciplines including industrial ecology (Frosch & Gallopoulos, 1989), ecological economics (Boulding, 1966), and environmental economics (Pearce & Turner, 1990). Overlapping conceptual iterations to the CE include: the performance economy (W. Stahel, 2010), the blue economy (Pauli, 2010), natural capitalism (Hawken, Lovins, & Lovins, 2013), industrial symbiosis and regenerative design (Lyle, 1996), among others. It is suggested that industrial ecology has had the heaviest influence on the development of the circular economy, given how the discipline has been defined as “the study of material and energy flows resulting from human activities” and it has been concerned with closing cycle to minimise the ecological impact (Antikainen et al., 2017, p. 22). Thus, many of the fundamental conceptual characteristics of the circular economy are not new, although they hold a common ground in the concept of cyclical close-loop systems (Milios, 2016).

2.2.1 Transitioning from linear to circular

Based on the conceptualisation of the CE system explained above, Planing (2015) makes the argument that in order to transition from a linear economy to a CE there are four essential building blocks needed to enable the transition: (1) materials and product design, (2) new business models, (3) global reverse networks, (4) enabling conditions. This thesis focuses in on the second and fourth building blocks, taking into account the types new circular business models that exist and can shake the CE paradigm, and looking at the enabling conditions public procurement may play, as well as the specific underlying enabling conditions for CPP.

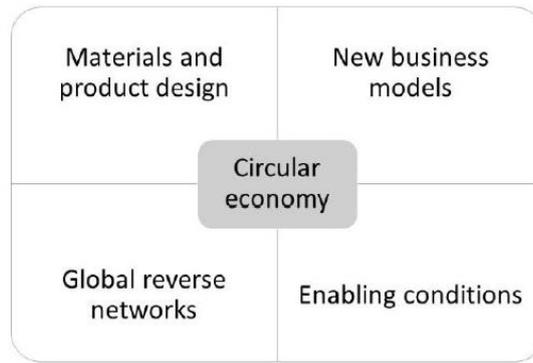


Figure 2-3 The four building blocks of CE

Source: Westblom (2015) based on Planing (2015)

2.2.2 Business model innovation for a Circular economy

As mentioned briefly above, business model innovation is an important step towards a circular economy, as it implies businesses must change the way they provide goods and services by revisiting their value proposition to offer more resource efficient, and closed loop, solutions (Mont et al., 2017; Planing, 2015).

Circular business models (CBMs) are a collective term encompassing a large variety of business models that close product and material loops, increase resource efficiency, and capitalise on the residual value of these products and materials (Mont et al., 2017). Consequently, these circular business models are considered to be more effective, and better equipped, at handling the challenges of economic and physical resource constraints (Mont et al., 2017). Nußholz (2017, p. 12) defines circular business models as “... *how a company creates, captures, and delivers value with the value creation logic designed to improve resource efficiency through contributing to extending useful life of products and parts (e.g., through long-life design, repair and remanufacturing) and closing material loops*”.

A fundamental aim of these models is to provide the same function that a user would derive from a conventional offering, but provides it in a more resource efficient way, which reduces the speed of resource throughput in the economy and resource extraction of virgin material (Lewandowski, 2016; Lieder & Rashid, 2016) by slowing, narrowing and closing materials loops – through different business model approaches (see Bocken et al., 2016). In doing so, they adhere to the principles of the CE.

There are a variety of ways circular business models may function. Some may focus on extending a products life-cycle through designed durability, reuse, modularity for ease of disassembly and repair, and remanufacturing. Other models may be based on providing access to a product’s function, such as through leasing, which also incentivises the business to extend the life-cycle of their product for as long as possible. These are only some examples of how these business models may capture value and be beneficial from a resource efficient perspective. In their paper, Bakker den Hollander et al. (2014) have categorised five distinct types of circular business

models, as seen below in Table 2-1⁵. The models offer very different value creation and capture opportunities, achieving different degrees of resource efficiency⁶.

Table 2-1 Five categories of circular business models

Types of circular business models	Value created and delivered through...	Value captured through the primary revenue stream from...	Examples
<i>Classic long life</i>	Durable products	Sales of high-grade products with a long useful life	<ul style="list-style-type: none"> • White goods (e.g. Miele’s 20year life span of appliances) • Luxury products claimed to last beyond a lifetime (e.g. luxury watches such as Rolex)
<i>Hybrid model</i>	Combination of a durable product and short-live consumables	Repeat sales of fast-cycling consumables	<ul style="list-style-type: none"> • Printer (durable) + cartridge (short-lived consumable) • Electric toothbrush (durable) + brush head (consumable)
<i>Access model</i>	Access to product rather than product ownership	Access to product via diverse payment schemes, the most widespread is pay-per-use	<ul style="list-style-type: none"> • Car-sharing • Launderettes • Clothes hire
<i>Performance model</i>	Product performance rather than product ownership	Product performance via diverse payment schemes, the most widespread is pay for the final result	<ul style="list-style-type: none"> • Lighting as a Service (LaaS), using a pay-per-lux model • Furniture/Mobility as a Service (Faas/MaaS)
<i>Gap-exploiter model</i>	Third-party exploitation of leftover product value	Reselling repaired, refurbished and upcycled products	<ul style="list-style-type: none"> • Refurbishment and remanufacturing companies, e.g. for products such as ICT* equipment and furniture.

Source: (Elaborated by author and expanded on from Bocken et al., 2016 and; Mont et al., 2017) *Information Communication Technology

First, the classic long-life model concerns producing and selling durable, long-life products to the consumer, thus the consumer tradition of ownership remains. This can certainly be seen on the market today, although it can be observed that many advanced products have been subjected increasingly to planned obsolescence. Second, the hybrid model concerns providing a durable product with short-lived consumables, which can be seen with printers (durable) and ink cartridges (consumable) or electric toothbrush (durable) and accompanying brush heads (consumable). Third, the access model shifts away from product ownership, and instead involves a pay-per-use, or per function, system. An example of this is car-sharing/leasing. Fourth, while the performance model is quite similar to the access model, there are defining separate characteristics. While the former gives you access to a product, this model enables a specific “product performance”, where the user/consumer pays for the final result. An example is pay-per-lux, a service developed by Philips, in which the user does not pay for the luminaire

⁵ This is just one of many types of conceived circular business model categories. See Planing (2015) for a exhaustive list of circular business model categories collated from the literature.

⁶ Although the resource efficiency difference between the business models is not explicitly stated in the figure, as it may vary on a case-by-case basis depending on the product-group and service.

product, but rather for the final result: light (Philips Lighting, n.d.). In other parts of the literature, such as in Bocken et al. (2016) these two models are bundled together into a single “access and performance model”. These two models indicate business models moving towards collaborative and shared consumption of goods, forming part of what can be understood as a product-service system (PSS). Fifth and last, the gap-exploiter model is used by businesses that exploit left-over value in product systems by either: repairing, refurbishing, remanufacturing or upcycling products. This final model has arguably been around for many decades, although likely conceptualised under different circumstances. Practical examples here include ICT equipment and furniture remanufacturers and refurbishers.

There are many businesses expressing interest and a support for circular business models. Companies such as Inrego (ICT), Re-Tek (ICT), Interface (carpets and tiles) and Rekomo (furniture) (‘Circular Economy | About | Interface’, n.d.; Crafoord, 2017; Öhgren, 2017; Zero Waste Scotland, n.d.-a) have been working with circular business models for many years now. More recently large businesses such as IKEA and Philips are also looking into developing circular business models or growing their current ones (Inter IKEA, 2018; Philips Lighting, n.d.). In Sweden and Scotland many of companies also collaborate on exploratory research projects and business development on how to best design circular business models with organisations such as RISE and MISTRA (in Sweden) and Zero Waste Scotland and Scottish Enterprise (in Scotland).

2.2.3 Circular economy challenges and limitations

While much of the attention is focused on the opportunities in system change and resource efficiency gains with circular economy, there appears to be a lack of sufficient recognition in the challenges and criticisms toward reaching meaningful circularity, particularly in the public debate. In academia these challenges are somewhat more recognised.

First, given some of the earlier conceptual foundations for CE, much of the focus has been on physical flows, with attention to monetary flows being left on the wayside until recently (Tanskanen, 2016). This has received increased attention with further research into circular business models and how companies may create value with these non-traditional business models (Bocken et al., 2016; Geissdoerfer, Morioka, de Carvalho, & Evans, 2018; Planing, 2018; Schulte, 2013). Second, there are limits to closing material loops through recycling (Nußholz, 2017), as 100% recycling is impossible due to the second law of thermodynamics, known as the law of entropy (Andersen, 2007), thus the theoretical and practical discourse should adequately reflect this. Third, determinants for decisions on replacement of products, that may be preferable to life-extending measures, need to be properly identified. It is argued that products which have the greatest environmental impact originating in the raw material extraction and production phases should be built for durability, reuse, and manufacturing (Mont et al., 2017). Whereas on the other hand, products with the highest environmental impact occurring in the use-phase should be considered to be either upgraded or replaced more frequently – most usually due to energy efficiency improvements (Bakker, Wang, Huisman, & den Hollander, 2014; Felton & Bird, 2006; Mont et al., 2017). Though it should be noted that with increasingly greener energy mixes and improve energy efficiency performance, the use phase, in terms of environmental impact, is becoming less pronounced, with more focus shifted to the production phase (Richter, Dalhammar, & Tähkämö, 2017).

Fourth, a topic that is currently lacking attention in the research field of CE pertains to how circularity should be measured (Saidani, Yannou, Leroy, & Cluzel, 2017). This lack is evident at several levels, it includes the need to evaluate product performance for businesses, otherwise product circularity performance cannot be assessed. Likewise, at the societal level, without proper measurement methods and tools it is not possible to monitor a transition towards a

circular economy in a rigorous way with high reliability. At the EU level, the European Commission has developed a “circular economy monitoring framework”, it comprises ten indicators (with sub-indicators) across four thematic areas (‘Indicators - Eurostat’, n.d.). However, while a move in the right direction, it appears to lack certain monitoring and measurements by focusing only at the Member State level. For example, not collecting data regarding the number of businesses engaging in circular business models, the value generated in the economy through activities such as leasing, sell- and buy-back schemes, etc. This is of course not a criticism of the CE concept itself, but rather of the application on monitoring as is currently being done. Appendix A presents the indicators used to monitor CE progress at the EU level.

Finally, a critical question regarding the environmental sustainability potential of CBMs depends on whether the closed loop system with cycling of materials and products replaces primary production *or adds* to it (Mont et al., 2017; Nußholz, 2017). This is a danger, or risk, highlighted by Zink and Geyer (2017), relating to the rebound effect, resulting in negative environmental consequences even through circular business models. This may occur, for example if the reuse and remanufacturing of products does not *displace primary production*, which could happen if recycled materials cost less, and thus lead to increased demand by consumers (Mont et al., 2017; Zink & Geyer, 2017). This is an important question to address as the political agenda of a circular economy forges ahead.

2.3 Public Procurement

Public procurement is the process by which public authorities, such as government departments or public-sector purchase works, goods and services from companies through a public contract (Lozano & Witjes, 2016; ‘Public Procurement - Growth - European Commission’, n.d.). It includes, inter alia, construction, education, administration, transport, office furniture and other equipment (Lozano & Witjes, 2016). Traditional procurement has typically only been concerned with fulfilling the basic function of procurement, which is to satisfy an identified need through the provision of products, works, or services, for the lowest price possible (European Commission, 2018). The typical public procurement process, and the stages it comprises can be seen in a visualised schematic in Appendix B.

The broadening of the procurement concept to include other aspects – starting with innovation/technology⁷ procurement – goes back several decades but can notably be identified to have been developed in the late 1980s and 1990s in the UK and other parts in the EU (Edler, Georghiou, Uyarra, & Yeow, 2015; Edquist, Vonortas, Zabala-Iturriagoitia, & Edler, 2015). Since the 2000s there has been a renewed impetus in the policy agenda in using procurement as a policy mechanism to support innovation, competitiveness and reduce environmental and socially adverse outcomes through green and sustainable public procurement (Uyarra, Edler, Gee, Georghiou, & Yeow, 2014). In the United Nations (UN), public procurement has also been identified to hold an important role towards a sustainable future. The role of public procurement is emphasised in sustainable development goal (SDG) 12, which seeks to “Ensure sustainable consumption and production patterns” (United Nations, 2015). Specifically, PP is mentioned in its Target 12.7 as a strategy for promoting “... public procurement practices that are sustainable in accordance with national policies and priorities” (United Nations, 2015, p. 27) and is recognised to hold value as a “soft” governance mechanism to encourage markets to produce more sustainable products and services to tackle climate change, address resource

⁷ The terminology used in the 1990s and earlier was “public technology procurement” but has since developed into “public procurement for innovation”, as it encompasses more than just technologies, which is the widely used term today (Edquist, Vonortas, Zabala-Iturriagoitia, & Edler, 2015).

efficiency and a range of social issues (United Nations Global Market Place, n.d.)(United Nations Global Market Place, n.d.).

2.3.1 Technical specifications vs. Award criteria

There are principally two routes for incorporating sustainability in public procurement. It is done either through (1) technical specifications, or (2) award criteria. Technical specifications are an *integral* part of the procurement process which define the characteristics of the product, service or works that a public authority intends to buy, and sets the minimum requirements that must be fulfilled (evaluated on a pass/fail basis) (Crown Agents Ltd, 2017; European Union, 2018).

These may include aspects of design, safety, environmental performance, or quality assurance. Applying award criteria on the other hand is *voluntary* and may be used by public authorities when evaluating tenders. Using award criteria in addition to technical specifications to address quality allows the market with ample room to provide more innovative and sustainable public procurement contracts (Crown Agents Ltd, 2017).

In 2014 the EU introduced “Most Economically Advantageous Tender” (MEAT) as an assessment method which can be used as the selection procedure for publicly procured contracts, allowing the contracting party to award a contract to a supplier based on more criteria than just price in the tender submission, which has previously been the case in conventional public procurement (European Commission, 2016b, 2018). Thus, tenders using the MEAT method require both cost and quality criteria – with a weighting⁸ distribution to find the best price-quality ratio – which has been a fundamental regulatory improvement to promote innovation and green/sustainable public procurement (Directive 2014/24/EU). Examples of quality aspects, based on Article 67 in the procurement directive (Directive 2014/24/EU, 2014, p. 134), include “... technical merit, aesthetic and functional characteristics, accessibility, design for all users, social, environmental and innovative characteristics and trading and its conditions”. The development of the MEAT method has opened up the door for incorporating sustainability criteria more extensively in product and service specifications, which were aspects not as broadly applied prior to the amendment and repeal of the previous procurement directive from 2004 (European Commission, 2004b, 2016a; ‘Most economically advantageous tender (MEAT) | felp’, n.d.). Arguably the MEAT assessment method has opened up the possibility for increased creativity in the demand specifications in tenders, which could give more freedom to procuring officers to develop demand criteria for improved environmental outcomes, including circular economy principles.

2.3.2 Characteristics of public procurement

Combining existing literature, Knight, Telgen, and Harland (2012), provide a synthesis on the distinguishable differences, both external and internal, between public procurement and private procurement. It provides a good clarification in terms of what characterises public procurement, in terms of what is demanded. The synthesis identifies five different demands: (1) external demand, (2), internal demand, (3) demands originating from the context, (4) demands on the process, and (5) multiple roles for the public organisation itself (Knight et al., 2012, pp. 17–18). External and internal demand will briefly be covered here, as the whole list is too exhaustive to cover (although highly recommended for the interested reader).

First, external demands include aspects of *transparency*, which implies equal opportunities for all bidders, and clarity in the process of tenders and bids; and *integrity and accountability*, in which the

⁸ Deciding on weighting of criteria means applying the relative (subjective) importance of each award criterion.

public sector should avoid wasteful, improper and corrupt practices, as well public authorities should be accountable for the efficiency, effectiveness and legal manner in which they conduct procurements. Secondly, internal demands characterising PP include *multiple internal goals*, such as achieving cost-effectiveness and delivery of the needed service for the procuring authority at the same time; while at the same time *political goals* of elected officials may need to be aligned in the process and taking into account the *many stakeholders* involved in PP (e.g. tax payers, citizens, suppliers, procurement officers, elected officials), all of which may have different objectives and priorities (Knight et al., 2012, pp. 17–18).

2.3.3 Conflicting interests in public procurement

With the increased popularity of using public procurement as a market-based policy instrument, PP is having to come to terms with satisfying a number of interests across different stakeholders (Knight et al., 2012). The *primary interest*, of course, must always be the fundamental aspect of what constitutes public procurement: acquiring the products, materials or services needed by the public organisation. *Secondary interests* are those that go beyond the contract at hand, and may be motivated by different aspects, depending on the stakeholder. For example, a *secondary interest* in the public sector, which has now become rather common practice in the EU organisations and Member States, can be to encourage markets – through demand-side pull factors – to produce more sustainable and resource efficient products and services, both in production and use-phase (Knight et al., 2012, pp. 19–20; United Nations Global Market Place, n.d.). On the supplier side a secondary interest could be the possibility to build a reference list of clients and increasing market shares, which goes beyond the primary interest which if the fulfilment of the procurement contract (Knight et al., 2012, p. 20). As such, secondary interests from respective stakeholders in the private and public sector may hold incentives for suppliers to provide, for example, circular solutions and build a reference list of clients in such an emerging market.

Additionally, Knight et al (2012) suggest that public procurement may contribute to a number of policy areas, including: job creation and employment; support to SMEs and regional involvement (by splitting up tenders into smaller lots, allowing smaller companies to fulfil the quantity demanded); diversity (by favouring different groups of suppliers – minorities, women, disabled – and opening up the market for foreign competitors); stimulating innovation (by demanding innovative products or processes); sustainability and environment (by *favouring* or *requiring* sustainable and environmentally friendly products or processes). Given the broad policy areas PP may affect or influence, it is understandable how public procurement has come into vogue as a popular policy instrument in recent years.

2.3.4 Procurement concept definitions and overlap

Before delving into what circular public procurement is, and how it can be defined, it is important to explore and discuss currently dominating, and somewhat overlapping concepts in public procurement. Namely, *green*, *sustainable*, *innovation*, and now most recently – circular – procurement. In the current state of the literature on public procurement, it appears that there is certain overlap between these concepts. Thus far there does not appear to have been any dedicated meta-study to reconcile the differences or similarities between the concepts. While it is not the purpose of this paper to fully straighten them out here, it is worth looking into how these concepts interrelate with each other. To provide some clarity, figure 2 provides some of the identified basic definitions of green, sustainable and innovation procurement.

- **Green Public Procurement (GPP)** is defined by the EU as “... a process whereby public authorities seek to procure goods, services and works with *a reduced environmental impact throughout their life cycle* when compared to goods, services and works with the same primary function that would otherwise be procured”
- **Sustainable Public Procurement (SPP)** is defined by the EU as “...a process by which public authorities *seek to achieve the appropriate balance between the three pillars of sustainable development*⁹ - economic, social and environmental - when procuring goods, services or works at all stages of the project”
- **Public Procurement for Innovation (PPI)** can be defined as a process in which a public organisation puts forth a tender for the fulfilment of specific functions within a reasonable period of time through a new product.

Figure 2-4 Identified definitions of various public procurement concepts.

Source: Elaborated by author based on (Edquist & Zabala-Iturriagoitia, 2012; European Commission, 2016c; ICLEI - Local Governments for Sustainability, 2017)

The difference between green and sustainable public procurement is not usually discussed in the literature. While the European Commission have provided working definitions for both concepts, it is clear that the concept they primarily use is GPP, rather than SPP (European Commission, 2016c; ‘FAQs - GPP - Environment - European Commission’, n.d.). Instead it can be noted that SPP features more heavily within the UN system, as well as in the country contexts of Scotland and Sweden, which are of relevance to this thesis (Regeringen, 2016; Scottish Government, 2016c; United Nations Global Market Place, n.d.; ‘Verktøy for bättre affärer | Upphandlingsmyndigheten’, n.d.). However, despite being dubbed as GPP, with time, the focus of EUs GPP criteria guidance has developed beyond only environmental aspects, also taking into account social issues. For example, through putting in demands relating to fair trade labels, or requiring entire supply chain compliance with codes of conduct set up in the contract (to ensure against the sourcing of conflict minerals for example) (Directive 2014/24/EU; European Commission, 2017c)

Public Procurement for Innovation on the other hand, is quite a broad concept in what it can encompass and has notable overlap with green and sustainable procurement. It, to a large extent, concerns itself with using public demand as a mechanism for the *development* and *diffusion* of innovations (Edquist & Zabala-Iturriagoitia, 2012). Examples of the former can be pre-commercial procurement (PCP) promoting research and development (R&D) for products and process innovations which are not yet on the market. When procurement authorities purchase existing goods and services it may promote the innovation through market diffusion, helping to overcome a certain fragmented public market demand (Rainville, 2017a). ‘Fragmented market demand’ can be understood here as markets not large enough or built fast enough to justify capacity investment (capital, labour, technology) from the private sector (Tsipouri, Edler, Rolfstam, & Uyarra, 2010). Overcoming fragmented market demand may be particularly important when trying to promote a shift in market demand to reflect the transition to a circular economy from the public sector, which would encourage more businesses to develop circular business models towards where there is a coherent and large enough market. In this regard the literature indicates the importance of sending clear and cohesive market signals to encourage investment.

⁹ Sustainable Development (SD) is typically referred to with the definition presented in the Brundtland Report “Our Common Future” as ‘*development that meets the needs of the present without compromising the ability of future generation to meet their own needs*’ (WCED, 1989, p. 43) although there are innumerable presented definitions for SD today.

The identified overlap in the literature is that many times PPI is in fact used to achieve environmentally positive (GPP/SPP) outcomes, for example by demanding more resource efficient and durable products and services. Edquist and Zabala-Iturriagoitia (2012) argue that the rationale for PPI is twofold; (1) to satisfy human needs, and (2) to solve societal problems. These societal problems include global warming, clean energy challenges, water scarcity and mobility, etc. (Dalhammar & Leire, 2012). Given this understanding it is understandable that PPI may be used to address environmental problems as well as a wider host of societal problems. It is made very clear on where PP stands as a strategic tool in the eyes of the European Commission, since it is stated in the new procurement directive that “*public authorities should make the best strategic use of public procurement to spur innovation. Buying innovative products, works, and services plays a key role in improving the efficiency and quality of public services while addressing major societal challenges*” (Directive 2014/24/EU p. 72). Had the procurement directive come out after 2015, it would probably not be far-fetched to believe there could be concrete mentions of the interplay between innovation and the circular economy

Circular Public Procurement

The importance of covering the above-defined concepts is to demarcate where circular economy belongs in this conceptual mire. From observations made in the literature, on the academic side, CPP is often discussed as an additional and separate form of procurement. In the European Commission’s (European Commission, 2017b) and in national procurement strategy documents (Regeringen, 2016; Scottish Government, 2016e) CPP comes across as a concept that is a *subset* of GPP/SPP, rather than a stand-alone procurement concept, such as PPI for instance (Alhola et al., 2017; Lozano & Witjes, 2016). This likely means that circular procurement, or circular criteria already are, or will be, embedded in GPP/SPP practices, which is important to be aware of, as they may be difficult to separate away from each other.

However, CPP is a new concept, and to give it a clear distinction it may still be necessary to just focus on CPP and its defining characteristics – in academia as well as in real procurement practice. Furthermore, circular procurement, much like green/sustainable procurement, is another concept aimed at promoting beneficial environmental, social and economic outcomes as it is supposed to follow CE principles. The main characteristic differences that can be noted between green/sustainable procurement and circular procurement is that CPP focuses on closing, extending and narrowing material loops and value retention – e.g. by reusing and remanufacturing products and materials several times while minimising environmentally harmful impacts (Alhola et al., 2017; Bocken et al., 2016) – and on promoting circular business models. Building on bridging the conceptual definitions of public procurement and circular economy, one of the more recent definitions – and more explicit thus far - put forward for CPP is presented by Alhola et al., (2017) as “... a procurement of competitively priced products, services, or systems that lead to extended life spans, value retention, and/or remarkably improved and non-risky cycling of biological or technical materials, making use of and supporting the circular business models and related networks”. While this is the working definition of CPP in this thesis, it should be noted that there is currently no standard definition in the literature for circular procurement (for a tabulation on CP definitions see Alhola et al., 2017).

Figure 2-5 below presents a visual representation on the thematic overlap between these procurement concepts and their respective focus areas. Presented in the “focus” area are the different domains of where the emphasis lies in the different procurement forms. The overlapping sections indicate how procurement approaches may not always appear clear-cut to which procurement approach they belong to, and more often than not it is a combination of more than one, such is the example with business model innovation (BMI) as seen in the

overlapping intersections. The focus areas presented here are not exclusive to that specific procurement type, but it is indicative of their main characteristics, as has been identified through the literature review.

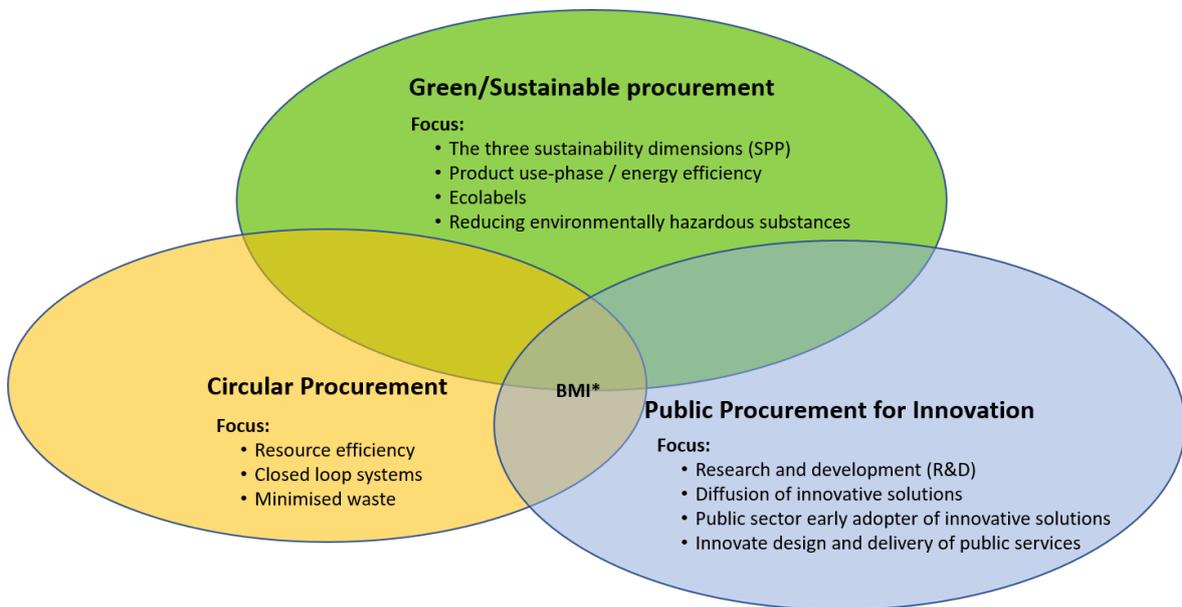


Figure 2-5 Visualised concept overlap, with respective focus areas.

Source: Elaborated by author. Based comprehensively on reviewed literature and research documents

2.3.5 Circular procurement routes

There are various ways in which procurement can be used to acquire circular solutions. There is not one singular best model suited to create circular demand and solutions, instead it depends on the conditions and options available to suppliers and their supply-chain partners.

Markets are also developing towards circularity at different paces, and thus are at different stages in their development so far. Meaning that the transition to a completely circular procurement model may not always be viable, or the best available alternative, for all markets, products, services and materials (Jones, Kinch Sohn, & Lysemose, 2018). The task for the circular procurement function is therefore to identify, in dialogue with market actors, what is the most appropriate CE approach for different products and services. It is important to do this because the CE principles are not a homogeneous standard that can be required for each product, instead it should be product-group or sector specific. Finally in order to improve circular procurement, which is at a nascent stage, it is important to benchmark, conduct pilots, create examples and to challenge the market into providing innovative solutions and evaluating what work best (Jones et al., 2018).

Jones et al., (2018) identify three elements of procurement that need to be in focus to promote circular solutions to the public sector:

- 1) Focus on service instead of products (PSS)
- 2) Focus on the product's design, use phase and end of life (durability, repair, energy efficiency, refurbishment/remanufacturing, design for disassembly)

3) Focus on market dialogue (developing new terms and contracts, and partnerships for innovation)

For suppliers to provide circular solutions, the products should be designed bearing in mind aspects of durability, repair & upgrading, reuse, ease of disassembly, reduced hazardous chemicals, etc. Again, in line with the CE principles to enable the value retention and cascading effects as seen in the CE diagram in figure 2-2. This emphasises the importance on the development of circular procurement criteria, to encourage suppliers to change product and service designs accordingly (Jones et al., 2018). Neubauer et al., (2017) have found that EU GPP criteria already contribute to the delivery of a CE, and categorises them according to which part of the products life cycle stage is targeted. Their overview on the GPP criteria with a link to the CE can be found in appendix C

Jones et al., (2018) identify the most common circular procurement routes as: buy-sell back, buy-resell, and PSS. The circular procurement business models presented in table 2-1 also indirectly informs on some of the types of circular procurement models which are available, as it reflects the availability of some procurement routes for procuring circularly. It is particularly the access & performance models (identified by Jones et al., as: PSS), and the gap-exploiter model with third parties refurbishing and re-marketing products (identified by Jones et al., as: buy-resell) that align with CPP models. However, buy-sell back is not covered in any of the CBMs in table 2-1. Buy-sell back concerns the original equipment manufacturer (OEM) purchasing back from the public organisation at the products end of use/life, for refurbishment and re-marketing. The difference between buy-sell back and buy-resell is whether it goes back to the OEM or goes to a third party.

2.3.6 Circular procurement research output

Relating to the above figure 2-1, academic output specifically targeting circular public procurement is in fact relatively low. The literature that does focus on it emphasises (1) the important role of business in the circular economy and how it can be promoted through public procurement as a demand-side policy instrument (Alhola et al., 2018; Edler & Georghiou, 2007¹⁰; Rizos et al., 2018). (2) It also looks at specific product-groups (e.g. IT equipment and furniture) through case studies in national contexts to assess current developments, barriers and drivers, and the potential needs for increased uptake of circular procurement practices (Crafoord, 2017; Crafoord et al., 2018; Öhgren, 2017).

In addition to academic output, the grey literature has produced guidelines for how to engage in CPP as part of the GPP strategy was published by the European Commission in 2017 (ICLEI - Local Governments for Sustainability, 2017), as well as regional reports such as 'Circular Public Procurement in the Nordic Countries' by the Nordic Council of Ministers defining the framework of circular procurement (Alhola et al., 2017) and assessing the Nordic countries progress towards SDG 12 on 'Sustainable Consumption and Production' (Bauer, Watson, & Gylling, 2018). Furthermore, amongst the CPP literature that is available, attention is given to performance-based or functional procurement specifications, where such specifications describe the desired result and which outputs are expected, as well as how they should be measured (European Commission, 2016a). It is also argued that such output detailed specifications, instead of input detailed specifications allow the supplier to assess what is the best way to provide the output, which may spur new technical solutions and innovation. This goes very much in line with the access and performance models discussed above in figure table

¹⁰ While Edler and Gerghiou do not at all discuss circular procurement, as the concept was not developed or publicly circulated in 2007, they do discuss the role innovation has with public procurement for demand-side policies.

2-1, that are examples of possible CBMs. However, it should be noted that while functional procurement can result in resource efficiency it is not necessarily a guarantee that it will happen (Turley, 2013). The outcome in resource efficiency depends on a variety of factors, Turley (2013) identifies that it depends on the operational characteristics of a firm’s business model and whether they can and are pooling their PSS to achieve higher resource efficiency. Furthermore, lack of willingness from consumers to access product services instead of owning them has been explained a major limitation in the implementation of PSS. For consumers one of the most valued attributes is having control over the ‘artifacts’ (such as products) in their lives, as they also have a more tangible value. The impressions of PSS are less accessible is also identified as an issues which does not allow consumers the same behavioural freedom as identified by Tukker (2015)

2.4 Public procurement as part of the CE policy mix

Policy instruments are the concrete tools that governments can use to implement their policies. Policy makers can use a wide range of instruments to address certain policy problems and design them to achieve a specific desired outcome. Thus, instruments, in this context, constitute a steering function to provide incentives for accomplishing a policy goal. A policy mix is a combination of different policy instruments that should, ideally, have synergistic effects on the desired policy outcome(s). In this regard, the use of policy instruments implies some form of political or governmental intervention (Milios, 2016).

Mont and Dalhammar (2005) present a categorisation of policy instruments, distinguishing three types of areas of policy intervention and two types (voluntary, mandatory) relating to their implementation mode. Table 2-2 visualises this categorisation and illustrates where public procurement fits among other policy instruments.

Table 2-2 Categorisation of policy instruments

	Voluntary	Mandatory
Administrative	e.g. standards, agreements between government and industry etc.	e.g. quotas, bans, license, standards, etc.
Economic	e.g. SPP/CPP, subsidies, loan guarantees, etc.	e.g. fees, taxes, tariffs, subsidies etc.
Informative	e.g. certifications schemes, awareness raising campaigns, ecolabelling	e.g. reporting requirements (chemicals), labelling (energy performance), etc.

Source: (Milios, 2016; Mont & Dalhammar, 2005)

Milios (2016) notes that while policy instruments may be well designed in targeting specific aspects of a desired outcome, they also come with a degree of context specific weaknesses no matter what type of instrument it is. In order to target this weakness, or shortcoming, from a singular policy instrument, it is important to holistically consider what effects can be reached with a well-designed and synergistic policy mix.

Thus, it is typically insufficient to adopt one type of instrument when designing policies dealing with the complexity of issues arising from, for example, a transition to a CE. It is then preferable to adopt a mix of policy instruments that can strengthen each other and cover the gaps identified in each policy instruments’ weakness (Milios, 2016).

In addition, an added element can be applied to the categorisation of policy instruments. Namely policy instruments which work as supply-side or demand-side measures. According to Edler and Georghiou (2007) and Mundaca (2018) demand-side measures tend to fall by the wayside in terms of attention, as more policy attention has historically been at supply-side measures

(Edquist, Hommen, & Tsipouri, 2000). Supply-side policies create a market push, e.g. by regulating (setting a floor), such as a carbon dioxide tax (that affects all ‘players’ without discrimination). While demand side creates a market pull by creating new market demands, e.g. demanding improved environmental performance of products and services on the market (creating a new untapped market which businesses can move into), thus incentivising (voluntarily) and creating certain market safety at the same time (‘Ecodesign | European Circular Economy Stakeholder Platform’, n.d.; Enkvist & Klevnäs, 2018). Public procurement holds significant power, given the public purchasing power of the EU and its Member States, on creating new sorts of demands in line with policy strategies for a sustainable development and Community.

CPP can be identified as a voluntary (demand-side) policy instrument, among a larger mix across the typologies described in table 2-2, that has potential to have a sizable impact to reach a circular economy. Milios (2018) provides a detailed overview of identified voluntary and mandatory EU policies affecting resource efficiency (thus having a CE consideration) across the three main life cycle stages (production, use/consumption, and disposal/waste management) and classifying the degree to which they have direct, partial or indirect effect on CE. The list is too exhaustive to include here, although it can be mentioned that the only two voluntary policy instruments identified are the public procurement Directive 2014/24/EC and the ecolabel regulation (EC) No 66/2010. It should also be noted that a number of the policy instruments tend to cover more than one life cycle stage and/or multiple environmental aspects. Examples include the Ecodesign Directive 2009/125/EC that affects resource efficiency in both the production and use phase, or the Waste Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU which covers the production and waste management stages (though they do arguably have different degrees of direct and indirect effect). Public procurement has been identified as affecting resource efficiency in the production and use/consumption stages (through the requirements specifications set in tenders) (Milios, 2018).

There is also great interest noted from both the public and private sector in moving towards circular business models and circular procurement. However, it is currently in a nascent, or exploratory phase, where testing and learning by doing is the current practice (Crafoord, 2017; Öhgren, 2017). On the public side, Kammarkollegiet, a government agency in Sweden responsible for framework contract in public procurement (more on it in section 4.3.1.), recently published a pilot study exploring circular furniture flows in order to understand the scope and in what direction a framework contract for circular furniture procurement could be developed (Ek & Björns, 2018; ‘Möbler och inredning - Avropa.se’, n.d.). It has been conducted due to clear expressed interest from public sector organisations that they wish to procure more according to CE principles, such as refurbished, recycled or with alternative service models.

2.5 Literature gaps

While there is much research on CE and PP in their separate research domains (see figure 2-1), there is limited research on where and how public organisations apply CE principles in their procurement activities. It is evident that more research is needed on CPP, in particular identifying barriers, and the opportunities or mechanisms to overcome them. Finally, there is a lack of comparative exploratory studies on CPP in EU countries which may be necessary to lay the groundwork for further specified research. This thesis tries to bridge a small portion of this recognised research gap.

3 Methodology and methods

In this section an overview of the methodology and methods used to carry out the research is presented. It covers and justifies the research design and methods used for data collection and analysis. These will be discussed in detail below.

3.1 Research design

Two research methods were combined: the exploratory method, with the qualitative comparative case study method, forming an *exploratory comparative case study design*. Case study methodology is recognised as a relevant approach for research projects that aim to investigate phenomena in a real-life context (Stake, 1995). The main justification for employing an exploratory case study design in this research is that it, through qualitative interviews, enables a deeper understanding of CPP with regards to understanding its potential, limitations, and current developments, than what can be derived from solely researching legislative and policy documents and literature. Given the current knowledge gap in the academic literature, as mentioned in section 2.5, an exploratory approach lends itself as a fitting choice, as the findings are meant to open up the door for further examination of the phenomenon observed. Additionally, due to the limited academic literature this research has been required to go beyond data collection through desk research (academic literature, grey literature, legal documents, and national policy/strategy documents) by conducting a number of semi-structured qualitative interviews. The comparative element is brought in to be able to review and compare developments in two different contexts, in order to understand the similarities and differences that may be found in each setting.

A further justification for the exploratory approach, in addition to the identified academic knowledge gap, is due to the growing interest for CPP amongst public sector organisations and procurement practitioners, but there remain a lot of uncertainties in this area. This can in part also be reflected by the recent emergence of an international congress on circular procurement, the first held in Amsterdam, the Netherlands, in 2016 and the second in Tallinn, Estonia in 2017, both dedicated to raising awareness of the concept of circular procurement and highlighting good practices ('Circular Procurement Congress', 2017).

3.1.1 Comparative case study design

In a comparative case study two or more interrelated cases are compared instead of one (Verschuren, Doorewaard, & Mellion, 2010). There are various sub-variant methods that can be applied to a comparative case study, including the hierarchic method, the sequential method, and more (see Verschuren et al., 2010; Yin, 2014). This study employs the *hierarchic method*, in which the research project is carried out in two stages: (1) first the separate cases are inspected and studied as if they are a series of single case studies. (2) Secondly, the results from the first stage are then used as input for a comparative analysis of all cases involved in the research project at a higher level of abstraction (Verschuren et al., 2010, p. 181).

This study employs a modified approach to the *hierarchic method*, in which the research project is carried out in two stages: (1) first the separate cases are inspected and studied as if they are a series of single case studies. (2) Secondly, the results from the first stage are then used as input for a comparative analysis of the two cases, alongside other data integrated alongside the analysis. The first stage can be observed in sections chapter 4, notably in 4.2 and 4.3, where the case contexts and initial results based on secondary data are gathered. The second stage is found in chapter 5 on findings and analysis, where the analysis of both case contexts is conducted alongside each other. Chapter 6 conclusion summarises and highlights the main findings for each RQ as well as the main difference and similarities between both case contexts.

The rationale for this two-step approach is to provide clarity of each case-context and the findings. It is done to facilitate comparison between the cases when finding explanations for the differences and similarities between the cases (Verschuren et al., 2010, pp. 181–182).

Concretely, the approach is operationalised in this thesis by presenting the case context and policy landscape for each case in a ‘landscapes’ chapter presenting results from secondary data, followed by an integrated findings and analysis chapter which makes simultaneous analysis and comparison (per thematic area) of each case, as seen in figure 3-1. Section 6 provides a final discussion, highlights the main difference and similarities, and concludes the thesis.

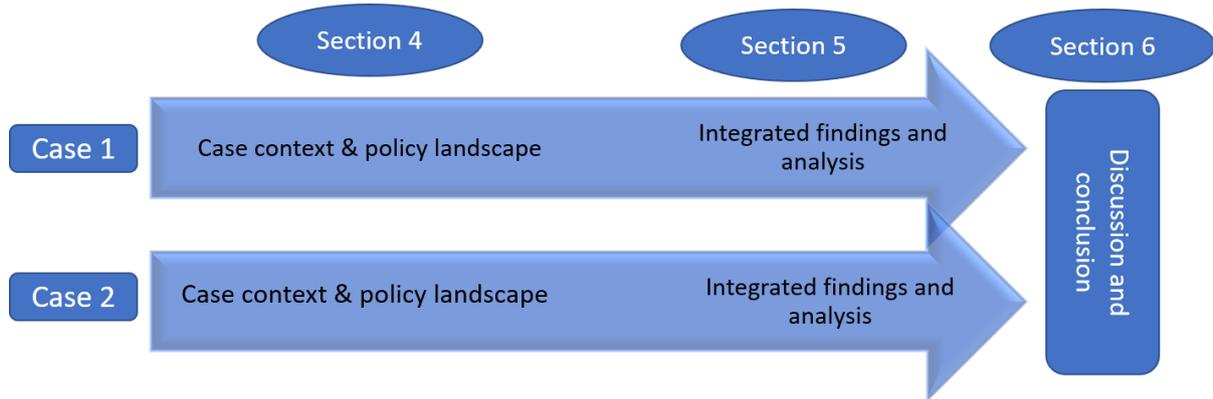


Figure 3-1 Hierarchical method approach

Source: Elaborated by author, based on (Verschuren et al., 2010, pp. 181–182)

Verschuuren and Doorewaard (2010, p. 182) argue that a hierarchic method in a comparative case study lends itself particularly well in a student thesis due to its simplified structure and given time- and -resource constraints for data collection and analysis. However, it should also be noted that Yin (2014, p. 57) warns against a comparative case study for student thesis for the exactly opposite reason, in that it may be too time- and resource intensive.

3.1.2 Selection (sampling) of cases

Another key characteristic of a case study is the sampling method. Usually *strategic* sampling is conducted, instead of *random* sampling typically seen in survey research to avoid selection bias. The reason for using strategic sampling is twofold: Since only a small number of cases or observational units are selected, there is greater risk for ending up with an atypical sample, which may have serious consequences for external validity of the research results. This makes strategic sampling a pertinent approach which should be guided by the conceptual design and the information intended to be extracted from the research (Verschuren et al., 2010, p. 179).

When it comes to the strategic sampling of *cases*, Verschuren and Doorewaard (2010, p. 180) argue that there are two predominant options to a strategic case selection. They recommend to selecting what they call “maximally similar cases” or “maximally different cases”, depending on the purpose of the research. Further, if the research project is of an *exploratory nature*, Verschuren and Doorewaard (2010, p. 180) recommend choosing cases that show a high degree of similarities, since it is otherwise difficult to attain generally descriptive assertions by looking at seemingly different cases.

As a result, following the guidance from the research strategy and design literature, two similar case studies have been chosen, where there is sufficient access to data, with the predominant shared characteristics consisting of (1) being EU countries (and thus obliged to follow EU rules),

and (2) that they are front-runner countries¹¹ in circular economy initiatives and on using public procurement as a strategic policy tool (as can be seen in chapters 4 and 5). Furthermore, they are both, relatively speaking, small countries and seen (to varying degrees) as welfare states.

3.1.3 Units of analysis and observation

A case study uses a relatively small amount of research units, for example compared to survey studies (quantitative in nature), which are referred to as *cases*. Thus, one consequence of choosing the case study approach is that a quantitative analysis of the data is (generally) not possible/practices, unless it is a mixed-methods case study. Instead the focus lies on understanding the researched phenomenon with greater depth, than breadth, requiring *qualitative research methods* to be used (Verschuren et al., 2010). In practice this means the emphasis is on comparing and interpreting the findings, rather than calculating and counting on the basis of the observational units. This means conducting semi-structured interviews for primary data collection, and desk study research to generate secondary data (academic & grey literature, policy & strategy documents). Additionally, a broader number of disparate sources can also be used for data triangulation in order to overcome (or identifying) potential weaknesses or intrinsic bias from specific sources (Verschuren et al., 2010, p. 179).

In this thesis the unit of analysis is: *circular public procurement landscape in Sweden/Scotland*. At a disaggregated level for data collection, the four units of observation are, (1) public procurement actors¹², (2), third-party organisations (3) policy and regulation documents, and (4) suppliers. Note: interview data from suppliers was only gathered in Sweden, as there was unsuccessful contact with Scottish suppliers. Figure 3-2 presents a visual representation on the unit(s) of analysis and observation. A unit of analysis is only developed to answer RQ 2 & 3 since RQ 1 is a more open and general question, aimed to be answered primarily through desk research (academic and grey literature).

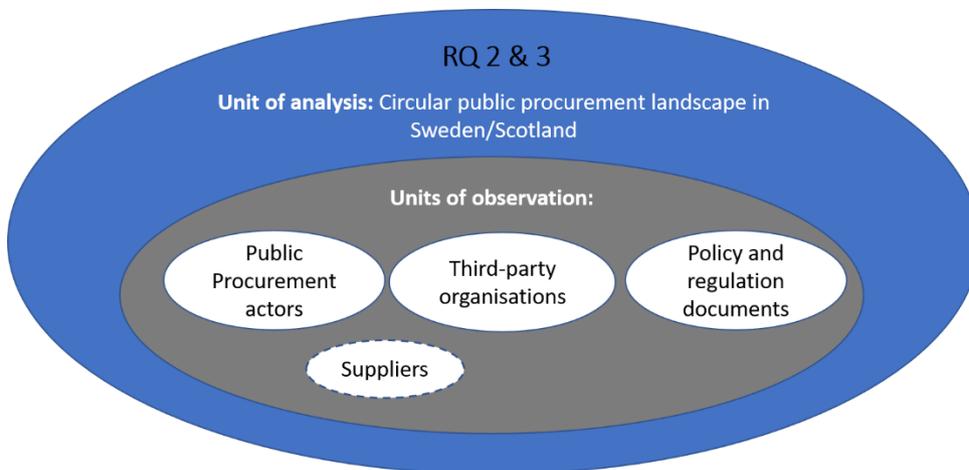


Figure 3-2 Visualisation of units of analysis and observation. Elaborated by author.

Public procurements actors include:

- National Public Procurement Agencies

¹¹ Alongside other front-runner countries such as the Netherlands, Denmark and Finland

¹² This encompasses procuring authorities across all levels of the public sector such as government agencies, counties and municipalities. Additionally, it also covers government agencies responsible for public procurement guidance and framework agreements.

- Legal, Financial and Administrative Services Agency (Kammarkollegiet)
- Governmental, Municipal and Regional procurement authorities

Private actors include:

- Suppliers engaging in (or intending to) providing circular procurement solutions

Policy and regulation documents include:

- Roadmaps and national strategy documents for circular economy and sustainable public procurement, and other documentations relating to these.
- Legislative documents on EU and national procurement, and other relevant (direct and indirect) laws
- State-funded investigations reports on related topics

3.1.4 Validity and limitations

In order to present reliable research design in social science, criteria for judging their quality have been created. There are typically four tests judging the quality of any given research design (for the different research stages); construct validity, internal validity, external validity, and reliability. These are meant to test trustworthiness, credibility, confirmability, and data dependability (Yin, 2014, pp. 45–49):

- **Construct validity** is about identifying the correct concept definitions and the operational measures for concepts that are being studied.
- **Internal validity** is about seeking to establish a causal relationship, wherein some conditions are expected to result in other conditions, as opposed to spurious relationships. (*Note: this is not applicable to descriptive or exploratory studies, thus not included below*).
- **External validity** is about defining the domain to which a study's findings can be generalised.
- **Reliability** is about demonstrating step-by-step the process of a study, such as the data collection procedure, to ensure that the study can be repeated by other researchers, with the same results. The purpose of reliability is to minimise the biases and errors in a study.

According to Yin (2014, pp. 46–47), to ensure construct validity one must cover two steps. First, key concepts being studied must be defined. Secondly, it is necessary to operationalise the key concepts, typically done by citing and basing it on previously published studies. In this thesis construct validity can be increased by using multiple sources of evidence, through data triangulation, to encourage convergent lines of inquiry. Practically this has been done by gathering primary (interviews with private and public actors, and legal documents) and secondary (reports from international and national organisations and government) qualitative data. A final approach was to send a thesis draft to a key informant checking that no misinterpretations were done by the author with regards to key concepts or in presenting the interview data in the results and analysis sections.

One limitation with the case study design is the fact that *external validity* of the results comes under pressure (Verschuren et al., 2010, p. 185). With only a few limited cases studied it becomes difficult to apply the results to other contexts or similar cases. In other words, generalisability of the findings suffers. However, given that the context boundaries are still within the EU system and its regulations and legislations, it can be safe to assume some degree of generalisability may be possible for other EU Member States. It should also be noted that this

study is first and foremost exploratory in order to better understand the current development from an academic viewpoint and to suggest more focussed research areas in the future.

Finally, to ensure reliability a draft case study protocol was established early on in the research process, however due to time constraints, revisiting and finalising a coherent final draft case study protocol was not done. The author recognises that the lack of a final case study protocol weakens the possibility for another researcher to ensure the reliability of the study by going through the same steps to see if they would arrive at the same findings and conclusions.

3.2 Data collection

3.2.1 Sampling

The primary chosen sampling strategy for primary and secondary data collection in this thesis is purposive sampling (also known as subjective sampling), a common approach in qualitative research, where data (literature, participants, documents) are sampled in a strategic way, relevant to the posed research questions (Bryman, 2012, p. 418). Additionally, purposive sampling data is typically selected based on the authors knowledge or certain selection criteria (Walliman, 2006, p. 79). See below in section 3.2.2. how selection criteria guided the literature review.

In addition to purposive sampling, snowball sampling has been complementary particularly when it comes to contacting interview respondents (Verschuren et al., 2010, p. 182; Walliman, 2006, p. 79). Respondents were selected strategically (purposively) based on the relevant organisations (identified based on the research purpose and RQs) they worked for and their expertise area when possible. When it was not clear who was the best respondent to interview, a general email inquiry was sent to the organisations, presenting the thesis project and its purpose, asking for who might best fit for an interview. The request for interview letter can be found in appendix D.

3.2.2 Literature review

A literature study was conducted for both the literature review and to investigate what earlier research findings have identified for the first research question, on *what role can circular public procurement can play in realising a transition to a circular economy* (sub-RQ1). In order to find the relevant literature, academic search engines such as Google Scholar, LUBsearch and Elsevier were used. Several search parameters were introduced to find the most relevant literature for this thesis. Keywords, used in different combinations included (introduced in no order of relevance): “circular economy”, “public procurement”, “circular public procurement”, “demand-driven innovation”, “product-service systems”, “performance-based procurement”, “Sweden”, “Scotland”, “business model innovation”, “circular business models”, “green and sustainable procurement”, “supply chain”, “policy”, “opportunities & barriers”. Additionally, to ensure state of the art literature would be found, research was initially limited to publications in 2017-2018, with subsequent progressions including publications from further back in time. A back-tracking of sources was also conducted among the more recent publications to get a better overview of older relevant publications. Finally, to ensure seminal papers on the key topics were not missed, the frequency of journal articles citations was used as another parameter to find them.

In addition to academic literature, conventional Google searches with a similar set of key words were used to gather “grey literature” data from the European Commission, government reports/documents/websites and law texts in Scotland and Sweden, and reports from

international organisations such as Zero Waste Scotland, the Nordic Council of Ministers, ICLEI¹³, SPP¹⁴ Regions, and the United Nations (UN).

3.2.3 Semi-structured interviews

As mentioned above, semi-structured interviews have been conducted for this thesis. Semi-structured interviews typically include a set of well-formulated questions, they can be broad or specific, and it allows for flexibility, encouraging probing prompts and exploration beyond the prepared questions (Mason, 2004; Stake, 1995, pp. 65–66)

Selection of interviewees

Sampling method of interviewees is covered in sampling section 3.2.1. Given the focus of the thesis and the units of observation presented above (3.1.3), interviewees were selected based on the organisational relevance and the individuals' expertise related to the research purpose. Specifically, interviews were made with government agencies, municipality, suppliers, and third-party organisations. A total of eight interviews were conducted, with six respondents in Sweden, and two respondents in Scotland. The Swedish respondents comprised two business representatives (IKEA and Inrego) and four public sector representatives at different levels; municipality (Helsingborgs Kommun), government agencies (Kammarkollegiet & Upphandlingsmyndigheten), and public sector member organisation (Sverige Kommuner och Landsting (SKL) Kommentus). In Scotland two representatives from the Zero Waste Scotland (ZWS) were interviewed. ZWS is a public-sector funded organisation, funded by the Scottish Government and the European Structural Funds Programme and its work aims at furthering the Scottish Government strategic objectives towards a more circular and greener Scotland by working with the private and public sector. The list of interviewees, organisational belonging, the type of interview-format and sampling method conducted can be found in appendix E

More interviewees were reached out to in Scotland, primarily by email. These included public procurers in the largest Scottish cities, procurement experts at the Scottish Procurement and Commercial Directorate, Scotland Excel, and suppliers with circular business models. However, none of these responded to the interview requests. For those organisations that had public phone numbers a phone call was attempted after sending a second email to get the respondents to participate in the research.

Interview guide

Two general interview guides were developed based on the interviews and their respective organisations and country context (deciding interview language). The interview guides have not necessarily been followed completely but have rather served to make sure a similar or appropriate set of questions have been asked to the respondents. The interview guides can be found in appendices F and G.

3.2.4 Ethical and practical considerations

The interview guides included an explicit request for consent to record and use the data for the thesis project. Any direct quotes or citations attributed to an interviewer would be sent to them for approval of the content and ensuring the interpretation of the data was not misconstrued or misunderstood.

¹³ International Council for Local Environmental Initiatives

¹⁴ Sustainable Public Procurement

All interviews were audio-recorded and transcribed verbatim. Due to most interview being conducted online through teleconferencing there were technical issues with regards to how data could be recorded with the least technical risk of something going wrong and assuring adequate audio quality. A software was installed to use the laptops built in microphone and stereo. In addition to the primary recorder a failsafe system was developed, using a smartphone recording app placed nearby the laptop in case of any software or other technical failure.

Another, unexpected, practical barrier surfaced with EU General Data Protection Regulation (GDPR) coming into force (European Parliament, 2016). Specifically relating to getting more contacts in Scotland through the snowballing method. ZWS is an organisation with many business contacts in the circular economy through their CE business support service. However, due to GDPR rules they could not hand out contact information to their partners, thus limiting the snowballing method for acquiring more interviews.

3.3 Data analysis

3.3.1 Semi-structured interviews

The initial literature review guided the identification of important thematic areas to investigate in this thesis that seemed feasible within the scope and what seemed to be important factors. In turn this heavily influenced the formation of the interview questions and the areas of thematic focus. However, interview questions also evolved and got adjusted based on the earlier interviews, through an iterative process. While general thematic areas were conceived, there was no clear idea on what kind of sub-themes or 'sub-sub-themes' were going to be found. This prompted a process of coding interviews, finding patterns and writing memos and grouping them to the higher order of coding in the different sub-themes, and eventually to the higher level of abstraction, reaching the core thematic areas. The approach was partly influenced by the conventional content analysis approach, which is recommended by Hsieh and Shannon (2005), for research where research literature or existing theory on a phenomenon is limited. Since circular public procurement is a novel research area there is limited and fragmented knowledge pertaining to this phenomenon, which warrants an inductive approach (Elo & Kyngäs, 2008; Hsieh & Shannon, 2005).

The justification for using this analysis method is because it is an exploratory study, thus there is no theoretical framework guiding the analysis or attempted to be proven. Through the use of content analysis-like approach and coding it is possible to approach the data in an inductive manner and open to interpret findings more broadly. The interviews were transcribed to allow for a more thorough reading and enabling the possibility to highlight key words or phrases, re-read transcripts, and annotating codes and memos on the side, forming the initial coding scheme (Hsieh & Shannon, 2005). The reading and analysis of the transcripts were done in an iterative process. Interviews were transcribed and coded in parallel to the data collection process, continuously developing coding categories, revisiting earlier codes and recoding data and grouping codes into meaningful core themes fitting for the research purpose. In addition, the parallel coding allowed for the refinement of interview questions for subsequent interviews. It is identified by Johannessen and Tufte (2013, in Crafoord 2017) and Creswell (2014) as important to maintain a continuous and holistic view on the data collection, to make sure new questions or gaps are addressed and followed up on in the remaining interviews.

With regards to how the coding was practically carried out, both manual (hand) coding and digital coding were utilised. Saldaña (2013) recommends manually coding on hard-copy printouts for first-time or small studies (such as thesis project) as it gives more room and malleability with possibilities of writing codes and memos in the margins. It is argued that learning the complexity of computer-assisted qualitative data analysis software (CAQDAS) may

be overwhelming and detract the attention to the wrong item (trying to learn the software rather than focusing on doing a focused qualitative analysis). This is of course very objective, depending on a researcher's computer literacy at hand. In addition, through this author's own experience with NVivo (version 12), another problem at hand were issues with the computers processing power not working optimally with the software, thus limiting software use. With this in mind the main bulk of coding was by hand and complemented with digital coding using the Microsoft suite (specifically, Word and Excel).

3.4 Reflections

The data collection process has been facing some challenges, particularly on how to deal with a lack of respondents from Scotland, causing an imbalanced primary data collection, rendering it more difficult to make a fair and balanced comparative study. Furthermore, there have been more opportunities among the Swedish respondents to corroborate certain ideas and perceptions with a larger sample of respondents, providing greater certainty in identifying and analysing patterns. One approach to counteract this weakness has been to increase the use and emphasis on official Scottish Government documents, as well as looking at context-specific studies, in order to triangulate data as much as possible to validate the findings from the interview data.

It is also a challenge developing interview questions without being too explicit about key concepts such as circular economy and knowing beforehand what expertise level the respondents possess. And connected to that, how to improvise and adjust interview questions accordingly depending on the revealed knowledge level from the respondent.

4 Legislative and policy landscapes

This section forms the first segment of findings by setting the case contexts, first at general EU level (4.1), then focusing on country-specific procurement structure, policies, and tools, as well as circular economy relevant strategies in Scotland (4.2) and Sweden (4.3).

4.1 European Union

4.1.1 Public procurement directives

The EU directive on public procurement (Directive 2014/24/EU) aims at promoting the free movement of goods and services and follows the principles¹⁵ derived from the Treaty on the Functioning of the European Union (TFEU) (European Union, 2010). The principles are designed to create a competitive, open, and well-regulated procurement market. In 2014 the EU adopted three new directives on public procurement, replacing the 2004 directives¹⁶ (European Commission, 2004b, 2004a), which entered into force in April 2016, meaning the new rules in the directives had to be adopted by Member States latest by then (European Commission, 2016b). The three new directives are:

1. Directive 2014/24/EU on public procurement,
2. Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors, and
3. Directive 2014/23/EU on the award of concession contracts

This thesis concerns itself only with the Directive 2014/24/EU on public procurement, as the other two remain outside of the research scope.

In order to promote the Single European Market and the Principles of TFEU, EU procurement law has set minimum harmonised rules for tenders with a whose monetary value exceeds a specific amount, and which are presumed to be of cross-border interest ('Thresholds - Growth - European Commission', n.d.). This means that the EU directive is applied and covers tenders when they exceed given threshold levels¹⁷. The threshold levels are generally revised every two years by the European Commission (European Commission, 2018). The threshold varies depending on the procuring authority and what is procured. For tenders of lower value where the procurement does not exceed the threshold national rules apply, although they must still respect the general principles of EU law (e.g. applied by transposing the rules into national law) ('Thresholds - Growth - European Commission', n.d.).

Foundational principles for the internal market

There are five principles in the TFEU that are fundamental for the internal market, and so these are also relevant for the area of public procurement (European Union, 2010; Konkurrensverket, 2014; 'Public procurement', n.d.). These include:

1. **The principle of equal treatment** means that all economic actors should be treated the same and be given the same conditions on which to compete, such as getting information at the same time

¹⁵ These include: equal treatment, non-discrimination, mutual recognition, proportionality, and transparency.

¹⁶ Directive 2004/18/EC the 'classical public sector directive' and Directive 2004/17/EC 'the utilities directive'

¹⁷ The threshold concerning central government authority's procurement of non-defence service and supplies was set at €144,000, taking effect January 1 2018.

2. **The principle of non-discrimination** means that it is forbidden to discriminate economic actors based on nationality or area of operation
3. **The principle of mutual recognition** means that certificate and documents issued by the appropriate authorities in one EU Member State must be recognised and accepted in other Member States
4. **The principle of proportionality** means that any qualifications and/or subject matter requirements must not be disproportionate or excessive and must also encompass a natural relation to the products or services being procured.
5. **The principle of transparency** means that the procurement process must be open to all economic actors, and clear enough to pursue.

As procurement law is legislated through directives instead of harmonised regulations, this opens up freedom for Member State (MS) to extend beyond the EU level requirements with more ambitious rules. However, it is noted, in a Swedish report on procurement, that the discretion at which Member States can create more ambitious national rules are limited by the regulations and principles set forth in the TFEU as procurement practices must still be compatible with the basic principles of TFEU (Directive 2014/24/EU; Sverige & Upphandlingsutredningen, 2013, p. 388). In short it means that sustainability-based criteria, such as circular criteria, must bear in mind and be compatible with the above-mentioned EU general principles, which in procurement practice implies that criteria must be linked to the subject matter of the contract, and be proportionate in its criteria demands based on what is procured ('Most economically advantageous tender (MEAT) | felp', n.d.).

Notable changes important for GPP/SPP/PPP

The changes made in the new public procurement directive are quite significant, and the recognition is noticeable in public procurement research prior to- and- after the adoption of the new directive. For instance, Dalhammar, Tojo, Långström and Stuijt (2011) discuss limitations, observed in the 2004 procurement directives, for green- and innovation procurement due to the political focus and priority on the European Single Market promoting free competition and non-discrimination. Moreover, while still possible to award tender contracts to suppliers based on criteria awards, the 2004 procurement directive did not hold as much clarity as the 2014 directive, which has prompted many judicial discussions on how extensive and demanding sustainability criteria could be set. The lack of clarity has in the earlier directive resulted in lack of legal clarity of what is and what is not allowed – at EU and subsequently at national level – with the effect that many procurers rather been on the safer side with the earlier directive, by procuring using less stringent award criteria (Sverige & Upphandlingsutredningen, 2013, pp. 386–392). With the changes noted below in bulletized form, contracts may be evaluated in more elaborate ways using award criteria emphasising a mix of different priorities and with clearer legal certainty. To contrast with Dalhammar et al., (2011) – Dalhammar and Leire (2017) discuss how developments with the new procurement directive indicate a shift in the EU's strategy in using public procurement as a policy instrument to reach societal objectives, including innovation and sustainability.

1. Innovation partnerships
2. Consulting the market
3. Lowest price award and life-cycle costing
4. Use of labels

While circular procurement is not explicitly mentioned in the new procurement directives, some of the changes noted above, such as innovation partnership, consulting the market, lowest price award and use of life-cycle costing, the use of (eco)labels, and defining the requirements of a

contract can also lay down a foundational ground for improving circular procurement opportunities. Namely, through improved market dialogue which can connect the identified demands from the public sector and the potential solutions private businesses can offer. In terms of lower price and life-cycle costing, a long-term perspective on a product or service with circular features could prove to be the more cost-effective option than cheaper short-term solutions from purchasing “linear” products or services (‘Policy framework - GPP - Environment - European Commission’, n.d.). Ecolabels can help in drawing up technical specifications of products and services, or it can also be used to ensure suppliers compliance with specification requirements. In addition, the innovation partnership focus provides exemptions in EU and national procurement laws where a procurement process does not have to follow the traditional rules, when promoting innovation and new solutions to new demands, set through innovation partnerships or competitive dialogue (European Commission, 2016b; ‘Policy framework - GPP - Environment - European Commission’, n.d.).

4.1.2 Legislative and strategic policy landscape

Figure 4-1 presents a landscape on the current EU policies and legislation promoting GPP and CE. While it is not an exhaustive presentation of all policies and regulations/directives that impact either GPP or CE, these have been identified as constituting some of the key policies. It should also be noted that procurement does not hold the exclusive focus of these policies, but rather is mentioned along a range of other considerations and action-worthy areas in the strategy and policy documents reviewed.

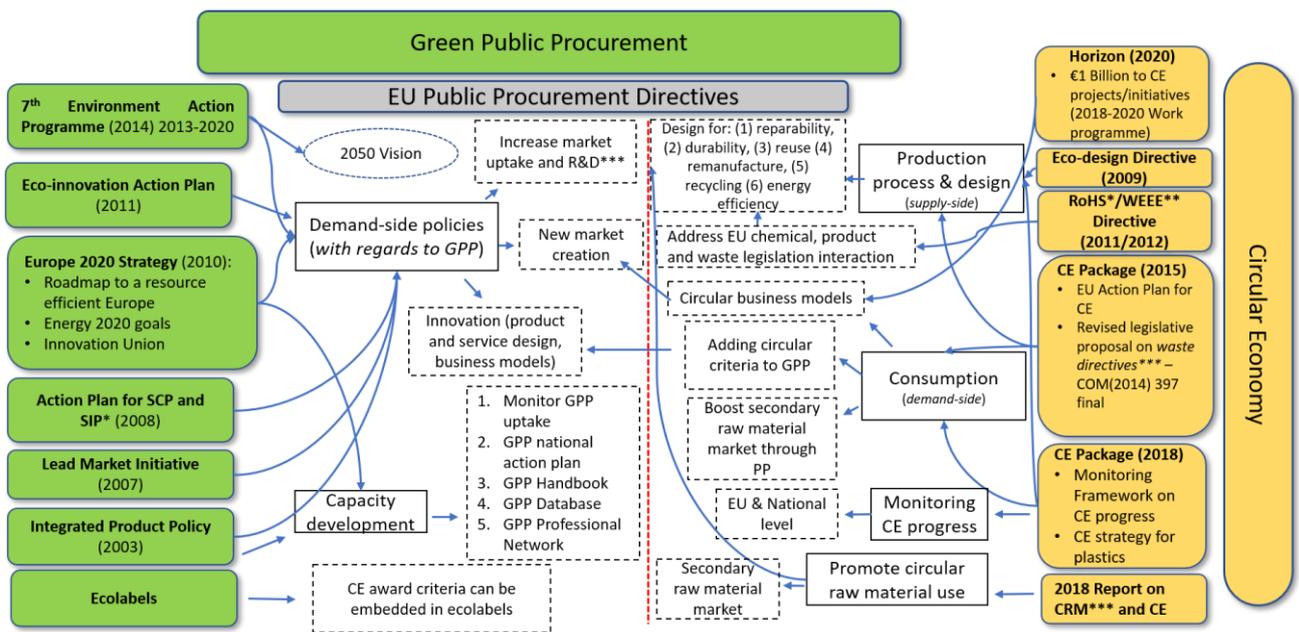


Figure 4-1 EU strategic policy and regulatory landscape for GPP and CE

Source: Elaborated by author, based on mentioned sources in the figure

Based on the landscape figure above, it is important to denote that not much concrete policy has emerged yet regarding *circular procurement* per se. Instead much of what has been done in the past 10-15 years has been focused on GPP and PPI, both with sustainability agendas in mind in areas such as sustainable production and consumption and industrial policies among others. To present some indications; in the European Commission Communication ‘COM(2010) 2020 final, Europe 2020: a strategy for a smart, sustainable, and inclusive growth’ one of the proposed working areas is for the Commission to “To develop a horizontal approach to industrial policy combining

different policy instruments (e.g. "smart" regulation, modernised public procurement, competition rules and standard setting)" and that at national level Member States need to (among other actions): "...deploy market-based instruments such as fiscal incentives and procurement to adapt production and consumption methods" (European Commission, 2010, pp. 10, 14–15). It is also proposed that under one of its flagship initiatives the 'Innovation Union' the Commission should work towards improving framework conditions for business to innovate by using full use of demand side policies, leveraging instruments such as public procurement and "smart regulation". Thus, a very tight connection can be observed between GPP/CPP and innovation under the EU strategic policies.

Regarding ecolabels Jones et al., (2018) bring up the point that ecolabels such as the Nordic Swan, the Blauer Angels, and the EU Ecolabel are based on life cycle analysis, and therefore the most important environmental impacts of the products of services are already taken into consideration by using these ecolabel standards as a guiding tool for setting criteria. This implies then, as is set out in figure 4-1 that CE award criteria can be embedded or considered in ecolabels (or added).

The CE 'axis' on figure 4-1 comprises *mostly* newer action plans and strategies, starting from the increased attention the EC has given to CE since 2015. For example, the Horizon 2020's final Work Programme for 2018-2020 is investing €1 billion into research, innovation, and financing of projects and initiatives that will support the EU's circular economy ambitions. This is done by promoting the development of circular business models and other innovative solutions for improved resource efficiency (European Commission, 2017a). By promoting such developments new markets may emerge as a result, which can be observed in the two boxes¹⁸ that have been identified to be impacted very clearly from both GPP and CE policies and strategies.

4.2 Scotland

4.2.1 Institutional context

Procurement in the UK is unique in the EU in three ways: (1) it is the largest in value EU-wide, (2) it makes the greatest use of restricted procedures and competitive dialogue, (3) and it is regulated by two different legal systems (European Commission, 2015a). The UK's administrative structure also affects its procurement system, with unique legal regimes for England, Wales and Northern Ireland on one hand, and Scotland on the other. With devolution in 1999 and reconvening of the Scottish Parliament and appointment of new ministers, public procurement for Scotland moved from being managed in London to being managed in Scotland. With certain weaknesses in the procurement practice as a result, a review was conducted of public procurement in Scotland which resulted in "The public procurement reform programme 2006-2016", a decade long improvement process of public procurement (Scottish Government, 2016f, 2016g).

According to national statistics, the UK procurement system spends approximately EUR 316 billion annually, making it the largest in the EU by value. However, out of the total UK sum, Scotland approximately spends €12.3 billion on annual public procurement (Scottish Government, 2016f), a relatively small portion. Despite the decentralisation in the procurement system of Scotland, there remain difficulties with accessing sub-national data on Scotland only, without the UK aggregate data.

¹⁸ These are: 'new market creation' and 'innovation (product and service design, and business models)'

4.2.2 Procurement structure in Scotland

Figure 4-2 below presents the interrelationships between the main four public procurement organisations and their corresponding responsibilities.

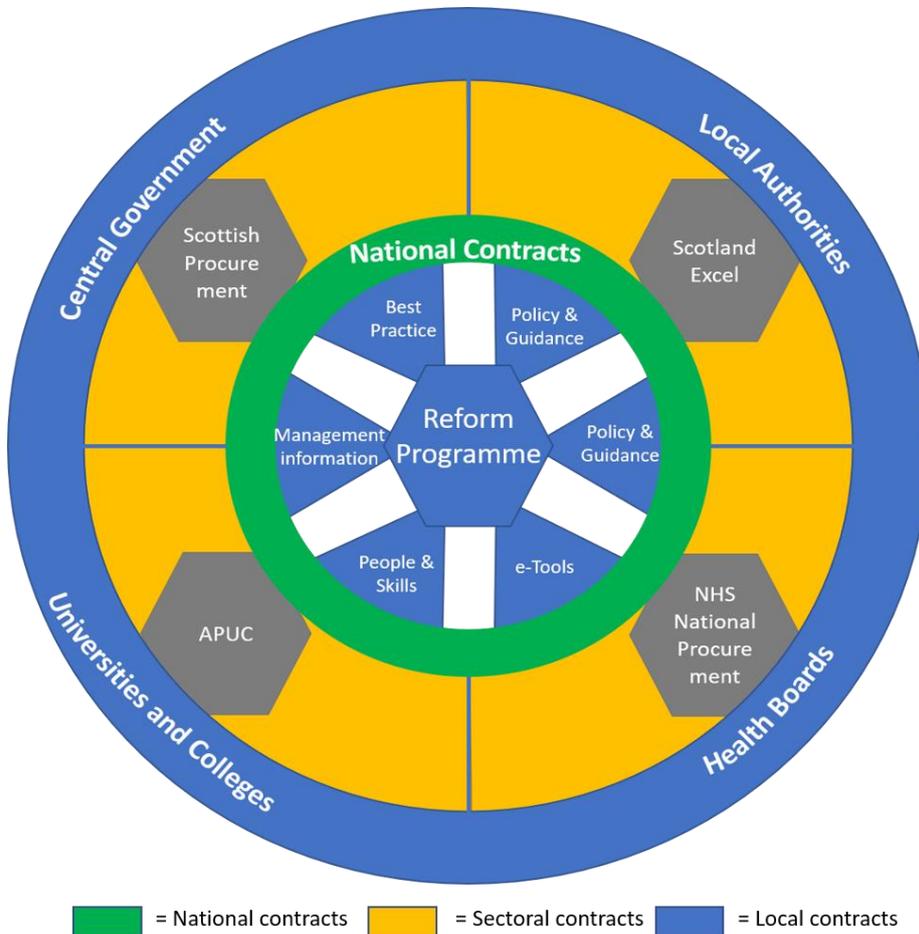


Figure 4-2 Organisational public procurement structure in Scotland

Source: Elaborated by author, based on (Scottish Government, 2016c)

Scottish Procurement and Commercial Directorate (top left) (referred to as Scottish Procurement) forms part of the central government and is responsible for developing and advising on various procurement activities, including implementing policy and setting up procurement contracts and framework contracts for itself and other parts of the public sector. In addition to the central government, there are three sectoral centres for procurement expertise, namely Scotland Excel, NHS¹⁹ National Procurement, and APUC²⁰, each responsible for local authorities, health boards, and university and colleges, respectively. These expertise centres are specialised in developing framework agreements, as well as offering guidance for the main needs identified within each public sector.

¹⁹ National Health Service

²⁰ Advanced Procurement for Universities and Colleges

4.2.3 Policy and legislation

The overall aim of Scotland's policy drivers is to prevent waste, increase resource efficiency, improve recycling performance, and accelerate a transition to a circular economy (McGregor, 2016; McGregor & Dew, 2015; Scottish Government, 2010, 2016d). A thorough compilation of relevant legislative and policy drivers promoting CE and CPP/SPP in Scotland are presented in table 4-1. A selection of these will be discussed and elaborated further in the analysis section against the backdrop of the interview data.

Table 4-1 Legislative and policy/strategy drivers in Scotland promoting CE and CPP

Legislation/policy	Relevance	Application
Waste Regulations (Scotland) 2012	Strengthens requirements to: <ul style="list-style-type: none"> • Reduce waste to landfill (prohibiting certain wastes deposited at landfills) • Extend the useful life of materials (promoting secondary resources) 	Mandatory National
Procurement Reform (Scotland) Act 2014	<ul style="list-style-type: none"> • Sustainable procurement duty* • Annual procurement strategy and procurement report <i>required</i> of procuring authorities 	Mandatory National
Public Contracts (Scotland) Regulations 2015	Both reinforce the importance of early consideration for sustainability outcomes, and in advertising these demands clearly and in detail to the market.	Mandatory National
Procurement (Scotland) Regulations 2016		
Scotland's zero waste plan (2010)	<p>Sets out an ambitious plan for a Scottish zero waste society, minimising waste and landfill, and encouraging resource management. Targets include 70% recycled and maximum 5% landfill by 2025.</p> <p>Ensuring prevention and reuse of waste is central Scottish public actions and policies</p>	Mandatory & Voluntary actions National
Zero waste, safeguarding Scotland's resources: Blueprint for a more resource efficient and circular economy (2013)	Scottish government's programme to reduce waste and create a more productive and circular economy. Aimed at: (1) Stimulating innovation and circular business models, (2) Helping businesses become more resource efficient, (3) using public procurement to stimulate innovation (for SPP).	N/a National
Scotland's Economic Strategy (2015)	<p>Scotland's economic strategy and the new strategy for manufacturing both clearly set out the economic opportunities of an approach encompassing circular economy principles.</p> <ul style="list-style-type: none"> • Seeks to adopt circular economy approaches across the Scottish manufacturing sector • Stimulate innovation for circularity • Use public procurement to drive innovation 	N/a National
Manufacturing Action Plan – A Manufacturing Future for Scotland (2016)		
Making things last – A circular economy strategy for Scotland (2016)	<p>Scotland's first circular economy strategy. It builds on the zero waste and resource efficiency agendas.</p> <p>Four priority areas identified:</p> <ol style="list-style-type: none"> 1. Food & drink, and the bio-economy 2. Remanufacture 3. Construction 4. Energy infrastructure <p>Strong emphasis on: reuse, repair, remanufacturing, and recycling</p> <p>Supports: the development of extensive CE principles training for Scottish public procurement community; circular business model innovation; awareness raising and development of case studies showcasing benefits of circular procurement.</p>	N/a National
Procuring for: repair, re-use and remanufacturing – category and commodity guidance (2016)	Produced by ZWS this guidance document develops specifications for CE outcomes within product-group and services commonly procured by the public sector. Guidance was developed for 12 product-groups	Voluntary – guidance National

	In addition, presents barriers to extending CPP and market commentary on the availability of CE-like services in the covered product-groups.	
Scottish Government Procurement Strategy 2017-2019 (2016)	Procurement strategy based on Scotland’s economic strategy and Scotland performs framework. The latter sets a vision with goals for national wellbeing beyond GDP. One relevant goal for CE is “We reduce the local and global environmental impact of our consumption and production”.	N/a National

Source: Elaborated by author based on the sources in the table (leftmost column).

Sustainable procurement duty

Sustainable procurement duty is one of the key legislative components for pushing towards CPP/SPP (Section 9 in Procurement Reform (Scotland) Act 2014). It requires procuring authorities to include a number of considerations before carrying out a *regulated procurement*. A regulated procurement is considered at procurement value above: £50,000 and above for goods and services, £2 million and above for works (Scottish Government, 2016e). The considerations include: *improving* economic, social, and environmental wellbeing and reduced local inequality; *facilitating* SMEs involvement in procurement; *promoting* innovation.

Procurement tools for sustainability

The Scottish government has developed a variety of guiding procurement tools, facilitating the process of integrating sustainability into public procurement process. This includes statutory guidance for procurement tools that must be used by procuring authorities when carrying out a regulated procurement (Midhamre, 2017; Sustainable Procurement Ltd., 2016). The list of tools can be observed in figure 4-3 (Scottish Government, 2015c, 2015d, 2015b):

1. **The sustainability test:** designed to embed proportionate and relevant sustainability requirements of procurement contracts and frameworks
2. **The sustainable public procurement prioritisation tool (SPPPT):** developed to assist procurers at early stage strategic planning through the consideration of environmental, economic and social well-being, as required by the Sustainable Procurement Duty (Section 9, Procurement Reform (Scotland) Act 2014)
3. **Life-cycle impact mapping:** helps the user identify and assess impacts. It takes into account the impacts throughout the product’s or service’s life cycle stages, from extraction, to transportation, to the use of product/service, to reuse/recycling or disposal of product and materials. The assessment of the risks and opportunities can be identified along four key phases:
 - I. Raw materials
 - II. Manufacturing and logistics
 - III. Use-phase
 - IV. End-of-life management or disposal
4. **The procurement journey:** best practice guidance intended to support all levels of procurement activities through a user-friendly decision-matrix (taking you step-by-step through the procurement process based on your needs)

Figure 4-3 List of tools for sustainable procurement in Scotland

Source: (Scottish Government, 2015c, 2015d, 2015b)

4.3 Sweden

4.3.1 Procurement structure in Sweden

In Sweden there are three key public sector organisations for public procurement, see figure 4-4 below. First, the Swedish National Agency for Public Procurement (Upphandlingsmyndigheten) is the central agency responsible for public procurement in Sweden²¹, including aspect relating to sustainable and circular procurement for goods and services. The agency develops and communicates knowledge, tools and methods as guidance for public procurement. This includes developing and guiding the use of sustainability criteria for product-groups that procuring authorities may utilise voluntarily.

Second, the State Procurement Center at Kammarkollegiet²². It sets the framework contracts for product groups and services exclusively for government agencies²³. Government agencies are legally mandated to use these framework contracts, unless stated with reason why they are not (e.g. may be the product or service they wish to procure does not have any framework contract) (respondent 2).

Third, the procurement centre at SKL²⁴ Kommentus, sets framework contracts for product-groups and services for municipalities and counties. Using the framework contracts developed by the is voluntary, although it is usually beneficial to use if the framework covers the need of the procuring authority, as procuring through framework contracts alleviates much of the administrative and economic burden of procuring authorities. This is particularly beneficial for the smaller municipalities with limited personnel and competencies in procurement (Peter Nohrstedt, 2018).

In addition, these three government agencies, the Swedish Competition Authority (Konkurrensverket) also plays an important role as a supervisory authority. Thus, it does not aim at guiding procurement practitioners, but rather in exercising oversight to ensure that public procurement (including procurement of framework contracts) are in compliance with the law ('Offentlig upphandling | Konkurrensverket', n.d.).

It should also be noted that despite there being more government agencies than municipalities in Sweden, the latter is responsible for a much larger number of announced procurements. In 2016 municipalities, government agencies, and counties announced 69%, 18%, and 10%, respectively, of all procurement contracts. Furthermore, in 2016 39% of procurements were conducted through framework contracts. Finally, in 2016 54% of procurements were announced and awarded according to lowest price, while 46% were awarded through the MEAT assessment method (Larsson, Morild, Jönsson, & Hammargren Gustav, 2017, pp. 45–46, 55, 60)

²¹ Upphandlingsmyndigheten was established in 2015 with the aim to hold a centralised focus on procurement. Prior to 2015 procurement support activities were decentralised and spread across various agencies including Kammarkollegiet, VINNOVA, AB Svenska Miljöstyrningsrådet, and Konkurrensverket (Upphandlingsmyndigheten, 2017).

²² Legal, Financial, and Administrative Services Agency

²³ Except for IT/ICT for historical reason. (respondent 2)

²⁴ Sveriges Kommuner och Landsting [Sweden's municipalities and counties]

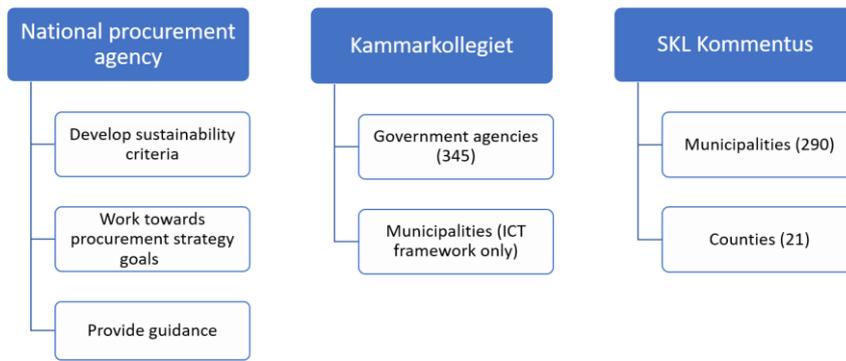


Figure 4-4 Key public sector organisations responsible for public procurement (and number of public entities).

Source: Elaborated by author

Sustainability tools

Upphandlingsmyndigheten has developed two primary tools for guiding sustainable procurement. The main two include a criteria directory and LCC tools. Additionally, a guidance on how to develop sustainability criteria is provided, recommended to use if there are no pre-established sustainability criteria. These are provided in more detail in figure 4-5.

1. **Criteria directory and criteria Wizard:** The criteria directory is a database including all product-group information relating to sustainability criteria, including background information, pre-studies and market analysis to each product/service area and product-groups. SNAPP have developed a six-step ‘criteria wizard’ in which procurers go through the steps of choosing product groups and provides a selection of basic or advanced sustainability criteria that may be used for the product or service intended to be procured. Procurers can use this to tailor make their tender specifications with the pre-developed criteria by downloading and copy-pasting the text into the tender.
2. **LCC tools:** Provides life-cycle-costing tools for specific product groups as well as one that is general and available to use in the need’s analysis phase before initiating the procurement process. Can provide the total cost of ownership (TCO) of procuring a good or service, considering the whole lifecycle, which can be important for decision making. It estimates how much money and energy can be saved between different procurement bids, and how climate impact (through CO2 emissions) can be reduced by embedding environmental and energy criteria in public procurements.
3. **Guidance on ‘shape your own sustainability criteria’:** Includes a check list and practical advice on how to go through the process of formulating environmental or social criteria.

Figure 4-5 List of tools for sustainable procurement in Sweden

Source: Elaborated by author, based on (‘Verktyg för bättre affärer | Upphandlingsmyndigheten’, n.d.)

4.3.2 Policy and legislation

Table 4-2 below presents a list of the identified legislation and policies of main importance to a circular economy transition and to sustainable and circular procurement. These will be discussed and referred back to in the analysis section of this paper. There is a notable absence in the policy strategies section with regards to a circular economy national action plan.

Table 4-2 Legislative and policy/ strategy drivers in Sweden promoting CE and CPP

Legislation/policy	Relevance	Application
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Ordinance on the transfer of the state's movable property (1996) // Förordning (1996:1191) om överlåtelse av statens lösa egendom	The ordinance states that the sale of goods may be done, if the asset is no longer needed or usable by the state. Further, a sale may only be conducted if done according to market principles*. (Paragraphs 6 and 7)	Mandatory National
Ordinance (2009:07) on Environmental Management in Government Authorities // Förordningen (2009:07) om miljöledning i statliga myndigheter	Requires a range of governmental agencies to have an environmental management system in place, including UHM, and to conduct environmentally sound procurement when possible.	Mandatory National (selected gov. agencies)
Capital provision ordinance (2011) // Kapitalförsörjningsförordning (2011:210).	“it [kapitalförsörjningsförordningen] clarifies what rules apply for leasing by the state ... it is namely that a contract for leasing or rental agreement can be made provided that, seen over the [asset's] whole economic life span leads to a lower cost for the State [compared to buying the asset]” (respondent 2).	Mandatory National
Waste ordinance (2011) // Avfallsförordning (2011:927).	Gives the Swedish National Environmental Protection Agency the responsibility to develop a national waste plan (NAP) and a programme to prevent waste. (the NAP in turn focuses on resource efficiency and CE issues/opportunities with waste goods.	Mandatory National
Act amending the Act (2015: 748) amending the VAT Act (1994: 200) // Lag om ändring i lagen (2015:748) om ändring i mervärdesskattelagen (1994:200)	Reduced VAT on smaller types of reparation, e.g. bicycles, shoes, clothes (Kap. 7. Paragraph 6 specifies types of reparation with reduced VAT.)	Mandatory National
Law on public procurement (2016) // Lag (2016:1145) om offentlig upphandling (LOU)	A procuring public organisation <i>should</i> take into account environmental, social, and labour law considerations if the nature of the contract motivates this.	Mandatory National
Chemical tax 2017 // Kemikalieskatt (2017)	The purpose is to reduce the occurrence, distribution, and exposure of hazardous flame retardants, thus encouraging more healthy and environmentally friendly substitutes to be used in future products entering the market. → non-hazardous	Mandatory National
National Procurement Strategy (2016) // Nationell Upphandlingsstrategi (2016)	<ul style="list-style-type: none"> • Sets 7 orientational goals • PP recognised as an important strategic tool in Sweden's transition to a circular, and bio-based, economy • Tasks the National Agency for Public Procurement for developing resource efficiency criteria that procuring authorities may utilise. 	N/a National
Strategy for sustainable consumption (2016) // Strategi for hållbar konsumtion 2016	<p>Strategy focus on:</p> <ul style="list-style-type: none"> • Phasing out hazardous chemicals for improved circular product and material flows • Extend life of products by reduced VAT (from 25% to 12%) for repair services, to promote circular economy and prevent waste-creation • Sharing economy 	N/a National
Action plan for smart industry – a modern industry strategy for Sweden	Proposes to promote:	N/a

(2016). // Handlingsplan Smart Industri – en nyindustrialiseringsstrategi för Sverige (2016)	<ul style="list-style-type: none"> • Public procurement for innovation • Innovation partnerships • Support for circular business models • Regulation to enable circular business models 	National
The Government's official investigations – From value chain to a value cycle. How Sweden gets a more circular economy (2017) // SOU 2017:22 – Från värdekedja till värdecykel, så får Sverige en mer cirkulär ekonomi	<ul style="list-style-type: none"> • Proposes to improve waste prevention in state and municipal activities. The proposal includes tasking UHM with developing criteria and measurements for circular procurement. 	N/a National
Pilot study on furniture and furnishings (2018) // Förstudierapport inom möbler och inredning, Kammarkollegiet (2018)	Pilot study looking into the potential for purchasing refurbished furniture, leasing furniture, and for possibilities in which the state can sell old furniture. Sets groundwork for the next framework contract for furniture product group for Swedish government agencies.	N/a National
'More do more' Action plan on reduced food waste (2018) // 'fler gör mer' Handlingsplan för minskat matsvinn – 2018 Livsmedelsverket, Jordbruksverket & naturvårdsverket	<p>Focus on:</p> <ul style="list-style-type: none"> • Reducing food waste • Promotion on transition to sustainable production and consumption & CE • Public Procurement, one of nine action areas • Mentions procurement as a strategic tool for the CE transition <ul style="list-style-type: none"> • Requirements setting in procurement processes to have significant impact on food waste. • Great need identified for good examples (best practice) on requirements that public and private procurers can adopt. • Competency development required for procurers to reduce food waste 	N/a National
National Waste Plan & waste prevention programme 2018 (2018-2023) // Nationell avfallsplan och avfallsförebyggande program 2018–2023, Naturvårdsverket (2018)	<ul style="list-style-type: none"> • Provides a comprehensive overview of the goals, policy instruments and measures taken to prevent waste and reach a more resource efficient and non-toxic waste management, adhering to the waste hierarchy. 	N/a National
Government Offices – Government appoints delegation for circular economy (2018) // Regeringskansliet – Regeringen utser delegation för cirkulär ekonomi (2018)	<ul style="list-style-type: none"> • The delegation will advise the government, develop a strategy and identify obstacles, needs for education and information in the CE. It will also be a knowledge centre and hold a coordinating function for the CE transition at both regional and national level 	N/a National

Source: Elaborated by author based on the sources in the table (leftmost column)

As can be seen above, Sweden has established a number of strategies that can be discerned to be of significance for the transition to a circular economy. This includes areas of waste management and prevention, reducing the prevalence of toxic and hazardous substances in products, extending product lifetimes (e.g. repair, refurbishment, remanufacture), and industrial policy initiatives aiming at innovation partnerships and promoting circular business models etc. However, thus far Sweden has not developed a specific CE strategy. Instead what can be observed is a general policy direction towards a CE, influenced by the EUs direction towards a CE, beginning with the 2015 Communication 'COM (2015) 614 final on an EU action plan for the circular economy'. The most recent development towards realising a circular economy strategy was announced on 30 August 2018 in which the Government announced it appointed a circular economy delegation, to provide a strategy and serve as a knowledge centre for coordinating the CE transition (Regeringskansliet, 2018b).

5 Finding and analysis

This section provides an integrated approach in presenting the main findings and analysis, primarily from the interview data, but also based on secondary data from the literature. RQ 1 derives heavily from secondary data based on the literature, with some complementary interview data, while RQ 2 and 3 derive heavily from interview data and complementary secondary data. Quotes from the interviewees are used as tool to highlight or corroborate important ideas relating to the main- and sub-themes at hand, and as a springboard to continue the discussion and to extend the analysis beyond just the quote. The main justification for integrating the results and analysis section is twofold: first, because it is a thesis based on qualitative data, and as results are presented it is very difficult to detach it from analytical aspect. Second, it would become too repetitive in the iteration of the findings for a second time, joined with the analysis.

5.1 RQ 1: What role can circular public procurement play in realising a transition to a circular economy?

While there has been plenty of discussion in academia on CE, CBMs, and the policy instrument potential of PP as part of a broader policy mix towards a CE, there has been a fairly limited discussion on just what role CPP should be playing towards the CE transition, what it can feasibly do, and particularly where its limitations lie. This RQ focuses the analysis based on the presented literature review (chapter 2), EU policy landscape (chapter 4) and an extended literature analysis.

5.1.1 Procurement as demand side policy instrument

In addition to stimulating innovation for products and services, as well as circular business models, public procurement has been identified as holding another major potential as a demand side policy instrument, namely in the creation of markets for more environmentally friendly and circular products and services in the EU (Dalhammar & Mundaca, 2012; Edler et al., 2015; Rizos et al., 2018). Public procurement can thus be understood to foster some market certainty and incentivise businesses – by reducing their *risk* – to tap into new markets that are created through a shift in demand (Enkvist & Klevnäs, 2018). This point is iterated also by Respondent 4 (from SKL Kommentus) stating that *“...If you can steer these volumes of money [referring EU/Swedish GDP spend in PP] towards more circular flows then it can have a great impact when such large customers actually decide that ‘we want to do something else, we want to affect the market’, and to succeed with that it is important to be clear and stand by what you say, show that you are being serious. Otherwise the industry will not dare to invest in such [circular] flows and new technologies.”* Furthermore, given the large purchasing power that the public sector holds, which was mentioned in the introduction section, typically ranging from 10-20% of national GDP in many EU countries, procurement can have considerable effect on some markets²⁵. Milios (2016) discusses the important role public procurement can play as part of a wider policy mix to achieve synergies in promoting resource efficiency improvements and to facilitate a circular economy transition. Other policy instruments include the Ecodesign directive (Directive 2009/125/EC) Waste Electrical and Electronic Equipment (WEEE) Directive (Directive 2012/19/EU) and Extended Producer Responsibility (EPR) (Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) Text with EEA relevance, 2012; European Commission, 2009; Lindhqvist, 2000; Milios, 2016).

²⁵ Depending on the sector/industry, the public sector may present a very big or small market share, such as in the healthcare, IT and construction sectors (‘Public procurement strategy - Growth - European Commission’, n.d.)

Adding some weight to the statements academia has made on the big role procurement may play, a survey by BDL²⁶ in 2003 (in Edler & Georghiou, 2007), comprising answers from more than 1000 firms and 125 trade federations, had over 50% of the respondents indicating that demand and new requirements are the main source of their innovation activity. Thus, the power of demand side policies on the market has been recognised by the private sector as well.

There are indications in the literature (Brammer & Walker, 2011; Milios, 2016, 2018; Neubauer et al., 2017) that GPP (or any other sustainability oriented iteration of PP such as CPP), which they focus on, is not used to its full potential due to obstacles by different key actors in the procurement process. These include market actors, citizen organisations, national agencies, procurement department, finance department, environmental department, and users, all of which can be potential ‘disturbing factors’ due to the absence of clearly defined goals in public sector organisations, different conflicting agendas, as well as lacking information, explicit regulation, and knowledge (Milios, 2018). Furthermore, another limitation for why PP is not used as proactively to achieve resource efficiency is that the way criteria are shaped are to enable procurement of products and services already available in the market (so called ‘off-the-shelf procurement’) (Rainville, 2017a), instead of promoting innovation through PPI which goes under other processes and tends to be more complicated, resource intensive, and with uncertain time horizons sometimes (also the reason why this occurs less than procurement with criteria) (Milios, 2018). While public procurement is limited by its regulatory and legislative context, with the recent developments in EU and national procurement laws, it has been identified that there are increased possibilities for promoting new innovative business models (Dalhammar & Leire, 2012) – although these are also not without limits, for example having to still keep in compliance with the TFEU principles (regarding the internal market), as covered in section 4.1.1.. A 2018 CE report by Material Economics reports demand side measures and opportunities could bring the EU halfway to net-zero emissions from EU industry, holding as much promise as the supply-side, in addition demand-side measures are often seen as more attractive (Enkvist & Klevnäs, 2018, pp. 5–6).

5.1.2 Complementary to supply side policies

Mundaca, Urge-Vorsatz and Wilson (2018) and Edler and Georghiou (2007) highlight the fact that supply side measures and policies feature prominently in the policy arena as well as the literature relating innovation and to pathways in tackling global warming, while much less attention is being paid to demand-side approaches. This, despite the fact that not only are demand-side measures inextricably related to achieving the same outcomes, such as decarbonisation, but that they also (can) complement supply-side measures.

Faure and Dalhammar (2018) point to that different types of supply-side policy instruments and demand-side instruments, in the domain of product policy, may result in either a synergistic instrument mix, or counterproductive instrument mess, presenting examples of both occurrences. Furthermore, looking at product-life cycle impacts, many supply-side policies (e.g. regulating product design) tend to focus at specific lifecycle phases, with some targeting the production phase (e.g. standards in operations, transport, packaging), use phase (e.g. minimum energy performance standards) and other the end-of-life phase (e.g. EPR policies) (Faure & Dalhammar, 2018). Figure 5-1 gives an overview on the types of influence CPP can have on each of the product life cycle stages. Interestingly, the difference between GPP and CPP here lies in that GPP focuses primarily on the production and use phase, with limited attention to

²⁶ Business Decisions Limited. The original source could not be found, but has previously been cited as: BDL. (2003). *The Power of customers to drive innovation (Study)* (p. 144). Business Decisions Limited for the Enterprise Directorate General of The European Commission. Retrieved from http://ftp.cordis.europa.eu/pub/innovation-policy/studies/studies_the_power_of_customers_to_drive_innovation.pdf

end of life and disposal of products. Encompassing the CE principles, thus extends further into exerting influence on how suppliers can improve the end of life/disposal phase for products, in order to ensure product material and economic value is retained according to the value retention cascades as seen in figure 2-2 on the CE system.

Figure 5-1 also show the complementary nature of the EU policy mix from both supply- and demand side policies that are outside of the dotted box. This figure only shows a small representation of relevant EU policies which affect product life cycles. It is also interesting to denote that CPP is the only policy instrument to be targeting all three phases in a rather concrete way, while the other policy instruments affect one or two areas. This is not a critique on the efficacy of the policies or promotion of quantity over quality, but it does show that many policy instruments are very focused, as they need to be when they are designed to target specific policy outcomes. The interest here lies however in the *potential* that CPP has on exerting the market to improve their operations relating to all stages of the product life cycle. Whether the potential will be realised or not is another question, and if it can do so under the guise as a voluntary instrument, or if it should be developed into a mandatory instrument for specific product-group or industry areas.

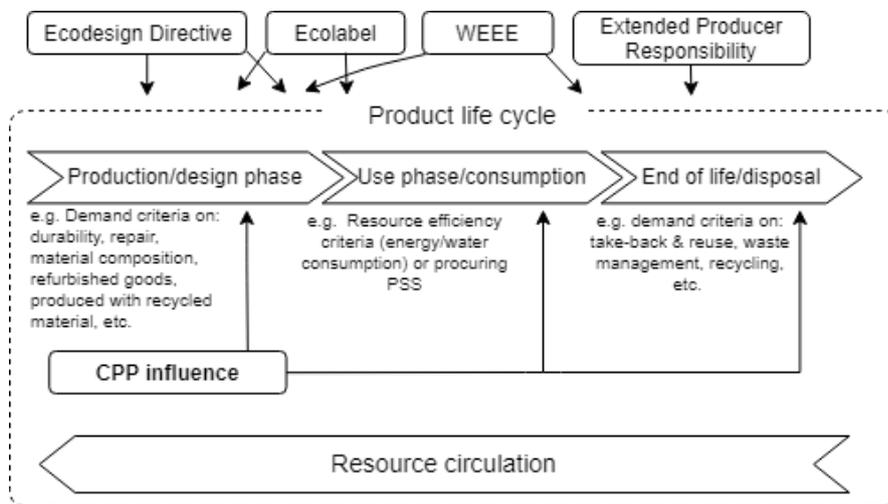


Figure 5-1 circular public procurement’s potential influence on each product life cycle stage

Source: Elaborated by author, inspired by Milios (2018)

Building on the previous point highlighted in respondent 4’ quote in section 5.1.1. with regards to the need for essentially setting clear market signals, the respondent adds that there is a need for coordination between a number of different approaches, “ I think that it is coordination between a number of things. I don’t think it is enough with big buyers, instead you must first standardise, in some cases you have to legislate so the industry gets clear game rules. It is always difficult to coordinate many customers preferences into one single direction...” This means that public procurement practitioners and strategists are aware of and recognise the need for coordination, and standardisation through legislation to create the ‘clear rules of the game’. Coordination between a number of approaches is important. It is not enough that big public sector buyers show interest in procuring in a certain way. But it is also important to standardise, to legislate in some cases so industries get clear playing rules to go by. However, as noted, it is very difficult to coordinate many customers preference in one specific direction. It is particularly this challenge in coordinating customer preference in one specific direction, e.g. through procurement, that indicates a clear need for a broader strategic policy approach that works in tandem with public procurement.

5.1.3 Promotes more circular markets

In discussing procurement as a demand-side instrument for innovation, Edler and Georghiou (2007, p. 956) propose that “... *the state can through the size of the peculiarities of public demand itself act as a lead user initiating lead markets*”. Arguably this statement works as well for procurement as an innovation instrument as it does for circular procurement, which can also require innovation measures on the side of the supplier. By this reasoning, public sector organisations hold the potential of being ‘lead users’ that adopt novel solutions provided by the market, aiding suppliers in these “lead markets” with market diffusion, helping them get their products and services or new business models off the ground and become more established (Edler & Georghiou, 2007).

One example of lead users initiating lead markets can be seen in a project discussed by respondent 3 from Helsingborg Municipality. Helsingborg is one of many regional partners involved in an EU Interreg (Öresund-Kattegat-Skagerrack) project called Cleantech TIPP (Testbed for Innovative Public Procurement), funded by the European Regional Development Fund (ERDF). The project aims at increasing innovation activity in the Öresund region, stimulated through public procurement demand, focusing on three areas: climate adaptation, waste management and industrial symbiosis. These three category areas arguably also have different connections to the CE, particularly waste management and industrial symbiosis come across as more self-evident based on what has been covered in the literature review (section 2.2). Respondent 3 discusses the importance of the existence of a “research and development exemption” in the Swedish public procurement law (transposed from the EU directive), within which they have developed an innovation procurement contract. With regards to this type of development respondent 3 states “*We have actually developed this [contract] ourselves, and then handed it over to the procurement agency that has received this with great interest. So, it is the other way around, we have helped them.*” In this way municipalities, and other regional actors, can be pioneers in creating novel procurement forms or requirements that can be useful for other municipalities and in providing further guidance by being incorporated in recommendation by the procurement agencies.

Other times market diffusion may sometimes simply be promoted through some types of ‘off-the-shelf’ procurements, though it may vary from product-groups and services needed. The view on public organisations potential as lead markets is shared by respondents 3, 4 and 5.

Along the same vein, Edler and Georghiou (2007) discuss how public procurement can address the issue of fragmented markets, which was discussed earlier in the literature review. A notable problem identified is that procurers are many times not fully aware about the possible product or service innovation that the market offers or could offer them. Likewise, suppliers with potential to develop new products and services may lack the knowledge on what the public customers may want in the future. This notably results from a lack of supplier-procurer interaction and communication, lacking clear articulation in what their future needs may be. In this context circular procurement may address some of the communication and interaction issues, as it is noted that circular procurement can bring procurers and suppliers closer through more *relational procurement practices* (PSS or other forms of servicizing) (Plepys, Heiskanen, & Mont, 2015), for example by including maintenance service as part of purchasing a product, or including a buy-sell back scheme in the contract, in which the supplier takes back the product at its end-of-life with the consumer, refurbishes it and put it on market again.

Furthermore, CPP looks not only to promote already emerging markets, but also looks to supply incentive for innovation to create new markets with improved solutions, which ought to be in line with the policy strategies and agenda. Thus, the interplay between supply-side policies, pushing for more efficient performance (the stick), and demand-side policies, such as procurement, are a tool for pulling the market (and the suppliers), and stimulating it towards

more resource efficient products and business models through incentives (the carrot). This interplay can be observed in figure 4-1 on the EUs legislative and strategic policy landscape (even though it does not explicitly focus on demand- or supply side policies), especially where the policy interventions or strategies cross the red line, presenting a simplified divide for sake of clarity, specifically meeting in the ‘outcome’ boxes of new market creation and innovation (product and services design, and business models).

5.1.4 Impact on local, regional and worldwide economy

With regards to considering EU policies for CE, it is important to consider one of the most significant (indirect) aspects of EU policy, namely the leveraging power it has on the worldwide economy through the so-called ‘Brussels effect’ (Bradford, 2012; Milios, 2016). Bradford (2012) discusses how this effect can be observed by its indirect influence of EU policies on the production systems of other areas around the world. In other words, by imposing specific rules of the game within the EU single market, other international market actors who want to participate have to abide by those rules as well. By consequence it can be surmised the same effect can be had by Member State countries, for example by setting high sustainability requirements in public procurement, required to be fulfilled by all suppliers in the value chain. As such both national and EU public policy intervention have a certain outreach even beyond the EU economy. Should the demand for further circular business models increase, the growth of such a market may encourage change in production systems and business model innovation in other parts of the world too.

However, while certain international outreach may be the case, there is much discussion in the academic and grey literature on the effect a CE has on the *local* economy, given that it is supposed to encourage energy, as well as material consumption, for example by transporting goods for shorter distances, and in boosting the local economy through increased repair, refurbish and remanufacturing jobs. For example, Andrews (2015) and Stahel (2016) both point to trends of decentralisation with the circular economy, where the remanufacturing and repair of old goods and buildings creates skilled jobs in local economies. In a WRAP (the UK Waste and Resource Action Plan) study one of their key conclusions stated “*Reuse and open loop recycling activities are likely to be the least geographically concentrated, requiring activity at local and regional level across countries...*” while “*...remanufacturing activity [is] likely to be relatively more concentrated and located near OEM [original equipment manufacturer] manufacturing facilities.*” (Mitchell & James, 2015, p. 15). Both findings indicate local economy activity, although dispersed across different geographical location, based on the necessary skill set and available technology and equipment.

5.1.5 Shortcomings/Limitations of public procurement

However, while public procurement serves as a good way to encourage sustainable and circular practices within the public sector, it is limited in its reach beyond public sector demand. Procurement practices within the private sector, which are not bound by the same legal restrictions, have also been identified to play an important role in the sustainability aspects considered by suppliers. Dalhammar and Leire (2017) have found there is negligible interest from private consumers regarding sustainability demands in, for example, IT-products. Meanwhile, it has been identified that setting high sustainability demands can be observed in both the private and public sector, and that this has a large significance for the operations of the suppliers. Procurement, in both the public and private sector, has thus been recognised as sending important market signals, many times pushing for more sustainable products on the market (Dalhammar & Leire, 2017). Respondent 4 echoes this consideration, stating that in Sweden “... there are more than 18 000 purchasers/procurers in Sweden today, officially registered as their profession. 3 000 are public procurers, the rest are private, so in the private

sector”. These numbers are quite revelatory in terms of the scale of impact procurement may have in the public sector vis a vis the private sector.

5.1.6 Summary

CPP can play an important complementary role amongst other EU policies comprising the policy mix towards CE. The fact that it has high degree of untapped potential means a lot more can be done in steering public sector market demand towards circular solutions in their various iterations. The market pull effect from the CPP in the public sector can make an important first step in kick-starting the increase of CBMs in the private sector by growing these circular ‘niche markets’ and providing a degree of market certainty for pioneer actors.

In order to create sustained long-term demand-pull to achieve critical mass CPP needs to be focused initially on priority areas where the public sector is a major client/consumer, as it helps target larger industry bases and incentivises the broader part of such a sector towards more circular approaches. Additionally, product groups and product and service areas also need to be prioritised based on the environmental impact derived from the products and service life cycle stages.

So, there is a lacking uptake of sustainability dimensions in procurement because there is no clarity in goal settings and each professional in their department have their work tasks, that may be counterproductive to another department colleague. The issue of department compartmentalisation means there is limited communication, and sometimes in public organisations there are separate public budgets for different purposes, making it very difficult to achieve productive interorganisational communication and coordination (respondent 4).

Lessons learnt:

- Circular procurement can play a key role in market creation, market diffusion of circular solutions and in overcoming market fragmentation.
- CPP can reduce risk for businesses by creating market certainty. (e.g. by creating clear policy guidelines in procurement strategy at, for example, municipal or national level)
- It is a complementary demand-side policy instrument that has potential to work well alongside supply-side policies if coordinated well. If policies are not well coordinated they may be counterproductive.
- More ambitious sustainable public procurement demands have been noted to work as a source of conducting innovation activity for improved circularity in products and services.
- It can kick-start an early transition to CE, but only to a certain/limited extent (e.g. its purchasing power).
- Introduces and mainstream CE as a concept to the public and private sector.

5.2 RQ 2: How is the landscape for circular procurement developing in Scotland and Sweden, and what barriers and opportunities can be identified?

5.2.1 Landscape (building on results presented in the landscape section + interview data)

As seen in chapter 4, the CPP landscape in Scotland and Sweden appear to be somewhat similar but containing certain distinctions. One of the most notable differences is the fact that Sweden still lacks a circular economy strategy or action plan, while Scotland developed one in 2016,

building on its ‘Zero Waste Plan’ from 2010. Thus, Sweden is lacking a government guided strategy which could set clear policy targets and mandated roles to government agencies, such as for example setting a 10% goal of procuring circular goods and services – a goal set by the Dutch Government for 2020 (‘Circular Procurement Green Deal – Netherlands | Circular Economy Club (CEC)’, n.d.; ‘Factsheet Circular Procurement IT equipment province of Utrecht’, n.d.). Thus it is important using policy goals to set targets and monitoring frameworks in order to track progress, which in this case relates to the uptake of circular solutions by the public sector. With the recent announcement by the Swedish Government of an appointed CE delegation, the indications are pointing towards progress in developing a national CE strategy plan, though there is no formalised deadline for delivery.

Priority areas

Scotland

There are four official priority action areas set by the Scottish government in their CE action plan, meant to tackle both issues relating to resource efficiency as well as cleaner and more efficient energy systems (Scottish Government, 2016b; Respondent 7). These are:

- Food and drink, and the broader bioeconomy
- Remanufacture
- Construction and the built environment
- Energy infrastructure

Specific waste prevention actions in Scotland includes a target of cutting food waste by a third by 2025. Furthermore, the action plan lays out CE service support in developing CBMs with existing and start-up companies, as well as an EU-funded CE investment fund for businesses requiring financial help to get on market before getting financially independent. It should also be noted that aspects of reuse, refurbishment, etc. fall under the priority area labelled broadly as ‘remanufacture’ which concerns a very broad number of product groups and services, many of which are commonly procured.

Public procurement is noted as a priority strategy that will, through the statutory guidance of the sustainable procurement duty under the Procurement Reform (Scotland) Act 2014, incorporate circular economy thinking by the procurement professional community. In order to do so extensive training on CE principles to procurement professionals is offered through Zero Waste Scotland (respondent 5 and 7).

A national quality standard for reuse (second-hand) goods has been developed in Scotland, called ‘Revolve’ (Zero Waste Scotland, n.d.-b). The standard gives customers *confidence* that pre-owned items are in good quality, and in safe condition. However, this development of reuse appears to be targeted primarily at private consumers, and not generally at the public sector, usually going through social enterprises or charities. There is a general indication that the reuse of furniture in Scotland is currently related to domestic furniture rather than office furniture. The latter is an area that has not picked up in terms of suppliers providing the type of sought after needs by the public sector – relating to refurbished/remanufactured furniture – according to ZWS respondent 5.

As seen in table 4-1 there is a significant focus in Scotland’s economic strategy and its manufacturing action plan on stimulating innovation and adopting circular economy approaches in the manufacturing sector (Scottish Government, 2015a, 2016a). Using public procurement as a tool for driving and stimulating these changes. These strategies are coupled with ambitious

targets for waste and resource management for year 2020 and 2025, for example including a target on 70% recycling/composting and preparing reuse for all waste by 2025 (Scottish Government, 2016d).

Sweden

Sweden is currently lacking a CE action plan and instead derives its environmental goals from its ‘generation target’, ‘environmental goals’ and ‘milestone targets’ (Naturvårdsverket, 2018b, 2018a; Westblom, 2015). The generation target sets 16 environmental quality objectives to be achieved by 2020 (Westblom, 2015). The milestone targets further break down into 24 targets to achieve the 16 environmental objectives. The targets are non-binding, but influential in the sense that they guide the environmental policy of the country. In lieu of a circular economy action plan, these environmental goals seem to currently be the most established in terms of dealing with a variety of environmental issues, including waste and resource efficiency. Specifically, objective 15 is relevant to resource efficiency and waste as it concerns ‘a good built environment’, and includes policies on sustainable waste management (Naturvårdsverket, 2018a; Westblom, 2015). Objectives one and four, on reduced climate impact, and a toxic-free environment, respectively, have also been identified as relevant in some regards, but still lacking a focus implementing circular economy further.

It should also be noted that in 2018 a climate law entered into force in Sweden (Klimatlag 2017:720) as part of a larger climate policy framework, which also contains new climate goals and a climate policy council (Riksdagsförvaltningen, n.d.-d). However, while production and consumption systems are inextricably linked to GHG emissions, there is no concrete mentioning of resource efficiency in this newly established climate policy framework. Instead sustainable production and consumption seems to be covered only by Sweden’s environmental objectives. Thus, while there are resource efficiency considerations and waste targets, the CE principles are not at the center of these environmental goals, which justifies the need for the development of a streamlined CE action plan, with clear strategy and target goals.

As seen in table 4-2, Sweden does have a national procurement strategy developed in 2016, guided by its national environmental goals and in fulfilling its Agenda 2030 commitments, here specifically related to SDG 12 on sustainable production and consumption (Regeringen, 2016). In the strategy CE and innovation is especially emphasised in policy objectives five and six in the procurement strategy, focusing on “public procurement that drives innovation and promote alternative solutions” and “public procurement that is environmentally responsible”, respectively (Regeringen, 2016, pp. 8, 20–22). The strategy plan emphasises a need of increased sustainable public procurement and that public organisations should use procurement as a strategic means to achieve environmental goals. Moreover, Sweden’s action plan for ‘a smart industrialisation strategy’ denotes the importance of improving the conditions for a CE, including actions on “supporting circular business models” (e.g. with business support through VINNOVA, Sweden’s Innovation Agency) and “creating regulations to enable circular business models”

Respondents from the Swedish National Agency for Public Procurement identified five priority areas, based on environmental impact and feasibility, for CPP in Sweden, namely:

- Construction
- Vehicles and transport (specific focus on biofuels)
- Food (reducing food waste)
- Furniture and textiles
- ICT equipment.

Finally, in April 2018 SNAPP updated the sustainability criteria for computers and monitors to encompass CE aspects. Specifically, they relate to requirements on extended product lifetime, increased reusability and recyclability, and the possibility to include requirements for services from the supplier to ensure reusability and recyclability of the products. It is arguably the first product group in Sweden to receive updated sustainability criteria with clear CE ambitions as the driver behind their development ('Kriterier för datorer och bildskärmar | Upphandlingsmyndigheten', n.d.)

5.2.2 Barriers

Organisational

Four primary organisational or cultural barriers have been identified, namely: (1) cost, time, and awareness, (2) risk, (3) (inadequate) human capital, and (4) social habit/attitudes. These are discussed below.

Cost, time, and awareness

First, cost and time have been identified by interviewees as a significant organisational barrier on the procuring authorities, noting that "... they [procurers] have been pressured a lot on cost savings and cost reductions, so that is at the forefront of everybody's mind. So they will think 'well I'm not going to do this more complicated take-back scheme if its going to cost me more money', so you have to prove things through your life-cycle costing, so I think that probably the biggest barrier is proving that a circular economy and adopting circular principles are cost-competitive" (Respondent 5). Thus, it seems to stand that among public procurers there is an issue with regards to the perceptions that circular procurement will prove to be more costly on the one hand, and that it takes longer time learning and developing the application of circular demands (such as a take-back scheme), on the other hand. The latter is also emphasised by respondent 4 stating that "There are a lot of things going into a procurement process today, and it takes an extreme amount of time." respondent 4 discusses how regular procurement is time intensive in and of itself, and by adding 'complications' in the procurement procedure by taking into account environmental or social criteria, further adds problem to the time aspect, because procurers typically need to take in experts in social or environmental matters to ensure criteria are developed or used in a correct way.

Furthermore, lack of awareness is noted by several respondents, including respondent 5 and respondent 6 from Inrego. However, they both approach the matter of lack of awareness from opposite ends. Respondent 5 primarily refers to the lack of awareness of procuring authorities in incorporating circular criteria for product groups such as IT, for which they have already been developed in Scotland. While respondent 6 states that "*something that we are suffering a lot from, one of our biggest obstacles, is the fact that few people are even aware that they can make these types of purchases [high-quality refurbished IT products]*". Thus, the issue is twofold when it comes to awareness: **1)** public procurers do not necessarily know the available market options of CBMs, and **2)** they are not fully aware of what CE really is and how it benefits the organisation, thus limiting the adoption. The first issue has been identified in earlier literature as well, such as by Edler and Georghiou (2007), who identify that poor user-producer interaction and communication leads to a lack of awareness on what the market can offer.

Respondent 1 (from IKEA) echoes this problem, not only with regards to specifically what the market can offer, but also about the criteria that should be set when procuring circularly and argues that "*this has to be done together, I think there is a lot of interplay in dialogue. Suppliers and procurers must together develop the demands... and you should have a tight dialogue.*" As an addition to the keeping the necessary market dialogue going, respondent 1 also discusses the importance of procuring authorities to engage with suppliers with certain foresight, and that they should identify their

needs, sometimes one or two years in advance, so that when the time comes to procure in the future the suppliers have time to come up with a business model solution that fits the identified need. This becomes particularly important in the case of circular procurement since there is currently a lot of experimentation going on.

Risk

Secondly, when it comes to identified issues relating to risk these are associated with either legal or economic risks by the respondents (Respondents 2,4,5). This has resulted in the reluctance of many procurers to do things differently, out of fear, because of the perceived risks associated with trying new business models or other circular procurement routes that have not yet been clearly established in procurement practices. In Sweden legal risks are perceived to be the most obstructing, “... *this [appeals²⁷] makes procurers very scared, as they do not dare trying new things out because they fear that they will open up the door for more appeals*” respondent 4 while in Scotland the economic risk is seen as the bigger hindrance “... *that definitely exists in procurement for everyone, they are quite risk-averse because they do not want to be challenged. But I would say that number one in Scotland is the value for money aspect*” respondent 5.

This leads to the understanding that are two predominant pressures to observe that procurers as subjected to in both countries: 1) ensuring that they are working within the boundaries of what the procurement law(s) allows, and (2) to procure the best price and quality possible for the public organisation. The first pressure, on delivering a judicially correct tender make procurers risk-averse, as some circular procurement requirements may be novel or have not been asked before, which leads to uncertainty in how it will be interpreted in the law and if bidding companies choose to appeal. Furthermore, appeals are seemingly avoided for two primary reasons, legal costs and to not be caught without a product or service contract during the arbitration period of the judicial process.

Finally, respondent 2 points out that “*in the end it is all about how the courts interpret them [the procurement laws] that matters. And now it has only been about [eighteen months] in with the new law, so not all legal precedents have been put in place yet*”. Procurers do not know what leeway CPP demand criteria has in the national or EU procurement laws, because a lot of procurement practices have not been ‘done and tested’ with regards to legal certainty. In fact, this leeway is unknown due to an absence of legal precedents in similar procurement cases which can more comfortably guide procurers in what they can and cannot do. Given this fact, procurers are risk-averse and many times are not eager to risk an appeal from suppliers in the public tender due to its specific CE requirements. It is argued by respondent 2 that a lack of good examples is one of the biggest barriers to mainstreaming circular procurement at the moment, stating that “*I would say that the critical factor is that we get a good example. I think that a natural barrier is the fear do to things wrong. I think that barrier is the biggest hinder really. I don’t know if it necessarily the law that is the problem, or if we are too afraid to interpret the law in an advantageous manner. So I think if we can get a clear example, then it can do a lot.*”. As a result, this necessitates bold and pioneering procurers that dare to take the risk by procuring in new and innovative ways to break this risk barrier, by either showing good successful examples, or gaining legal precedent in a court of law.

Human capital

Respondent 4 emphasises that the lack of human capital in procurement in Swedish public sector organisations is insufficient to achieve the ambitious environmental and social goals

²⁷ An appeal is a formal request to a court or a public authority asking for an official decision to be changed. Appeals function both as a process for error correction and as a process of clarifying and interpreting law for future legal guidance.

envisaged by the politicians stating that *“The average municipality maybe has a half to one procurer to manage everything by themselves. Its self-evident, it is completely unrealistic to believe that such a small resource can save the world with the tax money used for procurement.”*, in addition to the lacking number of procurers, he also brings up the issue that many smaller municipalities do not have the competencies required to perform regular procurement without any external help. Added to this, there is even less likelihood that they have the competencies needed to perform sustainable or circular procurement, which requires additional expertise, which can also be an issue for larger municipalities to grapple with *“...most of those working with public procurement today are experts on the law on public procurement, they are not experts in innovation, environment, or circular flows. Instead it is mostly people with a legal background, focusing on complying with the procurement laws and to not get stuck in an appeal process.”* (respondent 4). Thus, the predominant competence among procurers is in judicial expertise and knowing the law on public procurement. Furthermore, this finding can be corroborated across other literature, for example in Michelsen and de Boer (2009), in which a case study conducted on Norwegian municipalities and regions indicated a correlation between GPP and the size of the municipality, where GPP occurred to a greater extent in larger municipalities, while smaller municipalities required collaboration with other public organisations, since they did not hold the same kind of competencies in their local organisations.

In order to address this issue respondent 4 emphasises the importance of having relevant experts for the procurements as they best know how to establish tender requirements that are also in tandem with what the market can feasibly/realistically offer *“... If you are going to procure digital solutions you need a digital expert that knows the market like the back of his hand, otherwise you will be setting requirements in the wrong way”*. Currently this expert-competence is lacking in many places in Sweden if they are to engage in circular procurement.

In Scotland, Zero Waste Scotland trained about 700 people in sustainable and circular procurement practices as a way to address the misaligned competency requirements for fulfilling more sustainable public procurement practices (Respondent 5). However, respondent 5 notes the risks with providing free CPP consulting support to procurers, with the main issue being that procurers do not retain the necessary key competencies *“Either one person became upskilled in the organisation and didn’t pass on the information and then left or worse than that, worst case scenario, they lean too heavily on the environmental consultant to consider all of the risk for them, and not learning themselves how to do that process...”* Two negative outcomes have been identified to be common: First, only one or two people in a public organisation are mentored in developing the necessary skills to procure circularly, and when they leave the organisation the knowledge is not passed on internally to anyone else. Second, procurers tend to lean too much on the external/consultant help, so they are not incentivised to develop their own in-house competency. This weakens the organisational knowledge or capacity to procure circularly, and it is one of the reasons why free consultancy support has been limited from Zero Waste Scotland.

From the supplier side, the issue of human capital arises for companies, such as IKEA, that are trying to develop circular business models. Respondent 1 mentions that adjusting to circular business models requires dealing with logistics in a novel way, which will also require new competencies not in just that area, but also in the area of servitization providing repair and maintenance of the products they sell or lease to the public sector. This is likely a more significant challenge for larger companies such as IKEA that have to deal with large volume flows. This is of interest because furniture is one product group that has been identified as holding great potential for CBMs and subsequently for circular procurement, with many documented cases already existing on this as there are already many industry actors engaged in refurbishing and leasing of furniture to the public and private sector. (‘Different types of REBMs – REBus’, n.d.; Öhgren, 2017) The same problem with retraining to get the right competencies to dealing with challenges such as reverse logistics is a challenge not just for the

furniture sector, but many other sectors that can be required or incentivised to develop incentivised return schemes (respondent 1).

Social habit/attitudes

Respondent 4 discusses that there is an issue relating with the perception of customers, namely that second-hand products, such as IT and furniture for example, have a “*low social status*”. The consequence of looking down upon the purchase of refurbished or remanufactured means that there are risks or uncertainties with an uptake in procuring these types of goods. Consequently, this could imply limitations in the growth of second-hand products for the public sector. This view is shared from the supplier side, as respondent 6 has been asked questions from prospective procurers such as “*what do you think the students or the employees will say if we purchase old computers, how can we tell them this?*”. Thus, the social status of using second-hand and refurbished items may be perceived as shameful in some cases.

One way in which this could be managed is to leverage the purchase of refurbished and remanufactured items into a positive action by profiling the organisation as acting environmentally friendly by exemplifying the environmental and economic benefits by purchasing refurbished goods. In the case of Inrego, they give their customers a diploma stating how much CO2 emissions they have avoided by purchasing refurbished IT product.

Lessons learnt:

- Public procurers are pressed with delivering the best cost-effective option possible, while also time pressured. Resulting with procurers turning the attention to the conventional procurer process since it is easier and more “certain” in the expected time it will take.
- Lack of awareness among procurers in what kind of circular products or business models are on the market, and a general lack of understanding of the CE and how to apply circular criteria
- Fear and concerns over legal disputes cause a fear among procurers from setting strict criteria concerning resource efficiency or other aspects to conduct CPP.
- Not enough people working with SPP/CPP in pure numbers (human capital-related)
- Based on the findings Scotland appears to have a greater lead in training public procurers in procuring circularly compared to Sweden. However, interestingly enough more documented cases of CPP can be found among the Swedish public sector rather than in the Scottish. Nonetheless a lack of the ‘right’ competencies can be identified in both cases.
- Purchasing refurbished products can be perceived as shameful, implying there is a social preference or attitude problem concerning how refurbished products are perceived.

Regulatory

Two main areas of regulatory barriers have been identified in this thesis. First, lacking CE and CPP legislation to enable the mainstreaming of CPP. Second, regulatory barriers inhibiting the uptakes of CBMs, which consequently means the market is limited in what circular solutions it can offer to the public sector consumers.

As discussed in the landscape section above, one of the main barriers in Sweden is the absence of a regulatory framework or landscape that is adapted to a circular economy. Respondent 2 believes “... *it is one of the biggest problems that we do not have legislation that is adapted for a circular economy. Especially when it comes to public sector and government agencies, there is so much that can be done,*

but the law won't allow it." Other similar regulatory barriers have been identified in part of the literature, for example in Mont et al., (2017, p. 24) who state *"unfortunately, the existing policy frameworks, resulting in relatively high taxes on labour and low taxes on natural resources and pollution, are still more favourable for the linear economic model"*. This is a major regulatory and market hurdle, which is likely to make the diffusion of CBMs slower compared to if the regulatory framework would tax resources and pollution instead of labour. Consequently, this would imply that CBMs would remain somewhat of a niche market, meaning there may be a somewhat restrictive number of suppliers on the market, which in turn may drive up the prices of the circular procurement solutions as a result from low levels of competition.

In addition to a lacking regulatory CE framework, and national and EU procurement law, respondent 2 mentions that there are other Swedish laws that must be taken into account when government agencies are procuring, or wish to engage in more circular activities, such as with leasing, or take-back and resell schemes. For example, the administrative law (Förvaltningslag 2017:900) mandates what government agencies may or may not do (Riksdagsförvaltningen, n.d.-b). Additionally, there are a number of ordinances that make it increasingly uncertain on what government agencies can and cannot do, as the legislation is open to interpretation. Respondent 2 states that in the capital provision ordinance (Kapitalförsörjningsförordning 2011:210) and the ordinance on the transfer of the state's movable property (Förordning om överlåtelse av statens lösa egendom 1996:1191) the rules are not clear as to when and how government agencies may sell their movable property to the market (Riksdagsförvaltningen, n.d.-c, n.d.-a). This would most likely render implications for lower uptake of certain circular procurement models, including the take-back and resell schemes. Currently this is a topical issue for Kammarkollegiet to solve since *"... many [government agencies] are asking for circular furniture flows"* and in Sweden the business models are in place to provide 'circular furniture flow'. It is mainly the legal uncertainty standing in the way.

Further there are also legal complications with regards to government agencies renting or leasing assets such as vehicles, furniture or IT products. The capital provision ordinance states that *"an asset may be acquired by a government agency through a renting or leasing contract. [However,] such a contract may only be made if, seen over the asset's entire economic lifetime, leads to a lower cost for the state than it would by purchasing it"*. Even at Kammarkollegiet and other government agencies it is unclear on how one should follow these legal rules without the risk of breaking them. It is particularly important for an organisation such as Kammarkollegiet to 'get it right' since they negotiate framework contracts that other government agencies – and their procurers – use to procure goods and services. With regards to the leasing, respondent 2 poses the issue of 'how can one prove that leasing or renting will be cheaper for the state as a whole?' and whether it is the role of Kammarkollegiet (and if they have the knowledge and mandate) to determine what is the most cost-effective option for the state. This adds to the uncertainty and legal risk identified above in the organisational barriers. Again, the issue of supply in rental solutions for furniture is not a problem *"this is a pretty big barrier, because otherwise we could very easily create a rental contract, because there are many suppliers that are delivering rental solutions [to the public sector]."* (respondent 2).

More recently, legislative development has been focusing on social aspects of sustainability rather than on environmental or circular aspect. For example, a new legal requirement came in 2017 regarding labour law conditions in procurement (Regeringens proposition 2016/17:163) (respondent 4) (Regeringskansliet, 2016). This new legal requirement requires all public procuring authorities (agencies, municipalities and counties) to set labour conditions, based on central collective agreements, that suppliers must meet. A possible explanation for this development could be that it may be easier to develop such requirements and they are easier for suppliers to adapt to. Though this is a speculative explanation, and none that the respondents explicitly expressed.

Unlike Sweden, Scotland does not lack a circular economy framework, having developed its Circular Economy Strategy in 2016 (Scottish Government, 2016d), guiding the way forward by identifying priority areas and actions. However, direct legal enforcement to bring about a more circular economy is lacking in both countries. Respondent 5 notes that “... *there has been a talk about a circular economy bill, but it is not further forward in this current administration*”, indicating that there are other focus areas at the moment for the Scottish government. Furthermore, she notes that there are no regulatory drivers at the moment, either for a circular economy or circular procurement (respondent 5). Thus, it appears that currently there is only the Sustainable Procurement Duty in Scottish procurement law that requires direct legal compliance from procurers if they engage in *regulated procurement* as covered in the earlier chapter. However, the statutory requirements from the sustainable procurement duty denote a big departure in difference from the two countries. In Scotland public procurers *must* take into account the impact, or risk, of the procurement and act accordingly to mitigate it by considering the improvement of economic, social and environmental well-being. This is a national mandatory requirement in Scotland, whereas in Sweden using the sustainability criteria remain as a voluntary option. While a move in the right direction, there is no guarantee that the sustainable procurement approaches will result in an uptake of circular procurement.

Respondent 4 points to additional regulatory barriers in Scotland for a circular- or bio-economy. He adds “... *when you are talking about and dealing with waste materials you enter a minefield of environmental regulation. Sometimes it can be restrictive and prohibitive. Sometimes even just companies don't want to deal with it so we don't even get involved*” (respondent 4). There are challenges in the bioeconomy for businesses to use waste or by-products from certain processes due to that it is technically considered waste under current regulations, which adds increasing complexity and costs for companies by requiring license and certifications

Finally, from the supplier perspective in Sweden, respondent 6 argues that suppliers working in product-group areas such as with IT-products, have to some extent, suffered from the 2017 chemical tax – which is designed to reduce the occurrence, distribution, and exposure of hazardous flame retardants, encouraging more environmentally friendly substitutes to be used in future products entering the market. Specifically, the issue here relates to the import of IT-products to Sweden containing hazardous chemicals, regardless of whether they are new, or old and imported with the specific purpose of refurbishing the products to put them back on the market. From the supplier side such a tax on “old” products can be perceived by businesses as a form of penalisation, serving as a disincentive for businesses to engage in circular business models, because a core area of refurbishing IT products and reintroducing them to the market is for both the economic and environmental benefits.

Lessons learnt:

- Both Sweden and Scotland are lacking CE and CPP legislation to enable the mainstreaming of CPP.
- Both Sweden and Scotland face various regulatory barriers inhibiting the uptakes of CBMs, resulting in a certain market limitation on the circular solutions that suppliers can offer the public sector.
- Legislation is open to interpretation, causing uncertainty among public procurers on what can and cannot be done with CPP. Resulting in (overly) cautious procurers.
- Suppliers engaged in CBMs face some regulatory challenges, e.g. with taxations (such as the chemical tax) or waste regulation, requiring businesses to acquire proper licenses and certifications (disincentivising innovation and experimentation with waste/by-products)
- Legislation on social aspects to be considered in procurement moving ahead.

Market

Identified market barriers include (1) a lack of CPP demand and supply in Scotland and Sweden, to different degrees, (2) financing issues with banks and CBMs, and (3) the emergence of CBMs is currently ongoing and there are still market challenges faced, such as businesses not yet becoming economically viable on their own, or that some circular business model approaches target other consumers instead of the public sector.

Lack of CPP demand and supply

In a 2016 report on guidance for procuring circular products in Scotland a number of barriers were identified from the supply market (Sustainable Procurement Ltd., 2016). These include: *lack of demand* by the public sector for products and services that have CE outcomes, and a *lack of clarity* in public sector requirements; *insufficient capital* to provide solutions to the public sector market, implying that there are financing barriers for businesses to overcome; *lacking technical knowledge* and manpower, meaning that the knowledge needed to remanufacture product in an efficient manner is not readily available to non-OEMs (original equipment manufacturers) to handle large volumes. Both respondent 5 and 7 echo that there is a lacking readiness of the market to provide circular solutions, particularly directed at the public sector. McCafferty points to the issue of banks not financing businesses with CBMs “*So there are all kinds of associated issues with that, like banks for example, will not want to finance those kinds of models [CBMs]*”. This makes it even more crucial for the development of support programmes and initiatives targeted at overcoming such barriers.

Zero Waste Scotland works with European Regional Development Fund (ERDF) funding, offering both non-financial business support service, helping businesses developing circular business models, as well as a CE investment fund, helping to bring businesses that have fully developed CE business models and products out to the market (respondent 7).

Emerging CBMs

While enterprises with CBMs are currently emerging, most are not yet at an economically viable stage, implying there is still a lag and need for development in the coming years before more circular solutions can be put on the Scottish market. While ZWS has a support programme and CE investment fund for SMEs, they are not yet linking up with procurement according to respondent 5. Many of the SMEs are not yet commercially viable, and the ones who are, are lacking the track record to sell into the public sector. The lack of a track record highlights the points made by Knight et al., (2012, p. 20) (see sections 2.3.2, 2.3.3) regarding the importance of having a reference list of clients, especially in an emerging market.

Respondent 5 highlights the Scottish furniture market as an example where there are currently no enterprises offering comprehensive remanufacturing services and reconditioning of furniture. However, there are a lot of *reuse organisations* around, although these primarily relate to domestic furniture, rather than office furniture. Public Procurement is typically more concerned with office furniture, and there is currently a gap in the market to encourage longer life of office furniture.

Meanwhile in Sweden there appear to be more established CBM solutions on the market, especially pertaining to the furniture and IT product-groups, with both small companies and large companies offering some functions of circularity. In the furniture market it is predominantly refurbished furniture and leasing services (Öhgren, 2017; respondent 1), while in the IT-sector it is predominantly sales of refurbished products, although companies like Inrego are looking into expanding further in other CBMs such as leasing as well (respondent 6).

In Sweden there are various research projects on developing circular business models that work for both suppliers and customers. These include both RISE Research Institutes of Sweden and Kammarkollegiets research on circular furniture flows and the Mistra REES programme on resource efficient and effective solutions, with research on drivers and barriers for CBMs ('Business Models for Circular Economy: Drivers and Barriers – Mistra REES', n.d.; 'Nu ställer möbelbranschen om till cirkulär ekonomi | RISE Research Institutes of Sweden', n.d.; Mont et al., 2017).

Lessons learned:

- Though increasing, there is still relatively low demand for circular solutions from the public sector in Sweden and Scotland. The low demand has in part also led to lagging development of more circular solutions from suppliers
- From a market readiness standpoint Sweden appears to come out ahead from business model experimentation and with more CPP being practiced than in Scotland.
- There is no market actor offering any comprehensive remanufacturing service and reconditioning for office furniture in Scotland.
- Banks not financing, or apprehensive of financing CBMs which comprise non-conventional business models in revenue and value generation.

5.2.3 Opportunities

Organisational/cultural

Five primary organisational or cultural opportunities for CPP have been identified: (1) training, (2) collaboration, (3) good examples and learning from front-runners (4) functional procurement (5) standards.

Training

Setting up training programs on CE to develop the necessary skills and capacities of public procurers to engage in CPP is identified as an opportunity to address their current lack of appropriate skills in both Sweden and Scotland, as identified earlier by respondent 5 and 4. In Scotland, there is currently an ongoing transition on long-term competency training led by the public sector, established as a 'procurement and commercial training framework' (respondent 5). Based on the interviews and online search there is no apparent training programme or initiative in Sweden aimed training public procurers in CPP, instead the closest guidance material available is the 'good practice and guidance' report written by ICLEI and published by the European Commission (ICLEI - Local Governments for Sustainability, 2017). Thus, in Sweden there is an opportunity and a need for increasing the capacity of public sector procurers.

Respondent 4 denotes that *"if we are going to have this take off, then we need to have a completely different set of resources skill prerequisites in the public sector, otherwise it will never happen."* From this standpoint Respondent 4 argues that if public procurement is to be used as a demand-side policy instrument, then more resources and the right competencies need to be added to the public sector, namely in most municipalities, where depending on size, their capacities may be very limited. This must then be a politically active choice to make that happen. However, Respondent 8, sustainability expert at SNAPP, instead argues that there is no need in training procurers for CPP since circularity aspects are embedded in the sustainability criteria. It appears that in the Swedish context there are a difference of opinion among procurement professionals, meanwhile there appears to be more of a consensus in Scotland for training their procurement staffs in CPP.

Collaboration

In Pheifer (2017), close collaboration has been identified as necessary for creating open and transparent knowledge-sharing platforms. In both Sweden and Scotland further engagement in knowledge-sharing of CPP and best practices at national and international level may be beneficial.

In the Swedish context respondent 2 mentions that it is purchasing managers and heads of departments that conduct international visits and exchange of knowledge, while procurers are more limited to knowledge exchange at local or national level. In order to get a better exchange of best practices from other countries it could be a good idea to create, or encourage the use of, forums/spaces dedicated to sharing of best-practices by other EU procurers. There are EU networks such as 'the PPI platform' and 'Procura+' aimed at connecting procurers and sharing best practices for procurement for innovation and SPP/CPP (Midhamre, 2017).

Good examples and learning from front-runners

As has been discussed in the literature review, and earlier in this analysis, both suppliers and procurers can perceive disadvantages with circular approaches, most notably in the form of costs. 7 out of 8 respondents brought up 'good examples' as a critical factor for success (respondents 2,3,4,5,6,7,8).

Midhamre (2017) and respondent 3 both emphasise the importance of pilots. Successful CPP pilots will likely be able to provide the necessary good examples, as discussed by the interviewees, to mainstream and popularise CPP from a sustainability and economic benefit perspective. As was noted in the literature review, most of the current good examples tend to be presented as mini-case studies, most lacking sufficient information in how to do the CPP process if a procuring authority actually wants to engage in the practice. Respondent 7 adds three important points that should be included in communicating good example "... *how you did it, the benefits, and why it worked*". Respondent 5 also notes that it is necessary to provide clear cost-saving benefits as a selling argument to businesses when pitching CBMs.

Based on what respondent 2 said about good examples (see 5.2.2. under 'risk') it can be understood that good examples lead the way and encourage other procurers to follow suit when the fear of doing wrong is overcome/removed by presenting best practice examples.

Functional procurement (instead of ownership purchase)

In the past few years there have been increasing interest in functional procurement among public procurers, suppliers and researchers. For example, according to respondent 1, IKEA wants to see a change from specifications-based procurement to functional procurement, where the emphasis lies on fulfilling a need with the specified outcome. Functional procurement can entail both the purchase of products, or the purchase of a performance, based on what is most appropriate depending on the product group, the needs and specifications of the procurement.

"So we want procurement to move from a specifications based procurement to a functional procurement, where you talk about purpose and needs. That they ask themselves "what need do we have? We are building a classroom for children aged 8-12, and you should be able to sit in a corner and read in peace"... Instead today they come with 'we want to buy a table that is 120x11 and can weigh maximum 5kg' this results in so many specification-based requirements that it creates bad competition and it becomes expensive. The more requirements you set the more expensive it will become." (respondent 1).

The benefits, or opportunities, entailed in functional procurement is threefold: first, it can increase competition since suppliers are not burdened by ‘arbitrary’ technical specifications. Second, it is expected that increased competition would result in lower cost for the procuring authorities. Third, specifying a certain outcome instead of a specific product means the supplier has the freedom to creatively develop innovative solutions to fulfil the need that is expressed.

From the procurement side, respondent 4 shares similar thoughts “...if you look generally at public procurement, we have always bought things. Owned cars, owned IT equipment, we own our furniture and our machines. Why should we do that? Why should a municipality be a vehicle fleet owner? They are not particularly good at owning things, or managing vehicle fleets, that is not their core activity. Instead you should buy things as a function, procure functions, and through functional procurement trigger the market to find solutions to the defined needs. That’s what this is all about, about satisfying a need.” In this sense it is the fulfilment that is the primary focus, while the product type of how it is achieved is a secondary concern. This type of procurement fits within performance model presented in Figure 2-3 on the five categories of CBMs in section 2.2.1. So far, functional procurement has not been attempted in any framework contract (respondent 4).

Standards

The importance of developing standards in PP for streamlining procurement processes is denoted in some of the literature as pertinent for the uptake of SPP/CPP (Neubauer et al., 2017; Rainville, 2017b). Such standards should define methods for measuring the *quality* of recycled material or the longevity of products. Using ecolabels, a ‘voluntary informative’ policy instrument, as covered in table 2-2 is recognised as useful in supporting SPP or CPP procurement practices, as they make it easier to create standards that procurers and suppliers can later refer and adhere to, respectively. Respondent 4 recognises the benefits but also the challenges of standardising “I don’t think it is enough with big buyers, instead you first need to standardise, you have to legislate so that in some cases the industry gets clear playing rules. It is always difficult to coordinate many customers preference in one direction.” The standardisation of demand criteria is very important, and it’s a role that is attributed to SNAPP. Without developed and tested criteria to turn to, 290 municipalities and 345 government agencies would have to develop their own, which would certainly vary very much in quality, likeness and stringency, with the resulting consequence of immense difficulty for the market to accommodate all the disparate demand criteria due to a market fragmentation.

Lesson learnt:

- There is a need for training for public procurers to acquire the competencies needed so they can independently procure more circularly
- Collaboration at national and international levels provides sharing of best practices and good examples to learn from to increase confidence in procuring circularly. Exchange of knowledge needs to reach procurers and not heads of department
- Functional procurement opens up for more creative and innovative solutions, reducing the criteria/specifications restrictions typically seen when purchasing products or services. The outcome is what matters, not a specifically prescribed way on what has to be done.
- Standards are important for assessing and promoting a sustained level of quality, and it helps streamline SPP/CPP practices by having readily available, for example, ecolabels that can be referred to.

Regulatory & policy

Four main areas of regulatory opportunities have been identified, which will be discussed below. First, legislation and policy and the opportunities therein in increasing CPP. Second, the importance of monitoring in order to track progress and uptake of CPP. Third, new and broader procurement opportunities for more ambitious green or circular procurement established in the 2014 procurement directive. Fourth, the role of sustainability tools in increase the uptake of CPP.

Legislation and policy

As seen in tables 4-1 and 4-2 more regulatory and policy opportunities can be found in Scotland compared to Sweden. Scotland has a statutory requirement on regulated procurement to take into account sustainability aspects, through the sustainable procurement duty, while Sweden on the other hand maintains the use of sustainability criteria in procurement as voluntary. In addition to the sustainable procurement duty, the procurement act also requires contracting authorities expected to have a significant procurement expenditure²⁸ in a year to prepare a procurement strategy detailing how the organisation intends to make sure that its regulated procurement will follow the legally mandated requirements, such as: delivering value for money; contributing to the carrying out of its functions and the achievements of its purpose; and how the sustainable procurement duty will be complied with (Edinburgh City Council, 2016; Glasgow City Council, 2018; Scottish Government, 2014a). The contracting authorities are also required to produce an annual procurement report, reviewing and stating how they have accomplished the strategy goals, and if they have not, how they will make improvements and adjustments to reach the goals in the subsequent year.

As it appears from both online searches relating to Swedish procurement law, and from talks with expert interviewers, there are no such legal requirements on procurement strategies and annual reports in Sweden. Instead individual municipal- or region level procurement strategies can be found (Such as Stockholm and Region Skåne), although they also appear under different names (competition strategy, procurement plan/program, procurement policy) (Region Skåne, 2018; Stockholms Stad, 2016). The Swedish government has an opportunity to either encourage, on a voluntary basis, the benefits of having a clearly outlined local strategy (both for employees and prospective suppliers), or it can consider legislating the requirement of strategy plans according to parameters as done in Scotland, so as to not put undue administrative burden on smaller public sector organisations.

One of the clear benefits of having a procurement strategy and an annual procurement report is that it enables the public organisations to conduct follow-up activities on whether they have reached their targets, and how they can improve the organisational activities to make sure they fulfil them next year. This is particularly important when attempting to conduct SPP or CPP, since without follow-up on the organisations procurements there will not exist any framework for monitoring the progress, either at organisational or national level.

Monitoring

Following the discussion and analysis on monitoring here, in an interview with two sustainability and circular procurement experts at SNAPP respondents 8 and 9 elaborated on the fact that the Agency is currently lacking a systematic approach towards efficiently monitoring and gathering

²⁸ An authority has significant procurement expenditure in a year if the sum of the estimated values of the contracts to which its regulated procurements in that year relate is equal to or greater than £5,000,000 (Procurement Reform (Scotland) Act 2014

statistics both on the number of times that sustainability criteria, developed by SNAPP, are used and the quality in how they are implemented in tenders. Currently this type of data is gathered manually by downloading and going through individual procurement documents and searching among the criteria specifications, which is very time and resource intensive (respondent 9) and thus implies a heavy administrative burden. In short, this means that the current problem with the statistics collected regarding procurement activities do not fully cover the needs that are necessary to develop ‘result indicators’ and follow those developments to see that government targets or strategies are in fact fulfilled.

While this issue was not discussed with the Scottish interviewees, the Scottish Government’s most recent Procurement Strategy makes no mention of keeping and managing procurement statistics for monitoring the developments in public sector organisations towards achieving more circular and sustainable procurement (Scottish Government, 2016e). After conducting online searches, it should be noted that no procurement statistics are easily or readily available, at the very least not with regards to matters such as monitoring sustainable or circular procurement tenders through the frequency in which such criteria are used.

In 2017 the Swedish Government proposed a new assignment for SNAPP to review, through a preparatory study, the country’s public procurement statistics. In addition, the study is to lay a foundation for a new law on procurement statistics which is the responsibility of SNAPP to monitor and review (Finansdepartementet, 2017; Regeringskansliet, 2018a; ‘Upphandlingsmyndigheten ska se över upphandlingsstatistik - JP Infonet’, 2018). The focus on procurement statistics is being driven by Ardalan Shekarabi, Swedish Minister for Public Administration, who has stated that *“Statistics are necessary to follow the development of public procurement and to monitor how the national procurement strategy is being applied. For example, it is about ensuring that environmental and social requirements are followed”*. (Regeringskansliet, 2018a).

In order to get a quantifiable assessment on the frequency CPP practices are applied, there is a need for improved statistics, and developing the right indicators to monitor the development over time. This aspect is lacking in both Sweden and Scotland. It is currently an even more laborious and difficult process to find CPP tenders, since they are not necessarily labelled like ‘circular criteria’ in tender documents, but rather the CE principles are highlighted in the requirements section of the tender, which may or may not be embedded as basic “must” demands, or sustainability criteria.

New EU procurement Directive rules

As presented in section 4.1.1., with the new procurement directive (Directive 2014/24/EU) new opportunities to procure in more sustainable, exploratory and innovative ways.

With low virgin material prices, conventional linear economy business models hold an advantage over businesses using secondary material for example, as it becomes difficult for businesses with CBMs to compete in a cost-effective way (provided that secondary recycled raw material is more expensive, which it can be). This can be very disadvantageous in public procurement where price still plays a determinant role. A significant opportunity provided through the new Directive rules includes the possibility to use life-cycle costing (LCC) as an evaluation/calculation method in order to derive the total cost of ownership (TCO) a product or service will have throughout its expected lifetime. It also allows for internalising the external costs associated with the, usually seen at the production phase. This means that using LCC in procurement can take into account the societal cost of the environmental impacts associated with the product, as well as the costs emerging from the use- and disposal phase.

Conventional procurement typically concerns itself with purchasing a product with the lowest cost or best price to quality ratio, it usually does not take into account other types of hidden costs such as use or disposal phase that are outside of the procurement scope. This means that even if a business with a linear business model can offer a product at a lower price, when the external costs are accounted for, the most cost-effective procurement alternative may in fact be the suppliers using recycled materials even though the price they offer is initially seemingly higher.

Sustainability tools (in Sweden and Scotland)

When engaging in ‘regulated procurement’ public procurers in Scotland are guided by the government to use sustainability tool on a risk and opportunity basis to set priorities to decide which product-categories are of critical importance and why. The tools require procurers to input procurement specific information based on their needs, which scores and evaluates risk and opportunity in different impact categories, including: climate change, materials, waste production, emissions, hazardous materials, biodiversity, water, employment (Scottish Government, 2015d, 2015c). Based on the results from the impact categories, the procurers know where to concentrate the sustainability or circular criteria.

It should be noted that the Scottish Government has provided various valuable tools to identify priority, opportunity and risk areas to engage with sustainability issues. While most tools are aimed more generally at sustainability, it is the lifecycle impact mapping tool that stands out in terms of how it can contribute to circular procurement. through the lifecycle approach it guides procurers to take circularity considerations along the product lifespan, including energy efficiency, management of delivery fleet, packaging, end-of-life management, and product life extension through repair, reuse and refurbishment/remanufacture (European Commission, 2017b; ICLEI - Local Governments for Sustainability, 2017; Scottish Government, 2015a; respondent 5)

In Sweden, SNAPP have developed product-group specific LCC tools and a general one, simplified enough that it only requires the procurers to input basic data related to their procurement needs. Tools that are easy to use are more likely to be used to a greater degree by procurers. Additionally, the agency has a sustainability criteria directory and criteria wizard for eight product areas with a high number of product-groups covering hundreds of products and services. In April 2018, the agency developed contract guidelines to include more circular demands in the procurement of computers and monitors, specifically relating to reuse and recycling of computers by including demands in the contract for suppliers to provide buy-resell and buy-take back schemes, or simply that they have a certified third party actor that can take over the circular aspects of the product at the end of life phase (‘Tjänster för återanvändning och återvinning av datorer och bildskärmar’, n.d.; Upphandlingsmyndigheten, 2018)

Lesson learnt:

- There are more stringent legal requirements that public procurers must follow in Scotland when conducting regulated procurement, compared to Sweden in which sustainability considerations are generally a voluntary measure.
- Monitoring of CPP is basically non-existent, both Scotland and Sweden seemingly do not have any systematic and effective monitoring framework to track progress in sustainable procurement
- The 2014 EU procurement Directive opens up increased possibilities for innovation and innovative solutions to procure with increased environmental or circular demands.

- The sustainability tools in Scotland and Sweden contain important elements in promoting CPP, notably through lifecycle impact tool (Scotland) and the lifecycle costing tool (Sweden), highlighting hotspots of environmental impact, and giving an overview on the total cost of ownership, respectively. These two tools provide a more holistic view, taking into account all life cycle stages of products, which is typically not done in conventional procurement

Market

Two main areas of market opportunities have been identified, to be discussed below. First, the possibilities and importance of maintaining a good market dialogue between procurers and suppliers. Second, the potential importance of framework contracts in providing a sufficiently large scale to achieve critical mass by bundling demand from an aggregate number of public entities.

Market dialogue

There is a strong consensus among all respondents on the importance of improved interaction and communication between public procurers and suppliers, done through an increased market dialogue (All respondents). Communication and collaboration between public sector organisations and suppliers provide clarity on the present and future market demand, from the procuring authorities side. From the suppliers' side they hold the expert market knowledge of what suppliers can and cannot offer, as they typically know the business models and the market in which they engage in better than the public procurers do. Thus, through improved market dialogue the procurement needs, and market solutions, can be better aligned with what are feasible requirements to put in procurement tenders to promote existing CBMs and the creation of new ones.

Respondent 4 considers that proper dialogue is missing today, especially with smaller procuring authorities, such as the average municipality. *“the possibility to talk with the market has always been there, it is just that in Sweden we have been extremely careful, so we have not dared to talk to the market...”* (respondent 4). In addition to the remark respondent 4 makes about the possibility to have a market dialogue prior to the new EU directive, respondent 2 agrees that in Sweden there has been a tendency of procurers not using more extensive market dialogues since it was previously not expressly legal, nor illegal, thus remaining in a grey zone, implying perceived risks from the procurers' side.

The market dialogue can also send clear market signals if the public procurer community makes clear what kind of demands and technical specifications they will be requiring in the future. For example, by setting 'must' demands, instead of 'shall', you ensure that all procurers must fulfil those basic criteria to be even taken into consideration in the procurement process, whereas 'shall' requirements are optional, and only get a limited influence through a weighting method (respondent 2). Thus, establishing CE principles clearly as “must” criteria would create a serious incentive for suppliers to adjust their business models to CBM so that they have a chance of winning the procurement bids.

There is no information on market dialogue practices in Scotland.

Framework contracts

A key function of the framework agreement is that it gives the go-ahead to public procurers with setting the, for example, circular requirements stipulated in the framework contract. It sends clear signals on what is okay to procure, and how, as they are already established when

government agencies procure through the framework contracts – which they legally have to in Sweden²⁹. Furthermore, using a framework contract reduces the administrative burden typically associated with public procurement, resulting in a smoother procurement process for the procuring authority (respondent 4). Respondent 2 discusses, given the reasons above, that there is an element of **safety** (primarily in legal terms) when procuring authorities procure through framework agreements, since it reduces the risk of appeal from the suppliers. In addition to reducing the risk on the side of the procurer, it arguably also reduces risk for suppliers by providing an increased market and regulatory certainty of what the public sector demands. Given the safety of it and the reduced administrative burden, framework agreements are generally an attractive route to go if there is one available for the necessary product-group or service.

As a result, framework contracts hold great potential as a tool for circular procurement, as they can include circular options (Midhamre, 2017). However, they can also equally limit the successful procurement of circular products and services (Neubauer et al., 2017) since framework contracts are so big in scale in terms of money/cost, time horizon, and consumers (i.e. public organisations) that it creates a lock-in in suppliers available for specific product-groups and services for a number of years (2-4 years typically, depending on organisation) (respondents 2 and 4). Framework contracts have to be broad enough to fit all the different needs and requirements of the large number of organisations that may be using them (voluntarily or mandatory) (respondent 4). Sweden has 345 government agencies, these are legally required to use the framework contracts for procuring goods and services, unless they can provide a justified reason to be exempted from this rule. This means that the potential uptake of CPP rests on how framework contracts are developed. Additionally, there are 290 municipalities (responsible for 70% of tenders) and 21 counties in Sweden that can use framework contracts developed by SKL Kommentus purchasing centre, although these are used on a voluntary basis and cannot be legally mandated to be used. Both the private sector and public sector respondents (Respondents 2, 4 and 6) confirm that there are currently no framework contracts in place in Sweden that focus more explicitly on circular economy principles/outcomes.

There is, seemingly, a relatively limited demand among procurers for CPP in Scotland, and consequently a limited number of suppliers providing circular products and services, this restricts the likelihood of implementing CE criteria in framework tenders, since it does not seem to be expressly demanded by procurers, or even used by procurers when they have been formulated. In Scotland a framework contract has been developed for information and communication technology (ICT) client devices (Scottish Government, 2016b), with mentoring from ZWS. The framework contract has a CE outcome focus on: packaging (production/transport phase) energy and environmental management (use-phase) and on end-of-life management (disposal phase). Despite the development of such a framework that clearly lays out that the market is capable of supplying CE solutions for this product-group, respondent 5 notes that “... *we have put criteria in around take-back and reuse, we have put in KPIs [key performance indicators] for purchase and buy-back... but people are not using them... what is tending to happen is a very linear approach where people are buying really good spec on low energy, they are following low energy criteria, but they are still replacing them on a refreshed cycle as they need to replace the operating systems to be upgraded... but certainly there is no loop there to link back to the suppliers.*”. This indicates that even establishing

²⁹ Unless they fulfil the requirements for exemptions as stipulated in the procurement law (Riksdagsförvaltningen, n.d.-e)

framework contracts with CE outcomes is not sufficient on its own, or a panacea in solving the uptake in CPP among public sector organisations.

Lessons learnt:

- The market dialogue is a communication channel that has been explicitly made more clear to be allowed in the new procurement directive, and is important for better aligning the market expectations in terms of customer demand and what suppliers can provide, or develop to supply.
- Framework contracts can be either a tool for achieving critical mass in the uptake of CPP or serving as a bottleneck by throttling the uptake of CPP as public entities procure through framework contracts that lack circular elements.

5.3 RQ 3: In what categories of products and services do we find a potential to scale up CPP activities?

This RQ receives a brief look at what categories of products and services can be found to have a potential in scaling up CPP activities in Scotland and Sweden. It includes a mapping of CPP cases in Sweden and Scotland, tabulated with regards to the type of circular business models/procurement approaches that have been applied. It is a general description and does not go into detail of the cases, it is instead meant to highlight the product groups and services that have been mentioned in case studies or caselets, by interviewees, and in news articles or bulletins.

Sweden

Table 5-1 presents the identified cases of CPP in Sweden and the relevant CE principles connected to the procurement and the CBMs. Respondent 2 states that there are different types of procurement approaches that have inadvertently had ties to CE principles, without the principal purpose being to procure with CE outcomes in mind. Such examples include leasing of cars and coffee machines by the state, which has been done for a very long time. Additionally, respondent 3 echoes that effect, discussing how E-education and the use of software suites as government agencies and municipalities become increasingly digitalised and reduce the need for alternative physical goods and offsets the need for transport, when digital education or meetings can take place for example. Midhamre (2017) presents the case of Cradle to Cradle (C2C) construction in Swedish municipality Ronneby, using it as a case showing how construction can be approached in a more circular manner through long-term partnerships and increased market dialogue, however it is still recognised to be a sector that is slow (and resistant) to change (Blismas & Wakefield, 2009; respondent 7)

Table 5-1 Identified cases of CPP in Sweden and the relevant CE principles

Type of circular business model /procurement approach	Description	Example of cases	Applied CE principle
Product Service System (PSS) (e.g. access and performance model)	<p>Providing a service, function or outcome to satisfy user needs without requiring ownership of physical products</p> <p>Can be done through: functional or performance-</p>	<ul style="list-style-type: none"> • Car sharing • Coffee machines • Lighting • Furniture* • IT products* <hr/> <ul style="list-style-type: none"> • E-education 	<ul style="list-style-type: none"> • Slowing material loop, by: <ul style="list-style-type: none"> ○ Maintenance ○ Repair ○ Reuse ○ Remanufacture <hr/> <ul style="list-style-type: none"> • Narrowing material loop, by:

	based procurement specifications in tenders.	<ul style="list-style-type: none"> • Software suites 	<ul style="list-style-type: none"> ○ Dematerialisation
Gap-exploiter model	Purchasing refurbished and/or remanufactured products. It can comprise a part of the buy-resell scheme.	<ul style="list-style-type: none"> • IT products (computers and monitors) • Furniture 	<ul style="list-style-type: none"> • Slowing material loop, by: <ul style="list-style-type: none"> ○ Reusing products through life-extension measures such as remanufacture/refurbish ○ Upcycling
Demand for 'Cradle to Cradle' design. Or use of secondary raw material products**	Purchasing products comprising demand on recycled material content for new products	<ul style="list-style-type: none"> • Construction 	<ul style="list-style-type: none"> • Closing material loop, by: <ul style="list-style-type: none"> ○ Recycling (e.g. excess construction material) ○ Design for disassembly for material recovery ○ Applying Cradle to Cradle (C2C) concept
Demand on resource efficient processes and outcomes**	Focus on procuring with demands on more resource efficient and environmentally processes and outcomes	<ul style="list-style-type: none"> • Construction • Food waste reduction 	<ul style="list-style-type: none"> • Narrowing material loop, by: <ul style="list-style-type: none"> ○ Improving material logistics → resulting in reduced transport emissions

Source: Elaborated by author based on respondents 1,2,3,4,6 and (Crafoord, 2017; Crafoord et al., 2018; Midhamre, 2017; Öhgren, 2017; Persson, 2018)

*Note: some products can, and have been, procured in more than one way. Primary examples include IT equipment and furniture.

**Note: these are not formal types of CBM or CPP approaches. Instead it has been developed by the author to complement the other models identified in the reviewed literature.

A report by Kammarkollegiet from September 2018 on circular furniture flows has investigated the interest of circular furniture procurement among Swedish government agencies (Ek & Björns, 2018). The report finds that 45% of respondents are interested in buying refurbished furniture, while 35% state that they are not interested. Furthermore, only 19% are interested in leasing furniture, with 50% stating that they are not interested in doing so.

With regards to the report on circular furniture flows in Sweden and the advancements made by SNAPP on circular criteria for computers and monitors (as seen in section 5.2.1), it is identified that the two most likely product group and service areas for CPP upscaling in Sweden can be found in furniture and IT products (starting with computers and monitors). Respondent 6 states that 95% of the computers they receive and refurbish get put back on market, with only a very small share of equipment that is non-functional goes to certified recycling parties.

The likelihood for the upscaling of these two product groups is also corroborated with the findings from Öhgren (2017) and Crafoord (2017), both emphasising how cost savings are an important driver for the uptake of procuring these products more circularly, as refurbished IT and furniture are noticeably cheaper than new products. However, the public sector does face some organisational obstacles before the uptake for these product groups increase, which can be seen in Öhgren (2017) and Crafoord (2017) in more detail.

Scotland

Table 5-2 presents the identified cases of CPP in Scotland and the relevant CE principles connected to the procurement and the CBMs. The table presents a limited picture of the circular

business models available and the progress in many sectors/industries in Scotland, as most case studies are company-oriented, instead of highlighting public procurement processes per se – which is what is tabulated below. The fact that there are various circular business models reported on highlights high circular activity in Scotland, it just appears to not have spilled over to any notable degree into public sector purchases thus far.

Table 5-2 Identified cases of CPP in Scotland, and the relevant CE principles

Type of circular business model / procurement approach	Description	Example of cases & product groups	Applied CE principle
Product Service System (PSS) (e.g. access and performance model)	<p>Providing a service, function or outcome to satisfy user needs without requiring ownership of physical products</p> <p>Can be done through: access or performance-based procurement specifications in tenders.</p>	<ul style="list-style-type: none"> • Car sharing • ICT client devices (framework contract) <hr/> <ul style="list-style-type: none"> • Web conferencing 	<ul style="list-style-type: none"> • Slowing material loop, (prolonged product life) by: <ul style="list-style-type: none"> ○ Maintenance ○ Repair ○ Reuse ○ Remanufacture <hr/> <ul style="list-style-type: none"> • Narrowing material loop: <ul style="list-style-type: none"> ○ Dematerialisation
Gap-exploiter model	Purchasing refurbished and/or remanufactured products. It can comprise a part of the buy-resell scheme.	<ul style="list-style-type: none"> • ICT client devices (framework contract) • Furniture (domestic) 	<ul style="list-style-type: none"> • Slowing material loop, by: <ul style="list-style-type: none"> ○ Reusing products through life-extension measures such as remanufacture/refurbish ○ Upcycling (upgrading by replacing old parts with better parts)
Demand on resource efficient processes and outcomes*	Focus on procuring with demands on more resource efficient and environmentally processes and outcomes	<ul style="list-style-type: none"> • Cleaning services • Street lighting (LEDs) 	<ul style="list-style-type: none"> • Narrowing material loop, by: <ul style="list-style-type: none"> ○ Minimisation of consumables ○ Contractor using ‘carbon management’ for consumables and other materials to and from site. ○ Energy and water management (demanded by procurer) ○ Using energy efficient products • Closing loop <ul style="list-style-type: none"> ○ Biodegradable materials ○ Products manufactured from recycled materials

Source: Elaborated by author based on respondents 5 and 7, and (Scottish Government, 2016b, 2017, 2017, 2014b)

For example, ZWS has engaged in research to develop a number of specifications to include CE outcomes, such as repair, reuse, refurbishment, remanufacture and leasing of product groups and services that the public sector procures. Product groups and services to focus on was prioritised according to the relative public sector expenditure, present and future markets availability, as well as the scope and suitability for development of circular products and services (Zero Waste Scotland, 2015).

The research developed guidance for 12 product groups and services (Sustainable Procurement Ltd., 2016).

- Electrical and electronic
- Furniture
- Construction
- Textiles
- Catering
- Cleaning
- Flooring
- Power and hand tools
- Vehicles and tyres
- Outdoor playground equipment
- Waste services
- Medical device

This indicates significant expert knowledge and know-how is present in organisations such as ZWS. Currently it appears the need is for such knowledge and know-how is to disseminate among public procurement sectors, as there is much guidance involved for a number of product groups and services, there is legal support and certain mandated action needed towards sustainability actions, and the policy landscape is very clear on the priorities for a CE transition. Despite this there is a meagre number of case studies focusing on CPP that can be found for Scotland. This may be identified as another barrier for CPP uptake, as there are few ‘good examples’ available which the public sector can take part of.

Respondent 5 discusses the low uptake of using the circular criteria developed in the most recent national framework for ICT client devices (as seen in section 5.2.3. on framework contracts), adding that *“I would say there is more that needs to be done to strengthen it [the use of circular criteria] and raise awareness of it, because I think people are not using that facility to close the loop. And the products are still leaking from the system, they are not going back to the manufacturers at all.”* and *“... Also because it is really difficult to send it back to the manufacturers, you need to have enough equipment, and in a lot of cases they won’t pick up IT equipment that is not theirs, of course. So there are a lot of challenges around actually organising a take-back scheme and making it work on a larger scale. So that is an area we are kind of looking at the moment, is how do we make it more circular, given that we have enabled the conditions through procurement, but it is still not happening.”* Furthermore, as already indicate in in RQ 1 and 2, domestic furniture has been focused on in Scotland, as a result from the ‘domestic furniture and furnishing framework’ developed by Scotland Excel, on behalf of local authorities (Scottish Government, 2017).

Despite the challenges ahead for Scotland, the product groups most likely to see an uptake in CPP would arguably be ICT and furniture, just like in Sweden. Especially with procurers’ pressure on ‘delivering value for money’ refurbished goods can deliver high quality items at much lower costs compared to new goods. Also, uptake of more CPP in the furniture product group is more likely because it is a proven concept, there are many ‘good examples’, internationally provided on the available product offers from suppliers in the refurbished furniture market, and case examples of successful circular procurement of furniture that have resulted in both economic and environmental savings. Furthermore, given that framework contracts have already been established for these product groups it means there are many opportunities to learn from experience, both positive and negative, to improve framework contracts and CPP practices in the future.

6 Discussion & Conclusion

Circular public procurement is an emerging niche area within sustainable/green public procurement, resulting in large parts from the increased traction the concept of circular economy, especially in the European Union. There is limited academic knowledge on CPP concerning how to best implement it and what main barriers and opportunities are associated with it. Furthermore, it is not always a clear-cut as to when circular solutions are the most environmentally and economically advantageous options, as covered in the literature review, and it is something that needs to be looked into in more detail.

The study at hand aimed at addressing some of the knowledge gaps in the research area of circular public procurement by focusing on mapping out the national landscape (policy and CPP practices), and the barriers and opportunities for achieving an increased uptake of circular public procurement. To achieve the aim the objectives for the thesis was to investigate what role circular public procurement can play in the transition to a circular economy and identify how Scotland and Sweden are currently working with circular public procurement. Three research questions were developed to manage this:

1. *What role can circular public procurement play in realising a transition to a circular economy?*
2. *How is the landscape for circular public procurement developing in Scotland and Sweden, and what barriers and opportunities can be identified?*
3. *In what categories of products and services do we find a potential to scale up CPP activities?*

RQ 1 – It was identified that CPP can play an important role for the CE transition in various ways. First, it is a potent policy instrument among a larger policy mix that can work with synergistic effects, leveraging effects (alongside other more ‘target specific’ policy designs) on the main stages of products’ life cycle stages; the production phase, use/consumption phase, and end-of-life/disposal phase. Second, given the significant purchasing power of the public sector, it has the power to kick-start markets for CBMs, and – if aligned properly with strategies – can overcome market fragmentation by sending clear market signals to market actors. Third, it is one of few policy instruments that, through its demand, creates a market pull and incentivises suppliers to provide products and services with overall better impact on the society.

RQ 2 – CPP is arguably currently being underutilized, although this is also coupled with the fact that many CBMs are still in the experimental and growing phase, and that public procurers are not yet very experienced with circular procurement, and in many cases are hesitant to procure more circularly due to risks associated with cost and legal uncertainties. The main CPP barriers and opportunities are summarised in figures 6-1 and 6-2, respectively. In short, a large number of barriers and opportunities were identified pertaining to organisational, regulatory and market factors. Procurers face numerous pressures relating to cost (delivering value for money), the time and effort they can afford, and fear over legal disputes especially when procuring in new and ways where there is a lack of clarity in the legislation and practice. Regulatory and policy factors also have been identified as comprising obstructing laws and regulations, such as waste regulations and definitions of waste which has consequence for how by-products are managed, and such as the chemical tax in Sweden which is perceived to penalise, for example ICT refurbishers that import old products to improve and put them back on market. Furthermore, while there is interest from the private sector, there are market barriers businesses are facing in terms of securing investments to expand their CBMs, without which they cannot provide circular solutions to the public sector, among others.

A number of CPP opportunities have also been identified. Respondents have emphasised the need for training procurers in what the CE concept is and how to procure circularly, and to

know when it is suitable to do so. Furthermore, good examples have been mentioned as one of the most critical factors for success in the uptake of CPP as good examples give guidance on procurement practices that have been successful, giving procurers more confidence to try to procure by demanding new solutions. In addition, there are future opportunities for streamlining CPP through establishing CE strategies and legislation and setting national targets for CPP, coupled with monitoring frameworks that can track the progress and produce statistics to address issues that may arise down the line. Almost all respondents mentioned the need for improved market dialogue and communication between the public sector and suppliers to better align demand and supply, and for the public sector to announce their needs one or two years in advance so that the market can adapt and change to provide solutions to those needs.

Scotland and Sweden are generally facing similar barriers and opportunities, though it should be mentioned that Scotland is forging ahead of Sweden in terms of having an official circular economy strategy and statutory requirement on sustainable procurement considerations, whereas Sweden is lacking a CE strategy and its sustainable procurement practices are voluntary.

Circular public procurement barriers		
Organisational	Regulatory/policy	Market
<ul style="list-style-type: none"> • Cost (real and perceived) • Time/effort • Lack of awareness • Risk – legal and economic (real and perceived) • Inadequate human capital – in numbers and competencies • Attitudes towards refurbished products 	<ul style="list-style-type: none"> • Lacking CE legislation • Obstructing laws and regulations • Lacking CE action plan (Sweden) • Lacking mandatory incorporation of sustainability considerations in PP (Sweden) 	<ul style="list-style-type: none"> • High upfront investment costs • Financial obstacles → Limited funding for CBMs • Lack of clear market signals from the public sector → risk and uncertainty for suppliers • Time lag for the market to adjust

Figure 6-1 Summary of circular public procurement barriers

Source: Elaborated by author

Circular public procurement opportunities		
Organisational	Regulatory/Policy	Market
<ul style="list-style-type: none"> • Training for CPP • Collaboration and exchange of knowledge & best-practice • Communicating good examples • Functional procurement → procuring performance/function instead of product • Developing standards • Increase use of sustainability tool • Develop circular criteria for all product life cycle stages (production, use/consumption, disposal) 	<ul style="list-style-type: none"> • Implementing CE legislation • Set clearer market direction through legislation (e.g. mandatory Ecodesign or C2C design) • Monitoring framework • Exploit opportunities given for CPP in the PP Directive (MEAT tendering, LCC and TCO, market dialogue) 	<ul style="list-style-type: none"> • Improved market dialogue for communicating future needs and aligning demand & supply → market needs time to change and adapt • Use framework contracts to scale up CPP and scale up suppliers CBMs • CBMs business support and explorations with third party organisations

Figure 6-2 Summary of circular public procurement opportunities

Source: Elaborated by author

RQ 3 – It has been highlighted that the most likely products and services that have a potential to scale up CPP activities are ICT equipment and furniture, in both Scotland and Sweden. In Scotland framework contracts have already been developed for circular considerations in ICT equipment and refurbished domestic furniture. In Sweden there are not yet any framework contracts, although SNAPP has developed circular criteria for computers and monitors, and Kammarkollegiet has conducted a pilot on the possibility (and the interest in) for government agencies to procure refurbished office furniture and lease office furniture. While there are other product groups and areas that also have some advancements and potential they have not been identified to be as likely to break through with a high CPP uptake in the short-term. ICT and furniture are both proven concepts that work as a CBM for suppliers and that provides high quality goods for a significantly lower price to customers. The only identified issue here is lack of a supplier presence in Scotland that manages refurbished office furniture, though if demand is signalled clearly the market can be assumed to react in order to cover that demand.

The thesis was able to underline that even front-runner countries in CE and public procurement have a long way to go and many hurdles to overcome before the uptake of CPP becomes likely. The research has been able to provide insight into some of the differences and similarities in the case contexts of Sweden and Scotland.

The most notable difference being that Scotland appears much farther ahead when it comes to formulating a CE strategy and other supporting action plans and strategies and embedding the discourse on future actions around it, including the need to procure more circularly. Despite this there is seemingly a low exposure of CPP action, which would indicate either that there is a low level of CPP going on, or that the CPP practices occurring are not highlighted and receiving exposure. Meanwhile, the opposite development can be observed for Sweden, where strategy is lacking in Sweden, and an overall coherent policy approach to supporting CPP is missing. Despite this lack of coherence, Sweden appears to be very much action oriented, particularly observable at the municipal and county level, with many more cases of CPP easily found online or through other research papers. Thus, the general level of recommendation for Scotland is to increase the uptake of CPP and take effort towards greater exposure for such activities (a monitoring framework would help with this), and in doing so providing other procurers with ‘good examples’. Sweden while forging ahead with CPP actions still holds more potential for greater uptake in the future, but to do so procurers need to be less fearful of the risks concerning legal disputes, which can be achieved through clearer direction from the relevant procurement agencies (to guide better practices), and a coherent CE strategy aligning CPP with present environmental, social and economic goals.

Future venues for research could be done on:

- Quantitative studies looking at the uptake of CPP in specific product groups
- Research on the *effect* of circular procurement for product groups and services, distinguishing environmental benefits between CPP and ‘regular’ SPP
- Merge supply chain management and business model literature with CPP, to see what kind of concrete (circular) effects can be observed farther back in the supply chain

Moving forward there is a need for:

- *Public procurement agencies* to develop a monitoring framework, indicators for measuring CPP uptake and use statistics to guide future progress; and to establish framework contracts encouraging procurement with circular solutions.
- *Public procurers* to increase engagement in market dialogue with suppliers; receive proper training for practicing CPP; and dare to procure more circularly despite risk, as it can lead to setting legal precedent and guiding practice in the future

- *Suppliers* that engage in CBMs to create a database network which procurers can easily find and go through as a reference of what kind of circular solutions are readily available on the market.

Critical reflection

The discourse on CE and CPP is very often on a general and abstract level with regards to the environmental and climate impact benefits. LCA has proven to be a critical tool in order to understand where the hotspots are in terms of environmental impact on products' life stages, so that policy designs, including procurement, can be designed accordingly to target the most pressing effects. The need for a scientific basis, gained through LCA, cannot be emphasised enough, as it guides the best in whether it is a better approach to extend the lifetime of a product (if production phase is the high impact stage) or if it should be replaced by newer products that are more efficient in the use phase. Furthermore, for achieving a long-term uptake of CPP as part of a society transition to a circular economy system one will certainly need to be aware of the old management adage "if you can't measure it you can't improve it". There needs to be benchmarking and a systematic approach to developing and monitoring indicators if we are to truly know whether we are transitioning towards a circular economy, and the same goes for CPP. Finally, this opportunity also extends to the usefulness of providing early intervention if CPP uptake is not developing as desired.

It is important to remember, as it was identified in the literature review, that circular procurement is not a one-size-fits-all. Given the disparate products and services that can be procured, maybe a fully focused circular approach is not always necessary or desirable. Instead using a life cycle assessment (LCA) and impact mapping can be sufficient in identifying hotspots of environmental impacts, which can warrant other types of relevant requirement specifications, some of which can include CE criteria. More research will be needed in the future to identify what kind of product groups and areas are more fitting to promote and pursue in CPP practices.

Final reflections on the research experience and topic

It is a challenge conducting an exploratory study without the guidance or limitation of a theoretical framework to keep data collection and analysis more in check. Particularly when dealing with two, on their own, large and broad topics such as circular economy and public procurement, both research areas that contain a wide variety of stakeholders in society and can be focused from innovation, sustainability, business model, organisational, or law and many other perspectives. This exploratory research experience has been closer to what Yin (2014) said about exploratory study, that it is not recommended for a student thesis, rather than what Verschuuren et al. (2010) recommended. Though it is mostly about setting a manageable scope and boundary for the thesis.

Issues of generalisability and reliability have already been discussed in the methodology and methods chapter. However, it is worth reiterating that due to the lack of interviewee data from Scotland the thesis resulted in an unbalanced analysis and assessment of the situation in Scotland and Sweden, despite complementing this 'interviewee deficiency' by consulting more official documents from the Scottish Government and using proxy papers to corroborate own findings. Given the relatively low number of interviews in both case contexts one cannot argue that this paper has reached assertive and generalisable conclusions. Instead, this thesis means to give certain insights and lay the groundwork for future research that can render a greater degree of generalisability.

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Appendix A – Indicators monitoring CE progress in the EU

The monitoring framework on CE set up by the European Commission consists of 10 indicators in four category areas; production and consumption; waste management, secondary raw materials; competitiveness and innovation. These are seen in figure A-0-1

Green public procurement is found as an indicator in the ‘production and consumption’ category. The green public procurement indicator measures the share of public procurement procedures occurring at above EU threshold level, which include environmental elements.

The way the green public procurement indicator is used as an indicator for CE is in a very oversimplified manner. While the recognition that circular aspects such as requirements on reparability, durability, recyclability etc. are already a part of green public procurement and increasingly emphasised, it may be quite a stretch to use GPP as an overall indicator for a CE transition (‘Monitoring framework - Eurostat’, n.d.). Instead a refined and systematic approach would be needed to better track how CE principles are applied as requirements or criteria in procurement contracts at EU and national threshold levels.

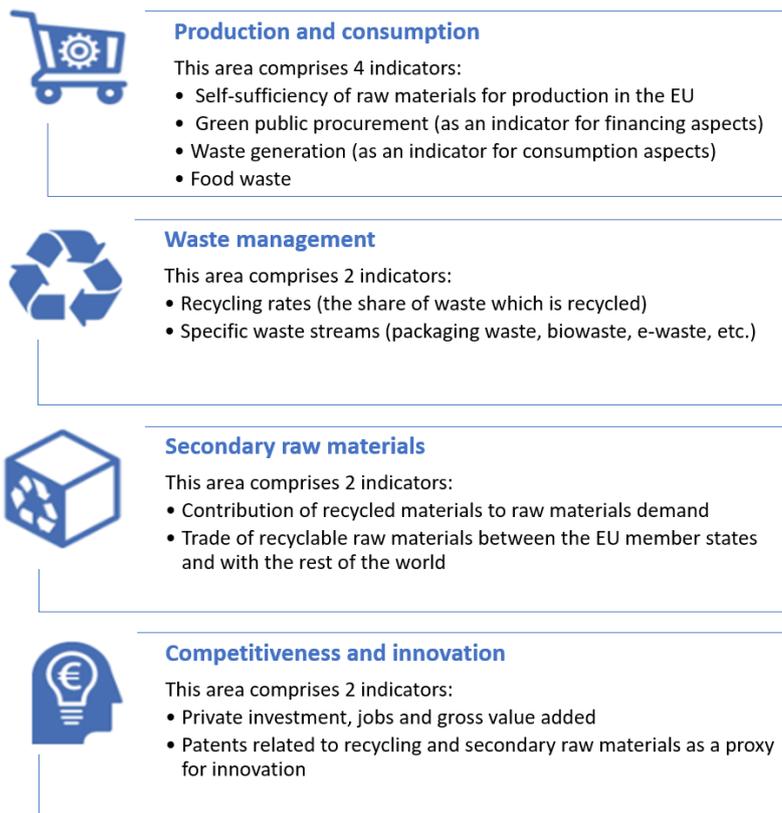


Figure A-0-1 Indicators used by the European Commission to monitor the progress towards a circular economy

Source: Elaborated by author, based on (‘Indicators - Eurostat’, n.d.)

Appendix B – Stages of the public procurement process

Witjes and Lozano (2016) present the typical procurement process as consisting of four stages (figure B-1):

- 1) Preparatory stage;
 - a. Beginning with presenting a problem definition and an inventory made of the demands related to external and internal stakeholders, a first set of specifications are made. The set of specifications are integrated into the first concepts of a product or service that will be procured
- 2) Specification stage;
 - a. The first concepts are further analysed and developed, leading to finalised specifications of the product or service
- 3) Sourcing stage;
 - a. Known as the ‘tender process’, where the product or service specifications are made publicly available to potential suppliers. This is also where the selection of the supplier is made after an assessment of all the submitted bids, and a contract is made with the winning bidder, signing the contract and thus ending the tender process.
- 4) Utilisation stage;
 - a. Where the supplier supplies the product or service agreed upon in the contract.

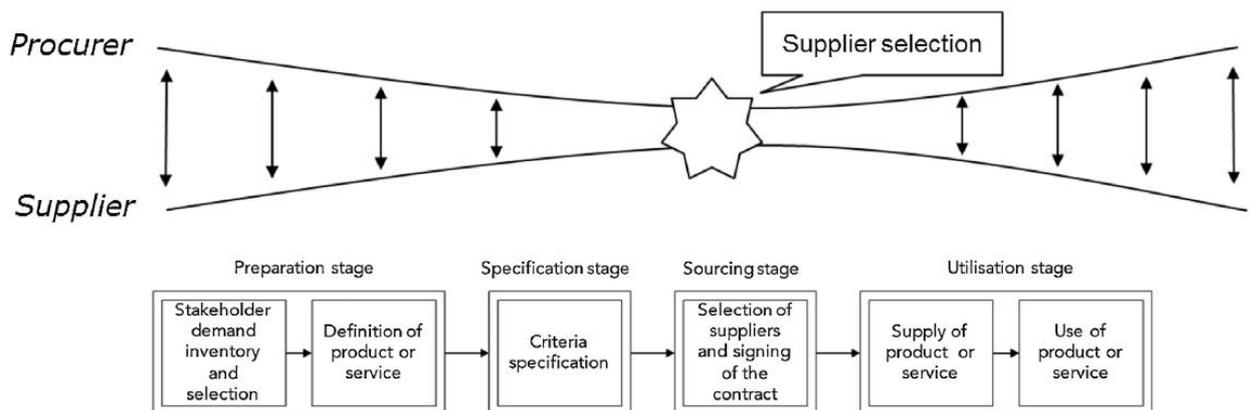


Figure B-1 Schematic of the typical procurement process, from preparatory stage to utilisation stage.

Source: (Witjes & Lozano, 2016)

Appendix C – EU GPP criteria linking to CE

In their report Neubauer et al., (2017) identify 216 GPP criteria, amongst the 21 product-groups reviewed, that are linked (to different degrees in circularity) to the EU CE action plan COM(2015) 614 final (European Commission, 2015b). 19 of the 21 product-groups have link to CE aspects. A considerable number of criteria (160) are linked to address procurement of a product, service or work, while a significantly smaller number can be identified for the remaining life cycle stages. 13 criteria address the contractor (this can include requirement of management systems, such as EMAS or ISO 14001), 15 criteria address the use stage, and 28 criteria address the end of life stage. Criteria on chemical content and design for longevity and recycling (and use of recycled content) are the most frequently used criteria across the product groups with regards to the ‘production stage’.

Table C-0-1 Overview of the number of GPP criteria with a link to CE (at product-group and aggregate level)

Product group	Con-tractor	Products, Services, Works						Use Stage	End-of-life Stage
		Chemical content	Recycled content	Designed for recycling	Designed for Longevity	Other criteria	Packaging		
Copying paper (2)		2	1						
Food (2)			1			1	2		1
Furniture		4	2	1	1		3		
CHP									
Wall panels (2)		7	4			5			2
Cleaning (7)		28				1	11		
Electricity									
Gardening (6)	1	6	5	1		3	2		3
Indoor lighting		1			2	1	1		1
Street lighting (2)		1			2	1	2		1
Textiles (2)	2	3	2		3			1	2
Transport (5)			10					2	3
Sanitary Tapware					3			2	
Toilets (2)						1		2	
Waste water	3	2	1			2			
Health care	1				1	2		1	
Imaging equipment						4		2	
Heaters	1			1		1		2	
Buildings	1	1	2			1			7
Roads	2		3		1				4
Computers	2	3		4	7			3	4
SUM	13	58	31	7	20	23	21	15	28

Source: Taken from (Neubauer et al., 2017, p. 32)

Appendix D – Request for interview letter

Both a Swedish and English version of the request for interview letter, with the same content. More actor-specific information was written in the email messages to avoid being too generic in the approach.

Subject: Invitation to participate in a master's thesis project on an exploratory and comparative case study on circular public procurement (CPP).

To whom it may concern:

My name is Diego and I am a master student of the Environmental Management and Policy Programme at the International Institute for Industrial Environmental Economics (IIIIEE) at Lund University, Sweden. The purpose of this letter is to request your participation in a thesis project that explores and maps circular public procurement processes from the public- and -private side. Two country contexts are explored: Scotland and Sweden.

As you may already be aware, the circular economy has in recent years become a popular topic both in academia and industry, given its potential to transition to a more sustainable society. Likewise, in public procurement - an already established field – there has been an increasing interest from political actors, researchers and businesses on the growth of circularity demand criteria in the public procurement process, and the potential this holds for a transition to a more sustainable and circular society.

It would be valuable to interview XX, for X and X reasons.

By means of this case study approach, my thesis project aims at achieving the following objectives:

1. Identify what role demand-driven CPP can play in realising the transition to a circular economy
2. Explore and compare the regulatory context and policy instruments relevant for facilitating CPP
3. Explore and compare what market, organisational and regulatory factors that serve as drivers and barriers in increasing CPP in each country
4. Outline areas where there is a large potential for future CPP efforts

Your input would be valuable in achieving these objectives by giving insights into identifying what the primary drivers and barriers are, in what context (specifically policy landscape) it is occurring, and where the future potential of CPP lies. As such, I kindly invite you to participate in an interview, which is expected to take no more than 45-60 minutes at its most.

The interview period is scheduled to take place from **6 to 25 August 2018**. I am based in Sweden and would appreciate an interview through Skype or any other preferred communication tool. If you are willing to participate, please suggest possible days and times in that period.

If you have any questions, please do not hesitate to contact me. Thank you very much and I look forward to an opportunity to speak with you.

Yours sincerely,

Diego Cattolica

Diego Cattolica, MSc Student
Mobile: +XX XX XXX XX XX
Email: XXXX.XXX@gmail.
Skype: XX.XX

Appendix E – List of interviewees

Table A-E-1

Organisation & country	Name & role	Respondent code	Date	Interview type	Sampling method
IKEA Business Sweden (Sweden)	Fredrik Kristiansson, country leader & public bid manager	1	25 June 2018	Face-to-face	Snowball
Kammarkollegiet, Statens Inköpscentral (Sweden)	Niklas Björns, Procurement officer	2	12 July 2018	Skype	Purposive /Snowball
Helsingborgs Kommun (Sweden)	Christina Zoric Persson, strategic regional planner	3	13 July 2018	Face-to-face	Snowball
Sveriges Kommuner och Landsting Kommentus (Sweden)	Peter Nohrstedt, Sustainability manager	4	8 August 2018	Skype	Snowball
Zero Waste Scotland (Scotland)	Claire Guerin, Sector manager – sustainable procurement	5	9 August 2018	Skype	Purposive
Inrego (Sweden)	Ulf Berglund, business manager – purchase and service sales	6	14 August 2018	Telephone	Snowball
Zero Waste Scotland (Scotland)	Peter McCafferty CE Business Support Framework Manager	7	17 August 2018	Telephone	Snowball
Upphandlingsmyndigheten (Sweden)	Heini-Marja Suvilehto & Joakim Thornéus. Segment manager of the customer unit & sustainability specialist, respectively.	8	29 August 2018	Skype	Snowball

Additional personal communication

Peter Abrahamsson Lindeblad, IKEA. Informal meeting, 2018-06-12.

Appendix F – Interview guide, public sector representatives (in Swedish)

Below follows an excerpt of a generic interview guide developed for the public sector organisation representatives, written in Swedish. A similar version was developed in English as well for the Scottish respondents. Each interview guide had country-specific questions developed as well.

The general interview structure was based on the funnel perspective, starting with broad and undefined questions, moving on to more specific and detail-oriented questions, and finishing with potentially tougher/critical questions (if warranted) in the end after rapport is established.

Note, below only highlights a selection of potential questions asked, more were developed depending on the information needed and the expertise knowledge of the respondent. The interview guide questions also developed continuously as more interview data was gathered and questions were readjusted and refocused. Each interview typically comprised around 15 main questions, some more and some less, depending on the time available and the respondent.

Introduktion

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Har du några frågor?

Del 1 – uppvärmning & generell information

- Hur länge har du jobbat på XX, och kan du berätta vad du har för arbetsroll?
- Jag fokuserar ju i mitt arbete på hållbar och cirkulär upphandling. Vilken roll tror du att dessa har för samhället?
 - Hur viktig tror du att upphandling är för omställningen till en cirkulär ekonomi?
- Vilken roll tror du XX har för omställningen till en hållbar och cirkulär ekonomi?

- Kan du berätta lite om hur XX jobbar med hållbar och cirkulär upphandling?
 - När började ni?
 - Hur ofta har ni gjort det?
 - Inom vilka produktgrupper?
 - Vilka utmaningar har ni stått inför?
- Vilken typ av kompetens tror du krävs för att göra en bra hållbar eller cirkulär upphandling?

Del 2 – huvudfrågor

1. Hur viktigt tror du offentlig upphandling är som styrmedel för att sporra innovation, hållbarhet, och cirkulära lösningar?
 - a. Vilka begränsningar tror du offentlig upphandling har för att uppnå ett cirkulärt samhälle?
2. Ser du någon relation mellan innovations- hållbar- och cirkulär upphandling?
3. Vilka möjligheter för cirkuläritet har öppnats upp inom offentlig upphandling?
4. Tror du cirkulär upphandling börjar bli vanligare?
 - a. Om ja: vad ser du som anledningar till varför cirkulär upphandling börjar bli alltmer populärt eller efterfrågat?
5. Tror du marknaden ställer om inför sådan här cirkulär efterfrågan?

Hållbarhet (social, ekonomisk, miljö)

6. Finns det alltid en miljövinna i att ha cirkulära krav tror du?
7. Man verkar vilja bidra med väldigt mycket genom upphandling: innovation, hållbarhet, cirkuläritet, jobb, osv. Kan det finnas för stora förväntningar på upphandling?

Kommunikation & marknadsdialog

8. Med nya regler i EU direktiven om offentlig upphandling så har man möjliggjort att man till större utsträckning kan rådfråga marknaden innan upphandlingen börjar. Hur tror du detta påverkar hållbar och cirkulär upphandling?
 - a. Hur såg det ut i Sverige/Scotland innan det nya EU direktivet trädde i kraft nationellt?
9. Hur viktigt anser du att en marknadsdialog är vid upphandling med cirkulära krav?
10. Hur sker er dialog med leverantörer?
 - b. Har du någon erfarenhet, genom interaktion, från leverantörssidan hur man ser på cirkulära krav i upphandling?

Barriärer

11. Vilka hinder ser du kan finnas för en ökning i cirkulär upphandling?
12. Vilka utmaningar tror du finns på landsting- och kommunnivå för cirkulär upphandling?
 - a. Exempelvis: organisatoriska, ekonomiska, etc.
13. Vilka utmaningar kan finnas för att inkludera cirkuläritet i ramavtal?
14. Finns det regelverk som försvårar upptaget av upphandling med cirkulära krav?

Potentiell upptagning av cirkulär upphandling och framtidssyn

15. Vilka produkt- eller servicegrupper tror du det är enklast att applicera cirkulära krav på?
 - a. Och vilka grupper verkar det svårt att applicera cirkulära krav på?
16. Var ser du potential för att skala upp cirkulära krav (i relation till nya ramavtal)?
17. Hur troligt tror du det är för en stor uppskalning
 - a. Inom vilken tidsram?
18. Tror du att det finns behov av ökad cirkuläritet i upphandling?
19. Finns det tillräckligt många leverantörer som kan erbjuda cirkulära lösningar som efterfrågas?
20. Vilken typ av support finns tillgänglig i Sverige/Scotland för att engagera sig i hållbar och cirkulär upphandling?
 - b. Exempelvis, nationella guider och riktlinjer, check-lists, osv.

Policy/regelverk

21. Finns det policyinstrument eller regelverk som förenklar cirkulär upphandling?
22. Har de uppdaterade offentliga upphandlingsdirektiven på EU nivå som trädde i kraft i 2016 haft någon påverkan på eran upphandlingsverksamhet?
 - a. Har det förenklats eller försvårat ert arbete?

Appendix G – Interview guide, business representatives

Below follows an excerpt of a generic interview guide developed for the business representatives, written in Swedish. Only a Swedish version was developed due to the lack of respondents from businesses in Scotland.

The general interview structure was based on the funnel perspective, starting with broad and undefined questions, moving on to more specific and detail-oriented questions, and finishing with potentially tougher/critical questions (if warranted) in the end after rapport is established, and also opening up for more general speculation.

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 - Hur viktig tror du att upphandling är för omställningen till en cirkulär ekonomi?
- Vilken roll tror du XX har för omställningen till en hållbar och cirkulär ekonomi?

- Hur ser XXs kundsegment ut, var säljer ni mest?
 - Är det offentlig eller privat sektor?

Del 2 – huvudfrågor

XX affärsmodell och marknad

1. Kan du prata lite om XX affärsmodell?
 - a. Vilka cirkulära aspekter appliceras?
 - b. Finns det någon prioriteringsordning gällande återbruk, reparation etc. av produkt?
 - c. Vilka XX-produkter täcker XX?
2. Varför har man valt att driva en affärsmodell baserad på återbruk av material och rekonditionering av XX-produkter?
3. Hur stor eller viktig är offentlig sektor som en marknad för XX?
 - a. Har ni märkt av ökat intresse de senaste åren? (fråga för att se trend)
4. Vilka risker och möjligheter upplever XX som är baserad på en cirkulär affärsmodell?
 - a. Vilka utmaningar?

Cirkulär upphandling

5. Vissa kommuner har börjat köpa in XX-lösningar baserade på XX produkter
 - a. Tror ni detta kommer bli vanligare i framtiden?
 - b. Hur tror du det kommer påverka er affärsmodell och erbjudande i framtiden?
6. Erbjuder ni leasing av produkter, eller säljer ni enbart dessa?
 - a. Skulle ni tänka er utöka er affärsmodell om det efterfrågas?
7. Vilka miljö- och sociala krav brukar kommuner ställa idag vid upphandling av XX-produkter?
8. Har ni utvecklat någon tjänst eller annorlunda produkt efter dialog/samråd med någon offentlig kund?
 - a. Hur gick den processen till?

Marknadsdialog

9. För ni någon dialog med relevanta myndigheter, så som Upphandlingsmyndigheten eller Kammarkollegiets inköpscentral?
10. Har ni någon marknadsdialog med offentlig sektor?
 - a. På vilken nivå brukar det ske? (exempelvis, kommun eller landstingsnivå?)

Drivkrafter och barriärer

11. Finns det några särskilda Svenska/Europeiska lagar som hjälper eller stjälper XXs [företag] affärsmodell? (kolla på regelverkskontext/faktorer)

12. Finns det någon specifik offentlig upphandlingspraxis gällande köp av rekonditionerade XX-produkter?
13. Vilka marknadsfaktorer kan vara drivkrafter för att öka XXs [företag] verksamhet?
 - a. Hur har XX ökat/växt de senaste 10 åren?
14. Vilka marknadsfaktorer tror du kan vara barriärer för XX verksamhet?
15. Just en barriär för upphandling av återanvänd utrustning så som laptops anges ett problem vara att produkten inte är kompatibel med senaste operativsystem, stämmer detta?
 - a. I en studie nämns det till exempel att IT-avdelning behöver ha det senaste.

Framtiden

16. Finns det andra XX-produkter ni skulle vilja genom cirkulära affärsmodeller?