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How can circularity indicators in public procurement lead to smarter, more informed decisions? The case of Bodø Municipality

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I. Sammendrag

Norges offentlige innkjøp, verdt rundt 650 milliarder norske kroner årlig, har betydelig potensial til å påvirke miljøfaktorer, spesielt i å redusere forbruket. Den gjennomsnittlige innbyggeren i norske kommuner genererer ca. 726 kilo avfall per år. Den sirkulære økonomien kan bidra til å oppnå miljømål ved å oppmuntre kommuner og samfunnet til å endre sine forbruksmønstre med forskjellige forpliktelser. Noen organisasjoner sliter med å innovere og implementere nye ideer på grunn av motvilje mot endring eller manglende erfaring. Denne studien tar sikte på å undersøke innkjøpspraksis i Bodø kommune for å identifisere indikatorer som kan lette smartere og mer informerte beslutninger for sirkulære offentlige anskaffelser.

Studien konkluderer med at vedtaket av sirkulære offentlige anskaffelser er en gradvis prosess og at effektive resultater kan oppnås gjennom samarbeid og felles innsats, muligens, men ikke begrenset til markedsdialog. Dette er fordi innkjøp ikke er en isolert aktivitet og involverer flere faktorer og interessenter. Organisasjonen trenger klare og robuste strategier og mål som gjør det mulig å oppnå de ønskede resultatene. I denne bestemte kommunen virker prinsippene for sirkulær økonomi enklere å gjennomføre i tildelingskriteriene og kravspesifikasjoner seksjoner av konkurransegrunnlaget for produkt-relaterte kategorier, mens innkjøpere sliter mer med å implementere det i tjenester som kategori, og kvalifikasjonskriterier fra konkurransegrunnlaget.

II. Preface

This thesis is the result of two vivid, icy, windy, challenging, but fun experiences from a Mexican student who came to the north part of the polar circle to take his Master degree in Global Management at Nord University and ended up in South Africa, Israel, and different cities of Norway, which increased his interest and trust in a better future where there is room for all without leaving nature out, especially in urban settlements.

Choosing this topic was the result of an exciting internship in Bodø Municipality, where I learned about public procurement, and its potential for positive value creation. Although it is easier to say it than do it, we have the urge to start somewhere. And considering public institutions as a driver of change to generate wellbeing and improve life conditions with innovative solutions got me thrilled.

I am deeply grateful to all those who stood by me and who have supported me throughout this journey: Truls Didriksen, Evgenii Aleksandrov, Elena Dybtsyna, the committee of the Edusmart Project, and my sage colleagues from Bodø municipality, especially John-Christian Lervik and Tor Gausemel Kristensen, who have believed and encouraged me since the very first moment we met.

The greatest recognition goes to Hareem Arshad, my compass, who helped me keep my north without losing track through her feedback and fast reply at any moment.

Finally, express my gratitude to my grandparents, parents, brothers, and sister, as their presence in my life has been a constant source of inspiration, even from afar. Their unwavering commitment to instilling resilience and values in me has shaped me into the person I am today - one who is endlessly curious and always seeking to learn something new.

Bodø, May 2023.

Christian Miguel JURADO MEZA

III. Abstract

Norway's public procurement, valued at around 650 billion Norwegian crowns annually, has significant potential to influence environmental factors, specifically in reducing consumption. The average citizen in Norwegian municipalities generates approximately 726 kilograms of waste per year. Circular economy may assist in achieving environmental goals by encouraging municipalities and society to alter their consumption patterns with different commitments. Some organizations struggle to innovate and implement new ideas due to a reluctance towards change or inexperience. This study seeks to examine the procurement practices of Bodø Municipality to identify indicators that can facilitate smarter and more informed decisions for Circular Public Procurement.

The study concludes that the adoption of CPP is a gradual process and that effective results can be achieved through cooperation and joint efforts, particularly but not limited to market dialogue. This is because procurement is not an isolated activity and involves multiple factors and stakeholders. The organization requires clear and robust strategies and goals that allow it to reach the desired outcomes. Additionally, it indicates that in this particular municipality, the implementation of circular economy principles appears to be easier to carry out in the award criteria and criteria specifications sections of the tender basis for product-related categories, while procurers struggle more to implement it in service-related categories and qualification criteria.

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BREEAM Building Research Establishment Environmental Assessment Methodology.

CA Competition announcements

CE Circular Economy

CPP Circular Procurement

DFØ The Norwegian Agency for Public and Financial Management

DOFFIN Public Procurement Database (Database for offentlige innkjøp)

EC European Commission

EMS Environmental Management System

EPD Environmental Product Declaration

EU European Union

ICT Information and communication technology

ILO The International Labour Organization

LUP Supplier development program (Leverandørutviklingsprogrammet)

MD Market Dialogue

NVE The Norwegian Water Resources and Energy Directorate (Noregs vassdrags- og energidirektorat)

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals

SDG Sustainable Development Goal

SIIN Municipality procurement collaboration (Samordna innkjøp i Nordland)

TED Tenders Electronic Daily

TEK 17 Building Technical Regulations of 2017(Byggteknisk forskrift 2017)

1. Motivation for the research

During my third semester of studies, I did an internship at Bodø Municipality's Public Procurement Department. My assignments encompassed being a part of discussions related to increasing sustainability levels to meet regional, national, and local objectives with strategical public procurement. The aim was to improve and maintain the living conditions of residents of this resilient community in the high north while increasing ambition in sustainable practices.

Public procurement is a complex process that involves the formulation of new factors, characteristics, and criteria to obtain optimal products and services. Employees engaged in such tasks undergo a constant learning curve, adapting to ambiguity, prioritizing decisions, and analyzing potential outcomes and scenarios on a case-by-case basis. The task is confusing and demanding.

Data accumulates continuously over time. The statement "information is power" is a commonly held belief among individuals. This study aims to assess the effectiveness of utilizing information as a means to enhance decision-making. But it does not stop there. In public procurement decisions, many factors are considered, including: do we have the capital to invest in a certain product or service? Are there people with the competence to use a new product or service (ex., new software)? Is this product or service available in the region where I am located? Among other questions that need to be answered. Therefore, those informed decisions have to be possible, achievable, and available.

Circular procurement processes add complexity. But human consumption keeps rising, and we need to solve today's problems to reduce our negative effects and prosper as a civilization with nature because we live in it and are part of it. Circularity can help us avoid nature's devastation by incorporating it into our daily routines and mitigating resource abuse.

I've been taught to think critically and lead by example during my master's degree, but how can we lead the unknown or abstract? Thus, I must analyze qualitative data from competition announcements and market dialogue to discover how Bodø Municipality navigates circularity.

1.1 Research question

The research question of this study is:

How can circularity indicators in public procurement lead to smarter, more informed decisions? The case of Bodø Municipality

The aim of the study is to see how the practice has been evolving throughout the distinct years in the three different parts of the tender basis: award criteria, qualification criteria, and criteria specifications, and what it indicates, to see if it contributes to smarter, more informed decisions based on the municipality's goals.

To answer that question, we have to look at the process that develops the tender basis in the organization and explore published competition announcement documents and market dialogue. Using Bodø municipality as a case study for this research.

2. Introduction

2.1 Smarter decisions in Bodø?

The term smarter has many ways to be understood. For Bullard (2007, p. 377), smarter in terms of growth helps cities get out of economic stagnation, reduce displacement and exclusion, and boost development for the majority of their population. Gardner & Matviak (2022, p. 4). study the term smarter from a collaboration standpoint, supporting the idea of involving different groups of people to tackle a problem from diverse angles and using the different expertise to solve complex or ambiguous matters.

Circularity and sustainability are relatively ambiguous terms, and many practitioners have their very own way of understanding them, complying with regulations and policies related to them, and reporting on them (Marco-Fondevila, Llena-Macarulla, Callao-Gastón, & Jarne-Jarne, 2021, p.3).

Public procurement can be complex, and it involves different actors during the process, from the users who have the need to the procurers who have the task of acquiring products and services to the suppliers who generate the goods or services to fulfill the need (Storsjö & Kachali, 2017, p. 344). A narrow focus on individual silos is not advisable. It is recommended to establish a competent team and enhance their knowledge or supplement it with pertinent information to facilitate informed decision-making.

Bodø is currently involved in the "Smart Bodø" project, which aims to enhance the city's livability and appeal by collaborating with various stakeholders to identify and implement solutions that prioritize the needs of its residents. (Bodø kommune utviklingsprosjekter, NDb). As part of it the city follows the principles from the national smart cities network and the The Design og arkitektur Norge (ND, p. 8), a roadmap which proposes strategies for smart cities that can as well foster circular public procurement and enhance the smartness of communities and urban development. Municipalities must prioritize their attention to people because they are part of the public sector and use public resources.

This analysis posed a challenge as the extensive and intricate data from tender publications spanning four years required collection, analysis, and comprehension. Non-data scientists may find this overwhelming. While producing datasets, it is necessary to consistently and systematically provide a significant amount of relevant and high-quality data, while allocating adequate human and financial resources to ensure quality, optimize outcomes, and improve employee proficiency.

Insufficient access to necessary tools or knowledge can lead to uncertainty, fear, and demotivation in employees tasked with demanding assignments, as they may perceive an inability to successfully complete the task. This may have negative effects on both mental and physical well-being. Working under high stress and with employee shortage is neither sustainable nor beneficial to employability (van den Broek, van Hoorn, Tooten, & de Vroege, 2023, p.6).

Smart city technologies encompass various elements such as algorithms, connectivity, data visualization, and complex systems like digital twins (DOGA, ND, p.35). Many important cities globally have implemented digital twin projects. Digital twins facilitate a new management approach that can analyze past events and explore innovative directions for making informed decisions. (Deng, Zhang, & Shen, 2021, p.132).

Bodø municipality is part of a European project called CityLoops (2020), which aims to "follow the progress made by 7 cities to become more circular" by, among other activities, proving, and increasing capacity and knowledge. Collaboration with academic and research institutions can facilitate the identification of opportunities, promote development and innovation, and create indicators to evaluate the impact of initiatives, as evidenced by the CityLoops Project (Gausemel & Bodø-Municipality, 2022).

The CityLoops project has resulted in the implementation of a digital twin for Bodø municipality (Bodø kommune utviklingsprosjekter, NDa). This system merely requires appropriate data and information to generate reports and visuals, facilitate informed decision-making processes in a more automated manner, potentially reducing employee stress. Digitalization as well can improve procurement's efficiency and transparency (Stoffel & Müngersdorff, 2019).

Bodø municipality wants to improve its knowledge management (OECD/Eurostat, 2005, p. 24), which relates to taking smarter and more informed decisions grounded in innovative processes as a result of gathering, practicing, and sharing knowledge throughout the organization. A single part of the organization cannot make it alone; the ideas, projects, and actions must be planned, accepted, tested, corrected, and implemented, with the goal of being able to be replicated.

Demonstration actions can be employed to assess the level of circularity of the city (Gausemel, T., & Bodø-Municipality 2022, pp. 20-25). Assessing the current state of the municipality and exploring innovative solutions to achieve optimal conditions or enhancements is a crucial aspect of an assessment.

Strategies to become smarter encourage the adoption and adaptation of information and communication technology to increase efficiency and effectiveness in procurement processes. However, it is crucial to consider various factors when implementing novel strategies. Such as the learning curve, diffusion and dissemination of information, courses, and testing of tools towards this goal (OECD/Eurostat, 2005, p.24)

2.2 Multiple objectives influencing public procurement at different levels.

Prioritizing climate and the environment are frequently discussed at various levels, including global, supranational, national, regional, and city. This discourse aims to connect the dots between circularity, public procurement, and the UN Sustainable Development Goals to align strategies and achieve objectives. This thesis explores this relationship. Circular public procurement's potential as a catalyst for change, appropriate tender criteria, and meeting user and local societal expectations are crucial considerations. Although theoretically simple, the subjectivity of the concept makes it challenging to achieve universal satisfaction. Improved decision-making has the potential to facilitate the creation of novel circular strategies, co-creation, waste reduction, emission reduction, enhanced energy efficiency in buildings, and potentially, in the future, the generation of numerous locally sourced products and services that might strengthen value creation.

2.2.1 The Global level

The Paris Agreement, ratified by approximately 190 nations, aims to restrict global warming to 1.5 degrees Celsius to prevent adverse consequences. Cities are encouraged to decrease emissions, collaborate, and enhance their capabilities in this regard (European Commission, NDa).

The United Nations (NDa) has established 17 sustainable development goals, which have been embraced by governments and local authorities as means of preparing for a more favorable future. Although all goals are important, certain communities prioritize some over others. Circular public procurement is linked to important SDGs such as 8, 11, 12, and 17 (Figure 1).

Figure 1 Sustainable development goals related to procurement.

2.2.2 The supranational level

The European Green Deal seeks to implement policies that promote economic growth while safeguarding resources. Its objectives include reducing greenhouse gas emissions by 55% by 2030 relative to 1990 levels and achieving net-zero greenhouse gas emissions by 2050. (European Commission NDb).

The circular economy action plan of the EC highlights the potential of public procurement, which accounts for 14% of the EU's gross domestic product, to promote waste reduction and encourage sustainable practices such as producer responsibility, repairability, and eco-friendly packaging, etc. This aligns with the green deal's objectives. The policy aims to promote the market for secondary raw materials, support cities, share best practices and replication strategies, create jobs related to the circular economy, and track progress using indicators (European Union, 2020).

2.2.3 The national level.

The Norwegian government (2022) aims to decrease its emissions by at least 55% in 2030 relative to its 1990 levels. Circle Norway (2020) reported that Norway's circularity rate is suboptimal, indicating a room for improvement of 97,6%.

2.2.4 The regional level

Bodø is situated in Nordland County. The county aims to achieve a low emission society by 2050 and intends to reduce emissions by 60% in 2030 relative to the levels recorded in 2009. The intention is for the local industry and businesses to become global leaders in promoting environmental sustainability. The county intends to leverage its procurement capacity to establish standards for eco-friendly goods and services, standardize regulatory frameworks, systems, and databases, and promote and highlight exemplary approaches. Such as the environmental product declaration, re-use or re-cycled materials or products, low energy use, zero emission construction projects or transportation when feasible, etc. And to use public procurement to establish and promote markets for circular products and services. (Nordland fylkeskommune,ND, p.23)

2.2.5 The municipality level.

Bodø municipality (2019) has separate goals, first as society, it aims to become a low-emission community by 2050. The document by the municipality defines a low-emission society as having a per capita CO2 emission of two tons annually. It highlights that the average Norwegian emits ten tons per capita annually, which is three tons higher than the global median per capita of emissions.

The goal for 2030 is to decrease direct greenhouse gas emissions by 70% from 2009 levels. The municipality aims to achieve a 70% material recycling rate for both household and industrial waste. According to the dataset of Eurostat (2023) regarding municipal waste per capita, Norway ranked third in waste generation in 2019 with 776 kilograms per capita, twelfth in 2020 with 604 kilograms per capita, and first in 2021 with 799 kilograms per capita among the 41 countries analyzed.

Secondly, as an organization, it aims to decrease greenhouse gas emissions for new and renovated buildings by at least 35% by 2025, compared to 2017 levels. Additionally, it aims to reduce energy consumption in existing buildings by 25% compared to 2009 levels. As well as decrease its environmental footprint by 50% in 2030, relative to 2017 levels.

Bodø municipality (2019) suggests that the organization should adopt innovative public procurement methods to request criteria for environmentally friendly products and services. The document emphasizes the importance of ethical and social considerations. The necessity for procurement regulations to include explicit requirements and guidelines, as well as proper documentation, is emphasized.

2.3 Circular economy and public procurement

On the one hand, municipal waste generation amounts to approximately 2.01 billion tons annually, as reported by the World Bank Group (ND). Approximately one-third of the amount is not being handled safely, assuming an optimistic perspective. On average, an individual produces 750 grams of waste per day, with approximately one-third of that waste being improperly disposed of. High-income countries, comprising 16% of the world's population, generate 683 million tons of solid waste, which is slightly over one-third of the global total.

Norway is a high-income country, and Bodø is part of it. In Norwegian municipalities, the annual per capita waste generation is 726 kilograms (Tiseo, 2023). Waste management is typically a local responsibility governed by various legislation and regulations. The average operational cost of a waste management system exceeds $100 per tonne. Based on the average cost of waste management, the annual operational expenses for waste management in Norway, serving a population of 5.42 million people (O'Neill, 2021), can reach approximately $393 million USD. Assuming the same cost for Bodø, its annual share could ascend to approximately 3.83 million American dollars for its 52,803 citizens (Statistics Norway, 2022a). The above estimated expenses are just an assumption, costs may increase or reduce due to additional factors such as waste treatment, collection, disposal, and transport. These factors must be adjusted to suit the challenging

environment of Bodø, where long distances and weather conditions may cause operational difficulties.

On the other hand, public procurement is another aspect to consider. According to Leverandørutviklingsprogrammet (2023), Norway annually expends approximately 650 billion Norwegian crowns on products and services procured through public tenders. Circle Norway (2020, p,71) reports a circularity rate of 2.4% in the country. if we estimate assuming that circularity rate of investment in circular economy-related tenders the share would ascend to potentially 15.6 billion Norwegian crowns in circular public procurement. However, the exact share is unknown and subject to estimation.

Alhola, Ryding, Salmenperä, & Busch (2018, p. 105) refer that circular economy and sustainability are very broad but flexible concepts that can be incorporated into public procurement, but the lack of available measurements or indicators requires a case-by-case analysis of procurement procedures to determine if circular or sustainable criteria are being considered. A more comprehensive understanding of the criteria being requested is necessary to make informed decisions.

In this sense, the Direktoratet for forvaltning og økonomistyring (2023c) offers "Innovation partnerships" a tender procedure to procure non-existent market solutions through a collaborative process between the procurers and suppliers. This procurement procedure integrates the design phase with the purchase phase in a single call for proposals. In theory, the process appears simple, but in practice, several factors may hinder it.

Norway has a low number of innovation partnerships relative to the number of competition announcements made over the years. According to Tvedt (2023), the number of innovation partnership procedures in 2019, 2020, 2021, and 2022 were 3 out of 8,200, 8 out of 8,122, 8 out of 8,422, and 6 out of 8,441 announcements, respectively. This trend is concerning. But although it can be discouraging, it does not mean that innovation partnerships are the only solution out there to incorporate circular economy practices in public procurement or that those innovations were in fact related to sustainable or circular solutions.

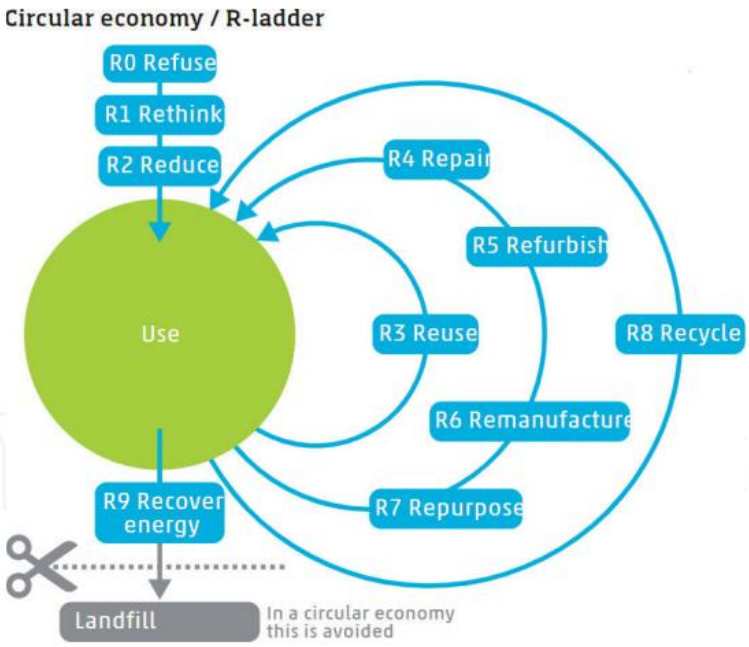
2. 4 Definitions of CPP and CE

After analyzing waste generation in Norway and recognizing the significance of public procurement in addressing environmental, economic, and social issues, there is potential for significant benefits by implementing circularity in public procurement to generate value for all.

For this study the definition of Circular Public Procurement by the European Commission (2017, p.5) was used and it is described as *"the process by which public authorities purchase works, goods, or services that seek to contribute to closed energy and material loops within supply chains, whilst minimizing, and in the best case avoiding, negative environmental impacts and waste creation across their whole life-cycle".*

In the case of the circular economy term the definition found in Cavaleiro de Ferreira & Fuso-Nerini (2019, p. 2) as a *"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, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models."* was appropriate for this research.

To understand the circular economy, we need to learn how to prioritize tasks or routines related to the use and consumption of resources. There is a very useful figure called the R-ladder (Minguez, Lizundia, Iturrondobeitia, Akizu-Gardoki, & Saez-de-Camara., 2021, p. 5) that is an open access model that can be strategically used to distinguish different levels of circularity and to help us prioritize our circular public procurement actions. (Figure 2)



Minguez et al (2021, p.5)

Figure 2 Circular economy R-ladder

3. Theoretical framework

This study employs legitimacy theory to examine the circular economy paradigm and its practical implementation in the context of Bodø Municipality.

Loewe & Zintl (2021, p. 1) describe legitimacy from an organizational standpoint as a social contract that seeks to meet societal expectations by the organization to be valid or accepted. Martens & Bui (2023, p. 2) say that legitimacy allows organizations to function by creating a perception of trust and responsibility. It is also said that legitimacy is time-dependent, meaning that what is accepted now may not have been accepted in the past or may not be legitimate in the future as society evolves and its beliefs change. I would like to use the legitimacy theory to explore the extent to which the circular economy has or has not been used as a criterion in public procurement in Bodø Municipality. McAdam, Hazlett, and Henderson (2006, p. 30) explain that *"legitimization involves a sense-making process of attempting to integrate the intended quality management principles to meet the needs of the critical incident."*

Based on the last statement, I used, instead of **quality management principles**, the evolution of the circular economy criteria through a retrospective analysis from 2019 to 2022. And for the **critical incident**, the goals that the municipality has set, **to try to understand** whether **the practice of circular criteria** is consistent or not and if it contributes to the CE procurement practice's legitimization in the municipality. Legitimization is a challenging yet crucial process that enables an organization to endure by satisfying expectations, pressures and consistently upholding them over time (Martens & Bui, 2023, p.14).; The implementation of innovation is a complex and potentially a problematic process. For instance, determining the optimal placement of circular economy criteria within a tender-based system can generate conflict. This may involve deciding whether such criteria are necessary and, if so, where they should be situated.

The municipality is an accountable entity in this case, accountable for its own goals. The term "accountability" is commonly employed to indicate an organization's satisfaction of its commitments to multiple stakeholders through a focused approach (Martens & Bui, 2023, p. 9).

The relation between implementing something new and legitimate it can lead to reexamination, which can potentially generate new values (McAdam et al., 2006, p.30) It could be that the new values result in effectively implementing circular criteria in procurement practices.

Based on the theoretical framework of McAdam et al. (2006, p.29) and my observations made in the municipality, I have made a model which I call "*legitimacy assumed construction"* which is represented in Figure 3. In this study I have paid special attention to the interaction between the tender basis and the circular economy.

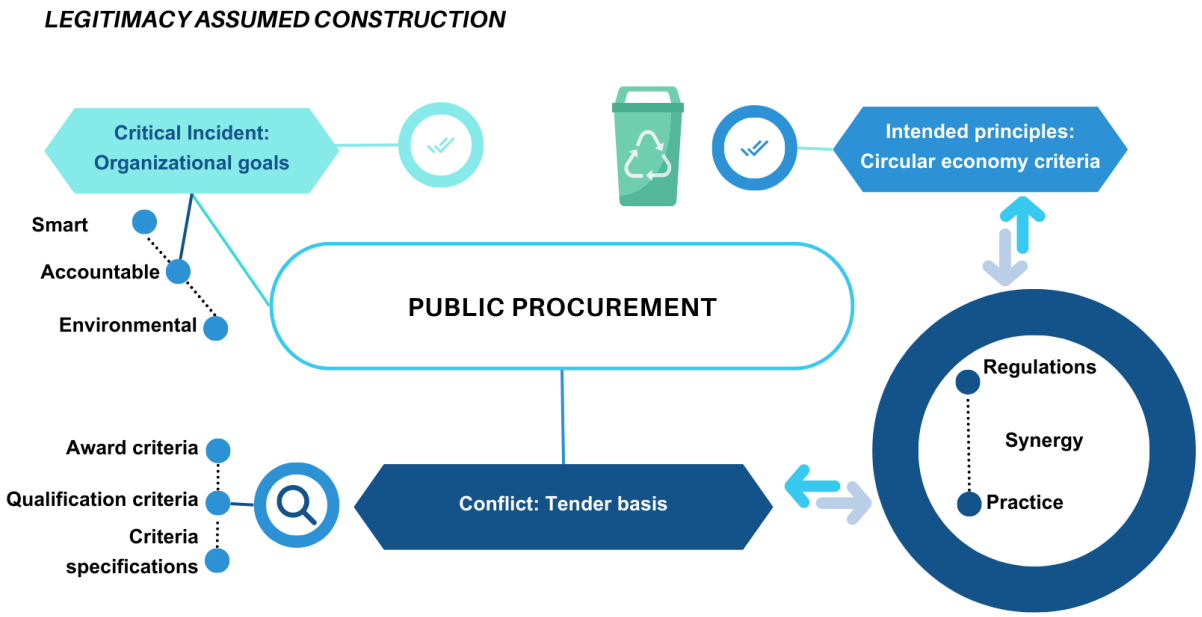


Figure 3 Model of legitimacy assumed construction

To explain the model in Figure 3, I have placed public procurement at the center and attached to it the organizational goals and the tender basis that are directly related to it.

Inside the goals, being **smart, accountable** (since it has a responsibility with the community for the use of public funds, as well as following and being aligned to national regulations) and being **environmentally** conscious because of the existence of its own municipal climate and energy plan (Bodø municipality, 2019), as well as procurement strategy (The City council, 2022, 17:20) which are assumed priorities.

For the tender basis, I have included the three different criteria components: **award criteria, qualification criteria, and criteria specifications** which are in a constant developing process to meet the organizational goals.

On the side inside a circle, the regulations and the practice which come back and forth with the intended principles of circular economy and the tender basis in a constant effort to try to include them as part of the tender basis, and which may generate conflict.

Meijer & Bolivar (2016, p. 401) describe different claims of legitimacy; among them, one is related to better outcomes, which could be related to what I describe as a critical incident, which are the municipality's goals; another of their claims is related to a better process in urban governance for smart cities; therefore, in this study, the process that generates the tender basis is investigated. Longato, Lucertini, Fontana, & Musco (2019, p. 1) mentioned the need for established ways to introduce concepts like circular economy in decision-making processes to develop strategies, and they pointed that t a participatory approach, helped to legitimize strategies and increase consciousness among the different parts involved in them. Meijer & Bolívar (2016, p. 399) describe perspectives on smart governance and levels of transformation.

Sönnichsen & Clement, (2020, p. 11) suggest that providing guidance to public procurers can enhance circularity and encourage its adoption. However, disseminating best practices and educating individuals on their usage, assessment, and support can further increase their commitment and effectiveness, along with long-term strategies. Hence, it is crucial to build upon existing work, enhance its practice, exchange knowledge, embrace novel concepts, take risks and acknowledge errors, while utilizing them as learning opportunities.

Wurster et al. (2021, p.1) have identified the absence of context-specific practices as a barrier to achieving circularity and sustainability in public procurement. Thus, this thesis can assess Bodø Municipality's commitment to implementing circular economy principles in its public procurement practices.

4. Methodology

This research is part of the Norwegian Edusmart Program: Knowledge and competence building for Smart City Governance and Performance Management in the High North (2021-2024) founded by the Research Council of Norway.

The qualitative method was used to make a descriptive analysis of the different criteria that were part of the tender basis over four years and estimate to what extent they are linked to the circular economy. At the same time, the market dialogues were analyzed for those years to see if they could have inspired the criteria formulation. It is said that to identify qualitative data, it has to be relevant for some particular concepts, theories, or the research of peculiar truths (Easterby-Smith et al., 2018, p. 172).

Primary data from direct observations during my previous internship and secondary data from different publications, published market dialogues, and tender competition documents has been collected, studied, and developed (Easterby-Smith et al., 2018, p. 173).

Bodø Municipality is a public organization; therefore, when competition announcements with obligatory declaration are published, they become available for everyone on the Database for offentlige innkjøp (ND), an online database for public procurement.

And some of them, in addition to Doffin, are also published in English at Tenders Electronic Daily (2023), which is a site for European public procurement.

In this study, I have used the the Doffin database, and as I examined the case of Bodø Municipality, I placed its organizational number **972418013** in the search engine to find competition announcements for the years 2019, 2020, 2021, and 2022, as it is important to get information that can be compared to see if there has been a change or not in the criteria related to circularity that have been asked throughout those years.

Both the organization's number and the date range were set in the search engine filters. I have set the dates from 01.01.2019 to 31.12.2019, for tenders published in 2019; the date ranges from 01.01.2020 to 31.12.2020, for tenders published in 2020, the date range

01.01.2021 to 31.12.2021, for tenders published in 2021; and finally, the range 01.01.2022 to 31.12.2022, for those published in 2022.

It is pertinent to note that only the category labeled as "Kunngjøring av konkurranse" in direct translation to English as "Competition announcement" holds significance. The study will focus on declarations that are mandatory under Norwegian law (kunngjøringsplikt) and those that have been voluntarily published on Doffin, as they are widely accessible (refer to Appendix D).

After getting the results from each year, I have consulted the documents that contain the tender basis. And registered the information from each one in a database:

4.1 Award criteria

Under award criteria, I have classified the criteria into three categories: price, quality, and environment/circularity, and added them to the database.
To analyze the information from the award criteria, I have categorized the results as follows:

- **Includes environment,** when the award criteria of a publication announcement specifically set a percentage for the environment.
- **NOI,** referring to the fact that there was no online information available that could give us an idea about that competition announcement.
- **Only price**, when the only parameter to review award criteria was limited to the price, or as other practitioners call it, the most economically attractive tender.
- **Only quality,** when the only parameter to evaluate award criteria was limited to quality.
- **Q&P,** when both quality and price have been considered but not aspects related to the environment or circularity itself.
- **Unclear**, competition announcements where the weight of award criteria can be confusing or seemed not clear enough.

4. 2 Qualification criteria.

I chose to integrate circularity-related aspects of the qualification criteria description and collect them in the database and to analyze the results I have categorized them as follows:

- **Circular**, when the description was related to circularity to a higher, clearer extent.
- **EMS**, when it includes an environmental management system.
- **ILO and EMS***,* when it includes aspects related to the international labour organization and the environmental management system.
- **ECO driving and EMS**, when the aspect in the qualification criteria was related to an environmental management system but also characteristics of driving in a more environmentally friendly way.
- **Apprenticeship**, when the qualification criteria asked for the need for the provider to employ apprentices to deliver the product or/and services.
- **NOI***,* in the case that no online information was available.
- **Non circular,** when there was information about qualification criteria, but it was not related to circularity.

4.3 Criteria specifications.

This section contained a detailed and extensive description of requirements, making the selection process challenging. I have placed an extract on the database, but for analysis purposes, all relevant specification information from the tender documents was reviewed.

The results of the analysis were categorized into:

- **Very good**, where there was a very specific and good description of circularity-related aspects as criteria.
- **Good**, when circularity criteria were asked, they did not seem to go beyond but were just sufficient.
- **To some extent**, when there was something in the description that was related in a way to circularity, but it did not explicitly seem formulated towards circularity, or it was a bit abstract to evaluate.

- **Poor**, when the specification criteria were not related to circularity.
- **NOI**, when no online information about the specification criteria was available.

4. 4 Market Dialogue

In the case of market dialogue, the organization number of Bodø municipality, **972418013** was used in the Doffin database, setting the filters for years. from 01.01.2019 to 31.12.2019, for MD published in 2019; the date range from 01.01.2020 to 31.12.2020, for MD published in 2020, the date range 01.01.2021 to 31.12.2021, for MD published in 2021; and finally the range 01.01.2022 to 31.12.2022, for those published in 2022.

At the same time, in Doffin, to find the MD, we must set the filters of notice type to "Veiledende" and that one of publication type to "alle" (even if there are 3 options in the publication type and one of them is specifically called "market consulting" but we get no results if we select that one). Subsequently, I reviewed the results individually to determine whether they constituted market dialogue and thus could be incorporated into the analysis.

Bodø municipality also uses a system from a service provider called Mercell (NDa). In that system, it is possible to search the organization profile of the municipality (Mercell, NDb) referred to the same organization's number 972418013 and in this case the filter does not offer much choice, so one must look in the title of each line from all the publications and look for the words "markedsdialog", "market dialogue" "dialog" or "dialogue" to identify if they belong to the years of interest, 2019, 2020, 2021, and 2022 in their description.

The data from Mercell and Doffin was stored in a database. To be able to compare it and generate a table which shows the results of the analysis (refer to appendix E).

4.5 Categorization.

To facilitate the analysis, ten categories were developed to group the types of products or services intended to be obtained by the municipality over the different years as it is shown in table 1.

Construction and infrastructure	Related to construction and infrastructure, it can go from road construction, building rehabilitation, maintenance, etc.
Consulting services	A variety of consultancy services.
Consumer products	Products to be used or consumed.
Transport	Products and services related to transport
Health	Products and services related to health.
Educational services	Services related to education
Electricity	Electric energy
ICT	Information and communication technology products and services.
Cleaning services	Cleaning services
Other services	Services that could not be places in any of the above categories.

Table 1 Categorization of competition announcements for analysis

4.6 Reliability and validity

For indicators, as noted by Spencer & Sargeant (2022, p. 2). Reliability refers to the consistency of results obtained through a particular research method, such that if the method was replicated by others, the same results would be obtained. in this case, competition announcements, market dialogues, the procurement strategy, and supporting publications are readily available online and accessible to the public which assures replication.

Assessing the validity of empirical data refers to determine its suitability for demonstrating or representing the studied concept. The study covers a four-year period, providing insight into the evolution of the CE phenomena in the municipality's procurement practices. The indicators resulted from this study are sourced from official publications. Therefore, the

information used in this research is both temporally comparable and credible, having been published by a public organization, the data is easily available and has been developed to be clear and understandable to facilitate the evaluative progress (Spencer & Sargeant, 2022, p. 2).

5. Bodø Municipality

In this section an overview of the procurement process of the municipality is described

5.1 The public procurement office

The economy and finance department, described in the organizational chart in Bodø municipality (ND) has three offices: the accounting office, the finance office, and the public procurement office. For this study, the focus is the public procurement office roles which are in green color in the visual representation that I developed for this purpose (Figure 4)

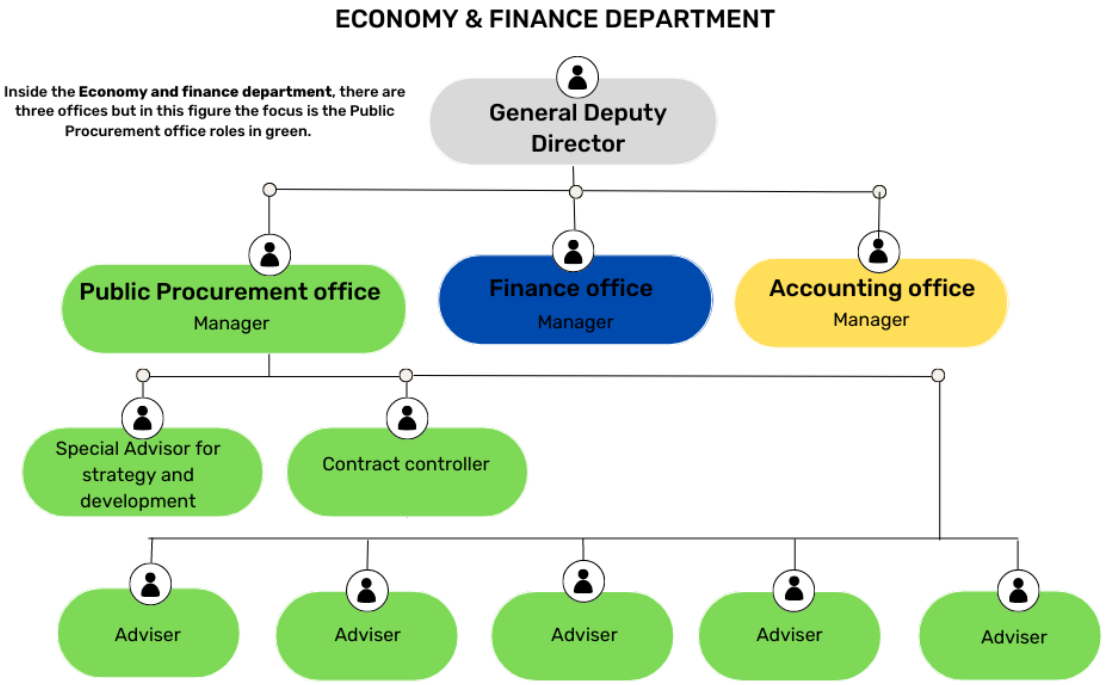


Figure 4 Visual representation of the organizational chart

The public procurement office consists of eight employees in total: one office manager, one special advisor for strategy and development, one contract controller, and five procurement advisors.

The tasks related to each of the positions are described below:

5.1.1 Office manager: This staff member is responsible for managing contract and tender process implementation, while also representing the municipality in the national program for innovative procurement (this can be beneficial for CPP). The manager is responsible for preparing cases for political evaluation, meetings, and interaction with businesses (dialogue is crucial and valuable in the development of a tender document).

The manager is responsible for professional, financial, and staff tasks, including procurement planning and strategy development (can also be associated innovative procurement, but not necessarily). Additionally, the manager handles joint regional agreements, supplier, and contract management, and implements measures to prevent work-related crime. whereas providing guidance on contracts, internal training, routine updates, and serving as a purchasing resource. (Karrierestart, NDc).

5.1.2 Special advisor for strategy and development: The position involves various activities, including the preparation, maintenance, and enhancement of a procurement and contract management strategy in accordance with established guidelines. The individual ensures compliance with the procurement strategy and other relevant documents during operational procurement work, as well as develop action plans and roadmaps within the strategy's focus areas. Additionally, it should develop key performance indicators for procurement and contract management and assist the purchasing manager in monitoring them. The individual must stay informed about procurement trends and developments to ensure that Bodø municipality's procurement work adheres to best practices. It should support the development of a competent and professional procurement organization and provide advice on strategic and tactical choices related to contract management, including political and administrative considerations. Assist Bodø municipality in achieving a favorable position in the procurement profession landscape.

5.1.3 Contract Controller: a position published as "Kontraktsforvalter" that started in March 2023 with the following tasks: This involves contract follow-up, development, strategic analysis, and multipartite cooperation throughout the contract's lifespan. It requires utilizing experience and expertise to optimize agreements, gaining familiarity with

them, and comparing theoretical concepts with practical application. The objectives are to identify and resolve deviations, prevent and address trade leaks using the e-commerce solution, and provide guidance and support for procurement-related tasks. (Karrierestart, NDa)

5.1.4 Advisor: There are five advisors in the category of "Innkjøper / Innkjøpsmedarbeider" The primary responsibilities of this role involve supervising and carrying out procurement projects, tenders, and contract management. Additionally, the role requires following up their own project portfolio and establishing and maintaining a product and service catalog in the purchasing portal for municipalities. they offer professional guidance to other units within the municipality, cooperate with other municipalities where necessary, serve as a liaison with suppliers, and contributes to the development of internal and external work within the municipality as well as in the purchasing cooperation. (Karrierestart, NDb)

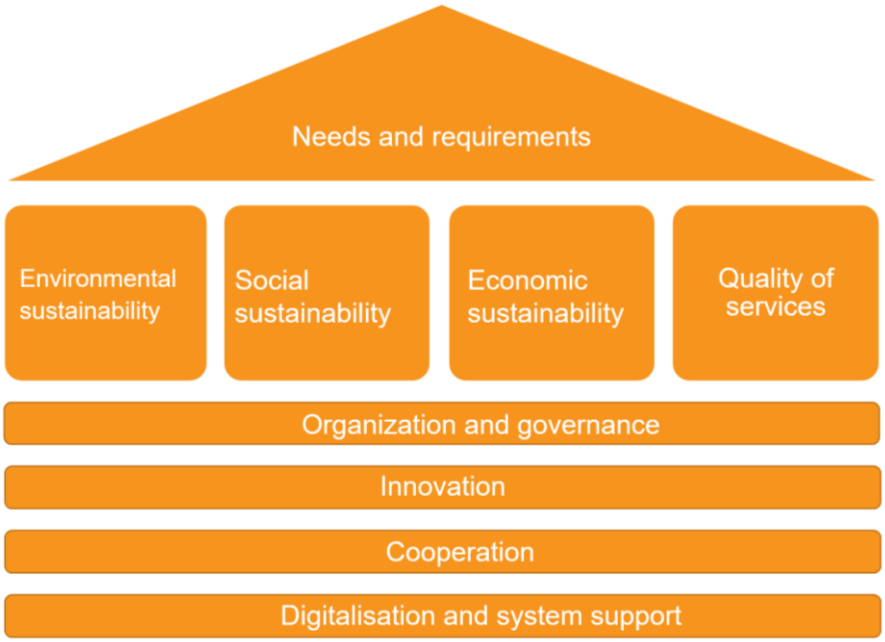
5.2 Tasks and responsibilities of the procurement office

I created a visual representation of the public procurement department's responsibilities and tasks according to Bodø Municipality (2023a) in figure 5:

Figure 5 Bodø municipality's public procurement office: responsibilities and tasks

5.3 The procurement strategy

Bodø Municipality has developed a strategy called the House of Public Procurement, this decision was officially adopted by the city council in October 2022 Increasing exponentially the chances to incorporate circular criteria inside the tender processes (The City council, 2022, 17:20).



The city council (2022, 17:20).

Figure 6 House of public procurement

The goal of the strategy is to place a special emphasis on the needs and requirements because the market can offer better solutions if those aspects are better described and expressed. This **need** should be based on four pillars; three of those four pillars are related to the triple bottom line.

Environmental sustainability. The objective is to utilize public procurement to mitigate the adverse environmental impact, including CO2 emissions. Promote green market practices, implement circular value chains, and minimize municipal consumption where possible.

Social sustainability. It refers to being responsible and require that the suppliers comply with social and ethical requirements, for example, by using the model from Oslo

municipality (ND), a framework developed to have more inclusive and fair terms and conditions in public procurement for a decent working life. Prevent human rights violations, facilitate the participation of small and medium sized companies, and ensure that health and safety procedures are followed by contractors or others in the value chain (where possible).

Economic sustainability. This is related to finding the equilibrium among quality, financial considerations, social responsibility, and efficiency. Evaluating the necessity of a product or service and exploring alternative options. Enhance market dialogue, promote cost-effectiveness, and identify potential savings and efficiencies throughout the product or service life cycle. Simultaneously maximizing the utilization of existing contracts.

Quality of services. It is about providing good and superior products and services based on functional requirements after going through analysis and feasibility checks. It also relates to increasing competence, capacity, and expertise and involving relevant departments and users.

After the pillars, there is a supportive structure:

Organization and governance. It relates to having an organization that is able to meet the procurement objectives, plan, implement, and follow up on procedures, provide advice, and increase internal capacity and cooperation. And enable specialization and category management in relation to the supplier markets.

Innovation. Bodø municipality can (where adequate) utilize public procurements to encourage innovation by prioritizing the need description over specific solutions, requesting open and functional requirements, and allowing the market to propose solutions that meet the municipality's needs. As well as having a stronger collaboration with Leverandørutviklingsprogrammet (ND) to ensure smarter solutions and get the necessary assistance for innovative public procurements.

Cooperation. Bodø municipality has a cooperation with other municipalities in the region called SIIN, where those municipalities adhere to bigger contracts produced by a tender led by Bodø municipality, helping them to get the same conditions without having to run a whole tender process by themselves alone. This collaboration will be adapted and

optimized to offer better purchasing conditions (Bodø Municipality, 2022, p.131). The procurement portfolio will be weighted where the greater benefits can be obtained jointly, and considerations for competitiveness related to small and medium sized companies and local businesses shall be considered. There is an ambition to establish a forum for technical cooperation, share knowledge, and increase competence among municipalities and other regional stakeholders.

Digitalization and system support. Efficient and verifiable procurement processes rely on accurate information to facilitate planning, prioritization, execution, analysis, management, and decision-making. Digital tools are necessary to ensure quality assurance, contract management, follow-up, verification, and data utilization across various tools, archives, and systems to assist procurement processes.

Effective implementation requires disseminating information to all levels of management and departments within the organization. In addition to creating guidelines, routines, and plans to support the overall strategy and achieve specific objectives (Kristensen, Mosgaard, & Remmen, 2021, p. 9).

5.4 The tender process.

In public administration, there are normally two different planning processes. In this section I explain how the procurement process happen in the municipality, with the portfolio planning process (figure 7) and the project process description (Figure 8) the mentioned figures are visual representations which seek to explain the procurement process and were developed after discussions with staff from the procurement department office but are not applicable to all types of tenders and the process can be impacted by several factors. However, they provide an insight of how the process should be in normal operations without deviations and for CA with obligatory declaration.

The first process is portfolio planning, where there is a general request from the procurement department office to all the other departments in the organization, to collect their different requests and evaluate, prioritize, and delegate the approved procurement

projects that are to be prepared throughout the year by the procurement department office. The image below represents how this process takes place on a general basis.

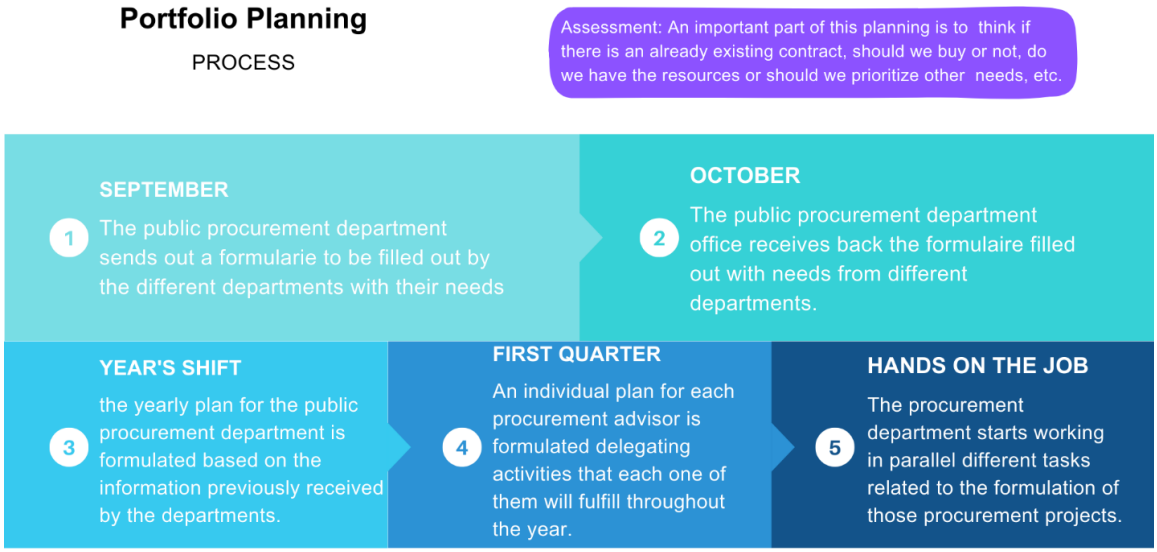


Figure 7 Portfolio planning process

The second process (figure 8) happens once the tender has been assigned to a procurement advisor, and it becomes a project. This phase commences subsequent to evaluating the financial feasibility at the project planning stage. The advisor assumes responsibility for the assigned project, conducts a needs analysis, and subsequently conducts market research. Following the market research, a strong interaction takes place between the procurement department and the user group. The user group consists of collaborators who possess a comprehensive understanding of the specific requirements and play a crucial role in formulating the tender basis for the procured product or service. These phases (1-4) can last three to six months on average, and the market dialogue can be included in these early phases.

Once the tender basis is formulated, there is a period of quality assurance (05), followed by the competition announcement (06), and then possible inquiries (07) by the potential bidders are received at the organization for response until the offer deadline (08). Once that offer deadline is finished, the process of evaluation begins (09); if the parties reach a decision and decide to allocate the tender (10), then it is assigned and a period of

quarantine follows (where complaints, if any, are received and handled). During this grace period, interested suppliers have the opportunity to suspend the conclusion of the contract. But if all goes well, then the signing of the contract takes place (11).

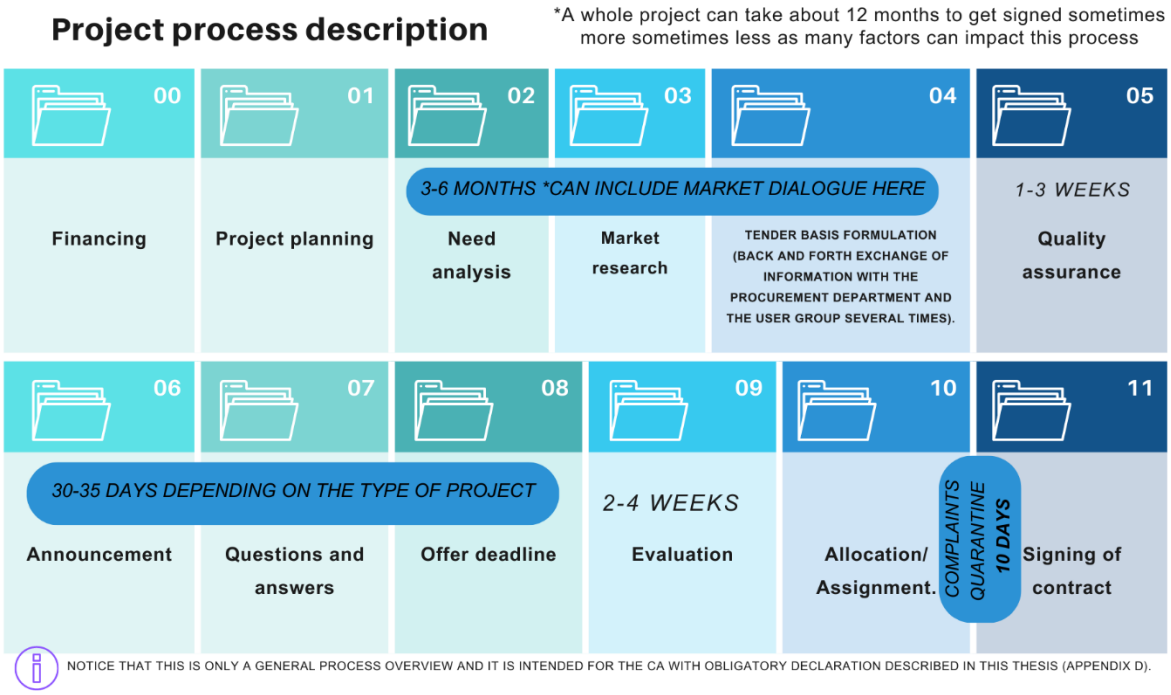


Figure 8 Project process description

The times can vary depending on the size of the tender, the communication with the user group, the need or not for a market dialogue, the response from the user group, consultancy, the level of complexity, the effective or ineffective communication, the facility or difficulty to reach understanding among the involved parts, the handling of complaints, priorities, etc. And not all tenders are successful, some might have to be reformulated, cancelled, or not get any participants after the deadline, numerous factors that can affect this process exist.

Once the project culminates with the signing of the contract, a following the process called "Kontraktsforvaltning" in Norwegian, translated to English as contract management, takes place, and it includes activities such as: following up, the implementation of the contract, practicalities, etc. (Direktoratet for forvaltning og økonomistyring, 2022a).

Normally, if the whole process has been successful and a contract has been signed, the first meeting with the user group and the provider takes place; it is called "opstartsmøte" in Norwegian. But we focused mostly on the tender basis formulation for this study.

5.5 Criteria for the tender basis

In Norwegian, the tender basis is called "Konkurransegrunnlag" and it forms part of the procurement documents. It helps the suppliers understand what the procurer is requesting, on which terms, how the competition is going to be done, and other supplementary and additional information and documents (Regieringen, 2017).

The criteria defined inside the tender basis can be divided into three, award criteria, qualification criteria, and criteria specifications.

5.5.1 Award criteria: Direktoratet for forvaltning og økonomistyring (2022c) says that we can also call them competition criteria. And they contribute to the best fulfillment of procurement needs at the lowest cost or price.

Additionally, It mentioned that there are many ways in which award criteria can be described.

- The lowest price
- The lowest cost, where one can consider the life cycle and price.
- The best degree between the lowest cost or price and quality
- Fixed price: in this case, quality is the area where the suppliers will focus.

Award criteria have to be concrete to facilitate both the evaluation and the follow-up, and a description of how the supplier can document those criteria should be given, as well as the weight to be considered for each criterion during the tender process.

In anskaffelsesforskriften (2016, § 8-11 & § 7-9) it is stated that award criteria can include "price, quality, life cycle costs, the environment, social considerations, and innovation" and that the procurer "may set environmental requirements and criteria at all stages of the procurement process where relevant and related to the supply" Of course, this is not necessary, but it can make things easier in some cases and be a suitable ground to

include circularity. Furthermore, it suggests a weight of 30 percent for award criteria related to the environment. However, the criteria should be objective, verifiable, and non-discriminatory and should not be too difficult or complex for suppliers.

5.5.2 Qualification Criteria: in Norwegian, they are called "Kvalifikasjonskrav" and Regieringen (2017) describes them as *"minimum requirements related to the supplier's suitability to deliver the procurement in question. The purpose of qualification requirements is to ensure that the supplier has the necessary organizational, technical, professional, economic, and financial capabilities to execute the contract."* Direktoratet for forvaltning og økonomistyring (2022b) expresses that the supplier should fulfill its obligations during the whole contract duration. And anskaffelsesforskriften (2016, § 8-7) mentions that the contracting authority may require certificates or documentation to assure that the contractor complies with the standards or conditions related to qualification criteria.

5.5.3 Criteria specifications: Direktoratet for forvaltning og økonomistyring (2023a) states that criteria shall specify the requirements related to the characteristics of the products, services, or construction work that are to be procured. Anskaffelsesforskriften (2016, § 8-5 & § 8-6) additionally mentions that they shall be related to the purpose and value of the procurement. The procurer may not be too specific; for example, specific processes, particular origins, types of manufacture, trademarks, or producers, which could potentially cause the exclusion or advantage of certain suppliers.

However, it is possible if needed for the purpose of a specific procurement, and only if it is not possible to describe those characteristics "sufficiently, precisely, and comprehensibly in another way". (Anskaffelsesforskriften, 2016, § 8-5), then one can set a specific description, but it has to be followed by the term "or equivalent", to open it up for suppliers who can document similar characteristics, preventing damaging their interests, and to avoid unnecessary limiting the competition.

It is important to say that the procurer may require specific labeling as documentation that shows that the procured goods or services comply with the environmental, social, or other characteristics contained in the contract terms, award criteria, or the same specification criteria under certain conditions (Anskaffelsesforskriften, 2016, § 8-6). This last point can

be very relevant for circularity and environmental purposes, for example, but it is not limited to them.

5.5.4 Market dialogue.

Circular public procurement typically involves initiating early market dialogue, communicating the need, and exploring supplier offerings to foster innovation (Leverandørutviklingsprogrammet, NDa). This activity promotes inclusive practices and collaborative thinking by encouraging interaction with varied stakeholder groups, such as businesses, entrepreneurs, and the local community, to build understanding, find consensus, and discover solutions. In this scenario, insufficient engagement, and limited resources—financial, technological, and human—may hinder growth. This process requires clear communication to ensure stakeholder understanding.

Understanding the market and communicating with it allows us to make prudent public procurement decisions. Procurement professionals feel concerned about correctly implementing laws and rules since dealing with legislative frameworks takes considerable time and expertise that not all procurement units have. Consequently, guidance is frequently required when executing intricate innovative procurement processes (Storsjö & Kachali, 2017, p. 344),

With dialogue, one can also influence the market, realize different, existent, or future trends or developments, and determine what is achievable or doable now and at another time. What criteria or requirements should be prudent to set, such as the costs, alternative products and services, and the level of maturity of the market, to increase the chances of healthier and smoother competitions (Direktoratet for forvaltning og økonomistyring, 2023b).

There are many ways to start this dialogue: by attending trade fairs, using hired consultants, meeting academic communities, arranging meetings, attending conferences, having an open consultation, etc. Fortunately, the Norwegian Agency for Public and Financial Management (DFØ) provides a platform for publishing calls for market dialogue. and it can be assessed by establishing indicators for the dialogue's impact, improvement, replication, and corrective measures for future potential co-creation.

By using the Doffin platform and providing relevant clarifications, for example, that the contracting authority will not necessarily use the information from that dialogue for a specific tender, that their participation in the dialogue is not conditional on being able to participate in future competition announcements, etc. one can have a smother process (Direktoratet for forvaltning og økonomistyring, 2022d)

However, this dialogue is regulated in Anskaffelsesforskriften (2016, § 9-3., § 12-2.) about what, how, when, and where this communication can take place. But so far, the most important aspect is to avoid giving competitors a competitive advantage, to treat bidders equally, to not disclose trade secrets, and to have a transparent dialogue.

6. Discussion and Analysis.

6.1 Criteria as a continuous development indicator.

Various factors can influence procurement. For instance, the year 2019 was not impacted by the Covid-19 pandemic, which was officially declared in 2020 (Ducharme, 2020) and persisted through 2021. Or the conflict in Ukraine which impacted the year 2022 when it escalated into war, and which persists 2023 (BBC News, 2022). Both situations have affected global supply chains and resulted in various consequences, including increased prices, product availability disruptions, and humanitarian and environmental crises. Simultaneously, these circumstances have emphasized the significance of prioritization and enhancing regional cooperation to bolster resilience and promote development.

Encouraging the development of novel business models and utilizing public procurement as a catalyst, particularly in the context of circular economy, to establish more ambitious standards than those currently in effect or non-existent is valuable. These efforts can facilitate systematic urban development. Development in municipalities is necessary, as Stoffel & Müngersdorff (2019) suggest that local authorities are perceived as passive and need of support and training.

Public procurement is seen as an approach to promote the circular economy and environmental sustainability. This involves various ambitions such as innovation, improved practice, competence, knowledge, cooperation, and better criteria. Although

theory and practice can diverge, requesting something without considering various factors and asking pertinent questions is not a simple process. Does asking this criterion entail discrimination or exclusion of suppliers? Is there a supplier capable of fulfilling my request? Is the utilization of specific criteria crucial for this particular tender? What is the primary focus of this tender project: cost, quality, environmental impact, or circularity? What are the objectives of our organization, and does this tender align with them? May I rephrase the criteria? Is assistance required for formulating certain aspects of the tender process? Is there internal expertise available within the department or organization, or is external assistance necessary? Can we assess our requests and criteria? Therefore, the scope of the study revolves around these when we want to evaluate the tender basis formulation.

2019	63
2020	69
2021	52
2022	69

Table 2 Number of competition announcements analyzed by year.

6.2 Award criteria

As explained in the methodology, four years of competition announcements were analyzed, and the evolution of the award criteria in those years is shown as follows for each year: (Refer to Appendix A)

6.2.1 Review of Award criteria for 2019

The absence of pandemic disruptions during the analyzed year allowed for a comprehensive examination of public procurement practices and operations under normal conditions. Out of 63 competition announcements analyzed, 31 pertained to construction and infrastructure, making it the most frequently occurring category. Consulting services and consumer products followed in order of frequency.

It is important to reveal that according to the online documents and information, there was a competition announcement that was unclear, as the criteria were not explicit and lacked clarity, which difficulted its analysis.

Consulting services and health were categories with a special focus on quality, as reflected in the number of competition announcements that prioritized it.
Quality and price together were present in the majority of categories to a lesser or greater extent.
Price alone was considered in four different categories, with construction having the majority, followed by consumer products, and consulting services and ICT being tied.

Environment.

Environment was explicitly considered as an award criterion only in three categories: construction and infrastructure, consumer products, and transport, with the same number of competition announcements. All of them were weighted less than the 30 percent suggested in anskaffelsesforskriften (2016, § 7-9).
In the construction and infrastructure, for example, the required characteristics prioritized universal design, environmental considerations, and innovative features.
In the transport category, low emissions, average fuel consumption, the result of a European environmental engine test, as well as the possibility of electric vehicles, were considered.
From the consumer products category, considerations were made for an environmental certification, and a special focus on the product design, content, durability, lifetime, and functionality.
To summarize, during 2019 there was not a big ambition on the environment as the award criteria weight was in all cases below the suggested 30% and only three categories had environmental considerations. Furthermore, one of them was a bit ambiguous or not specific enough.

6.2.2 Review of Award criteria for 2020

This year was marked by a disruptive global event, namely the pandemic. A total of 69 competition announcements were analyzed, with 34 pertaining to construction and infrastructure, and consulting services and consumer products following in order of frequency.

There were no unclear or only quality oriented competition announcements.

Quality and price award criteria were the majority with 39 CA, followed by only price with 15 CA.

Environment.

In the case of the environment, four competition announcements explicitly mentioned it.

One from the construction and infrastructure category which requested environmental footprint assessment, emissions assessment, and energy efficiency. Weighting at 35%, a bit over the suggested 30 percent by anskaffelsesforskriften (2016, § 7-9). While the other three CAs were below that percentage.

The CA from the transport category weighted the environment very low (5%), however, it requested energy efficiency, paid attention to the environmental impacts of the operational life of the vehicle, prioritized the use of hydrotreated vegetable oil or biodiesel, environmental certification and the level of CO2 emissions.

From the consumer products category weight was given at 20% and 15% respectively, ecolabelling documentation and quality were important factors; furthermore, these two CA belong as well to the SIIN collaboration, where the municipalities part of it would receive the same products as Bodø Municipality increasing the the influence of the tender to other communities.

To summarize, during this year there was one more CA which prioritized the environment than in the previous year; in regard to weight, it was more ambitious as one of the CA requested more than the suggested 30% weight for environment, however the rest of CA

were not as ambitious. Finally, the categories which required circular characteristics were the same as the categories from the previous year.

6.2.3 Review of Award criteria for 2021

During this year, the world experienced a “new normal”. I analyzed 52 CA; this time, there were no unclear and no only quality-oriented CA.

The number of CA in the case of construction and infrastructure was again the greatest proportion, but in comparison to previous years, they diminished, as they were only 21. If we compare that number to the two previous years, there was a decrease in the number of CA of about 30% for that category.

The second category with the highest volume was consulting services, followed by ICT and transport in that order.

The majority of award criteria were linked to quality and price, followed by just price in second place.

Environment

However, unlike the previous years, in 2021 there were only two CA that explicitly mentioned the environment, both with 30% value, one in transport where the focus was on zero emission, hybrid vehicles, and environmental certification. And the second in the category of consumer products leaning towards zero-emission vehicles, energy labels, and prioritizing products that could be repaired. Surprisingly, the construction and infrastructure category did not explicitly assign a value to the environment this year, in contrast to the previous two years.

In summary, there was a decrease in the level of ambition this year compared to the previous year, particularly in the construction and infrastructure sector where environmental considerations were not given priority, although it was noticeable that the number of CA from this category diminished. However, robust and well-defined requirements were only demanded by the transport and consumer products categories.

6.2.4 Review of Award criteria for 2022

The year marked the end of the global pandemic, but a war in Ukraine started. During that year, 69 CAs were analyzed. The leading category was construction and infrastructure, followed by transport and a tie between consumer products and ICT.
There was no unclear CA, but the focus on only quality CA reappeared only in the health category.
The biggest share of CAs was in those ones where both quality and price were part of the award criteria, but a surprise was found, as the second biggest share was a total of 15 CAs that explicitly included the environment being in a tie with the CAs focused on only price with 15.

Environment.

Environmental award criteria were distributed in construction and infrastructure, transport, consumer products, ICT, health, and cleaning services, but not in consulting services. In this case as there was more information to analyze, I described them by each category which included environmental aspects.

Construction and infrastructure. The criteria prioritized sorting of waste material for recycling; information on waste volumes; a solution for recycling; diminishing C02 emissions and considering the circular economy; environmentally friendly vehicles (electric, hydrogen, biogas, and diesel, in that order); energy efficiency; a holistic environmental perspective—all of them were weighted at 30% or more.

Transport: the priorities were related to car sharing, zero-emission vehicles, hydrogen vehicles, renting vehicles instead of buying them, and the given weight was between 67% and 40%. Erdiaw-Kwasie et al. (2023, p. 4) mention that service sharing, for example, in the first criteria for transport that is described, facilitates, and makes a more efficient use of resources, which contributes to CE.

Consumer products. It had the biggest share of competition announcements linked to the environment as a category, the criteria weighted from 20% to 30%, and some CA were connected to SIIN expanding its reach to other municipalities. Criteria such as PVC-free,

dangerous chemicals avoidance, type of energy used in the delivery vehicles, packaging, certified material sources, ecolabel, environmentally friendly materials in production, routines for recycling, emissions reduction, information about cancer, reproductive hazards, or mutagenic contents, zero-emission vehicles, energy labeling, the best solution for a circular value chain, highest content of recycled plastic, environmental documentation, and environmentally friendly transport (electric, hydrogen, biogas, diesel, in that order) were some of the required characteristics. If I compare it with previous years, 2022 seems to have been more ambitious.

ICT. The CA was linked to SIIN, increasing its reach to other municipalities. It was a bit low in wight at 10%, but the content of the award criteria was linked to the criteria specifications and it included a variety of characteristics such as to avoid cancer, reproductive hazardous contents, prioritized energy efficient products, adapted products for people with special needs, fossil-free vehicles, procedures for reuse or sale products, electronic waste handling, packaging(no more than necessary, avoid dangerous material content, made of reused materials or suitable for recycling, etc.).

Health. It was connected to SIIN, increasing its reach to other municipalities. The weight was 15% for environment, and the award criteria were linked to the specification criteria where environmental certification, recycled materials, allergy-free products, characteristics for packaging, ecolabeling, type of vehicles for distribution, environmental footprint reduction, routines for recovery, recycling, and reuse of equipment were part of them.

Cleaning Services. The CA weighted the environment at 25% and the criteria was related to a big degree of sustainable production, ethics, and environmental focus of textiles, fair trade, Tencel (ND) certificate or similar (related to sustainable sourcing of raw materials and environmentally responsible process).

The research shows that there was a lower ambition in the categories of ICT, health, and cleaning services, as lower percentages for award criteria were given in contrast to the other categories.

However, the consulting services category had no environmental or circular focus, maybe because of the challenge of putting a circular criterion in a service, as services are normally more oriented towards quality, experience, and delivery times. However, it is said that it is not yet clear how institutions integrate CE in services and that contextual, institutional, and strategic factors related to CE knowledge can positively influence its adoption (Erdiaw-Kwasie, Abunyewah, Yusif, & Erdiaw-Kwasie, 2023, p. 2, 11).

To summarize, this year witnessed the implementation of more ambitious objectives and distinctive criteria across six categories, encompassing circular economy. The criteria in all categories were more precise, except for consulting services, which did not require circular criteria, possibly due to insufficient knowledge of implementing CE in intangible services.

6.2.5 Award criteria evolution.

The award criteria have undergone a transformational specialization in relation to the concepts of CPP and CE (Table 3). The requirements have evolved from general terms, such as innovative features and fuel consumption in 2019 to more specific requirements in 2022. Among others, these requirements include awareness of energy type, production process, recycling routines, possibility of reuse, considerations on packaging, and the circular economy itself.

Year	Relation with CPP definition.	Relation with CE definition and/or R-ladder
2019	Environmental, innovative features, low emissions, European environmental engine test value, environmental certification, lifetime.	Average fuel consumption(R2), electric vehicles(R1), design(R1), content (R1), durability/lifetime (R1,2), functionality (R1)
2020	Environmental footprint assessment, emissions assessment, energy efficiency, environmental certification, operational life.	Operational life(R1), fuel type(R1,2), ecolabel (R1), energy efficiency (R2).
2021	Low emissions, energy efficiency.	Zero emission vehicles (R1,2) environmental certification(R1,2), energy labels(R2), possibility to repair(R4).
2022	Low emissions, waste volumes, energy efficiency, holistic environmental perspective, production, transport, life cycle, consider circular economy, environmental certifications, ecolabel, sustainable production, process, and sources, etc.	Waste sorting(R1,3), energy type (R1,2), circular economy (R1), energy efficiency (R2), zero emission vehicles(R2), recycle routines and content (R8), ecolabel (R1,2), avoid dangerous chemicals(R1,2,3,6,7,8) material sources and content (R1), packaging(R1,8). Reuse of sell (R3,7),

Table 3 Relation of the environmental award criteria over the years with the concepts

6.3 Qualification criteria

Circularity is sometimes confusing, and the best indicators for it can be difficult to find, but if the aim of the circular economy is to look at processes, we cannot underestimate the social aspect, which is in essence part of the process. I agree with the work of Wurster & Ladu (2022, p. 19), where they develop the Triple-C model that includes social aspects and circularity indicators as part of it. New business models, social innovation, and different ways to produce and consume, can at the same time help to develop skills and knowledge that increase capacity and competence. Systems, like environmental management systems, are components of the transformation and help to achieve resource efficiency, and this resource efficiency is related to the circular economy. (Witjes & Lozano, 2016, p. 38).

Therefore, I assessed EMS, ILO, Apprenticeship and CO2 reduction as components of transformation related to circular economy, although not directly circular in themselves, on one hand, I assume that we do not want to consume recycled products hypothetically produced by forced labour of children in India, slavery of any kind, and/or stimulate poor working conditions; on the other hand, I assume that we want to increase the number of organizations using an EMS that although costly, it helps to reduce the organizations

environmental impact linked to their resource use((Marouen-Amiri, Noubbigh, Naoui, & Choura, 2015, p.117) and is somehow legitimized in the practice, if we want to increase local sourcing and the development of suppliers one way could be by increasing the number of apprentices that will be able to gain experience and support local producers or service providers with their knowledge and to become more competent.

To analyze the qualification criteria during these years, please refer to the visuals presented in Appendix B.

6.3.1 Review of the year 2019

There were a total of 63 CAs of which 28 included components of transformation related to the circular economy, specifically the requirement of an environmental management system and the requirement of confirmation of adherence to the International Labour Organization (ND) Convention No. 94 and/or the eight core conventions 87, 98, 29, 105, 100, 111, 138, and 182. (The convention is related to the right to an ordinary wage for employees and subcontractors, the right to be organized collectively, no discrimination, the prohibition of cruel child labour, etc.)

In 2019, seventeen CAs from those 28 asked for EMS, and 11 asked for both EMS and ILO. But none of the requirements in the qualification criteria for that year were explicitly related to circularity, although it could be argued that a EMS could be linked to circularity as its goal is to diminish or keep track of the environmental footprint. Furthermore, the findings show that 27 competition announcements asked for non circular related qualification criteria.

6.3.2 Review of the year 2020

There were 69 CAs in total, from which one of the consumer products category requested eco-driving as an environmentally driving method, which could be an indicator for the green circular industry as it is linked to energy efficiency and can contribute to improving carbon neutrality in the logistics for supply. (Palander, Haavikko, Kortelainen, & Kärhä, 2020, p. 18).

However, 22 CA included components of transformation related to the circular economy, specifically the ILO and EMS. And 35 CAs asked for non circular qualification criteria.

6.3.3 Review of the year 2021

Fifty-two CA were analyzed, and one of them from the category ICT was circular, as it specified that to be qualified for the competition, the provider must have had expertise in sustainable ICT, be able to deliver the services with the lowest environmental impact, have a low energy consumption, provide solutions to reuse, recycle, and decrease the need to purchase new equipment, and increase energy efficiency.

Two CAs from the category construction and infrastructure and two CAs from the category consulting services mentioned CO2 reduction as qualification criteria. Erdiaw-Kwasie et al. (2023, p. 5) point out that CE promotes the reduction of input resources, waste, emissions, and the environmental footprint. Those same CAs required an environmental management system as well.

Nineteen CA had components of transformation related to the circular economy, specifically environmental management systems and International Labour Organization practices, and their documentation was required for potential suppliers.

6.3.4 Review of the year 2022

The year 2022 looked, in terms of qualification criteria, a bit less ambitious than, for example, the previous year. Although 69 CA were analyzed and every category included at least one competition announcement with components of transformation related to CE, only in the category of construction and infrastructure we can observe labour-oriented criteria such as ILO and apprenticeship (as qualification criteria). Something to notice during this year is that apprenticeship was incorporated directly as part of the qualification criteria in two competition announcements, which is new if it is contrasted to the practice in previous years.

6.3.5 Qualification criteria evolution

The previous analysis and its representation (table 4) reveals that 2021 was the most favorable year for circularity-oriented qualification criteria, particularly in the ICT category. However, one robust CA out of 253 suggests insufficient efforts towards circularity in this specific aspect of the tender basis.

Year	Relation with CPP definition.	Relation with CE definition and/or R-ladder
2019	Environmental management system	Environmental management system (R1, R2)
2020	Environmental management system, energy efficiency.	Environmental management system (R1, R2), eco-driving (R1,2)
2021	Sustainability, lowest environmental impact. low emissions, environmental management system,	Lowest environmental impact(R1), energy efficiency (R1,2), solutions to refuse (R0), recycle (R8), reuse(R3), environmental management system (R1,2)
2022	Environmental management system.	Environmental management system (R1, R2)

Table 4 General relation qualification criteria with the concepts

6.4 Criteria specifications

The criteria specifications allowed a more detailed description of the need from procurers. Specifications may relate to award criteria or technical details such as methods, times, production, etc. In this case, I am not going to categorize the criteria with the concepts of CE or CPP, as it was done for award criteria and qualification criteria, because there are many specificities and we would lose part of their content, which would not be ideal for the analysis. But the criteria specifications were reviewed through the four ambition levels explained in the methodology: **very good, good, to some extent** and **poor** over the different years. (Appendix C)

6.4.1 Criteria specifications from the year 2019

Level very good

In total seven CA scored very good; three of them from the category of construction and infrastructure, where the criteria was linked to have an environmental follow up plan, waste handling plan, reuse plan, to avoid environmentally hazardous materials, to

increase the amount of materials with recovery potential, emphasis on characteristics of materials that could directly be used in the construction or go to a bigger recycling process, demanding materials with potential to reduce the environmental impact, environmentally friendly manufacturing processes, packaging characteristics (recycled, or avoid using more than necessary), distribution characteristics (lower emissions), environmentally certified products and their expected lifetime.

Two CA from the category of consumer products, prioritized environmental certification, expected product's lifetime, and even a list of products expected to be reused.

From the ICT category, two CA prioritized packaging of products with as much recycled content as possible, and able to be recovered in Norway; environmentally friendly return of used consumables; arrangements for possible recycling and reuse of consumables; waste handling; a return scheme; and to consider the life cycle cost and environmental consequences as stated in Anskaffelsesloven (2016, § 5). Additionally, one of them included a list of existing equipment to be reused and specifics for its destination.

Level good

From the level good, there were nine CA from the construction and infrastructure category where the criteria emphasized the development of a waste plan (Byggteknisk forskrift, 2017, § 9-6), recycling of asphalt masses, waste sorting, and the development of a contaminated mass handling plan.

At the same level, there was one CA from the consulting services category where an EPD was required. The Norwegian EPD Foundation (ND) describes it as *"documents that contain trustable information that can be compared regarding the environmental impact of a product's life cycle"*, which is beneficial for circularity as procurers are more conscious of acquiring something supported by legitimate information. In principle, if we consume a product that we know has a lower environmental impact than others, we are reducing environmental costs.

Finally, there was one CA from the transport category emphasizing the need for low or no power consumption at standby mode for vehicles.

Level to some extent

In the Construction and Infrastructure category, there was a CA that required electric vehicle charging points. This in principle can potentially impact energy efficiency as people will use more electric vehicles if there is infrastructure for them.

In the category of consulting services, a CA was related to increasing the cycling infrastructure in the city. Although not circular in itself, more infrastructure could increase the use of environmentally friendly transport, thus reducing the need for fossil or electric sources and decreasing emissions as a result of it.

Level poor

At this level, there were 35 CA with poor criteria specifications related to circularity, which is a bit more than half of the 63 CA analyzed in total from this year.

6.4.2 Criteria specifications from the year 2020

Level very good

At this level, there were in total 12 CA; the construction and infrastructure category led with ten of them. where the criteria specifications included waste management plans, reuse plans, environmental follow up plans, characteristics for materials (environmentally hazardous contents avoidance, long service life, resistance, low maintenance needs. energy efficiency, low CO2 emissions, etc.) to consider the climate and energy plan of Bodø municipality; to follow the specifications of pollution for crematories related to emission levels and energy efficiency (Forurensningsforskriften, 2004, § 10); the BREEAM certification, which is related to net zero emissions, circularity, reporting, responsible sourcing of materials, water, anergy and waste reduction, etc. Especially designed for the building industry (Bre, ND).

In the consumer products category, there were three CA; which prioritized ecolabelled, recyclable, biodegradable paper and plastic products, the avoidance of REACH chemicals (European Chemicals Agency, 2023); and emphasized packaging characteristics (recycling, recovery, materials, etc.)

In the consulting services category, recycled materials, low-carbon concrete, and environmentally friendly materials were requested.

In the health category, the requirements emphasized ecolabelled products and recyclable or recovered packaging characteristics.

In the electricity category, the requirement was an NVE electricity certificate ensuring that the electricity was from renewable energy sources such as hydropower, wind, solar energy, etc. (Noregs vassdrags- og energidirektorat, 2015).

Level good

At this level, there were 13 competition announcements from the categories of construction and infrastructure, consulting services, and consumer products.

First, there were ten CA from the construction and infrastructure category emphasizing a waste management plan, possible asphalt recycling, use of pure materials, and avoidance of environmentally hazardous content.

The CA from consulting services leaned towards minimizing the use of cars, prioritizing pedestrian safety, facilitating business activities, showing cultural importance, and BREEAM certification.

Finally, the CA from the consumer products category requested products that avoided substances from the Norwegian Priority List. The Norwegian Environment Agency and the Norwegian Labour Inspection Authority are responsible for the regulations, implementation, and follow-up on this topic. (Miljødirektoratet,2022). Asking for products free of dangerous substances increases the possibility of better waste management and their potential recycling or reuse, as well as diminishing the environmental impact.

Level to some extent

In this case, ethical trade, related to labour regulations, was required, according to Repp, Hekkert, & Kirchherr (2021, p. 12). As it is not clear if CE can be used to generate wellbeing for all as a social effect (vs. sustainability) or whether or not this effect is intended, this criterion was placed at this level. Other CA requested solar panels which are positive for energy efficiency and can potentially reduce other types of energy

consumption(for example fossil energy), but on the other hand and as for today the recycling of solar panels is not cost effective and they have to go through long processes to minimize their waste generation (Senthil, 2022, p.98), it is a bit uncertain if it is a good contribution for CE itself or if solar panels have robust positive impact especially in an arctic city such as Bodø where there is sun for prolonged periods of time during the day but only for a few months, being the dark period with very few hours of daylight a reality in this city, where we might not even have the chance to see the sun directly or at all for a majority of months, limiting the potential of solar panels, but of course some research should be done regarding the solar panel feasibility in the city.

Level poor

This level of specification criteria had twenty-seven out of sixty-nine competition announcements which means an improvement compared to the previous year as the share of CA with poor level decreased in proportion to the total for the year.

6.4.3 Criteria specifications from the year 2021

Level very good

There were eight CAs distributed in four different categories.

Construction and infrastructure was the one with the most CA, among the different specifications suppliers were requested to come with solutions to reduce the greenhouse gas emissions during the construction, operational phase, and to from TEK 17 which contains construction standards requirements and characteristics for Norway and it is also known as Byggteknisk forskrift (2017); to consider reusing parts of an existing façade as an option, to provide an environmental monitoring plan, waste management plan, to reuse existing swing racks and existing climbing frames, to follow the substitution obligation (using substitute products, chemicals, and biological material with less harmful alternatives if they exist), and emphasized the use of durable, adapted for climate, easy to maintain and quality products and materials while constructing accordingly to Bodø municipality's environmental goals.

In the ICT category, the specifications were related to environmental certifications, source separation, electronic-waste recycling scheme, the supplier's responsibility to handle the packaging or to have a return scheme approved by the Norwegian environmental agency; it was set as the supplier’s responsibility to assess if the equipment could be reused and if that was the case, prepare it to be reused. As well as follow the specificities related to the use of chemicals and hazardous products to health and the environment (Produktforskriften, 2004).

From the consultancy services, emphasis was set in environmental planning, emissions reduction, reducing transport use, considering environmentally friendly material choices, and providing greenhouse gas accounting.

In the consumer products category, the criteria requested was related to avoid harmful substances to health or the environment; to prioritize repairs instead of new products, estimated repair times, the possibility of zero emission vehicles and local points of sale which can be positive for the environment as it could decrease delivery distances and increase energy efficiency.

Level good

At this level, construction and infrastructure had six CA, where the criteria were related to waste management plan, potential reuse of materials, potential recycling of asphalt, and a green structure related both to recreation and ecosystem preservation (Miljødirektoratet, 2023). According to Fabbricatti & Biancamano (2019, p. 24), in the urban landscape, there can be spaces to reactivate, regenerate, and recover the potential of areas using the circular economy to stimulate "community relationships" and rebalance the environmental symbiosis in urban settlements, making cities more inclusive, safe, and resilient.

In the consulting services category, it was required to consider Bodø municipality's ambitions from the climate and energy plan 2019–2031, the BREEAM certification, and to include a passive house level related to energy efficiency, which apparently uses only a quarter of the energy of traditional similar constructions. (Børre,2013)

Level to some extent.

The categories of consulting services, and ICT asked specifications related to the ILO, and the use of apprenticeships by suppliers, which, as stated before, could be seen as a component of transformation related to the circular economy but not a circular criterion in itself.

In the transport category, the criteria were related to the proper handling of garbage and to decrease emissions related to sea transport and the specific compliance for NOx Emission Tier II which is about the reduction of nitrogen oxide values (Sjøfartsdirektoratet, 2019).

Level poor

In 2021, less than half of the total number of cases analyzed belonged to the poor level, being this a progress if we compare its proportion to the two previous years.

6.4.4 Criteria specifications from the year 2022

Level very good.

Consumer products had the biggest share of CA from this level, emphasis was paid to reusing, recycling and minimizing packaging or adhere to schemes related to it such as Grønt Punkt Norge (ND); to prioritize zero emission vehicles both for use and delivery; to prioritize repairs over new acquisitions; to comply REACH regulations avoiding use of dangerous cancerogenic, reproductive or mutagen agents in products; to use ecolabel and environmental certifications; to diminish the environmental impact, to develop reuse and recycling routines and have the highest content of recycled materials in some products or parts of them; to provide the opportunity to reuse equipment be able to sell it after its use; to provide electric waste disposal scheme; to have local sale points and a sustainable forest certification in case of products sourced from threes.

Construction and infrastructure. had the second biggest share of CA. Especial focus was paid to have a system for handling recycling and reusing packaging; to comply with all national requirements relating to emissions and the environment; to have high material recycling, sorting routines, guidance, courses, and assistance for waste management for

schools and companies; to use environmentally friendly or zero emission vehicles; to have a waste management plan; to provide less harmful alternatives of products where they exist; to increase energy efficiency; to be a member of a return scheme; to assure proper handling of packaging for example Grønt Punkt Norge (ND) which works with sustainable and circular packaging using recycled materials.; and to consider the environmental and energy plan (Bodø municipality, 2019)

Transport. In this category, especial attention was paid to vehicle sharing, zero-emission vehicles with preference for fully electric or hydrogen and hybrids; products that satisfied health, safety, and environmental requirements of Norway and that avoided risk of harm to users or the environment. Some products requested the CE-mark as well where relevant, which also means that they comply with the European Union standards (Standard Norge, 2022).

ICT. In this category emphasis was on the possibility to change batteries in products; preference for energy efficient products or services, universal use (for people with special functions); Priority for fossil-free vehicles and electronic equipment with potential for reuse, resell, or restoration; packaging requirements(avoiding unnecessary packaging, making it according to the product size, its content of recycled materials or materials able to be recycled, and avoiding hazardous substances in it, etc.).

Health. In this category emphasis for certified products, ecolabel; production with environmentally friendly materials; allergy-free materials; priority on zero emission vehicles; routines for recycling; opportunity to reuse equipment; reduce the environmental footprint.as well as placing the packaging handling as the supplier's responsibility were among the specifications.

Cleaning services. In this category attention was paid to new clothing to be produced according to Tencel (ND) standards or equivalent. Which are related to sustainable and renewable sources of textiles and compostable materials that can biodegrade and revert back to nature. As well as require suppliers of a return scheme such as Grønt Punkt or similar; the preference for zero emissions vehicles; that the supplier had a focus on the environment, ethics, and sustainability; to avoid using harmful or toxic chemicals and for the supplier to take over the packaging responsibility.

Only the consulting services category did not figure at this level.

The level good,

There were only CA from the construction and infrastructure category. The main focus was to align with the requirements of the Byggteknisk forskrift (2017) related to construction standards; for the supplier to have system for sorting, recycling, and/or reusing the packaging; to sample of potential hazardous substances in building elements before removal and to provide a sorting and waste management schemes.

The level to some extent

There were only CA from the transport category, where emphasis was on using batteries instead of cables for electric vehicles and prioritize the energy type of vehicles (starting with electric, hybrid, gas, and if not available, diesel or gasoline as last choice).

The level poor

It is important to notice as well that 32 CAs out of 69 had poor specifications regarding circularity, which means both that more can be done and that there is still a long way to go towards more circular criteria.

6.5 Market dialogue

To get insights about market dialogue, both Mercell and Doffin have been considered. After the analysis it has been found that: there was no MD in 2019; there were three different market dialogues in 2020, two from the category construction and infrastructure and one from other services; and there were two MDs in 2021, one from the transport category and one from construction and infrastructure. And finally, there was no MD found in 2022. (Appendix E.)

Year 2019

No dialogue was found.

Year 2020

Smart architecture: The market dialogue exhibited a progressive and innovative approach towards data sharing, use, and collection. The publication was released at both the European and national levels, and in both English and Norwegian languages. This MD looked for solutions to barriers that procurers often have problems with, in this case, information. Having reliable information can help prioritize projects where the municipality can generate the most value, and being able to quantify effects and seek better information can indeed be smart. There are many ways this can be applied, for example, to evaluate the effect of circular procurement (Zijp et al., 2022, p.11).

Craftsman and painting services: In this case, it was interesting to see that the municipality was asking for suggestions to avoid being exclusionary and to avoid considering just price during the process; the text was in Norwegian only. I have to point out that the part about being more inclusive could be related to one of the barriers studied by Kristensen et al. (2021, p. 10) and is about diminishing the risk of external complaints, as public institutions must ensure the correct application of law, and taking innovative risks can make the process slower, unintentionally exclude suppliers, or imply an excessive use of resources. It can also complicate the performance of other departments, services, activities, or duties within the institution. However, as we can see here, by opening a dialogue, one can seek to solve and prevent complaints to a certain extent, get information, and improve practices while increasing and generating competence and knowledge.

Tourist information. I believe that when one does not have all the answers, it is good to seek them. In this case, the municipality was asking for suggestions for a specific tourism-related project. Zijp et al. (2022, p. 12) point out the importance of co-creation for CPP criteria. Although it is the decision of the procurer to decide which information from the MD will be used or not for the different objectives of that dialogue, it is noticeable that better understandings and synergies can be found.

Year 2021

Climate and environmental requirements for zero emission construction sites. This was a digital dialogue, and it was related to have a grasp about the current and future trends in the construction sector towards zero emission construction, due to the upcoming intensive years of construction related projects in the municipality, such as the airport project, and roads.

Acquisition of electric vehicles. The analysis shows that the municipality was trying to evaluate the feasibility to acquire electric vehicles and to understand its implications in terms of availability, performance in winter conditions, efficiency and expectations required to service and functionalities, as it was an unexplored acquisition.

Both market dialogues, the one for climate and environmental requirements for zero-emission construction sites and the acquisition of electric vehicles, are of great importance to diminishing the environmental footprint, which is directly linked to the concept of CPP. One of them is from the transport category, and the other is from the construction and infrastructure category.

It looks like the municipality in 2021 was very eager to diminish emissions, as it collaborated and tried to increase its knowledge about electric vehicles and zero-emission construction sites. This is very positive because one of the barriers to CPP is a lack of knowledge (Kristensen et al., 2021, p. 10). The collaborative effort with suppliers to gather information appears to have been effective and positively influenced the tender basis formulation for the following year.

Kringlen (2022) commented about the municipality's plans to ask for criteria for zero emission construction, and this year the first zero emission construction site in northern Norway became a reality with the use of electric excavators (Johansen, B. & Grimstad, S., 2023). Apparently, about 95% of direct greenhouse emissions come from the use of machines and transport during the construction phase due to their high and intensive diesel use (Kjendseth, 2022). This appears to be a promising development, given that construction and infrastructure are among the leading sources of carbon dioxide emissions in Bodø municipality (Larsen, 2022, 06:30).

The experienced impacts of the dialogue in 2021 seem to have developed a positive mindset in the municipality while showing that innovation and adaptability are possible. Åvangen (2021, p. 31) suggests reusing construction materials, such as rocks, to avoid the need for sourcing new materials from mountains. This is noteworthy since the depletion of mountains can have severe and irreversible environmental impacts. An application by the municipality to Statsforvalteren (ND), specifies that the project for rehabilitation of Sjøgata, (the same about the zero emission construction sites) could possibly reuse materials too.

This validates the statement of Al-Sinan & Bubshait (2022, p. 20), who point out that involving stakeholders can, in essence, help to set the path or standards, synchronize efforts, contribute to a stronger CE ecosystem, and facilitate a smoother transition to better practices.

Year 2022

It is concerning that although the MD of 2021 had a positive impact on procurement practices in the municipality, there was an absence of MD in 2022.

6.6 Results discussion

Deegan (2014, p. 248) suggests that legitimacy theory seems to provide an elevated explanatory power for environmental reporting. He defines legitimacy as *"a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions."* But then, if legitimacy is relative and based on perception, has circularity been legitimized as a concept in practice in the municipality? We can assume that the values, beliefs, and definitions of the organization come from the compromise with the social contract and are desirable, set in different documents, and aligned with different goals for the organization, the city, the region, the country, the EU, or the world. It looks like CE can help and is helping to reach those goals.

The award criteria (Appendix A) for competition announcements, which encompassed the environment, exhibited a rise from three in 2019 to four in 2020, a decline to two in 2021, and a subsequent increase to fifteen in 2022. This demonstrates a significant improvement in the utilization of environmental standards in procurement processes, with a favorable outcome.

If we look at categories, in 2019 and 2020, three categories included the environment, namely construction and infrastructure, consumer products, and transport. In 2021, the categories were reduced to consumer products and transport. However, in 2022, the environment was included as award criteria in six categories. The progress towards 2022 appears promising. However, a lot of work needs to be done in the case of consulting services, which never made it for environmental aspects in any of the years for award criteria. In terms of categories, consumer products, construction and infrastructure, and transport seem to have been the ones with better progress in award criteria towards circularity.

The qualification criteria outlined in Appendix B presents a discouraging panorama. EMS have been required 110 times over the years, and while they are a common practice, they are not explicitly listed as a criterion for CE. CPP's objective of mitigating environmental harm aligns with the circular economy's principles of environmental responsibility, but the rationale for EMS inclusion in procurement processes in relation to the circular economy appears ambiguous. In 2020, a CA in the consumer products category requested eco-driving, which is related to the Rethink and Reduce elements of the R-ladder (Figure 2). In 2020, two CA in construction and infrastructure and two in consulting services attempted to reduce CO2 emissions, aligning with the Reduce component of the R-ladder. In 2021, only one CA from the ICT category explicitly incorporated criteria related to circular economy principles. Out of the 253 CA analyzed over the years, only six remain after excluding the ones which requested EMS. Furthermore, only one of these six CA was explicit enough to meet the CE qualification criteria. Therefore, the qualification criteria for CE appear to be insufficiently ambitious.

An evolution shows that procurers have been improving or specializing in a way, asking for a bit more ambitious and specific characteristics, while passing, for example, from the award criteria required in 2019 related to fuel consumption to the characteristics of 2022 requesting recycle routines, reuse products, zero emission vehicles, and even asking for the circular economy itself.

It is not the case for all criteria, as quality criteria had one very good example back in 2021 that was very progressive: asking to reuse, recycle, avoid buying if not necessary, etc., but it seems to be an isolated case as in 2022 qualification criteria were not as ambitious.

Specification criteria. The number of CA meeting the very good level has increased from seven in 2019 across three categories to 19 in 2022 across six categories. It is noteworthy that the increase in amount may be accompanied by greater specificity in the categories. Throughout the study, the specification criteria were generally satisfactory, with slight changes in wording such as transitioning from fuel consumption to zero emissions.

The CA were so diverse from one category to another and their specifications, for example: CA for upgrading a cemetery, for the acquisition of IT equipment, for the renovation of a façade, or to procure fresh fish cannot ask for similar criteria and therefore, each CA must be considered case by case or by categories. I must say that being a procurer seems like a job full of variation, and one might have to have very broad competence in different topics.

A lack of knowledge is evidenced in the practice as we see that some criteria are placed in different places among the tender basis, and the use of sustainable and circular criteria seems to be mixed, which is not bad but could be a result of the ambiguity of working with these types of concepts (Kristensen et al., 2021,p.10), making it difficult to separate the one from the other. Nikolajeva & Sørgård (2020, p. 15) identified lack of knowledge as a barrier. Overcoming this obstacle requires developing knowledge. We can see that the municipality is trying to increase its knowledge, among others, through the market dialogue, and although it is the decision of the procurer to incorporate information from it to elaborate the tender basis. The approach appeared effective in achieving zero

emission construction sites. Market dialogue results can enhance competence and facilitate future efforts and replications, as evidenced by their positive outcomes.

Langseth & Similä (2021, p. 205, 217) emphasize the significance of early market dialogue and a continuous search for innovative solutions as a variable for innovation in public procurement. They suggest that organizations that engage in early market dialogue and have experience with innovative procurement processes are more likely to be receptive to innovation, leading to the development of competence over time. Alhola, Ryding, Salmenperä, & Busch (2018, p. 106) mention that market dialogue is one essential aspect of innovation in CPP. However, insufficient experience, inadequate market communication, and low competence or support can impede the progress of implementing and promoting CE.

Lack of resources, in terms of time and money, was identified as an organizational barrier for CE by Nikolajeva & Sørgård (2020, p. 15). The scope of this thesis is limited to the qualitative aspect; therefore, I have not included the economic aspect. The procurement department's chart (figure 4) indicates ongoing human resource development, with the recent addition of a contract controller in March and a new legal advisor position that has been published.

The job description for the legal advisor includes enhancing competence, establishing market connections, and utilizing procurement processes to attain the municipality's goals such as reducing CO2 emissions, as stated in the job advertisement (Karrierestart, NDd).

The office manager and special advisor for strategy and development, along with the procurement department and the organization as a whole, are responsible to continue driving the change towards innovative public procurement and environmentally friendly criteria after the municipality's goals have been established (Bodø municipality, 2019, p.30).

Incorporating circularity in procurement processes can be challenging due to legal requirements. Therefore, having a dedicated resource for legal matters in the department is a positive indicator, as discussed in the thesis. It is premature to predict the effects of these modifications on the practice. A further review will be needed to determine their

impact. However, from an organizational development perspective, these changes appear to be encouraging. The attention to environmental sustainability, and circular economy may foster the development of employment opportunities as well as expertise.

In the case of public procurement, it's essential to establish routines, have good participation and communication from all departments, analyze risks, use institutional systems and tools, and be open and able to embrace change, while minimizing negative effects (Nikolajeva & Sørgård, 2020, p. 17).

The procurement strategy demonstrates the organization's commitment to its goals by incorporating various best practices, including a focus on environmental sustainability and innovation (The City council, 2022, 17:20). And it is particularly pertinent for the circular economy.

If we look at the perspectives on smart city governance, it looks like Bodø municipality has been more participatory and conscious seeking "*innovative decision-making processes*", and its level of transformation could be "*medium-low* "(Meijer & Bolívar, 2016, p. 399). As there has been an evolution that has translated into a steady increase in the number of CA that has included CE-related criteria and the different categories that contain them.

7. Conclusions.

The research question of the study is: How can circularity indicators in public procurement lead to smarter, more informed decisions? The case of Bodø Municipality has been analyzed with results from indicators:

Award criteria seem to have improved over the years, and CE-related aspects were steadily included more and more and increased in level of weight. However, research shows that consulting services remained unexplored as category for circular economy criteria in the municipality.

Qualification criteria was the section of the tender basis which had the least development; there was only one CA ambitious enough to request circularity aspects explicitly in 2021; some other less ambitious isolated cases in 2020 and 2021 requested

eco driving and CO2 emissions reduction respectively; Although EMS is a recurrent criterion, it is unclear whether the motivation to request it is CE or not.

Criteria specifications demonstrated very good examples of circularity through all the years, and it has increased in the number of categories where those circular criteria were found. The research shows that the biggest improvements are in the categories of consumer products, construction and infrastructure and transport with a steady increase, probably because physical objects are often easier to attribute with characteristics than services, However, circular criteria as criteria specifications for services have become more prevalent over the years, such as the preference for zero emission vehicles in deliveries.

Although the research found that it was possible to ask for CE in all parts of the tender basis. It appears that this municipality preferred to request CE-oriented criteria as part of award criteria and criteria specifications.

Market dialogue It is evident that there is a lack of knowledge in some specific tasks or innovative processes, as the dialogues from the municipality were related to: first, co-creation for services, as observed in the tourism MD from 2020 during the pandemic; second, the concern to ask for criteria that could seem exclusionary; and third, the uncertainty that unexplored procurements can cause, as evidenced, for instance, in the MD from 2020 for smart architecture and the MD from 2021 for zero emission construction sites.

However, things take time. Research shows that the MD of 2021 impacted procurement in 2022, demonstrating that the implementation process can be slow, requires long-term planning and follow up but that is worth it as it can generate positive tradeoffs such as the initiation of zero emission construction sites that diminish the environmental footprint. Dialogue and collaboration can help solve complex or unexplored tasks.

Although the municipality has achieved good results from market dialogue, it is concerning that there was no MD in 2022.

Circular public procurement as a method with potential positive impact can be used as a driver and support for different procurement projects and to achieve organizational

goals. In that sense, Bodø municipality should engage more, get inspired by others, and inspire others while continuously trying to innovate procurements and be open to learning how to improve routines and processes for the transition towards circularity.

The circular criteria conflict seems to reside in its continuous development process and the confusion of where or how to include it in procurement while dealing with laws, rules, and regulations, but it seems to be steadily adapting in different categories; however, more work needs to be done, and that work needs to include collaboration, which has proven to be effective.

At the organizational level, the municipality's goals align with the new procurement strategy that incorporates environmental sustainability; new vacant positions that take environmental aspects into consideration; and the prevalent increase of environmental criteria in CA, which is setting robust foundations for the circular economy. However, the heterogeneity of CA documents posed a challenge to their analysis, which indicates that different procurers employed different approaches in their construction over time.

If legitimization entails the sense-making of an intention, in this case, the circular economy as an intended principle to meet a critical incident, defined in this thesis as the municipality's goals to incorporate environmental aspects in public procurement, it is demonstrated through this analysis that there was a sustained increase of CE criteria in the procurement activities of Bodø municipality and, hence, its legitimization during the studied period.

In this thesis, we can observe that local procurement actions can have a sustained and increased impact through collaborative innovation. One person or a single institution cannot solve the world's problems, but they can certainly contribute to solving them.

7.1 Recommendations

Implementing a routine for record-keeping in procurement can aid in measuring and assessing the effects of procurements, producing reports, data visualization, and enabling well-informed decision-making. It would be advantageous to utilize the digital twin in a systematic manner by incorporating relevant public procurement data, including circular

information. To guarantee its precision, it is suggested to assign specialized personnel to take on this responsibility or provide training for the use of this tool.

Bodø municipality, whenever feasible, should enhance or commence market contact and collaboration both within and outside the organization to obtain input for designing the tender basis, as it has resulted in beneficial insights and outcomes.

To ensure clarity and compliance, it is recommended to create standardized, robust, and comprehensive tender documents for the different product or service categories to avoid confusion, deviations, complaints, etc. These template documents should be distributed to relevant users in the organization and accompanied by established procedures, guidelines, and training for staff members as needed.

Enhance the level of ambition towards CE or the environment, particularly in categories that have the potential to generate significant impact or are frequently executed, such as construction and infrastructure, transport, and consumer products.

Once a method or criteria has proven to be effective, it should be embraced, maintained, and continuously improved, not abandoned. To facilitate this process, establishing a widely accessible organizational databank of best practices should be prioritized.

Procurement authorities in the municipality are advised to articulate their requirements with precision while also allowing for potential input from bidders.

7.2 Limitations.

This research exclusively examined the tender-based criteria, particularly those associated with the circular economy and its progression in competition announcements, alongside certain organizational elements and procurement procedures linked to CE. Other procurement aspects, including contract execution, monitoring, complaints, etc., were not within the scope of this study.

This study was limited to the practice of public procurement in 2019, 2020, 2021, and 2022 in Bodø Municipality and from competition announcements with obligatory declaration in Doffin, as well as market dialogues from both Doffin and Mercell; therefore,

the results cannot be assumed to be the same or generalized for other types of competition announcements, years, or municipalities.

In the data collection process, there was some information that was not found online (server problem, broken link, etc.); as a result, some important information could have been lost in the process.

For reasons of time, it was not possible to assess other years and different parts of the procurement process, such as the evaluation of offers itself, complaint management, contract performance, etc.

7.3 Future research

For further research, it would be useful to quantify the circular public procurement effect described in Zijp et al. (2022, p. 3). As the "difference in impact between the supplied product and the market standard". To get an idea of how good or bad it is for the local market to use circular criteria in procurement and be able to correct, improve deviations, or adjust ambition levels. But also, to get an idea of the performance of the CPP criteria over time.

It would be worth analyzing the complaints from suppliers related to criteria formulation to see what aspects the market is more concerned about, confused about, interested in, or reluctant to fulfill regarding not only CE but innovative processes and to understand the local reasons behind them.

Further research should be performed in other arctic municipalities that may encounter comparable market limitations, data accessibility, infrastructure realities, objectives, and environmental goals, and that may have already established a pre-existing strategy or be in the process of implementing one.

Further research needs to be done in the past years before 2019 and in the present and upcoming years to keep track of and follow up on trends related to CE and CPP.

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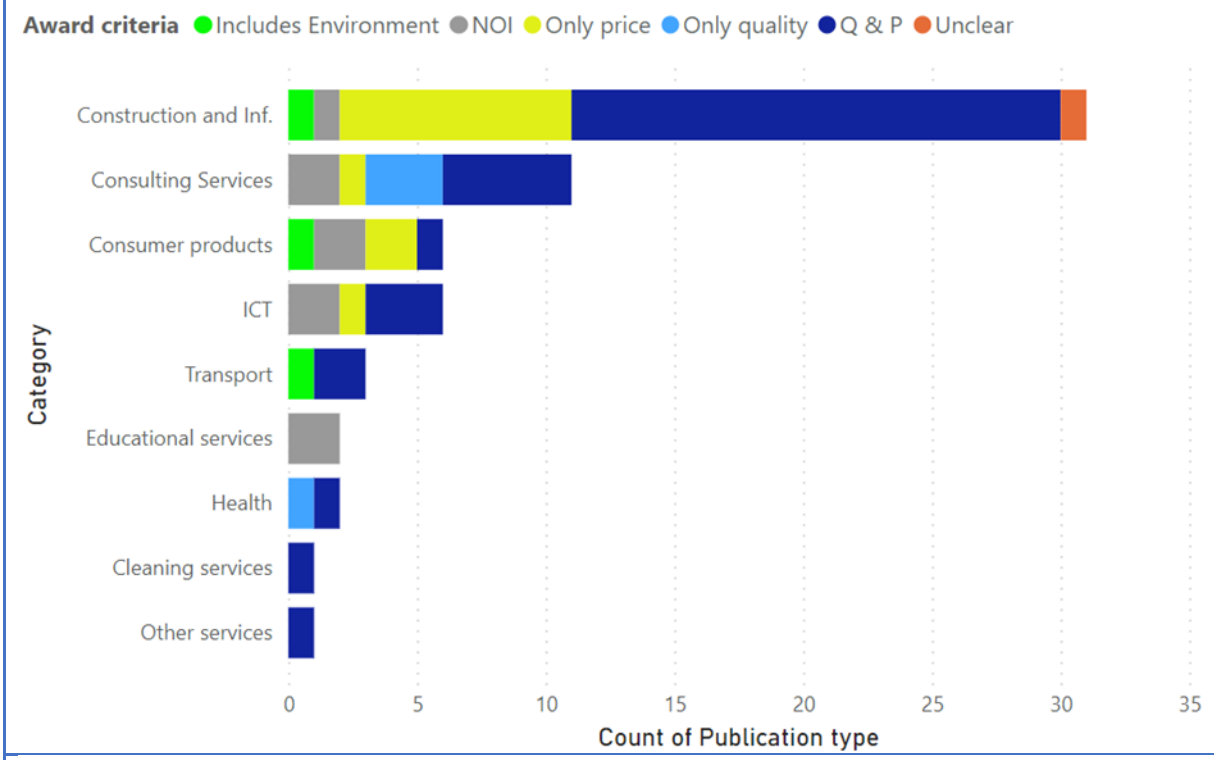
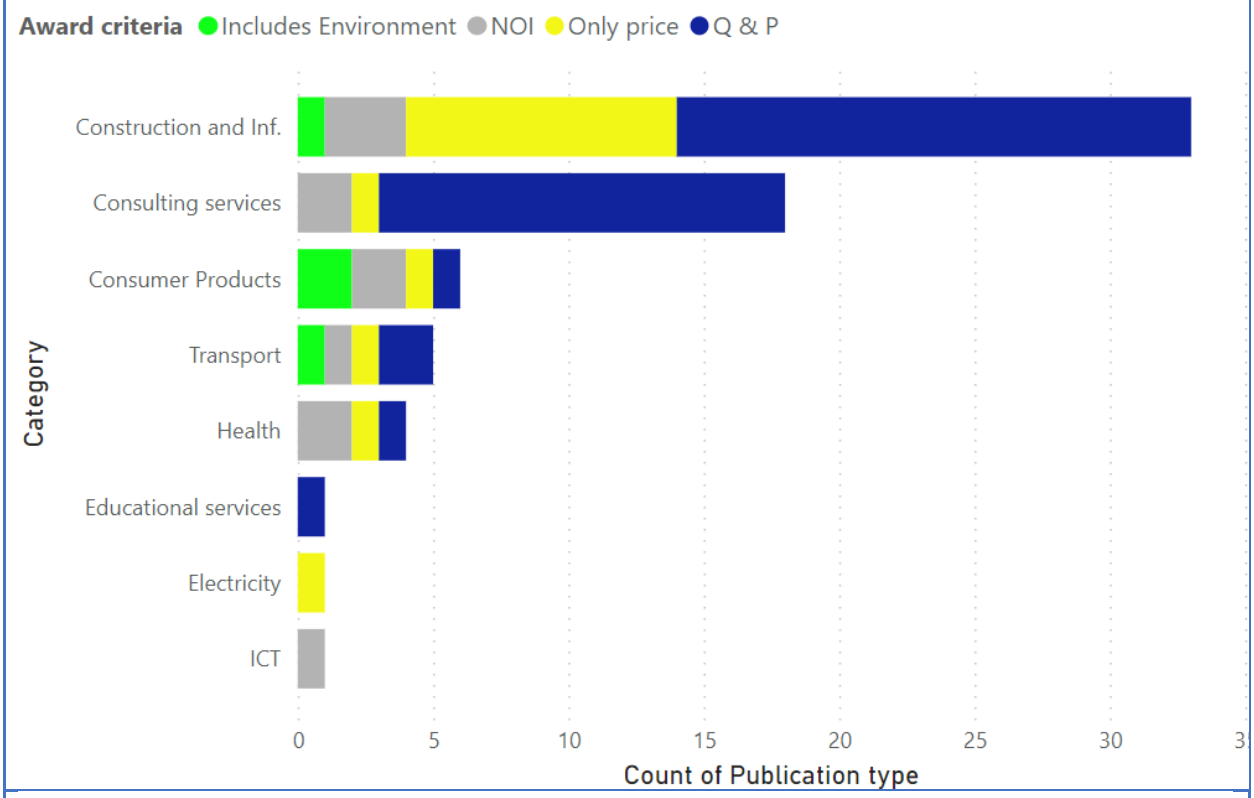
Appendix A. Award criteria tables and graphs for the four years

Award criteria of 2019



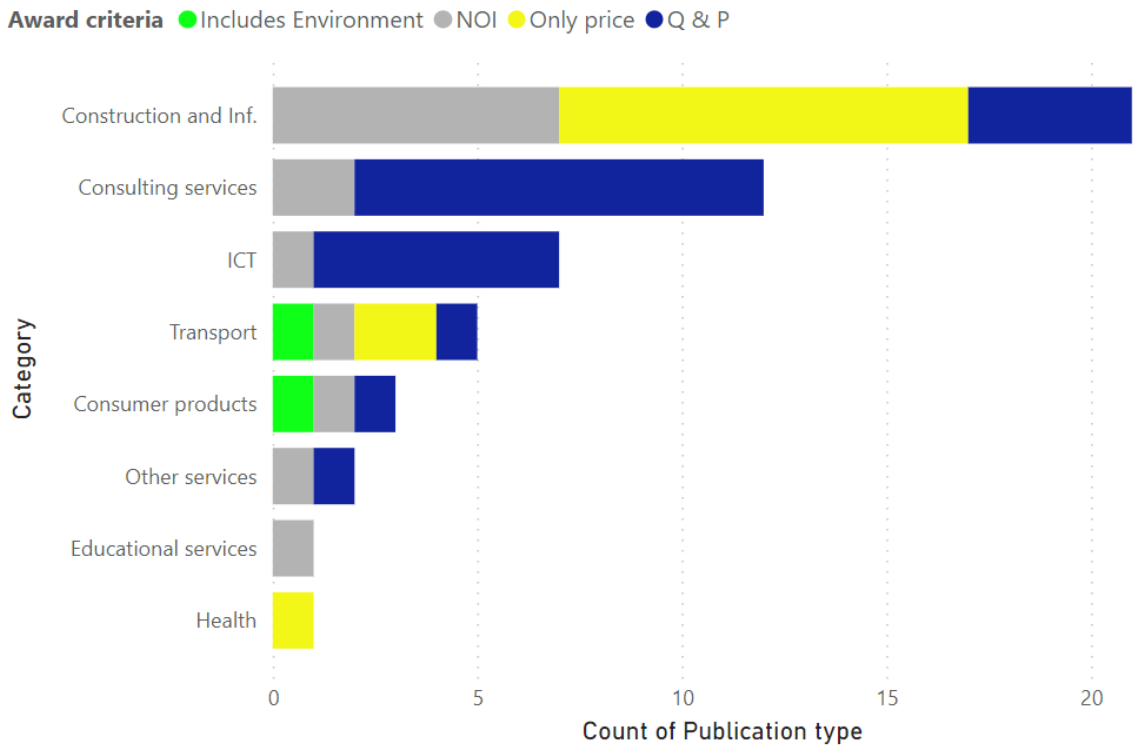
Category	Includes Environment	NOI	Only price	Only quality	Q & P	Unclear	**Total**
Construction and Inf.	1	1	9		19	1	**31**
Consulting Services		2	1	3	5		**11**
Consumer products	1	2	2		1		**6**
ICT		2	1		3		**6**
Transport	1				2		**3**
Educational services		2					**2**
Health				1	1		**2**
Cleaning services					1		**1**
Other services					1		**1**
Total	**3**	**9**	**13**	**4**	**33**	**1**	**63**

Award criteria of 2020



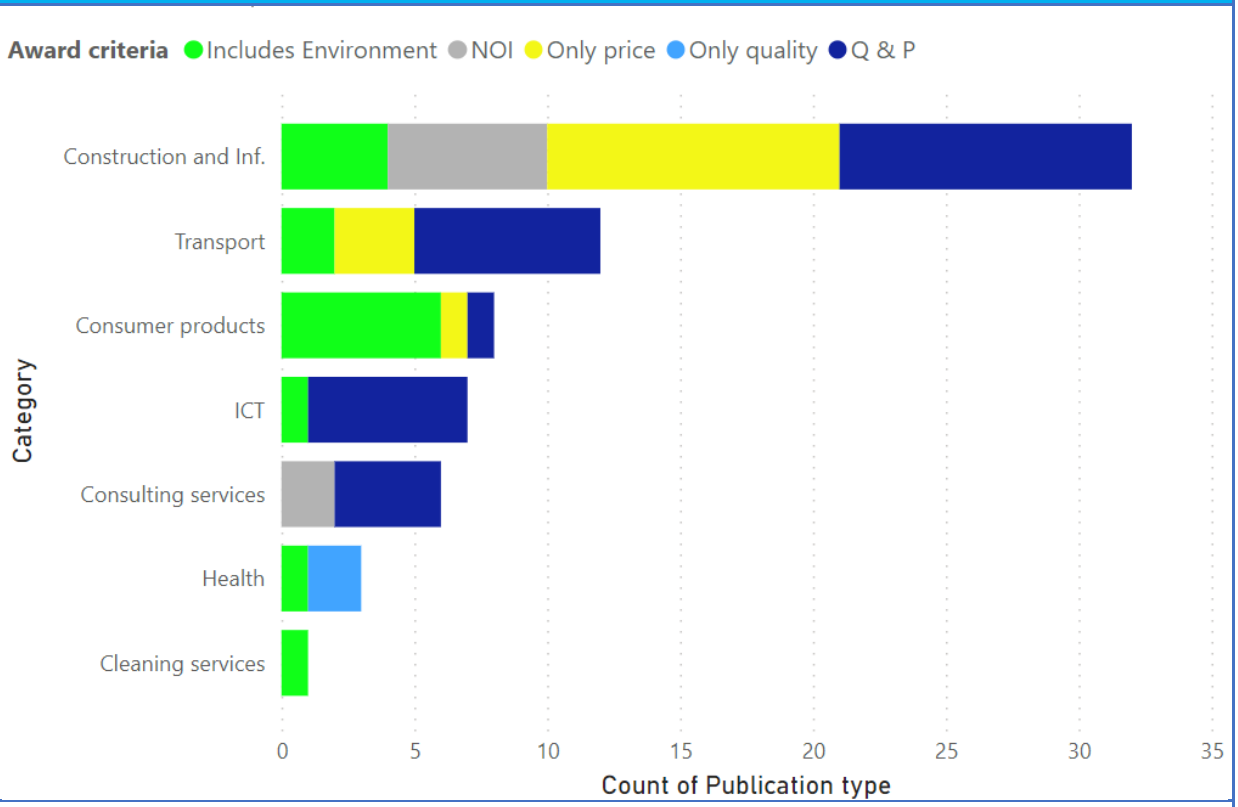
Category	Includes Environment	NOI	Only price	Q & P	Total
Construction and Inf.	1	3	10	19	**33**
Consulting services		2	1	15	**18**
Consumer Products	2	2	1	1	**6**
Transport	1	1	1	2	**5**
Health		2	1	1	**4**
Educational services				1	**1**
Electricity			1		**1**
ICT		1			**1**
Total	**4**	**11**	**15**	**39**	**69**

Award criteria of 2021



Category	Includes Environment	NOI	Only price	Q & P	Total
Construction and Inf.		7	10	4	**21**
Consulting services		2		10	**12**
ICT		1		6	**7**
Transport	1	1	2	1	**5**
Consumer products	1	1		1	**3**
Other services		1		1	**2**
Educational services		1			**1**
Health			1		**1**
Total	**2**	**14**	**13**	**23**	**52**

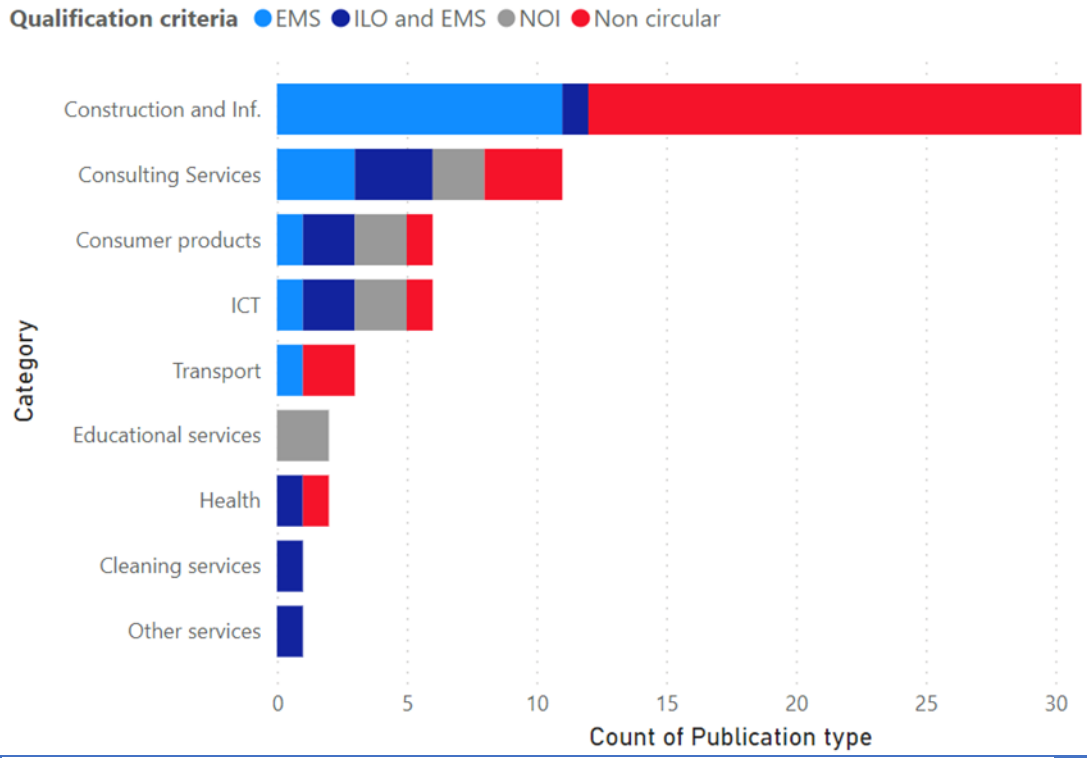
Award criteria of 2022



Category	Includes Environment	NOI	Only price	Only quality	Q & P	Total
Construction and Inf.	4	6	11		11	**32**
Transport	2		3		7	**12**
Consumer products	6		1		1	**8**
ICT	1				6	**7**
Consulting services		2			4	**6**
Health	1			2		**3**
Cleaning services	1					**1**
Total	**15**	**8**	**15**	**2**	**29**	**69**

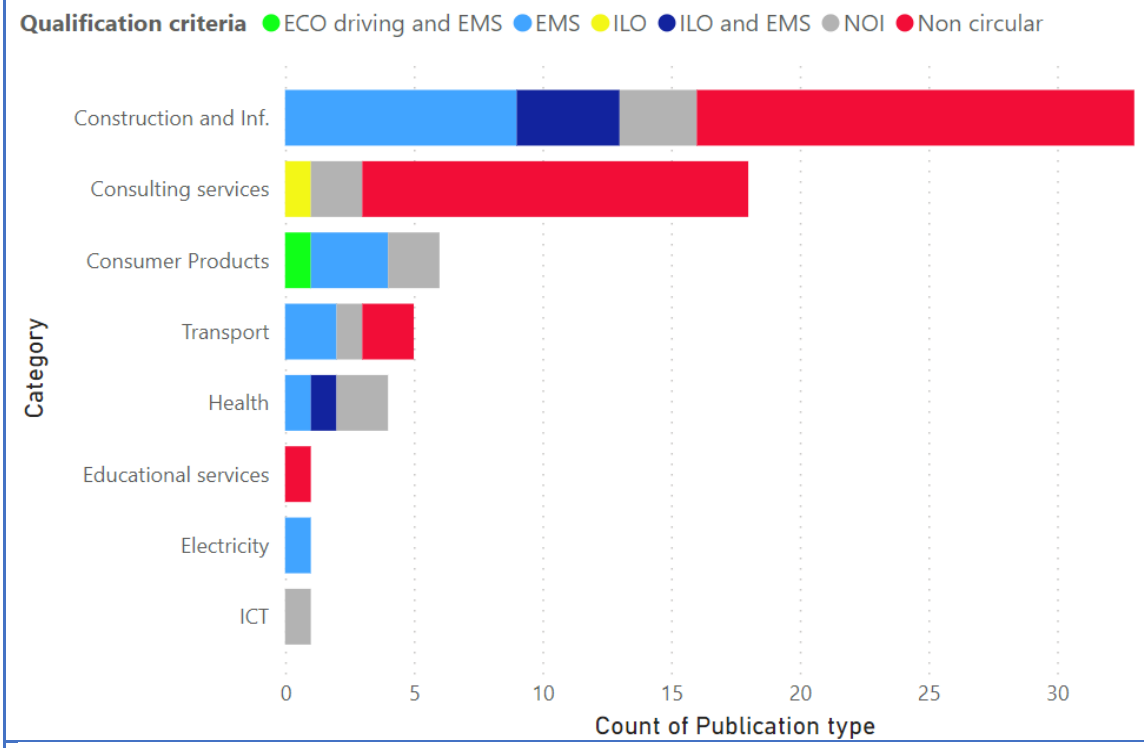
Appendix B. Qualification criteria tables and graphs for the four years

Qualification criteria of 2019



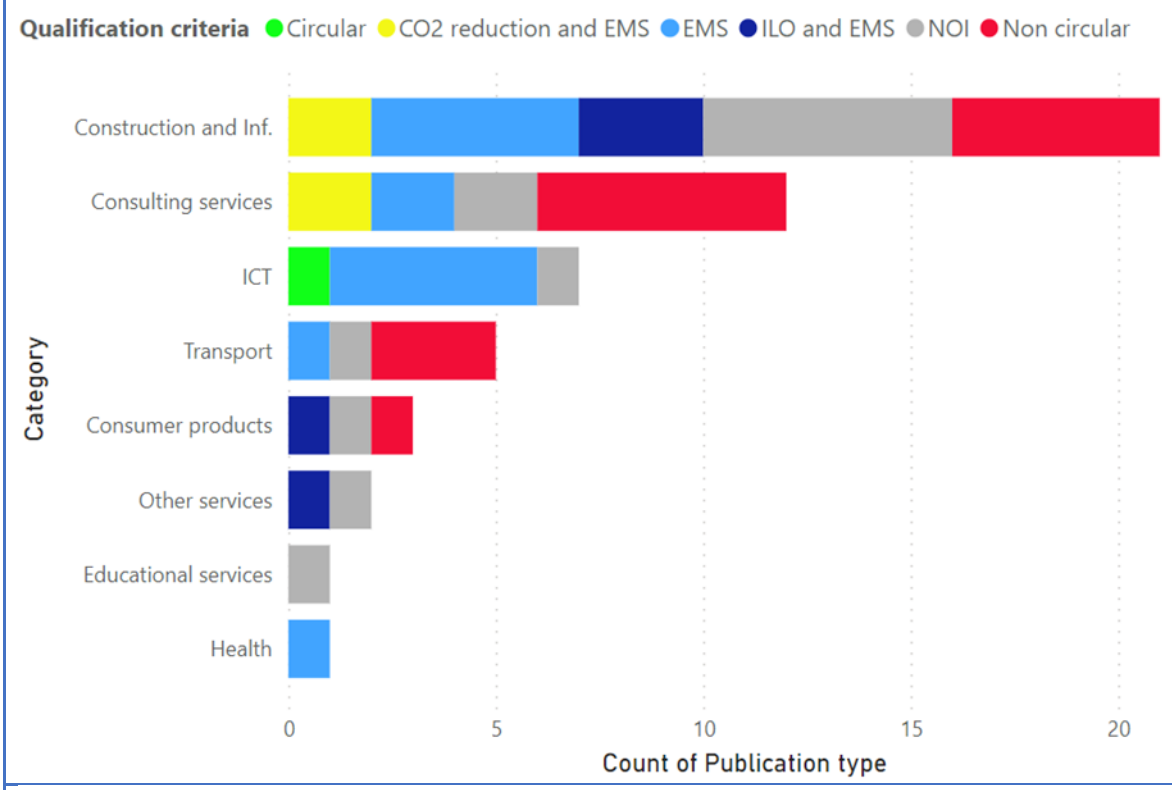
Category	EMS	ILO and EMS	NOI	Non circular	**Total**
Construction and Inf.	11	1		19	**31**
Consulting Services	3	3	2	3	**11**
Consumer products	1	2	2	1	**6**
ICT	1	2	2	1	**6**
Transport	1			2	**3**
Educational services			2		**2**
Health		1		1	**2**
Cleaning services		1			**1**
Other services		1			**1**
Total	**17**	**11**	**8**	**27**	**63**

Qualification criteria of 2020



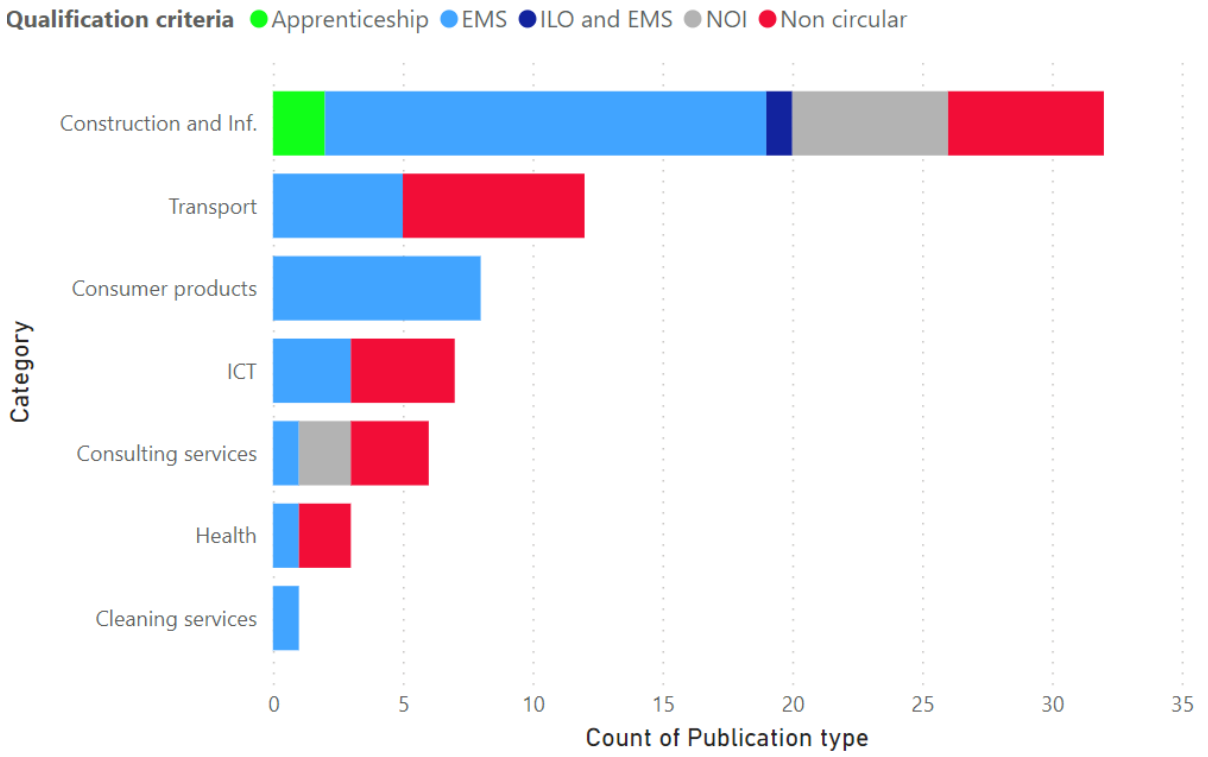
Category	ECO driving and EMS	EMS	ILO	ILO and EMS	NOI	Non circular	Total
Construction and Inf.		9		4	3	17	**33**
Consulting services			1		2	15	**18**
Consumer Products	1	3			2		**6**
Transport		2			1	2	**5**
Health		1		1	2		**4**
Educational services						1	**1**
Electricity		1					**1**
ICT					1		**1**
Total	**1**	**16**	**1**	**5**	**11**	**35**	**69**

Qualification criteria of 2021



Category	Circular	CO2 reduction and EMS	EMS	ILO and EMS	NOI	Non circular	**Total**
Construction and Inf.		2	5	3	6	5	**21**
Consulting services		2	2		2	6	**12**
ICT	1		5		1		**7**
Transport			1		1	3	**5**
Consumer products				1	1	1	**3**
Other services				1	1		**2**
Educational services					1		**1**
Health			1				**1**
Total	**1**	**4**	**14**	**5**	**13**	**15**	**52**

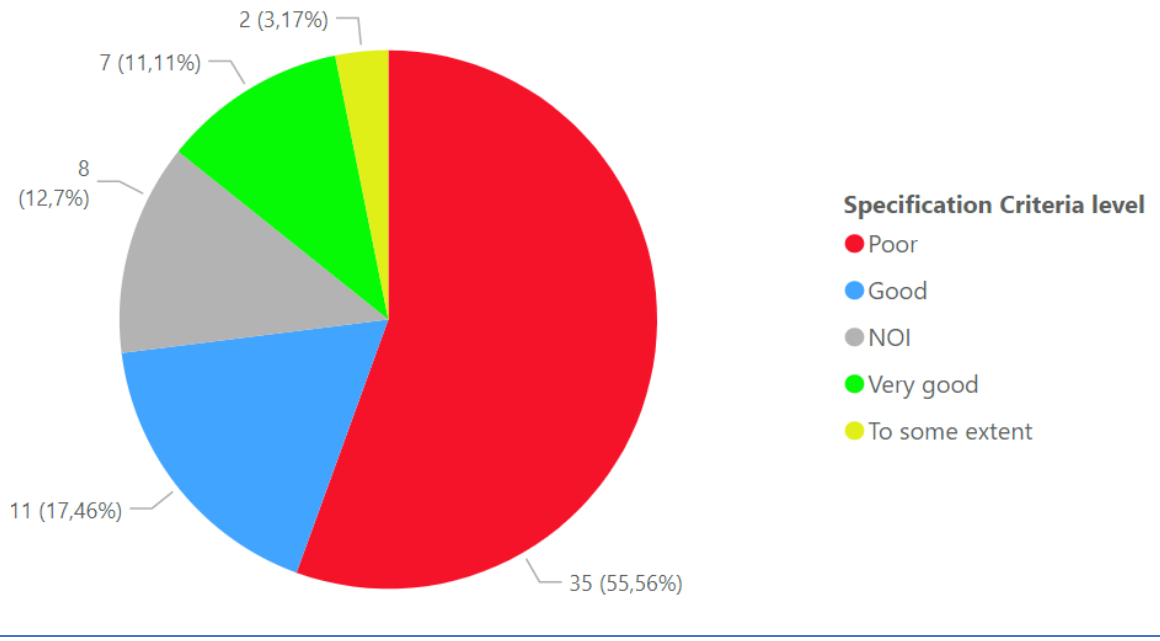
Qualification criteria of 2022

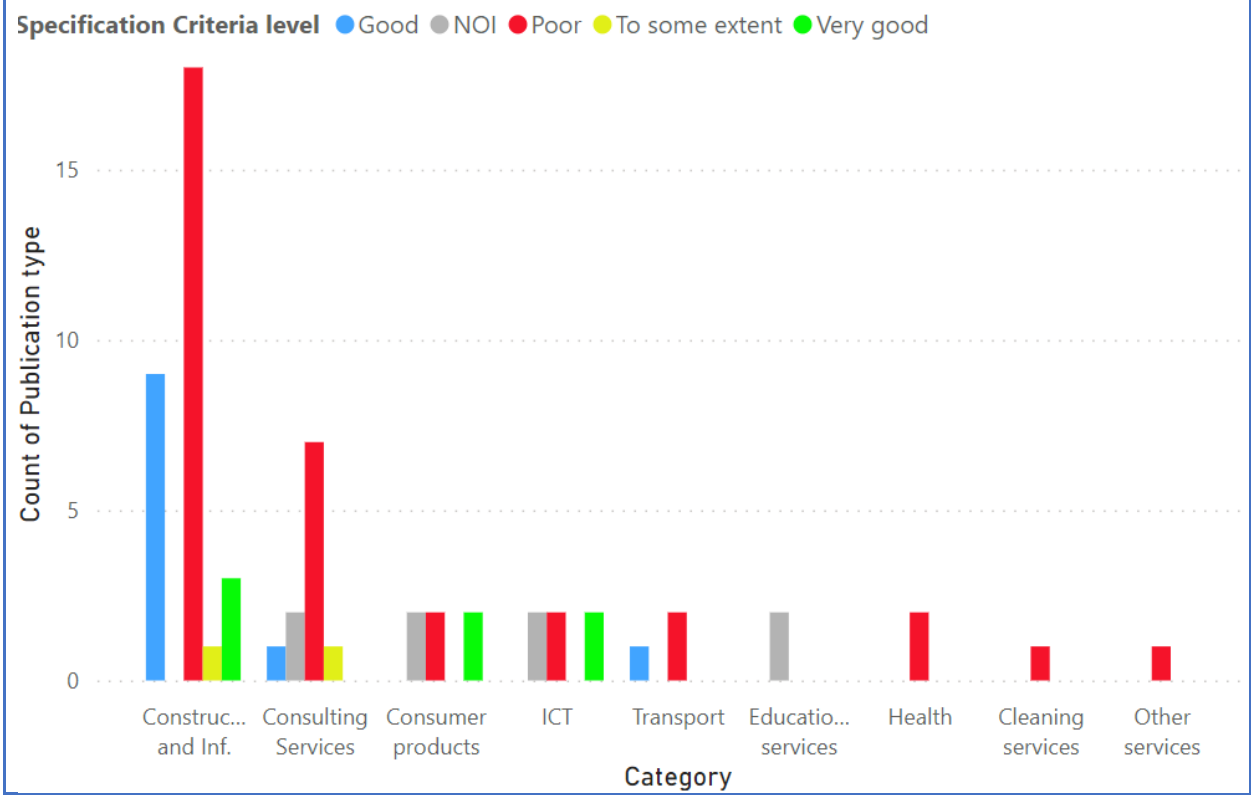


Category	Apprenticeship	EMS	ILO and EMS	NOI	Non circular	Total
Construction and Inf.	2	17	1	6	6	**32**
Transport		5			7	**12**
Consumer products		8				**8**
ICT		3			4	**7**
Consulting services		1		2	3	**6**
Health		1			2	**3**
Cleaning services		1				**1**
Total	**2**	**36**	**1**	**8**	**22**	**69**

Appendix C. Specification criteria tables and graphs for the four years

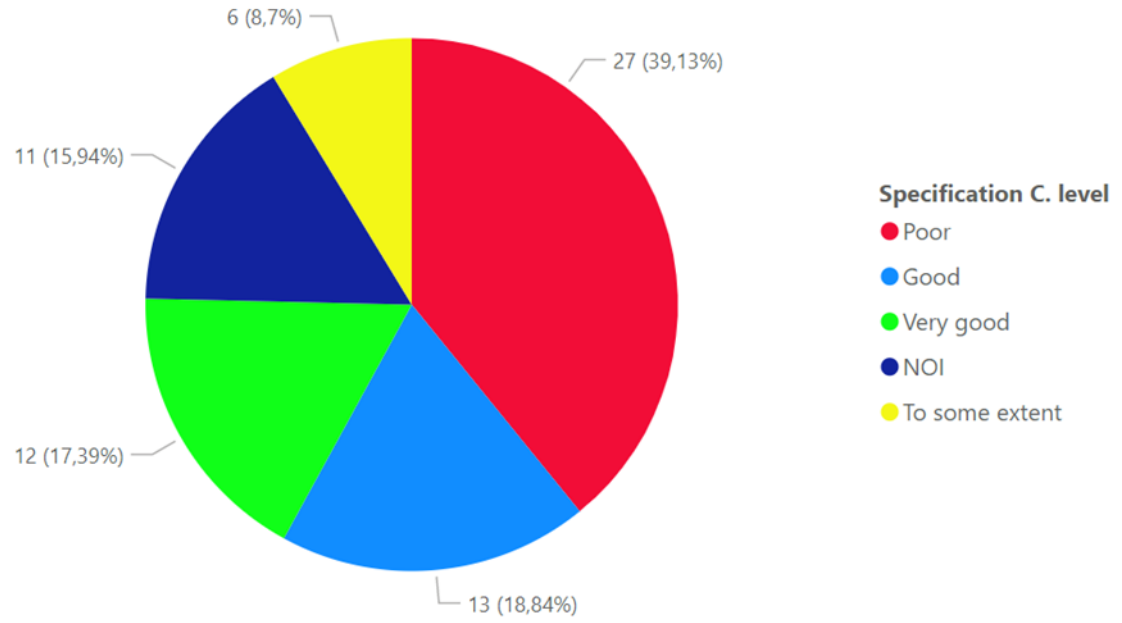
Specification criteria of 2019

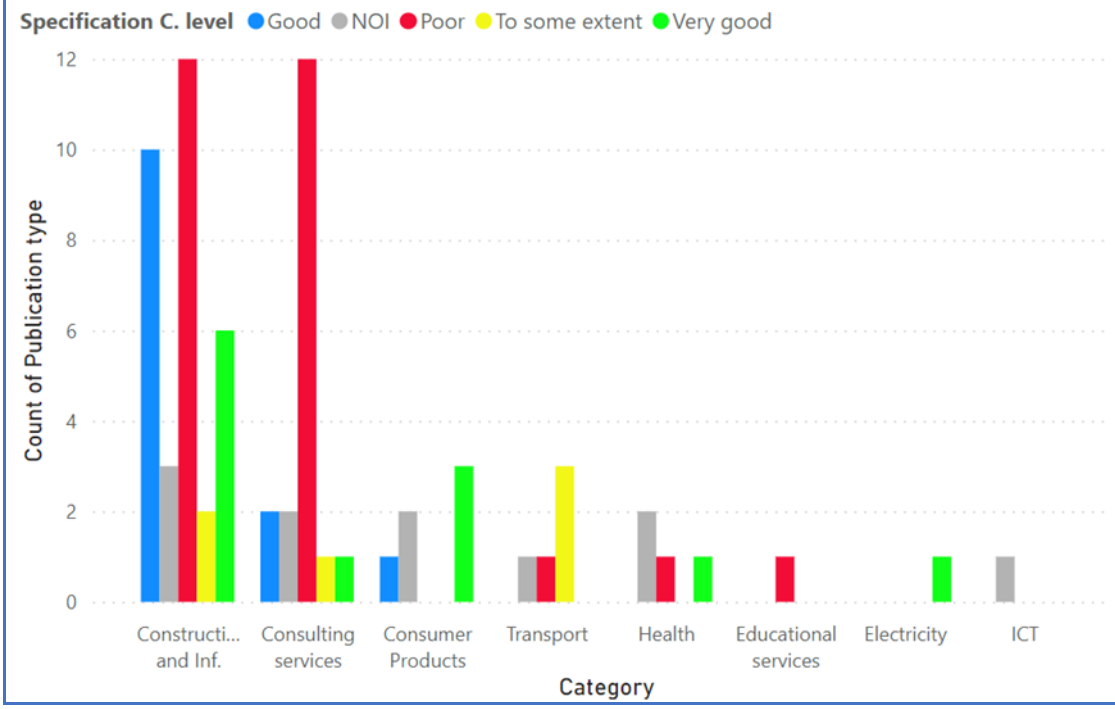




Category	Good	NOI	Poor	To some extent	Very good	**Total**
Construction and Inf.	9		18	1	3	**31**
Consulting Services	1	2	7	1		**11**
Consumer products		2	2		2	**6**
ICT		2	2		2	**6**
Transport	1		2			**3**
Educational services		2				**2**
Health			2			**2**
Cleaning services			1			**1**
Other services			1			**1**
Total	**11**	**8**	**35**	**2**	**7**	**63**

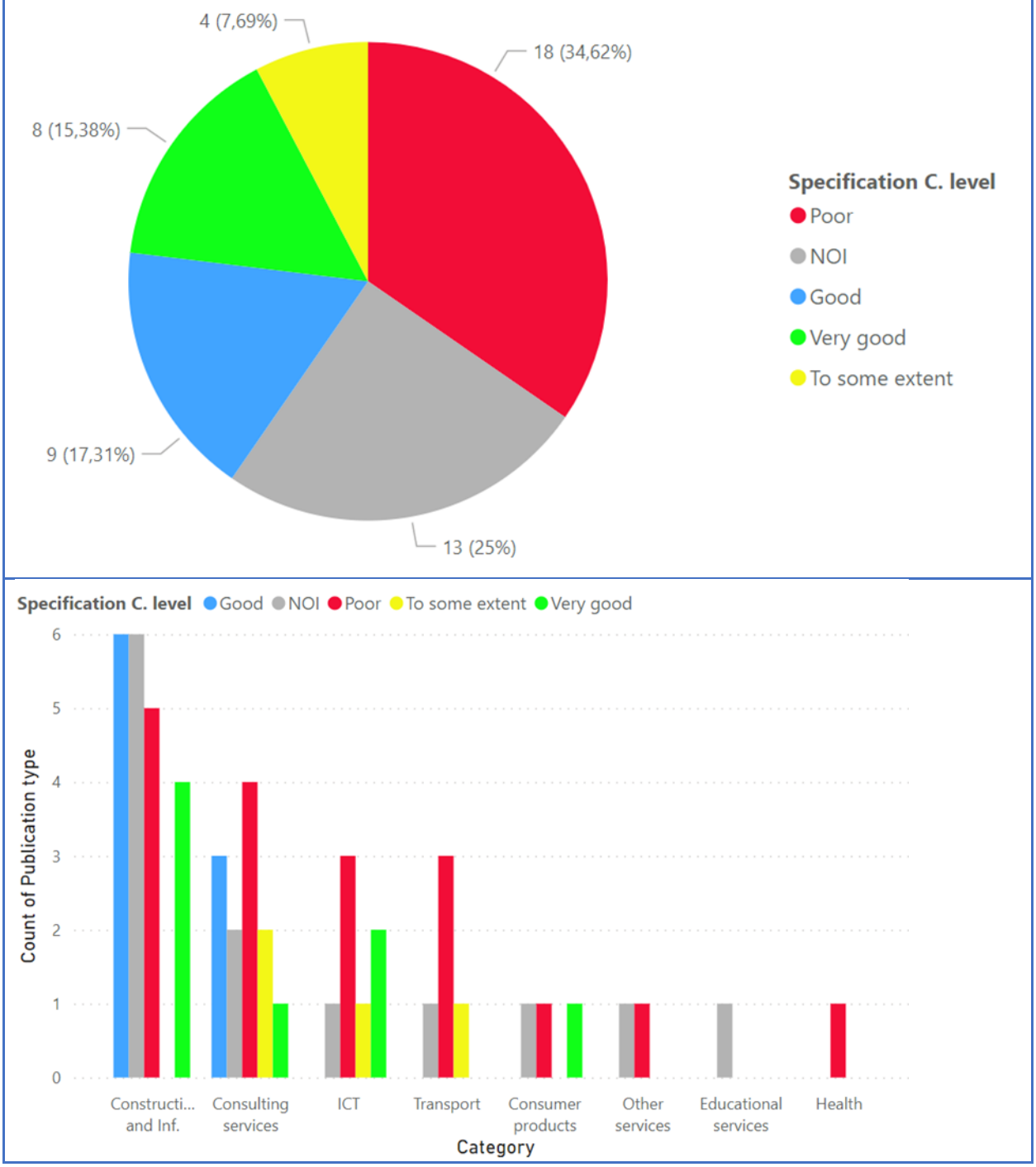
Specification criteria of 2020





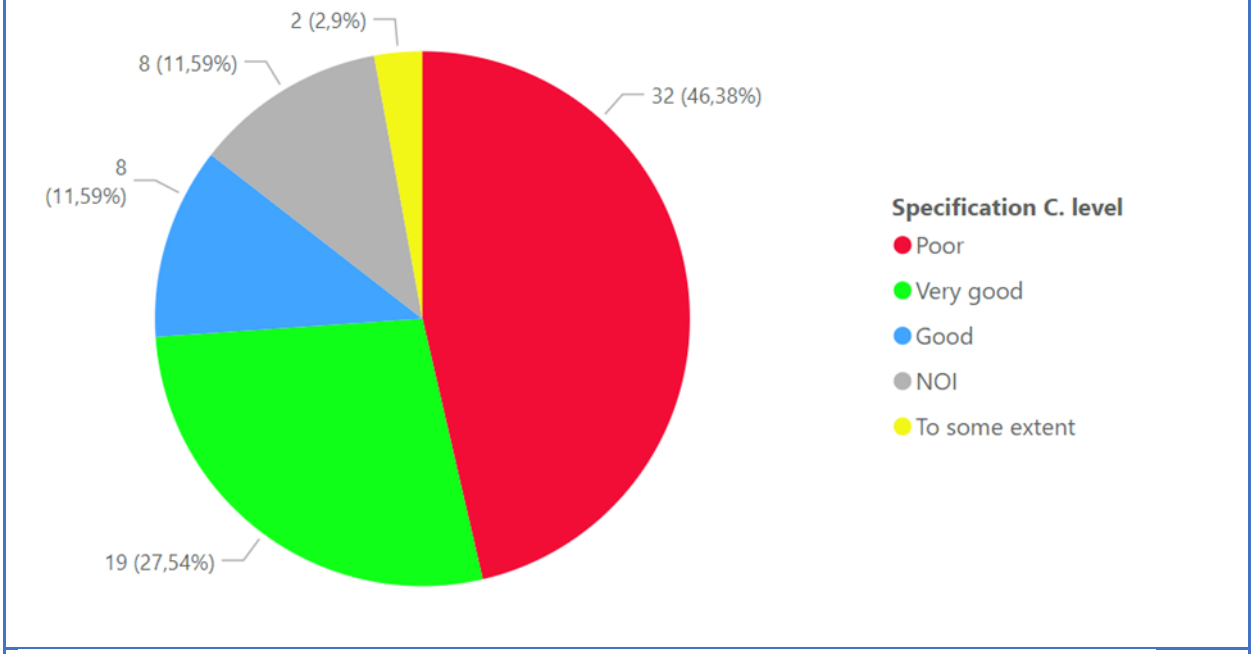
Category	Good	NOI	Poor	To some extent	Very good	**Total**
Construction and Inf.	10	3	12	2	6	**33**
Consulting services	2	2	12	1	1	**18**
Consumer Products	1	2			3	**6**
Transport		1	1	3		**5**
Health		2	1		1	**4**
Educational services			1			**1**
Electricity					1	**1**
ICT		1				**1**
Total	**13**	**11**	**27**	**6**	**12**	**69**

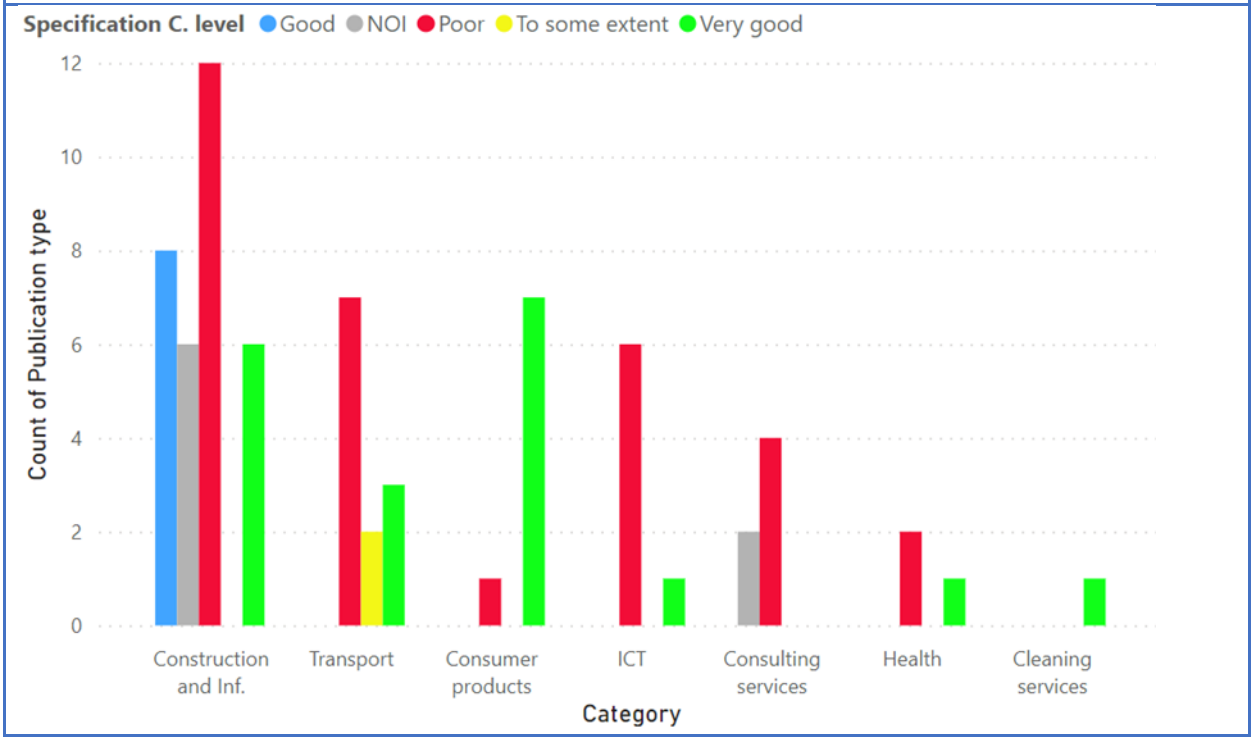
Specification criteria of 2021



Category	Good	NOI	Poor	To some extent	Very good	**Total**
Construction and Inf.	6	6	5		4	**21**
Consulting services	3	2	4	2	1	**12**
ICT		1	3	1	2	**7**
Transport		1	3	1		**5**
Consumer products		1	1		1	**3**
Other services		1	1			**2**
Educational services		1				**1**
Health			1			**1**
Total	**9**	**13**	**18**	**4**	**8**	**52**

Specification criteria of 2022





Category	Good	NOI	Poor	To some extent	Very good	**Total**
Construction and Inf.	8	6	12		6	**32**
Transport			7	2	3	**12**
Consumer products			1		7	**8**
ICT			6		1	**7**
Consulting services		2	4			**6**
Health			2		1	**3**
Cleaning services					1	**1**
Total	**8**	**8**	**32**	**2**	**19**	**69**

Appendix D. Obligatory declaration in Doffin and TED according to the Norwegian procurement regulations (Anskaffelsesforskriften)			
		Doffin	**TED**
Part I	procurements over NOK 100,000 excluding VAT and up to the national threshold value (up to the EEA threshold value for health and social services)	voluntary	
Part II	Procurement of goods, services, construction work and special services from NOK 1.1 million up to the EEA threshold value	obligatory	
	Special services above the EEA threshold value (NOK 6.3 million)	obligatory	obligatory
Part III	Procurement of goods, services, construction work above the EEA threshold values	obligatory	obligatory
Part IV	Health and social services above the EEA threshold value of NOK 6.3 million	obligatory	obligatory
Part V	Planning and design competitions	Notification obligation in Doffin **under** Part II for procurements below the EEA thresholds.	
		Notification obligation in Doffin/TED under Part III for procurements **above** the EEA thresholds.	
Source: Regieringen (NDa); Direktoratet for forvaltning og økonomistyring (2022e)			

Appendix E. Market dialogue from Doffin and Mercell		
Year	**Doffin**	**Mercell**
2019	Not found	Not found
2020	*Smart architecture.* Focus areas. Digitalization and architecture. Explore solutions to develop a smarter Bodø, focusing on acquisition, share, collection, planning and training related to the Internet of Things and statistical information. (in Norwegian) Through a flexible open forum	*Smart architecture.* Focus areas: Digitalization and architecture. Explore solutions to develop a smarter Bodø, focusing on acquisition, share, collection, planning and training related to the Internet of Things and statistical information. (Both in English and Norwegian)
	Not found	*Craftsman and painting services.* Focus on how to carry out the competition and feedback about which criteria could be more suitable, preventing distorted, price driven or /and exclusionary competitions
	Tourist information. Focus areas: To find how the ownership of the project should be, the organizational form, objectives, and potential developers, owners and operators of tourist information. (In Norwegian)	Not found
2021	*Climate and environmental requirements for zero emission construction sites.* Focus areas on projects related to roads, the new airport and construction projects in the municipality. Look for existing solutions, future technology, or the possibility of co-creation, gather information to formulate requirements for future competitions. Digital dialogue.	*Climate and environmental requirements for zero emission construction sites.* Focus areas on projects related to roads, the new airport and construction projects in the municipality.
	Acquisition of electric vehicles Focus on: Environmentally friendly solutions Performance in winter conditions Delivery times Charging stations Loading expectations Service	*Acquisition of electric vehicles* Focus on: Environmentally friendly solutions Performance in winter conditions Delivery times Charging stations Loading expectations Service Existent vehicles and future developments. Both in English and Norwegian.
2022	Not found	Not found
Source: Table generated by the author with information from Mercell (NDa); Database for offentlige innkjøp (ND)		