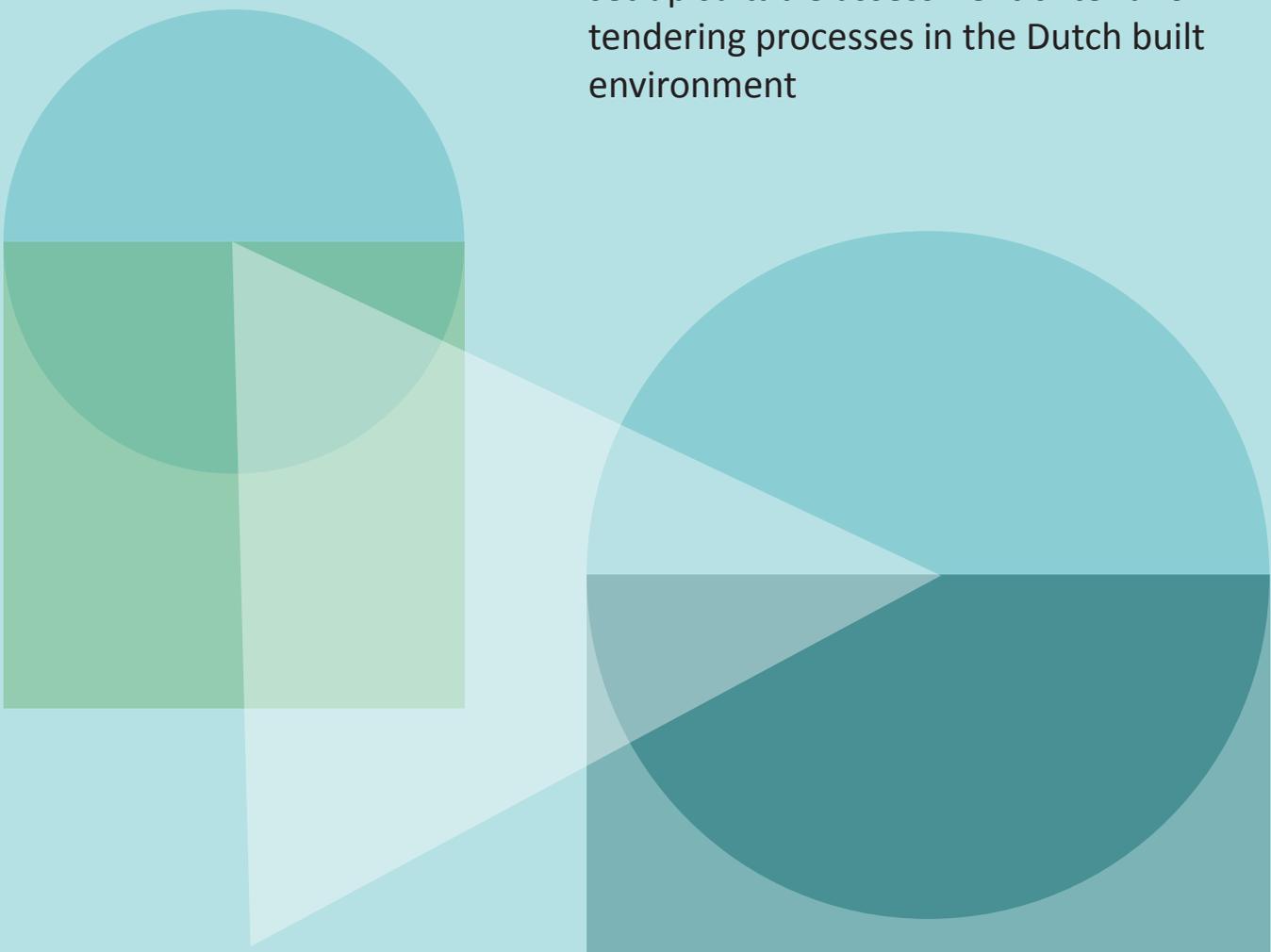


TENDERING IN THE CIRCULAR ECONOMY

A tool that traces circular ambitions to set up suitable assessment criteria for tendering processes in the Dutch built environment



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Preface

The built environment is a subject I'm interested in since I was young. Ever since I was a little child I've been inspired by the passion and effort my father and grandfather put into our family company operating in the construction sector. Now the end of my study career is near, it is time to apply my acquired knowledge and skills to practice in the working field and to keep learning a lot in the coming years. After that period of time, it is probably up to me and my brother to express our expertise in the family company. Since the call for sustainable and circular construction has also landed in the construction sector, I had decided to focus my graduation project on the circular economy in relation to the construction sector.

This thesis into tendering in the circular economy was written in the context of my graduation from the Construction Management & Engineering Master program at the Technical University of Eindhoven and commissioned by internship company Alba Concepts. From September 2018 to February 2019 I have worked on the research and writing of the thesis.

By providing a tool for contracting authorities translating their ambitions into suitable assessment criteria and making them aware of all circular possibilities that are available out there, I hope this thesis contributes to an accelerating shift of the linear economy into a circular approach economy in the construction sector.

Many people have contributed either directly or indirectly to this study. To my University supervisors, Assistant Professor Qi Han and Hajo Schilperoort, my sincere thanks for your skillful guidance during my graduation project. I am grateful for your expertise, critique and advice over the course of this work. Grateful acknowledgment is here made to the interviewees who helped me gather data for this paper. This work would not have reached its present form without their invaluable help.

I also would like to thank Alba Concepts and my colleagues for giving me the opportunity and confidence to conduct my graduation research under their supervision and playing 'Champion League' all the time. From the first day I was welcomed with open arms and I was immediately seen as part of the team. Most of all I would like to thank Pim de Valk and Elaine Kieboom, who always made time for discussion, guidance and advice the past six months, even in busy periods.

In particular, I would like to thank my friends at the Department of Architecture, Building and Planning for giving me an unforgettable time during the past five and a half year. Thanks to their support, enthusiasm and the necessary distraction.

And above all special thanks to my family who went, unfortunately, through a hard time in the final stage of my thesis, for being helpful and supportive during my time studying at the University.

I hope you enjoy your reading.

Martijn Drijvers

Vught, February 2019

Summary

The Dutch construction sector is in full swing of the transition from a linear approached economy to a circular one. The traditional ‘take-make-waste’ model is redesigned into an economy which is regenerative by design, with the aim to retain as much value as possible of products, parts and materials (C. Kraaijenhagen et al., 2016). Since raw materials become scarce, there is an increasing awareness that the security of supply of certain raw materials is under pressure. The fact that this awareness also has landed and is getting ground in the construction sector is an important step forward in developing a more sustainable society. With no less than 32% of the solid waste in our economy derived from construction and demolition waste (Bourguignon, 2016), the construction sector is one of the biggest polluters of our planet. Closing (construction) material cycles by following the example of natural ecosystems and bringing materials back into the life-cycle, will directly have major influences on the total amount of waste derived from the construction sector. In addition to this social aspect, the upcoming tighter legislations also leads to political motives for the transition to a circular economy.

Over the past few years, a lot is written about the concept of the circular economy (CE) both in relation to the construction sector. However, both in theory and practice it turns out there is still no unequivocal definition about the concept of CE. Despite that the noun ‘circularity’ is about the high-value reuse of materials, where the circular economy is the large, holistic economic system, there is no unambiguously measurable definition of the concept (Bosch, 2017). For example, a mere 43% of the UK people indicates to have a well understanding of the concept of the CE (UKCG, 2014). In addition, from these professionals indicating to have a ‘well understanding’ of the concept, there is a variety of the meaning of CE in relation to the construction sector. An analysis of 114 definitions of conceptualizing the CE (Kirchherr, Reike, & Hekkert, 2017) shows a wide variation in the personal interest that each individual attaches to the circular aspects. It seems that the concept of CE can be interpreted differently by different individuals.

Therefore, simply asking for a ‘circular’ work or service in a tender document does not seem to be sufficient as it will not automatically lead to the desired results. Even when contracting authorities think they have their personal ambitions sharp in mind, they have difficulties translating their ambitions into suitable assessment criteria: there is a gap between the ambitions and the requested (selection and) award criteria within circular tender processes. Secondly, contracting authorities often think with blinkers and do not know that there are even more possibilities, besides the options that they themselves have in mind. In addition, despite a growing number of contracting authorities are open for implementing circular elements in their projects, they have problems formulating their own ambitions properly and translate them into suitable assessment factors. While a clear formulation of one's own ambitions is the foundation of a successful circular construction project starting setting-up selection and award guidelines within the tender process. This research formulates an answer to the question: *How to define, specify and classify suitable assessment criteria during the tender process of circular construction-related demand in the Dutch construction sector in order to fill in the existing gap between contracting authority's circular ambitions and the requested criteria within tender documents?*

Basically, a tender process consists of two phases (selection and award) in which requirements and criteria are formulated: grounds of exclusion, minimum requirements, suitability requirements, selection criteria and award criteria. The Public Procurement Act prescribes an exhaustive list of mandatory and optional exclusion grounds, in which there is no scope for the implementation of circularity. Within the other aspects, on the other hand, it is permitted to implement circular elements. However, it is not recommended to include circularity in the minimum and suitability requirements in

order to prevent an unnecessary strong restricted market. Within the selection and award criteria, contracting authorities do have a lot of freedom resulting in the possibility to request circular aspects without restricting the market.

This research, therefore, mitigates the formulated problem by classifying circular assessment criteria in a new and structured way. Secondly, it provides a tool that enhances a suitable formulation of the assessment criteria subsequent to the contracting authority's ambitions. Three studies are conducted in line with the grounded theory by analyzing, coding, comparing and validating the collected data. The comparison of the outcomes of the three studies results in the following classification of the selection criteria: a request for vision, references and business operation. The purpose of the selection criteria is to trace whether the tenderer's level of ambition matches that of the contracting authority, whether the tenderer has sufficient experience in-house to carry out the assignment and/or whether the tenderer's affairs regarding their own organization is up to par. In addition to the classification of the selection criteria, the research results in a classification of the award criteria as well. In the award phase, criteria are set relating to the assignment and can be classified into the following three categories: technical-content, process-based and financial-economic. Since circularity in the construction sector is yet complex and an uncommon aspect, implementing comprehensive circular aspect within the award guideline is important.

The research shows that the degree of the contracting authority's ambitions directly influences the interpretation of both selection and award criteria. In contrast to the selection criteria categories, where not all categories need to be asked necessarily, it is strongly recommended to request at least one sub-criteria from each category in the award criteria. In this way, the award guideline is comprehensive and therefore justified. Generally, an award guideline consists of three to five criteria. This offers the contracting authority the possibility, in addition to the 'mandatory' criterion under each category, to request two (extra) criteria under categories to emphasize their preferences, if desired. The set-up of the selection and award criteria strongly depends on the specific needs and ambitions of the contracting authority. Contracting authorities often do have insufficient knowledge about how to request certain circular aspects in order to fulfill their specific needs. They are not familiar with the wide range of possibilities when it comes to including criteria that refer to circularity. On the other hand, in the search of contracting authorities for the correct interpretation of the assessment criteria, other aspects are often observed from one preferred field, as a result of which other (important) aspects are overlooked. This gap between the contracting authority's ambitions and the actual formulation of subsequent criteria is filled up by means of a developed tool. Filling in twenty-five rounds with three statements per round, a profile sketch of the contracting authority is made that directly reflects their ambitions. It immediately shows the aspects within the various categories that the contracting authority considers as most important and to which the correct selection and award criteria can then be drawn up from. After the personal sketch of a contracting authority's profile derived from the tool, a tailored list of selection and award criteria is offered in accordance with the specific outcomes of the contracting authority's outlined profile.

From the research can be concluded that effective preparation of assessment criteria in circular tender documents plays a crucial role in achieving the contracting authority's circular ambition. The results have shown that classifying both selection and award criteria leads to an effective classification. By developing a tool to uncover and map the contracting authority's ambitions regarding their circular thoughts, in line assessment criteria can be formulated.

Samenvatting

Momenteel bevindt de Nederlandse bouwsector zich volop in de transitie van een lineaire economie naar een circulaire benadering. Hierbij is het traditionele 'take-make-waste'-model doorontwikkeld tot een economie die qua ontwerp regeneratief is, met als doel zoveel mogelijk waarde te behouden van producten, onderdelen en materialen (C. Kraaijenhagen et al., 2016). Doordat grondstoffen schaars worden, is er een groeiend besef dat de voorzieningszekerheid van bepaalde grondstoffen onder druk staat. Het feit dat dit bewustzijn ook is geland en terrein wint in de bouwsector, is een belangrijke stap voorwaarts in de ontwikkeling van een duurzamere samenleving. Met maar liefst 32% van het afval afkomstig uit bouw- en sloopafval (Bourguignon, 2016), is de bouwsector een van de grootste vervuilers van onze aarde. Het sluiten van (bouw)materialcycli door het voorbeeld van de natuurlijke ecosystemen te volgen en materialen terug te brengen in de levenscyclus, zal direct grote invloed hebben op de totale hoeveelheid afval afkomstig uit de bouwsector. Naast dit sociale aspect leiden de naderende strakkere wetgevingen ook tot politieke motieven voor de overgang naar een circulaire economie.

De afgelopen jaren is veel geschreven over de circulaire economie (CE), ook in relatie tot de bouwsector. Zowel in theorie als in de praktijk blijkt echter dat er nog steeds geen eenduidige definitie bestaat van 'de circulaire economie'. Ondanks dat 'circulariteit' voornamelijk gaat over het hoogwaardige (her)gebruik van materialen, waarbij de circulaire economie het grote, holistische economische systeem is, is er geen eenduidige meetbare definitie van het concept (Bosch, 2017). Ter illustratie, slechts 43% van de bevolking in het Verenigd Koninkrijk geeft aan een goed beeld te hebben van de betekenis van de circulaire economie (UKCG, 2014). Bovendien, binnen deze professionals die aangeven een 'goed beeld' van het begrip te hebben, is er een verscheidenheid in de betekenis van CE in relatie tot de bouwsector. Een analyse naar 114 definities van de CE (Kirchherr et al., 2017), toont een grote variatie in de persoonlijke opvattingen en interpretaties die elk individu hecht aan de verschillende circulaire aspecten. De circulaire economie wordt dus verschillend geïnterpreteerd.

Simpelweg vragen om een 'circulair' gebouw of dienst in een aanbesteding blijkt dus niet voldoende te zijn en leidt niet automatisch tot de gewenste resultaten. Zelfs wanneer aanbestedende diensten de persoonlijke ambities scherp in gedachten hebben, blijken ze moeite te hebben om deze te vertalen naar geschikte beoordelingscriteria: er is een kloof tussen de ambities en de gevraagde (selectie en) gunningscriteria binnen circulaire aanbestedingen. Terwijl een duidelijke formulering van de eigen ambities de basis is voor een succesvol circulair bouwproject en begint met het opzetten van selectie- en gunningsrichtlijnen binnen het aanbestedingsproces. Ten tweede denken aanbestedende diensten vaak met oogkleppen en weten ze niet dat er nog meer mogelijkheden zijn, naast de opties die ze zelf voor ogen hebben. Dit onderzoek formuleert een antwoord op de vraag: *Hoe kunnen geschikte beoordelingscriteria gedefinieerd, gespecificeerd en geclassificeerd worden voorafgaand aan het aanbestedingstraject van circulair projecten in de Nederlandse bouwsector zodat de bestaande kloof tussen de circulaire ambities van de aanbestedende dienst en beoordelingscriteria gedicht wordt?*

Kort gezegd bestaat het aanbestedingsproces uit twee fasen waarin eisen en criteria worden geformuleerd: uitsluitingsgronden, minimumeisen, geschiktheidseisen, selectiecriteria en gunningscriteria. De Aanbestedingswet schrijft een uitputtende lijst voor van verplichte en optionele uitsluitingsgronden, waarin geen ruimte is voor de implementatie van circulariteit. Binnen de andere aspecten is het daarentegen wel toegestaan om circulaire elementen te implementeren. Het opnemen van circulaire aspecten in de minimum- en geschiktheidseisen kan echter leiden tot een onnodige sterk beperkte markt. Daarentegen hebben aanbestedende diensten binnen de selectie- en gunningscriteria meer vrijheid, wat de mogelijkheid oplevert circulaire aspecten op te vragen zonder de markt te beperken.

Dit onderzoek geeft antwoord op het geformuleerde probleem door middel van het classificeren van zowel de selectie als de gunningscriteria. Aansluitend daarop biedt het onderzoek een tool voor het formuleren van gepaste selectie en gunningscriteria, voortgekomen uit de ambities van de aanbestedende dienst. Hierbij zijn drie onderzoeken uitgevoerd in overeenstemming met de *grounded theory*, waarbij de verzamelde gegevens zijn geanalyseerd, gecodeerd, vergeleken en gevalideerd. Het vergelijken van de uitkomsten van de drie onderzoeken heeft geleid tot de classificatie van de selectiecriteria in drie categorieën: de uitvraag om een visie, referenties en bedrijfsvoering. Het doel van de selectiecriteria is om te achterhalen of het ambitieniveau van de inschrijver overeenkomt en/of aansluit met dat van de aanbestedende dienst, of de inschrijver over voldoende ervaring beschikt om de opdracht uit te voeren, en de mate van circulariteit van de gegadigde binnen de eigen organisatie. Naast de classificatie van de selectiecriteria heeft het onderzoek ook geleid tot de classificatie van de gunningscriteria. In de gunningsfase worden criteria vastgesteld met betrekking tot de opdracht en kunnen worden ingedeeld onder de volgende drie categorieën: technische-inhoudelijk, procesmatig en financieel-economisch. Omdat circulariteit in de bouwsector complex en nog een relatief nieuw terrein is, is het implementeren van alomvattende circulaire componenten binnen de gunningsleidraad belangrijk.

Uit dit onderzoek blijkt dat de ambities van een aanbestedende dienst rechtstreeks van invloed zijn op de inrichting van zowel selectie- als gunningscriteria. In tegenstelling tot de categorieën van de selectiecriteria, die niet noodzakelijk alle drie in de uitvraag meegenomen hoeven te worden, wordt ten sterkste aangeraden om ten minste één sub-criterium uit elke categorie van de gunningscriteria categorieën uit te vragen. Op deze manier is de gunningsleidraad alomvattend en daarom gerechtvaardigd. Over het algemeen bestaat een gunningsleidraad uit maximaal drie tot vijf criteria. Dit biedt de aanbestedende dienst de mogelijkheid om naast de 'verplichte' criteria voor elke categorie, twee (extra) criteria onder categorieën uit te vragen om desgewenst hun voorkeuren te benadrukken. De opzet van de selectie- en gunningscriteria hangt sterk af van de specifieke behoeften en ambities van de aanbestedende dienst. Aanbestedende diensten hebben veelal onvoldoende kennis over het uitvragen van bepaalde circulaire aspecten die voldoen aan hun specifieke behoeften. Ze zijn niet bekend met het brede scala aan mogelijkheden als het gaat om het opnemen van criteria die verwijzen naar circulariteit. Daarnaast worden de beoordelingscriteria vaak opgesteld vanuit een bepaald voorkeurdomein zonder alternatieve mogelijkheden te overwegen. Deze kloof tussen de ambities van de aanbestedende overheid en de eigenlijke formulering van volgende criteria wordt opgevuld met behulp van een tool. In vijftientig rondes met drie stellingen per ronde wordt een profielschets van de aanbestedende dienst gemaakt die direct aansluit op de ambities. Het toont meteen de aspecten binnen de verschillende categorieën die de aanbestedende dienst als belangrijk beschouwt en waarop vervolgens de juiste selectie- en gunningscriteria kunnen worden opgesteld. Nadat het profiel van de aanbestedende dienst is geschetst, die is voortgevloeid uit de tool, biedt het onderzoek een lijst met selectie- en gunningscriteria die in aansluiten op de specifieke resultaten van het geschetste profiel.

Uit het onderzoek kan worden geconcludeerd dat een effectieve voorbereiding van beoordelingscriteria in circulaire aanbestedingsstukken een cruciale rol speelt bij het realiseren van de circulaire ambities van aanbestedende diensten. De resultaten hebben aangetoond dat het classificeren van zowel selectie- als gunningscriteria leidt tot een effectieve uitvraag binnen circulaire aanbestedingen. Door een tool te ontwikkelen die de ambities van de aanbestedende diensten met betrekking tot hun circulaire gedachten in kaart brengt, kunnen de juiste beoordelingscriteria worden geformuleerd.

Abstract

Over the past few years, the circular economy is receiving increasing attention worldwide both in politics, academy and business as a way to decline the current consumption waste stream of products and (raw)materials. The shift from a linear 'take-make-waste' model to a circular system, involving closed loops, manifests itself to a growing degree in the construction sector. However, implementing circular aspects in the tendering process of such a construction project appears to be new grounds for clients (contracting authorities). Unambiguity in the definition of the concept of circular economy regards constructions, unfamiliarity in the various possibilities of circularity and difficulty in formulating own ambitions are underlies by this. In addition, the associated circular tendering process is so complex and unfamiliar for contracting authorities that they often completely miss the mark when it comes to translating their ambitions into right requests. In practice, it turns out that contracting authorities often have difficulties in setting up suitable assessment criteria derived from their individual specific ambitions.

This research reports on classifying the assessment criteria for circular tendering processes in the Dutch construction sector derived from three types of studies and develops a tool for tracing contracting authorities circular ambitions before translating them into suitable selection and award criteria. Together, the three studies are conducted in line with the grounded theory by analyzing, coding, comparing and validating the collected data. Utilizing the results from a literature review and theoretical study leads to the formulation of three categories for both selection and award criteria. By means of an in-depth practical study and interviews further interpretation was given to these categories and the category set-up was validated. The data collection result indicates that there is a gap in circular tendering aspects between theory and practice. A tool is derived from the classification of both assessment criteria providing a method to profile the contracting authority's drivers and ambitions before translating them into suitable assessment criteria. A tailored list of selection and award criteria are offered in accordance with the specific outcomes of the contracting authority's outlined profile. The reliability of the tool is validated by means of a case study regarding a circular construction project which tender documents were recently published.

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Abbreviations

Abbreviation	English	Dutch
AW	Dutch procurement law	Aanbestedingswet
ARW	Dutch procurement act works	Aanbestedingsreglement Werken
CA	Contracting Authority	Aanbestedende Dienst
CE	Circular Economy	Circulaire Economie
DCC	Dutch Civil Code	Nederlands Burgelijk Wetboek
GT	Grounded Theory	Gefundeerde Theorie
GTC	General Terms and Conditions	Algemene Voorwaarden
MEAT	Most Economically Advantageous Tender Proportionality Conditions	Economisch Meest Voordelige Inschrijving (EMVI)
UAC	Uniform Administrative Conditions	Uniforme Administratieve Voorwaarden (UAV)
UAC-IC	Uniform Administrative Conditions – Integrated Contracts	Uniforme Administratieve Voorwaarden – Geïntegreerde Contracten (UAV-GC)

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Part ONE:

RESEARCH INTRODUCTION

“When you talk about ‘saving the planet’ you turn it into an ethical question, and I think you won’t solve problems if they are ethical”

Michael Braungart

1 Research Framework

This chapter will discuss the subject of this research, the research problem, the objective, the research questions, the design and the research overview.

1.1 Background

Over the past few decades, it has become clear that current ways of production and consumption of materials in the construction sector are putting a major burden on the environmental capacity of the planet Earth. Since raw materials become scarce, there is an increasing awareness that the security of supply of certain raw materials is under pressure. Moreover, individuals and corporate entities have become increasingly aware of the greater role they need to play in preserving natural resources. (Nasir, Genovese, Acquaye, Koh, & Yamoah, 2017). This leads to an overall growing interest in the concept of a circular economy (CE), both in politics and in business, both in the Netherlands and throughout Europe. Given the potential contribution that the CE can make to the major challenges of our time, such as the climate challenge and the energy transition, is a good thing. (Jonker, Kothman, Faber, & Navarro, 2018). The call for the concept of a CE now seems larger than ever before.

The transition to a circular economy will not happen automatically and it asks for behavioral adjustments from clients, companies and social organizations. Understanding the behavior of citizens and businesses, and the motives behind behaviors, will help to shape effective circular economic policy. According to several recent studies, many clients and companies think this transition is indistinct and abrupt and therefore uninteresting despite the fact that the Dutch government aims for a fully circular economy in 2050. (H2O, 2018). This means that raw materials are used again and again without or to a very limited extend losing their value. In 2030 the use of primary raw materials must be reduced by half. (H2O, 2018). In a circular economy, a firm can optimize recycling, extend the lifespan of products or organize a different approach to products, such as sharing products or offering services around a product. This reduces the need for raw materials and makes the economy less vulnerable. In the building industry, this can be done by optimizing the reuse of materials, for example, to convince suppliers to buy back their materials after some years at pre-set prices. Tools like the Material Passport have been developed to provide assistance to companies in doing this. To be able to reuse a building product or material many years after it was initially used in a building as a product, element or material, it is essential that sufficient information is available about its composition.

The literature describes various definitions of the concept of a circular economy. However, in almost all studies is referred to the perspective of the Ellen MacArthur Foundation (EMF) describing that the circular economy is a concept in which products and the materials they contain are highly valued based on a 'take-make-waste'. On the basis of a so-called butterfly model, which contains the production and consumptions of products, is aimed to limit the leakage of resources as much as possible. In practice, this means that in the concept of a circular economy waste should be reduced to a minimum by I) reusing products over and over again, II) refurbishing products as much as possible, III) repairing products whenever possible, IV) recover the energy demand, V) refuse or prevent the use of the products, VI) re-purpose products in different ways rather than just reuse them, VII) remanufacture new products for second hand and finally, VIII) recycling existing materials and products.

Moving to a circular economy not only provides opportunities including increases in gross domestic product, employment growth, and reduced pressures on the environment, it is expected that this transition brings economic society-wide benefits, including increased competitiveness, innovation, net material savings, and reduced risk of material price volatility and supply. Cramer (2015) suggests that there are four conditions in order to shift from a linear to a circular economy. Initially, there must be an initiator who understands the importance of a circular process and wants to get started with it.

In the continuation of this research, the initiator will mainly be referred to 'the contracting authority'. The second condition is concerned with smooth collaborations in the cycle chain including end users. Also, new financial arrangements must be agreed and finally, additional customized instruments must be indulged.

The transition does not only amount to adjustments aimed at reducing the negative impacts of the linear economy. Rather, it represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits (Ellen MacArthur Foundation, 2013). To achieve the benefits of circular construction, the entire construction supply chain needs to be involved (Van Sante, 2017). This shift from a linear economy to a circular economy also entails a shift of interest and another way of thinking and working of all parties involved. This change of mindset concerns all stakeholders involved in the building process and starts at the beginning of a construction process: the tender process. In addition, the shift also poses challenges such as financing, key economic enablers, skills, consumer behavior and business models, multi-level governance and in legal field (Bourguignon, 2016). This research focuses on the latter aspect, in which a closer look at the procurement procedure of the whole tender process will be taken. To be more specific, the research strives to fill in the existing gap between the contracting authority's personal motives and ambitions for implementing circular aspects and the actual criteria requested in the tender documents. It covers the translation of circular ambitions into suitable actions in the tendering process of a circular building. In doing so, the assessment criteria on which selection and awarding take place will be pointed out and the principles of the circular tendering process are compared with the traditional tender process as it has been the same for years.

Over the last few years, already much research has been conducted on how to imply the circular economy in the construction sector. However, limited research is conducted into the tendering process, which is actually the starting point. Some authors stress that formulating suitable selection and award criteria are the most critical factors in setting up suitable tender documents for circular projects in the construction sector. Another critical factor for a successful circular construction process is the fact that contracting authorities currently lack practical knowledge and tangible success stories (Stoepman & Zeilstra, 2017). Also, the procurement process is a key factor to boost the transition towards a circular economy (Van Kruisbergen, 2017). In the same article, Van Kruisbergen also noticed several bottlenecks that often occur in the procurement process of a circular building process. The absence of an internal basis, together with the financing and a time-intensive purchasing process are examples of this. To tackle these bottlenecks and to convert them into success factors, a proper list of assessment criteria together with a crucial collaboration between the chain partners, whereby contracting authorities can go far in their demands and ambitions, is required.

1.2 Problem definition

Shifting from a linear to a circular economy in the construction sector in itself is, of course, a good thing. At the moment the construction sector is in full swing of this transition towards a more circular economy, while the term circularity in itself is not a matter of course for everyone. Despite that the noun 'circularity' is about the high-value reuse of materials, where the circular economy is the large, holistic economic system, there is no unambiguously measurable definition of the concept (Bosch, 2017). This is confirmed by an investigation into the understanding of the concept of the CE among companies in the United Kingdom by UK Contractors Group (UKGC) in 2014. With an electronic survey with almost 300 responds from different professionals working in the construction sector (contractors, suppliers, developers, etc.) it turns out that (only) 43% of the people indicates to have a well understanding of the concept of the CE. This means that more than half of the surveyed people indicates to have limited knowledge of the concept, from which 12% said they have never heard of it

(UKCG, 2014). From these professionals indicating to have a ‘well understanding’ of the concept, there is a variety of the meaning of CE in relation to the construction sector. In addition, the 4R framework (reduction, reuse, recycling, and recovery), which is a frequent mentioned term in regard to the definition of the concept of the CE, is valued differently for each individual. An analysis of 114 definitions of conceptualizing the CE (Kirchherr et al., 2017) shows a wide variation in the personal interest that each individual attaches to the four aspects. It turns out that only 40% of the definitions mention a system level, on which a circular economy should function, 50% focus on reducing material use and almost 80% of the definitions include a certain degree of recycling. Apparently, it is the case that - and that is also directly the problem - circular economy regarding the construction sector has become a personal concept where everyone has private feelings and ambitions. Of course, everyone can and may have their own interpretation of the concept. However, it creates a gap between the personal motives and ambitions and the actual criteria requested in the tender documents: the translation of the ambitions into actions falls short in the tendering process of a circular building.

Thus, contracting authorities in the construction sector who take the step to ask for circular elements in a project find out that the term circular economy is not always understood the same (Loppies, 2015). There is no clarity about the concept of circularity, so simply asking for a ‘circular’ work or service does not seem to be sufficient (Van Haagen, 2018). Even when the ambitions are properly defined, it turns out that the current form of contracting is less responsive to the changing market: there is a gap between the ambitions and the requested assessment criteria within circular tender processes. Various studies have shown that contracting authorities, like governments, often do not know how to implement circular criteria within the tender documents. Assessment criteria are clear to everyone in a traditional tendering process because they have remained virtually unchanged over the years since the market has not asked for change. Nowadays both contracting authorities and tenderers have difficulties on how to react on this shift during the procurement process of a circular construction process. Where previously, for example, the experience of the tenderers was assessed on the basis of the number of reference projects, this is virtually impossible in the procurement of circular construction projects in advance because many tenderers have no or very limited experience and/or knowledge with circular construction projects.

Secondly, recent studies (Grinsven, 2015; Adams, Osmani, Thorpe, & Hobbs, 2017; Jager, 2016) has shown that both contracting authorities and contractors have a growing ambition to enter into circular construction projects, however, they don’t know how to do so. Despite a growing number of contracting authorities are open to implement circular elements in their projects, it turns out that they find it difficult to formulate their own ambitions properly. While a clear formulation of one's own ambitions lies at the basis of the preparation of the selection and award criteria. The research will focus on this challenge that can be found in the procurement process of the tender process. Consequently, the current assessment criteria in circular construction process mismatch to the tendering process. This paradigm is translated in the following problem definition:

Due to a lack of knowledge and undefined ambition provisions contracting authorities struggle to request proper criteria in both selection and award phase in the shift to a circular construction process.

The problem definition is therefore twofold. On the one hand, contracting authorities have difficulties in formulating their specific drivers and ambitions (since they often aren’t aware of all circular possibilities). On the other hand, since it is open for individuals to value and interpret several aspects personally, there is not an unambiguous definition of the concept of CE regarding the construction sector. This makes it even more important to formulate suitable criteria that in the end leads to a construction that is in line with the needs and ambitions of the contracting authority.

1.3 Research Questions

The problem definition leads to the following research question:

How to define, specify and classify suitable assessment criteria during the tender process of circular construction-related demand in the Dutch construction sector in order to fill in the existing gap between the contracting authority's circular ambitions and the requested criteria within tender documents?

To acquire an answer to this question, sub-research questions are defined that will help support the main research question. They are formulated as follows:

- I. What is meant with a circular economy in the construction-related demand in the Netherlands?
- II. What different types of contracts and procedures fit the best for requesting circular aspects within the tender documents?
- III. Which phase(s) of the tender process allows the inclusion of circular aspects?
- IV. How can the selection and award criteria be classified? Which circular aspects can be requested in the selection and award phase?
- V. How can the circular ambitions of contracting authorities be translated into the right formulation of the selection and award criteria?

The main objective of this research is to investigate how the selection and award criteria can be formulated in such a way that it fulfills the ambitions of the contracting authority. Firstly, the criteria must be defined, specified and classified in order to formulate suitable assessment criteria. The aim of the research is to provide recommendations for contracting authorities by developing a tool in order to understand the ambitions before processing a tailored list of criteria for both selecting and awarding the tenderers that fits these ambitions. The goal, therefore, is to narrow down the existing gap between the lack of knowledge and the specification of the selection and award criteria within the circular procurement process by classifying the assessment criteria into categories.

1.4 Research Design:

A progressive identification and integration of categories of meaning from data (Willig, 2013) serve as the basis for the classification of both selection and award criteria. This way of categorizing data is also known as the grounded theory (GT). It constantly uses comparative analysis of collected data and no literature is appraised or included within the framework of a GT study unless it supports the emergent theory (Schurch, 2015). A combination of methods is used in the categorization of the data collection, such as archives, articles, practical webpages, interviews and observations, and the 'evidence' may be qualitative (e.g., words), quantitative (e.g., numbers), or both. How the GT is used for collecting and analyzing all the data is explained in more detail in [4 The grounded theory](#). This section will roughly explain the structure of the research. Based on the five sub-questions and the main research question, the research is structured as depicted in Figure 1.

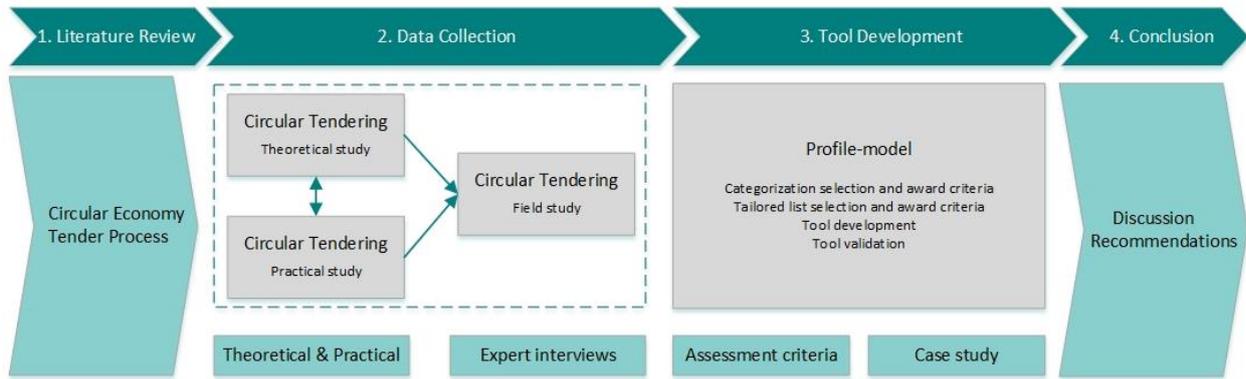


Figure 1: Research Design

1.4.1 Literature Review

Initially, the grounded theory methodology encourages the researcher to commence the research project without conducting a thorough literature review, so that the researcher's knowledge of previously conceptualized theories and research evidence relevant to the area of study is limited (Dick, 2014). However, since the tender process is such complex and additional knowledge is needed, within the context of the research, it is decided to conduct a purposefully broad literature review prior to the research project that aimed to promote the understanding of the context to the area under research, whilst limiting my influence of previously conceptualized theories (Birks & Mills, 2015).

Kumar (2011) describes that there are mainly two methods for collecting data; data collection of primary (literature studies) and secondary sources (case studies & expert interviews). As mentioned in the previous section, the first part of the study is based on a broadening literature study on both the concept of the CE related to the construction sector and the traditional tender process (1. Literature Review). In this first part, a definition of the concept of CE is formulated and related to the construction sector together with the conduction of an inquisitive study into the traditional tender process based on proven literature such as articles, papers, and theses. Since tendering is a complex process, the first part of the literature research serves to demarcate the research' boundaries and defines the starting points of the remainder of the research.

1.4.2 Data Collection

In line with grounded theory methodology, in-depth studies from three perspectives were conducted following the completion of the literature review, in order to create a holistic view on the assessment criteria of circular tenders. Firstly, a theoretical study is conducted in which several articles and studies were analyzed to gain first knowledge input and formulating categories. The categories serve to classify both selection and award criteria on which sub-criteria can be subdivided.

Secondly, on the basis of a practical study, 29 tender documents with a circular approach were analyzed in order to see how and what type of circular elements are implemented in the request of current construction projects. The historical research method is used to gather data and knowledge from research and situations that already have occurred. After conducting intrinsic research on both processes, it is expected that substantial differences between both literature and practice will emerge. Comparing these differences will hopefully lead to new insight into the classification of the criteria on which tenderers can be selected and awarded.

Thirdly, data is obtained from the field by means of expert interviews. Data collection used a semi-structured interview format as this is a well-established method of collecting data within qualitative research methods to enable meaningful interactions with participants, allowing them to share their

experiences, thoughts, attitudes, and beliefs (Richards & Morse, 2013). Although a range of data collection methods can be used within grounded theory methodology, face-to-face interview methods are particularly useful because meaning is constructed through participant-researcher interactions in order to generate new knowledge (Charmaz, 2014). The interviews are used to validate the findings from both theoretical and practical studies, to gain new insights from experts in the field and to formulate statements that serve as input for the conceptual model. The six expert interviews serve as a basis for this revising and validating and the new data input. Comparing the theoretical, practical and field study hopefully leads to overall insights about circular tendering. The goal of this comparison is to find a way to categorize both selection and award criteria together with composing a long list of selection and award criteria.

The Section ends with a conclusion and an elaborated discussion between the outcomes of the three studies. All worth mentioning differences between the theory and practice will be discussed together with the reasoning why the theory and practice differ from each other.

1.4.3 Tool Development

A tool is developed in order to map the contracting authority's ambitions before translating them into suitable selection and award criteria. As mentioned above, the expert interviews also serve as a foundation for this tool: the profile-model (3. Tool Development). The goal of the profile-model is to clarify the contracting authority's ambitions for implementing circular elements in their tender document. Since the drivers and ambitions are the foundation of a circular tender, it is important to clearly define them in order to set up a proper tender. In order to test whether the model works properly, a validation will take place by means of a (real-life) case study. The objective of the case study is to identify possible reliability deficiencies along the developed tool. The tool is validated by means of comparing the tool's outcomes with the questionnaire outcomes. This will be explained more in detail in [Section 9.4 Tool validation: Case study](#).

1.4.4 Conclusion and discussion

The research ends with a final conclusion with recommendations for both researchers and contracting authorities (4. Conclusion) by providing answers to the main research question and all sub-questions. Furthermore, this section covers the research' relevance and limitations.

Part TWO:

LITERATURE REVIEW

“As the 'circular' approach to sustainability begins to gather ground, we humans are finding ourselves within the circle, not without.”

Michiel Schwarz

“In the end, the term 'circularity' may just be one way to make us aware that we need a more encompassing, integrated and restorative sustainability path that includes people as much as technology and nature.”

Michiel Schwarz

The starting point of this research is a literature study to, firstly, determine the concept of the circular economy (CE) in relation to the construction sector, before diving deeper into the legal side of the (circular) construction process. Since the circular economy is an emerging topic and the term still lacks a structured definition, a literature study is performed in order to gain a better understanding of its meaning. For this procedure, the author searched for CE definitions in several papers, articles, and theses, in which 17 definitions were selected and listed. For these different interpretations of the CE, the first part of the literature study ends up with a definition of the CE as will be the starting point of the research. The aim of the literature study, therefore, is to get the concept of a circular economy related to the construction sector sharp. Before going into the concept of a circular economy, it is of added value to first consider the predecessor of this concept and where it originated from: the linear economy. Since the shift is still far from accessible and self-evident for many economies, it examines what this change means for the construction sector. After defining both concepts, it is examined what this shift to a circular economy actually means for the construction sector.

The final (and most complicated) topic that has been investigated in this literature study, relates to the legal aspects of a construction process: the tender process. The tender process of a construction process is quite a complex process since, on the one hand, a lot of legal obligations must be met and on the other hand, decisions are free and therefore very (project) specific. In addition, the current laws and regulations are often freely interpretable, which had resulted in the fact that in many recent studies a lot of terms and concepts have been mistakenly intertwined and confused with each other. Based on this, the literature study also serves to gain clarity in these terms, conditions, and concepts. Furthermore, the study also serves to reinforce the argumentation for certain choices, decisions, and assumptions that provide the guiding principle for the research. One of the most important decision that is made in this literature review, is the question which type of procedures and contracts, that are available and optional in a tender process, is most likely to use in a circular construction process. So, after analyzing all these different types of forms, a decision will be made whether to focus on just one specific form or to keep the scope of the research more expanded. In order to find an answer to this, it is decided to pay short attention to the elaboration of all these options before a suitable choice will be made.

2 Closing the loops: from linear to a circular approach

2.1 The Linear Economy

The past 150 years of industrial evolution have been dominated by a one-way or linear model of production and consumption in which goods are manufactured from raw materials, sold, used and then discarded or incinerated as waste (Ellen MacArthur Foundation & McKinsey & Company, 2013). This is better known as a linear way of product consumption: companies harvest and extract materials, use them to manufacture a product, and sell the product to a consumer, who then discards it when it no longer serves its purpose. This linear economy is based on a take-make-waste pattern where, with the use of energy, labor, and capital, products are made from natural raw materials with a one-off life cycle (Figure 2). Raw materials are extracted from the earth (take), products are made from this (make) that are thrown away after the use phase (waste). The model is structured around the consumption of goods instead of keeping them at their highest value.

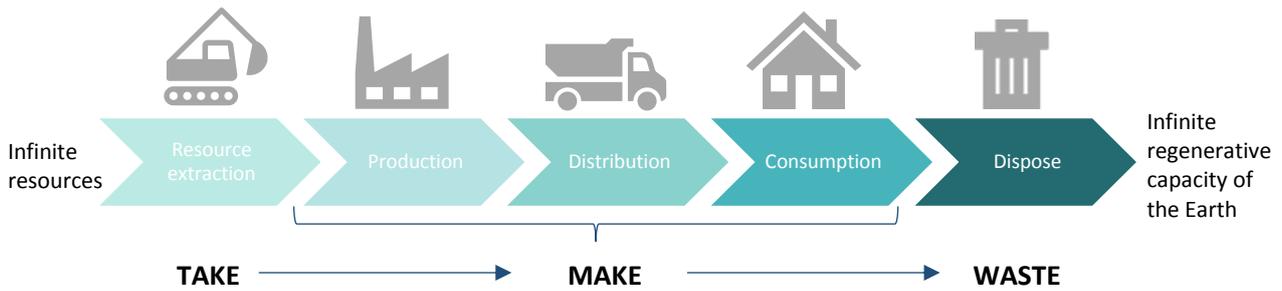


Figure 2: The linear economy; the 'take, make and waste' approach of production

Historically, the intrinsic nature of living systems allows resources to return to the environment through a complex web of energy flows and nutrient cycles. With the advent of industrialization, these systems began to shift away from this sustainable way of life. Redesigning the way we conduct business and policy is a critical step towards bringing human activity back into alignment with the planet's ecosystem (Tan et al, 2017). In the linear economic system, raw materials are converted into products that are destroyed at the end of their useful life. A linear economy depends on large quantities of accessible raw materials and energy which the earth, due to population growth and consumption growth, can't provide infinitely.

The linear economic system, as presented in Figure 2 by the, is represented by the horizontal line consisting of mining and manufacturing materials towards parts and products, providing a service, using the product, recovering energy by burning the waste and placing the very last parts as landfill (Verberne, 2016). The linear consumption pattern, in which the end user becomes responsible for the removal of the product, seemed successful in providing affordable products and global prosperity but is entirely at the origin of raw material waste and the creation of waste (Loppies, 2015).

2.2 The origin of the Circular Economy

Over the past few decades, it has become clear that current ways of production and consumption of materials in the construction sector are putting a big burden on the environmental capacity of the planet Earth. Since raw materials become scarce, there is an increasing awareness that the security of supply of certain raw materials is under pressure. Moreover, individuals and corporate entities have become increasingly aware of the greater role they need to play in preserving natural resources. (Nasir et al., 2017). This leads to an overall growing interest in the concept of a circular economy (CE), both in politics and in business, both in the Netherlands and in Europe. Given the potential contribution that the CE can make to the major challenges of our time, such as the climate challenge and the energy transition, is a good thing. (Jonker et al., 2018). The call for the concept of a CE now seems larger than ever before.

As investigated in the research of Globechain (2018), each year every person produce approximately 2.2 billion tons of waste globally. According to the World Bank Group, this number is set to double by 2025, and double again every 25 years (Globechain, 2018). In terms of volume, some 65 billion tons of raw materials entered the economic system in 2010, and this figure is expected to grow to around 82 billion tons in 2020 (Ellen MacArthur Foundation & McKinsey & Company, 2013). Despite the fact that the rate of recycling has risen from 11% to 35% worldwide in the last decennia, recycling alone, however, is not sufficient (McCarthy, 2016). A more human behavior change and a radical rethink of resource management systems are required.

It becomes increasingly clear that the linear economy is no longer a tenable model within the limits of the planet Earth. Over the past decades, a growing awareness has emerged that the current way of consumption and production of products can no longer continue in the same way. In a circular

economy, one person's waste is often another person's raw material. It should take the place of today's more linear economic system, which is based on consuming and disposing of them after their use. The use of virgin raw materials will be minimized, as will all forms of wastage and other negative environmental impacts in material cycles. The circular economy is a practical solution to this resource problem. It is an economic system that is restorative by intention and design. In other words, this solution of optimizing resource yields will span over the entire product life cycle. Beginning from the 'take' stage to after the product's end-of-life. The goal is to take less and fully utilize all products, components, and materials through their life cycle.

2.3 The Circular Economy

The circular economy (of which circular construction is a specific application) is able to turn the current linear logic into a closed system, whereby further depletion of raw materials and growing waste heaps is a thing of the past. A circular economy differs from a linear economy in a fundamental way. In the CE the use of virgin raw materials will be minimized, as will all forms of wastage and other negative environmental impacts throughout material cycles. It is based on the idea of closing the cycle of production-consumption of a linear economy. Products and materials are reused and raw materials retain their value as much and for as long as possible. In a CE, the goal is to minimize waste from the design and then continue to use raw materials, materials, and products for as long as possible at the lowest possible operational costs during the physical life cycle. The goal of the CE is for human consumption to achieve zero waste in order to minimize the depletion of natural resources and damage to the environment. Moving to a CE not only provides opportunities including increases in gross domestic product, employment growth and reduced pressures on the environment. It is also predicted to bring economic society-wide benefits, including increased competitiveness, innovation, net material savings, and reduced risk of material price volatility and supply.

The literature describes various definitions of the concept of a circular economy. However, in almost all studies is referred to the perspective of the Ellen MacArthur Foundation (EMF) describing that the circular economy is a concept in which products and the materials they contain are highly valued based on a take-make-consume-throw away. On the basis of the so-called butterfly model (Figure 3) by Ellen MacArthur, which contains the production and consumptions of products, is aimed to limit the leakage of resources as much as possible.

The overall concept of the circular economy represents the different economic cycles for the biological nutrients in grey on the left side and for technical nutrients in light blue on the right side (Figure 3). Overall, it is the aim to prefer smaller cycles against longer cycles to create a small negative environmental impact and increase the positive benefits (Stahel, 2016). In practice, this means that in the concept of a circular economy waste should be reduced to a minimum by I) reusing products over and over again, II) refurbishing product as much as possible, III) repairing product whenever possible, IV) recover the energy demand, V) refuse or prevent the use of the product, VI) re-purpose products in different ways than just reuse them, VII) remanufacture new product for second hand and finally, VIII) recycling existing materials and products.

The butterfly model distinguishes three integrated parts: the biological (bio) cycle, the economic model and the technical (techno) cycle. Where the linear economy stops at the disposal of materials or products, the circular model defines closed loops where consumed products circle back into the economic model through different circles (Figure 3).

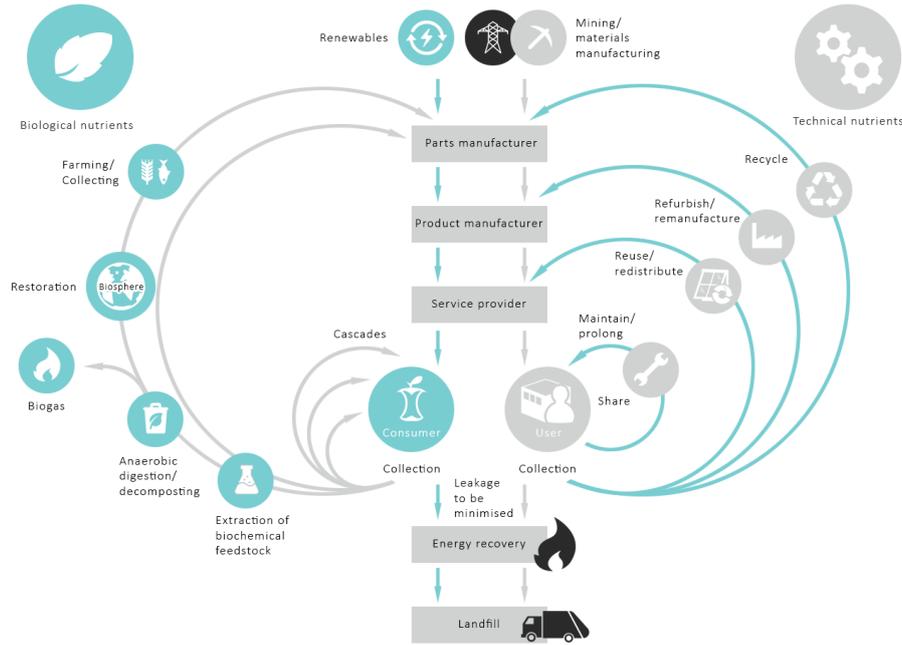


Figure 3: The Butterfly Diagram: the Circular Economy model (Ellen MacArthur Foundation, 2013)

The center of the circular economy model represents the economy with as starting point, the manufacturing of materials, parts, and product. These become available on the market and are used or consumed. Instead of just disposing the product at the end of the lifecycle, like in the take-make-waste model, products are to be collected to enter one of the many feedback loops. Leakage of materials to be burned for energy recovery or as landfill should be minimized (Ellen MacArthur Foundation, 2013). For both the bio-cycle and the techno-cycle, residual flows that are not polluted with other materials can be collected most easily and reused. By ensuring that materials are easily separated after use and residues are collected in such a way that they are not contaminated with toxic substances, residual flows are most useful. Internal business processes during production or service provision should also include this principle where abundant material should be minimized or reused, recycled, etc. which means the principle can be applied to different scales (refuse, rethink, reduce).

The left side of the model represents the biological cycle. In this bio-cycle, it is important to let the ecosystem do its work as well as possible. Consumption may take place in this cycle (food, water, fertilization) as long as the streams are not contaminated with toxic substances and ecosystems do not become overloaded. Then renewable organic raw materials can be regenerated. Materials that can safely be returned to the biosphere can function as biological nutrients for the next cycle.

The right side of the model represents the technical cycle. In this techno-cycle, it is important that the stock of finite materials is well managed. The use of materials replaces its consumption. After use, materials are reclaimed from residual streams with a focus on value retention. Within the techno-cycle, there are different levels of reuse. Most of the inner circle is preferred over the larger cycles because they require fewer processing steps, labor, energy, and new material resulting in that more value is maintained (Ellen MacArthur Foundation, 2013).

Various definitions of the CE have been offered over the years. The concept is trending both among scholars and practitioners (Kirchherr et al., 2017). This is indicated by the rapid growth of articles on

CE: more than 3000 articles were published¹ on the topic in 2018, compared to only about 1000 articles in 2013. Although an increasing number of publications are being written, there is no definite definition of a circular economy found both literature and practice. If ten people are asked to define the concept of a circular economy, they will probably come up with ten different definitions. For this reason, critics claim that it means many different things to different people. The problem in the current market is that there is no unequivocal definition of the concept. In doing so, the definition of the circular economy must clearly be formulated to create clarity and prevent misunderstandings for this research. In order to define an unambiguous definition of the concept of a circular economy, almost twenty definitions of the circular economy that are used in the literature, are analyzed (Table 1). Comparing these definitions with the outcomes of Kirchherr's et al and Homrich's et al research, who have respectively analyzed 114 and 35 definitions of the circular economy, a comprehensive definition of the CE is drawn up.

Table 1: Definitions of CE

Author	Components	Definition
Birat (2015)	Materials, resources	CE is a contemporary and popular concept that describes how materials and resources should be handled in the future
Bourguignon (2016)	Economic system, materials, closed loop,	CE is an economic model based inter alia on sharing, leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, which aims to retain the highest utility and value of products, components and materials at all times.
Ellen Macarthur Foundation (2015)	Products, materials	CE is restorative and regenerative by design, and which aims to keep products, components and materials at their highest level of utility and value at all times, distinguishing between technical and biological cycles.
Gregson et al. (2015)	Resources, materials	CE has emerged recently as a policy goal in the context of rising resource prices and climate change. The aim is to move away from the linear economic model, summarized as 'take make dispose' with raw materials in at one end and externalized wastes at the other
Haas et al. (2015)	Materials, closed loop, resources, economic system	CE is a simple, but convincing, strategy, which aims at reducing both input of virgin materials and output of wastes by closing economic and ecological loops of resource flow.
Hartman (2014)	Materials, energy, resources	CE is an economic system that is designed to maximize the reusability of products and raw materials and to minimize value destruction and uses renewable energy sources for this purpose.
Het Groene Brein (2015)	Economic system, materials	CE is an economic system that is based on minimizing the use of raw materials through the reuse of products, components and high-quality raw materials.
Homrich et al. (2018)	Economic system, closed loops	CE is a strategy that emerges to oppose the traditional open-ended system, aiming to face the challenge of resource scarcity and waste disposal in a win-win approach with economic and value perspective.
Jiao & Boons (2014)	Closed loops,	CE was defined as a holistic concept covering the activities of reduce, reuse, and recycle in the process of production, circulation, and consumption
Jonker et al. (2018)	Materials	CE is based on (re) designing production systems at various levels in which value retention in chains and during the lifespan of raw materials, goods and materials is central.
Leising (2016)	Total lifecycle	Circularity in the built environment is defined by the focus on the total lifecycle of a built object.
Li et al. (2010)	Closed loops, products, environment	CE aims at closed-loop material and energy systems in all sectors of industry in order to reduce the use of natural resources and the environmental impact
Kraaijenhagen, Van Oppen, & Bocken (2016)	Economic system, closed loops	CE is an economic system where products and services are traded in closed loops or 'cycles'.
Smol et al. (2015)	Value chain, resources	Transition to a more circular economy requires changes throughout value chains, from product design to new business and market models, from new ways of turning waste into a resource to new modes of consumer behavior
Van Oppen, Croon, & de Vroe (2018)	Economic system, closed loops	The circular economy is based on an economic system in which circular products are actually used in a circular fashion.
Wen, Zhao, & Liang (2007)	Resources, environment, economy	CE and eco-industry are effective ways to solve sustainable development problems on resources, environment and economy
Zhu, Geng, & Lai (2011)	Environment, resources, economic	CE promotes continuous economic development without generation of significant environmental and resource challenges. It advocates that economic systems can and

¹ Retrieved from ScienceDirect at November 2018.

	system, materials, energy	should operate according to the materials and energy cycling principles that sustain natural systems. CE also emphasizes the recycling of essential materials and energy as well as the capacity for one entity's wastes to be used as a resource by another entity through self-organization capacities
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The terms most derived in the literature study are “open/economic system”, “loss of raw materials”, “closed loops” and “environmental impact”. Other frequent word connections are “resources”, “energy” and “equipment”. Based on the EMF perspective (Ellen MacArthur Foundation, 2013) and supported by definitions of academics including (Table 1) the following definition of CE is formulated:

“Circular economy is an economic system for the valuable use of resources, without loss of raw materials, products, capacity, and people and with the aim of creating positive effects for climate, environment, employment and economy: a closed loop.”

In recent years, the concept of the circular economy has gained more and more support. According to several studies, the concept promises a solution for future resource scarcity and resource efficiency problems in the form of system innovation. This shift from a linear to a circular economy involves a change in thinking, preparation, transparency, costs sharing, working method and execution for all stakeholders involved (Hogeschool Rotterdam, 2015). This leads to an overall growing interest in the concept of a circular economy, both in politics and in business, both in the Netherlands and in Europe. Given the potential contribution that the CE can make to the major challenges of our time, such as the climate challenge and the energy transition, is a good thing (Jonker et al., 2018).

The necessity of this sustainability has come about from a growing awareness to deal more consciously with the current supply of raw materials. Reducing the pressures on the environment, enhancing the security of the supply of raw materials and increased competitiveness are opportunities of shifting to a more circular economy. However, the shift is also faced with potential challenges such as financial, key economic enablers and consumer behavior and business models.

2.4 Circular Economy in the Built Environment

After defining the concept of the circular economy, this section will lay down its relationship to the construction sector. Since the Dutch built environment is 90% dependent on raw materials like iron, aluminum, copper, clay, limestone, and wood (Odijk & Bovene, 2014), a lot can be saved if these processes are more circularly arranged. The linear economy not only creates problems regarding material scarcity but this model has also a great impact on the environment. The usage of products in the take-make-waste model results in large amounts of waste. Some of this waste is recycled but much is assigned as landfill. The current way of recycling is suboptimal and is also referred to downcycling. The recovered materials from recycling are of lower quality than the original materials (Odijk & Bovene, 2014).

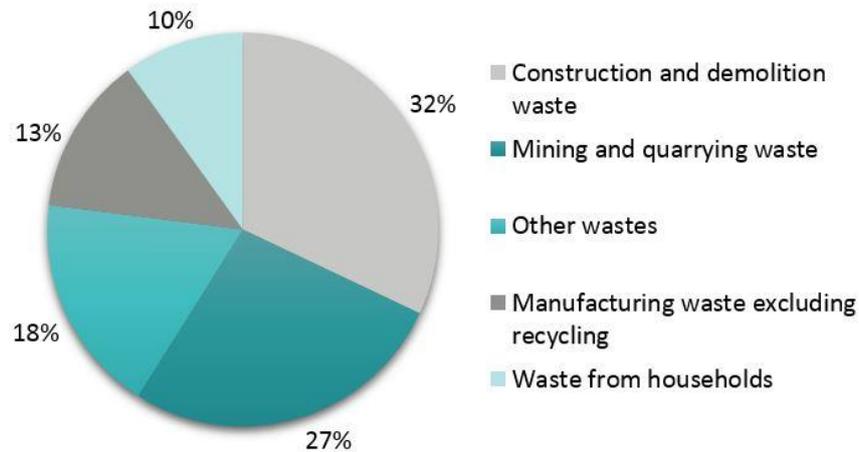


Figure 4: Waste Generation in EU-28 by sector – Bourguignon (2016)

Economic growth has been gigantic in recent decades and the consumption of goods and services has increased considerably (Quick, 2012). The construction sector has a large share in this since it produces an enormous amount of waste, Figure 4. Currently, about 32% of the solid waste in our economy derives from construction and demolition work (Bourguignon, 2016). A small improvement in the recovery of raw materials can offer huge potential benefits in this sector.

It is generally known that as the world’s population soars, so does its consumption, and as a result, humanity is stretching many of the natural resources to their limits. At the same time pollution and depletion of natural resources has increased. Of course, the assumption is that human ingenuity and market forces will prevent supplies from running out: there could create better or cheaper extraction methods, recycle materials, find alternatives to non-renewable sources, or reduce consumption. If humanity fails to correct consumption trends, then when will our most valuable natural resources run out? This question is answered by an in-depth research by Quick in 2012. Quick (2012) has discovered that, based on a negative scenario, construction materials like copper will be exhausted within 32 years, oil will also be on its last reserves within 37 years and the same goes on for aluminum which will be exhausted within 80 years, Figure 5.

The awareness of a more sustainable way of dealing with materials has been going on for decennia. But the real first official step in the Netherlands to counteract the 'take-make-waste society' in the construction sector was started in September 2016. The then Dutch Secretary of State of

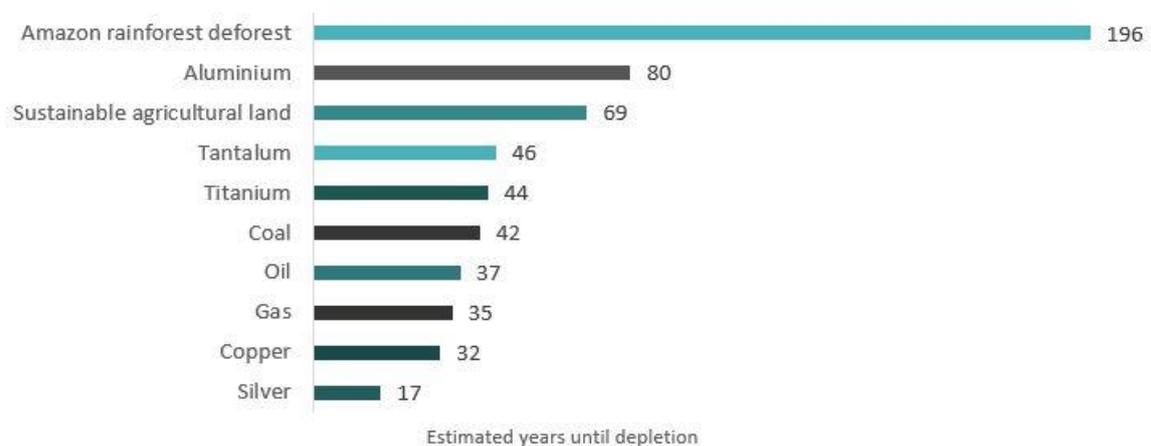


Figure 5: Stock Check: how long do our known reserves of resources have left? (BBC IIB Studio, 2012)

Infrastructure and Environment, Sharon Dijksma, and Henk Kamp, Dutch Minister of Economic Affairs presented the Government-wide program 'The Netherlands Circular in 2050'. By now thinking about the more efficient use of construction products after their functional life, it can be ensured that the construction can become truly circular. Sounds simple, but it will be a big challenge for the Dutch construction market. Not only because of the conservative attitude in the construction industry, driven by the short-term financial objectives but also about new responsibilities that come into play in this new economic form (Peters, 2018).

So, now it has become clear that the circular economy in the construction sector is primary about bringing materials back into the cycle by thinking in advance, during the design phase, about how a building or building element can become part of that cycle again at the end of its life. It turns out that the transition to a circular construction sector is therefore important and received much attention by scholars, businesses and government instances. In 2016, Cheshire developed a model that compromises the principles of the circular economy (Ellen MacArthur Foundation & McKinsey & Company, 2013) in relation to the built environment (Figure 6). The model consists of concentric circles representing both technical and biological loops. Like in the butterfly model, the loops consists of different levels of material reutilization (the 7R model). The surrounding circles represent how new business model help enable to achieve a more circular economy across the construction sector In order to achieve the most resource-efficient design for construction, Cheshire overlaid the design principles for buildings with the different levels of material reutilization. The five design principles for circular building aim to make conscious decisions regarding several aspects of circularity and are as followed:

- Building in Layers (Brand 1994);
- Design-out waste;
- Design for adaptability;
- Design for disassembly;
- Selecting materials.

Since the design is the starting point of a new building, all principles have a focus on different areas and should be used in combination when designing a building (Cheshire, 2016). Reducing construction waste begins at the drawing board.

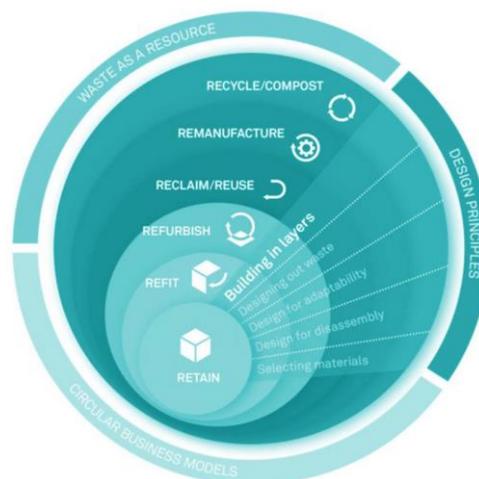


Figure 6: Applying Circular Economy principles to the Built Environment (Cheshire, 2016)

Good design can reduce the squandering of resources, energy, and money at the outset and throughout a building's lifetime. An inspiring statement of the circular economy in the construction sector was found in the article of (Unger & Hoppe, 2018) in which is stated that circular construction connects past, present and future with each other: buildings from the past serve as raw materials for buildings of the present, buildings from the present are raw materials for buildings of the future.

2.4.1 Building in layers (Brand, 1994)

For a better understanding of the different technical lifetimes of building components, a classification into groups of elements is necessary. The shearing layers of change are proposed by Brand (1994) and are adopted in various technologic research regarding the end of life assessment of buildings. Each layer has its own life span and has its own dynamics and rhythm. Brand distinguishes site (earthwork), structure (support structure), skin (the skin), services (the installations), space plan (the layout) and stuff (the layout). These six layers, shown in Figure 7, are useful to further zoom in on materialization on the one hand and nuances in the sphere of influence on the other. The turnover rate of these layers - or of the products and materials used - vary from virtually infinite (site) to 1 to 10 years (stuff, such as household effects) and the rest falls between them.

The element of time plays an important role. Each layer has its own life cycle with its own dynamics and rhythm. For example, the location and construction of a building change considerably less than the furniture in it. Each layer has its own life span. The different layers, each with their own dynamics, are summarized in layers (Figure 7). The thicker the line the longer the life of the architectural layer. In each building, the architectural layers will have a different life span. Most of the profits can, therefore, be obtained from the inner shells since they are due for replacement. It is the key to take conscious (material) choices into account during the design (resulting from the tender criteria), to extend the life span of the materials and products as much as possible.



Figure 7: Shearing layers of change (Brand, 1994)

2.4.2 Design out of waste

Designing out waste requires to build the principles of using resources efficiently into the design stage of construction projects. The aim is to plan, as far as possible, to use available materials as efficiently as possible in order to minimize the amount used for construction. This helps to reduce the quantity of waste created during the construction process.

There are five key principles that define design out of waste which are:

- **Design for reuse and recovery of materials;** use of recycled materials or materials salvaged from other sites
- **Design for off-site construction;** use of prefabrication to reduce the number of trades and activities on site
- **Design for materials optimization;** by minimizing excavation, or standardizing materials or component choices
- **Design for waste efficient procurement;** through early consultation of contractors on how to reduce waste in the supply chain, or tighter specification of work procedures such as allowing the use of off-cuts
- **Design for deconstruction and flexibility;** allowing for recovery of materials during building refurbishments, such as the use of easily disassembled structures in buildings or civil engineering projects

The five design out of waste principles can be applied to a building or civil engineering project. Design out of waste is of course directly linked to the approach of the circular economy. In this way, written-off materials can be rearranged elsewhere over and over again. Unfortunately, this is a costly and time-consuming process which makes it not yet customary in the construction market

2.4.3 Design for adaptability

The design for adaptability principle explains that design efforts usually look at the life cycle costs to reduce waste and pollution, but is limited regarding looking to extend the life cycle (Van Vliet, 2018). Changes in the environment challenges the adaptability of buildings. At the same time, the building itself goes through a change process related to the building's deterioration and technical decline. The gap between the level of performance and the increased level of expected standard (building quality, user expectations, and legislation) widens as the building ages. Design for adaptability can be described as a strategic process, which must be developed and refined throughout the project (Blakstad, 2001). Adaptable systems are designed to modify the performance of the building or building parts to enable a longer useful life. An adaptable building is, therefore, able to easily evolve together with shifting user requirements, increasing the potential use lifecycle (Kasarda et al., 2007). Over the past few decades modular building concepts, which are in how level adaptable, gaining ground in the construction sector. These relative small building concepts are mainly designed for private housing.

2.4.4 Design for disassembly

Design for Disassembly intends to maximize materials conservations from building end-of-life management by making parts possible to be disassembled, replaces and/or reused, and create adaptable buildings to avoid building removals altogether (Van Vliet, 2018). The goals for design for disassembly are to create enduring buildings and projects, create value for building owners, and eliminate waste with closed loops. The result is more flexible buildings that are easy to repair, refurbish, or reconfigure; buildings that function as material banks; and products and materials that retain value and return to productive use at end of life. The disassembly of buildings to recover materials and components for future reuse is not widely practiced in the modern construction industry. However, the concepts of Design for Disassembly are already revealing themselves in a handful of products and projects. The principles are easier to achieve when products already designed to do that. One of the key ways to achieving value retention is through verified input, which Cradle to Cradle product certification provides through the very nature of its process of analysis and continual improvement, i.e. the concept ClickBrick construction elements.

2.4.5 Selecting materials

The materials used in a building are an important factor when building for the circular economy. There are many different properties to consider when selecting the materials. Architects, designers and construction specifiers may consider a variety of attributes when deciding which materials and products to use in building design and construction – including cost, product durability, performance and aesthetics, as well as health, environmental and sustainability impacts, such as indoor air quality, energy efficiency, carbon footprint and more. Materials used in building and construction applications have unique strengths and weakness, and there are often tradeoffs among these attributes. For example, a particularly durable product may also come with a hefty price tag. Or a particularly beautiful product may be difficult to maintain and need early replacement.

2.5 The seven pillars of circular construction

According to Van den Berg (2018), circular construction is primarily based upon seven pillars, Figure 8. These seven pillars are essential for a successful circular construction project and should be the starting point of all circular construction projects. Since these pillars are inextricably connected with each other, a certain consideration or decisions in one pillar influences the actions in the other six pillars. Although this research only focuses on the pillar of circular tender, it is nonetheless important to understand the meaning of all individual pillars.

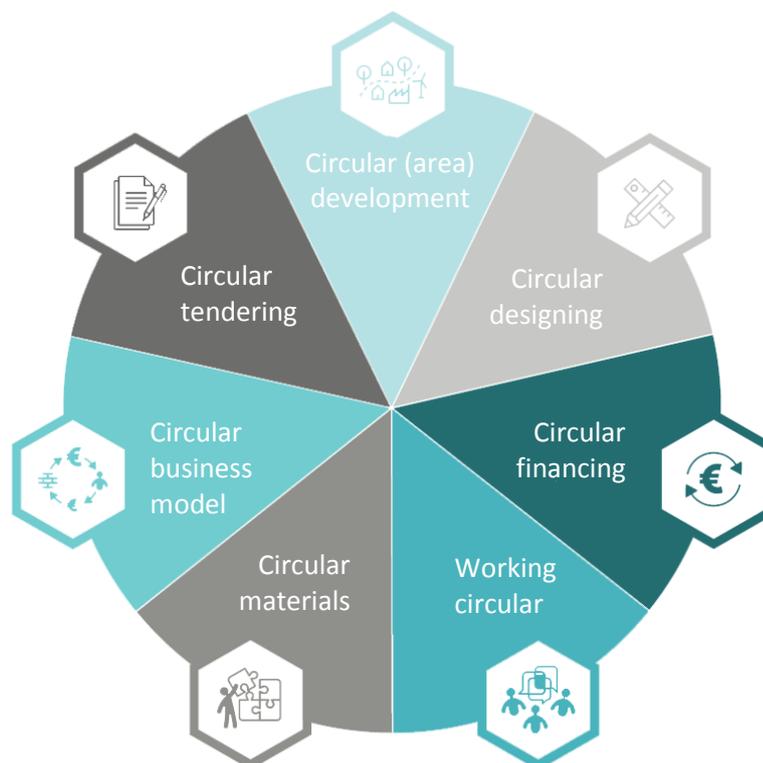


Figure 8: The seven pillars of Circular construction (Van den Berg, 2018)

The first pillar is circular (area) development. Companies can choose to settle on a business park if their waste stream is the raw material of another company and/or if one of their raw materials can come from another's waste stream. This is also extended in the energy field, in which a company with a heat surplus can use this heat for a company with large heat demand.

The second pillar is circular designing. In circular construction projects, the design method should radically change. Designing building elements in such a way that the building is dynamic, changeable,

demountable and modular and functional as temporary storage of materials. Architects and building consortia together have to construct buildings that are flexible, adaptable several times.

The third pillar has to do with circular financing. On this point, Van den Bergh (2018) is quite critic. The banking sector has learned nothing from the crisis, so construction projects should be financed outside of them. Forms of financing through total cost of ownership, life cycle cost, investments that are paid for savings or earnings over time, a deposit on materials and leasing formulas.

Working circular is the fourth pillar and means that workspace is offered as a service. The office is open and dynamic with high-tech support. Communication and connection with other employees and companies are central. Van den Bergh (2018) says that this new way of working will have a major impact on how to set up offices and buildings and therefore is a pillar that should not be missing in circular construction at all.

The fifth pillar is about making materials (more) circular. This means that materials are regrowable, reusable, recycled or upcycled so that they remain in the cycle for as long as possible. Circular materials are therefore materials and raw materials that can be reused a number of times in sometimes other capacities. At the end of their life cycles, they must be able to be dismantled in an environmentally friendly way.

Another important pillar is the pillar of (new) circular business models. Mainly, this means that the ownership of materials should be returned to the producer, which makes materials more sustainable again. To goal is to purchase products as a service whereby the producer remains the owner and is responsible for the maintenance and the return.

The final pillar is about the starting point of a building process: tendering. Circular construction also means that the way of tendering will change. The circular tender process can be seen as a package of openly formulated ambitions with fixed budget challenges the market to form a consortium and to come up with innovative building solutions. It is a form of tendering and project realization where the quality and the sustainability ambitions come first, instead of the price component, which is the case of traditional tendering. The relationship between contracting authority and executor(s) is one of collaboration which is at odds with the (legal) jousting of classic tendering, where both parties are often diametrically opposed.

2.6 Conclusion

The literature study has resulted in some interesting findings of the concept of the circular economy in relation to the construction sector. There is an overall growing interest in the concept of a circular economy (CE), both in politics and in business, both in the Netherlands and throughout Europe. However, it turns out that there is no unambiguous definition of the concept of the circular economy especially in relation to the construction sector. Each individual has his or her own interpretation of the concept, which could lead to misconceptions in communicating the subject. Relating the CE to the construction sector, five principles lay behind this translation in which the design principle is of crucial importance. However, a suitable (circular) design starts with formulating suitable starting point from which the design must depart of: the tender process. The contracting authority plays the leading role in this, with the aim of translating its (circular) ambitions into a suitable request that leads to the intended design. The relationship between contracting authority and contractor(s) is one of collaboration which is at odds with the (legal) jousting of classic tendering, where both parties are often diametrically opposed. The circular principles of the contracting authority can be based on the five design principles focuses on materials (re)use, adaptability and/or disassembly.

3 Tendering in the construction sector

In the previous chapter, the shift from a linear economy to a circular economy is introduced and it is explained what this shift particularly means for the construction sector. This part of the literature review is appointing the formation of a (circular) construction project: the tender process. Prior to almost all construction projects, a process has to be followed in which the most suitable contracting party is chosen for the execution of the good, service or work.

Tender processes can be distinguished in European and National tenders. In Europe, the European Union's directive on public procurement governs all procurement by public sector bodies. This directive contains detailed rules on the process to be followed and what the public sector may or may not do. There are no equivalent rules for the private sector and very few cases involving private sector procurement (Mayer, 2012). In contrast to private individuals, who are in principle free to enter into a contract with anyone and can choose a contractual partner however they wish, government bodies are not free in this. Procurement law deals with how a government body selects a contracting party: it is the pre-contractual law between government bodies and tenderers. The aim of regulating this traffic is to give everyone a fair chance on the large government market. As just said, only contractual authorities are required to hold tendering procedures. In the meaning of the Public Contracts Procurement Rules Decree, 'contracting authorities' are: the State, a provincial authority, a municipal authority, a water board, a body governed by public law or an association of these government bodies or bodies governed by public law (Chao-Duivis, Koning, & Ubink, 2013).

If a contracting authority is obliged to tender, it must adhere to the four tendering principles of tendering, which are general and statutory. When talking about *circular* tendering, Van Oppen et al. (2018) has added another two principles (collaboration and innovation) to these four main principles:

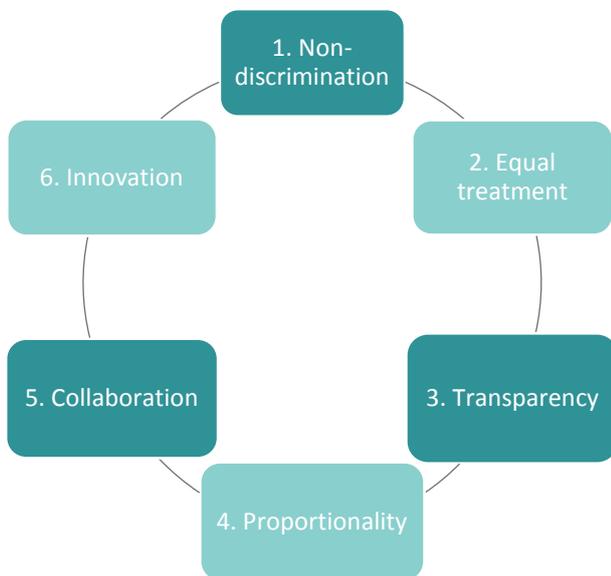


Figure 9: The six principles of circular tendering

1. Non-discrimination: no distinction can be made according to nationality;

2. Equal treatment: every market party that participates in the tender must receive identical information. Each party must be assessed in the same, objective manner;

3. Transparency: it must be clear to each market party what it is expected. The client must clearly motivate decisions;

4. Proportionality: the procedure itself and its content, including the requirements and criteria, must be proportionate to the nature and scope of the assignment;

5. Collaboration: cooperation between the client and market parties within the legal framework must be stimulated and the gap, that is traditionally present between the two parties, must be bridged;

6. Innovation: make it possible to stimulate innovation and circular developments within the tender.

A contracting authority is obliged by law to make the tender publicly available in Europe above certain contract values, the so-called European threshold values. The threshold value depends on the type of contracting authority and whether the tender is a good, service or work. First and foremost there is an important distinction between contracts with values below and above the European limits. A public contract that is equal to or more than the threshold amount must be tendered at European level. Different threshold values apply for works and supplies or services under the classic procurement Directive, the concession directive, and the defense directive. In addition, there is a distinction between threshold values for orders from the central government, local authorities and special sector companies. The following threshold amounts for the Classical Directive 2014/24/EU tendering and will apply from 1 January 2018 to 31 December 2019.

Table 2: Overview of the European Threshold value in 2018 (PIANOo, 2018)

	Central government authorities (State)	Sub-central contracting authorities
Works contracts, subsidized works contracts	€ 5.548.000	€ 5.548.000
Service contracts, all design contests, subsidized service contracts, all supplies contracts	€ 144.000	€ 221.000

How the value of a contract is calculated is set out in Article 9 of the Public Contracts Procurement Rules Decree and falls out of the scope of this research. If the value of a contract is below the limits, this does not mean that it need not be put out to European tender: the Court of Justice has ruled that in the case of contracts below the European limits but with cross-border interest there must be adequate transparency so that the contract is also published outside the country in question (Chao-Duivis et al., 2013).

If a contracting authority is required to hold tendering procedures, the next step is to explain which type of procedure and contracts are used to put out to tender. These decisions don't take place after each other but are considered parallelly. According to the Public Contracts Procurement Rules Decree, a 'public works contract' is defined as:

A contract for pecuniary interest concluded in writing between one or more contractors and one or more contracting authorities and having as its object 1. Either the execution, or both the design and execution, of works related to one of the activities within the meaning of Annex I or a work, or 2. The realization, by whatever means, of a work corresponding to the requirements specified by the contracting authority.

An important distinction that should not be overlooked, is that there is a difference between the central and the decentralized government. The central government consists of all ministries, the judiciary, High Colleges of State, advisory bodies and independent administrative bodies, while the decentralized government consists of provinces, municipalities and water boards. Because the Netherlands is a decentralized unitary state, this means that it has its own powers, but only in those areas where they do not fall under the jurisdiction of the State. For example, the legislative and executive power of the Netherlands does not have jurisdiction over the territory of other sovereign states or over international waters. In concrete terms, this means that a parliament cannot make laws that apply to the territory of another state and that the police of one country has no powers (and therefore cannot perform independent acts) in the other country.

The most important agreements and conditions for building contracts are laid down in the UAV 2012, the UAV-GC 2005 and the DNR 2011. These rulesets provide direction and make it easier to draw up contracts because they are generally known (PIANOo, 2017). However, it is important to realize that these are not the only rulesets, so it is not mandatory to use these sets. The conditions only apply if they are declared applicable in a contract (Chao-Duvis et al., 2013). Which type of projects and contracting authorities that apply to a tender process, which different type of procedures are available and which laws and regulations are in force, is explained in detail in the remainder of this paragraph, starting with the tender process.

3.1 The Tender process

As already said in the introduction of this section, tendering is the process of finding a suitable contractor for the execution of a desired product, delivery or service, finalized in a contractual agreement (Jager, 2016). It comprises the entire process, from the preparation of the tender documents to awarding the most suitable contractor with the contract. The determination of the most suitable tenderer depends on the assessment of the selection and award criteria. Globally can be said that the process of tendering consists of three main stages: the pre-procurement stage, the procurement stage and the contracting stage (Figure 10). However, the organization of a tendering process is highly dependent on various factors and choices (such as the value of the assignment, the type of contract and type of procedure). But even outside of this, every tender process is often self-contained and unique and can be arranged specifically by each contracting authority itself. The contracting authority has a lot of freedom within the law and regulations to fill in and specify their specific requests. Figure 10 gives an impression of how a tender process can globally look like.

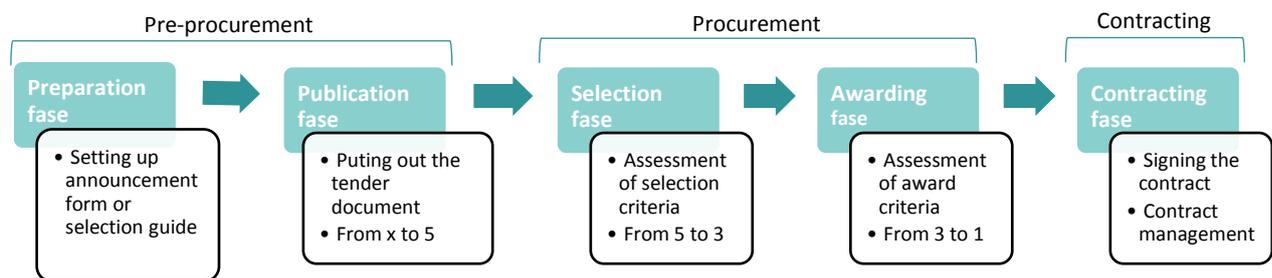


Figure 10: The tender process globally

Entering a tender process, a contracting authority announces that he or she wants an order to be executed and asks companies to submit a quotation. This outsourcing of an order is a comprehensive concept and is concerned with acquiring all of the goods, services, and work that is vital to an organization. In example I) a 'work' can be the construction of a physical architectural or civil engineering object such as building or tunnel, usually based on specifications, II) a service can be carrying out a relocation, providing legal advice or carrying out an engineering assignment and III) a delivery can be the delivery of goods like coffee machines or cars. The research is focused on the construction related-demand and is therefore limited to the 'work' assignments.

Within the pre-procurement stage, the announcement form, selection guideline and award guideline (depending on the type of procedure that is chosen) is set up by or on behalf of the contracting authority. This differs in the fact whether a procedure has been chosen with or without a preselection. This will be discussed in more detail later on in this section. Criteria derived from contracting authority's needs and ambitions are set within the selection and award guidelines in order to find the most suitable market party to fulfill these ambitions. The next step of the pre-procurement stage is to put out the tender documents for tender after which tenderers can register for the assignment.

The procurement stage is focused on reducing the number of tenderers from 5 to 1. This takes place in two phases: the selection phase and the award phase. After the most suitable tenderer has been announced for the execution of the assignment, the contract phase starts. When entering a tendering process, the contracting authority is bound by a number of rules. This law and regulations are included in the procurement law. In order to provide an equal chance between providers and optimize the functioning of the construction sector, procurement is regulated by European Procurement Law. The essence of procurement law is to guarantee transparency, non-discrimination, and competition to find an optimal provider for the procured assignment (Jager, 2016). In the remainder of this section the various stages are extensively discussed. The final stage of the tender process is awarding the most suitable market party, derived from the assessment of the selection and award criteria with the contract.

The following section elaborates on the different tender process stages. [Section 1.4 Research Design:](#) explained that the aim of the research is to classify the selection and award criteria. Since the selection and award criteria are formulated and composed in the pre-procurement, most attention is paid on this specific stage of the tender process.

3.1.1 The pre-procurement stage

As mentioned in [Section 3.1 The Tender process](#), the research focuses mainly on this phase of the tendering process as in this phase, in most procedures and contract forms, determinative considerations regarding the selection and awarding take place, which is assumed that may differ from those of a linear process in comparison with a circular process. The pre-selection stage involves inviting tender submissions from prospective contractors from which a selection can be made based on a request for tenders (RFT). A request for tenders indicates the conditions of the tender, the contract conditions and the tender specifications will be provided to potential suppliers who will be invited to submit tender proposals. This is the so-called contract advertising. In the Netherlands, this advertisement often takes place in an online environment at which the website TenderNed.nl is used. The website is an online announcement platform set up in 2010 as a result of the introduction of the Public Procurement Act 2012. Its use is mandatory for the publication of tenders by government departments and companies (Rijksoverheid, 2018).

If a contract is advertised, there often follows a pre-qualification process. The main goal of this process is to allow the long list of contractors that have submitted an expression of interest to be reduced to a reasonable number that can be invited to tender (Tender evaluation, 2018). This number differs for each project but is usually around 3 to 4 contractors. The creation of this issue comes from two perspectives. On the one hand, when more contractors are admitted, it would waste the contractors time and reduce the likelihood of receiving sensible tenders as the likelihood of a contractor being selected would be too low. While on the other hand, when fewer tenderers were selected, there may not be sufficient competition or enough information to be able to sensibly compare offers.

Pre-qualification also involves seeking information about the contractor's experience, capacity and financial standing. This is often done on the basis of a pre-qualification questionnaire (PQQ). The answers to these questions enable the contracting authority to produce a short list of contractors that are likely to be most appropriate for their particular project and may then be invited to tender for the contract (Design Buildings Wiki, 2017). This pre-qualification process helps to save time for potential tenderers who would not have any realistic chance of winning the contract and also saves time for the client processing and assessing inappropriate tenders. The information requested in the questionnaire should be straight-forward, relevant and proportionate to the size of the contract. A typical pre-qualification questionnaire will request full company contact details, evidence of previous work and

require answers based on financial, quality, status, environment, equal opportunities, safety and health aspects. The outcomes of the questionnaire will be processed and used for restricting the long list. From the moment the shortlist is defined, the selection phase starts.

When a contracting authority, i.e. the State, a government agency or a provincial authority, itself is unable to solve a problem or carry out work, or when it is assumed that a project gives rise to competition when putting it on the market, they have the possibility to (partly) outsource the project to another party. This is the so-called tender process. In such a case, it is wisely for the contracting authority to first draw up a so-called procurement strategy. This procurement strategy is part of the pre-procurement (or preparation) phase of the tender process and can be defined as ‘the whole of the underlying considerations and motives that play a part in the choice of a certain form of tendering and/or the phasing in it’ (Ensie, 2017b). During the preparation, the scope and size of the tender are determined and the tender documents are drawn up. It is the framework and guidance for all documents that play a role in the tender process and starts right after the project organization is known and the advisors are hired. The strategy is recorded in a decision-making document that must be approved by the decision-makers of all parties involved.

Determining the tendering strategy ensures that the project team thoroughly thinks about the choices and risks to be made in advance. Issues such as the manner in which a contract must be put out to tender and how the selection and award will take place, what risks there are and which party should carry these risks and what responsibilities the contracting authority wants to take and what responsibilities the contracting authority wants to leave to the contractor are examples that can be included in such a tendering strategy. In other words, strategic procurement is an organization-wide process that requires input from all departments and functional areas of an organization. When the contracting authority has made an assessment based on the specific project characteristics, a project can be filled in more concretely. It can, for example, be determined which activities and what quality level the tenderer must carry out, which form of contract can best be used, which contract form best suits the wishes of the client and which risks must be controlled. All these decisions and information is provided in the so-called selection guideline (*in Dutch: selectieleidraad*) and award guideline (*in Dutch: gunningsleidraad*).

3.1.1.1 Type of procedure

Within this selection guideline document, also the type of procedure under which the request will be put out for tender is described. The procurement procedure can be defined as the official way in which a work is awarded to (different) contractor(s) (Ensie, 2017a). As said before, there are multiple tender procedures described in procurement law where tenders above the European threshold value, should in principle be put out to tender in accordance with European procedures.

Besides describing the information, as mentioned at the beginning of this paragraph, the selection guideline also includes the type of procedure and type of contract under which the request will be put out for tender. In procurement law, a distinction is made between the standard tendering procedures and the specific tendering procedures. Within the standard procedures, the contracting has the opportunity to choose between open procedures and restricted procedures. In practice, these two are the most important procedures since they can always be used. The other types of procedures can be used in specific cases. These specific procedures are based on a number of preconditions and are listed below. Examples of specific procedures are:

- *The competitive dialogue*
- *The innovation partnership*
- The negotiated procedure with prior publication of a contract notice

- The negotiated procedure without prior publication of a contract notice
- Direct agreement procedure
- Concession procedure
- Framework agreement
- Design contest

The competitive dialogue and innovation partnership are by far mostly used, especially in the transmission to a circular economy (Van Oppen et al., 2018). The differences between these procedures lies mainly in the type of contract permitted during the procedure and the possibility of limiting the numbers of tenderers. In the introduction of this section, something is already said about when European and national procurement is required. In the following paragraph, the different procedures are discussed. Van Haagen (2018) highlighted that not all standard tendering procedures are suitable for a circular tender. He pointed out that restricted procedures and competitive dialogue procedures are most suitable for a circular construction process. In the conclusion of this paragraph, it will be explained to which procedure the research is limited. Before making informed choices, all different procedures are briefly explained and can be found in [Appendix 1: Type of procedures](#). First, the open and restricted procedure will be defined and subsequently, attention is paid to the competitive dialogue and the innovation partnership.

3.1.1.2 The choice of procedure for circular construction projects

The literature study into the determination of the procurement strategy and tactics shows that the choice for the type of procedure depends on the value of the project, the number of suppliers in the market and whether cooperation between disciplines should be explicitly encouraged or not. Table 3 provides an overview of the most common European tendering procedures in combination with the various considerations, as discussed in [Appendix 1: Type of procedures](#).

Table 3: Overview of the Assessment framework for tender procedures (Copper8, 2017)

Type of procedure	proportionality		Collaboration		Renewed character	Certainty of result	Level of competition	Pre-selection
	Number of procurers	Transaction costs for market	Between client and contractor	Between chain parties				
Open Procedure	Low	Low	--	--	Low	+	High	No
Restricted Procedure	High	Middle	-	-	Low	+	Low	Yes
Competitive Dialogue	High	High	+	+	High	+	Middle	Yes
Innovation Partnership	Not applicable	High	+	+	High	-	Middle	Yes

The table shows that the competitive dialogue procedure has significant benefits compared to the other three procedures. This is partly because the competitive dialogue makes it possible to connect parties more closely together and demand and supply are strongly attuned to each other. However, a frequently noted detriment of this procedure is that special attention must be paid to the transaction costs of the market parties according to the principle of proportionality since the dialogue session can be very time-consuming. Table 4 shows the timescale of the various procedures. It turns out that the competitive dialogue process is most time consuming compared to the other three procedures.

Table 4: Overview of the phases within different tender procedures

	Publication	Request to participate	Selection & Invitation to tender	Dialogue phase	Calculation time	Registration	Assessment	Awarding
Open Procedure								
Restricted Procedure								
Competitive Dialogue								
Innovation Partnership								

However, there are already several companies that offer a lighter form of competitive dialogue that can be followed in a period of only 6 months instead to the usual 9 to 24 months. In addition, this extra time saves costs later in the process because clear consultation has taken place in advance and the involved parties know what is expected of each other.

3.1.1.3 Type of contract

Another step in the tender process is to determine which form of contract fits the best for the execution of the order. As pointed out in Figure 10, contractual aspects are discussed during the pre-procurement process. Different types of contract models are used in construction. In their book, Chao-Duivis, Koning, & Ubink (2013) mentioned that a ‘contract’ is defined in the Dutch Civil code, Article 6:312, as:

‘An agreement in the meaning of this Title is a multilateral juridical act whereby one or more parties enter an obligation toward one or more other parties’.

In this division, a distinction is made between the division of responsibilities: which party, contracting authority or contractor, is responsible for which aspects of a building assignment. In addition, the models differ from each other in terms of the influence that the client has on the elaboration of the assignment, based on legal-administrative conditions, process agreement, technical project-specific conditions and the associated risks and liabilities. In order to find out the type of contract influences the criteria on which the selection and awarding take place in the end, the most common contract forms are discussed. A contract form determines the legal recording of the contractual agreements that are made between the participants (PIANOO, 2018b). The construction organization form describes the way in which the tasks are divided among the various participants in the construction process. There are various building organization forms and there are standard contract types. Chao-Duivis, Koning, & Ubink (2013) and PIANOO (2018) distinguishes four contract models that are used in the Dutch construction sector:

- The traditional model
- The integrated model
- The life-cycle model
- Alliances

In the case of the traditional model, a subdivision is made in Design and Build model and Design team model. The same goes on for integrated models which are subdivided into Design & Construct, Engineer & Construct and Turn-key contracts. The DBM(O)contract and DBFM(O) contract are examples of the life-cycle models, which are also called fully-integrated contracts. The last model, the alliance model, differs from all the above models in that the client is, in fact, more involved in design and execution.

The most important agreements and conditions for building contracts are laid down in the UAV 2012, the UAV-GC 2005 and the DNR 2011. These rulesets provide direction and make it easier to draw up contracts because they are generally known (PIANOO, 2017a). However, it is important to realize that these agreements and conditions are not the only rulesets, so it is not mandatory to use these sets. The conditions only apply if they are declared applicable in a contract (Chao-Duivis, 2016b). Each model has specific characteristics and is governed by specific General Terms and Conditions. While UAC 2012 and UAC-GC 2005 are mostly used for construction projects, also maintenance projects can be governed by these conditions (Elemans, 2016). The most common contract models in construction are the traditional and the integrated model. The main difference between these models lies in the responsibility for the construction project and the number of construction or life phases that are contracted at once (Castelein, 2018). For this research, it is expected that the integrated model is most relevant, as it is assumed that this model offers the most freedom for implementing circularity aspects.

The types of contracts that are described in the remainder of this paragraph is limited only to the most common contract in the Netherlands. Another important note that cannot be left unnoticed is the fact that the General Terms and Conditions, which for every type of contract are mentioned below, are only common alternatives to the contracts mentioned and are not bound by the contract forms. In [Appendix 2: Type of contracts](#) all four models are roughly explained.

3.1.1.4 The choice of contract for circular construction projects

As mentioned, construction law distinguishes different types of contract models. The most common models are categorized as the traditional model, the integrated model, the life-cycle model, and the alliance model. The models, presented in Table 5, differ mainly in the degree of design control, the influence that the client has and the resulting liability. The table offers a comprehensive overview of the determination of what type of contract is most valuable and useful for circular construction projects.

Table 5: Overview type of contract models

	Type of contract	Relationship	Contract conditions	Requirements	Design control	Flexibility contractor	Risks	Finance
Traditional	RAW	Classic triangle	UAC 2012	Detailed	Contractor & Consulting engineer	Minimal	High contractor & consulting engineer risk	Client
	Early Contractor involvement	Client – design team	The New Rules 2011	Detailed	Contractor, consulting engineer & architect	Minimal	Fully balanced	Client
Integrated	Design & Build	Client - Contractor	UAC-IC 2005	Functional	Balanced	Optimizing	Slightly more contractor risk	Client
	Engineer & Construct	Client - contractor	UAC-IC 2005	Functional	Balanced	Limited optimizing	Slightly more contractor risk	Client
	Turnkey	Client - contractor	UAC-IC 2005	Functional	Contractor	Boundary conditions	High contractor risks	Client
Life-cycle	DBM(O)	Client - contractor	UAC-IC 2005	Functional	Contractor	Boundary conditions	Balanced	Client
	DBFM(O)	Client - contractor	UAC-IC 2005	Functional	Contractor	Boundary conditions	High contractor risks	Contractor
Alliance	Strategic alliance	Client - contractor	The New Rules 2011	Functional	Fully balanced	Fully balanced	Fully balanced	Client

The literature has shown two new principles (Chapter 3), in which cooperation and innovation are central, that has to be overlooked when entering circular tendering. This means that cooperation between the client and market parties within the legal framework must be stimulated and the gap that is traditionally present between the two parties must be bridged. In some way, innovation and circular development within the tender must be stimulated. When making the link to circular buildings, thinking about design is an important principle. In fact, in the design phase, many decisions are made in terms of material choice and layout of the building. In order to achieve integral thoughts between the involved parties, it is advisable to sit down together early on the process to exchange knowledge and decisions. The integrated contracts and life-cycle contract fits best to these requirements. Recent research by Van den Boogaard (2018) confirms this line of thought. In her research, she relates several circular building criteria to the components of integrated and life-cycle contracts in order to find out what type of contract is most suitable for circular building projects. According to Van den Boogaard (2018), the closest contract to the circular characteristics is the DBFM(O) contract of the life-cycle model. The different types of integrated and life-cycle contracts are mainly based on six different components, each with a different composition, Table 6.

Table 6: Integrated and Life-cycle contract components (Van den Boogaard, 2018)

	Component	Description
	D - Design	Work out the outline design into a preliminary design.
	E - Engineer	Work out the preliminary design into a final design.
	B - Build	Construction of the works. Always included in an integrated contract. Sometimes named 'Construct'.
	M - Maintain	Maintenance of the building. Usually for a period of 10 – 15 years.
	O - Operate	Operation of the building
	F - Finance	Contractor is responsible for the finance of the project, the client pays for the delivered performances.

Of course, the DBFM(O) contract includes the most components of an integrated and life-cycle contract and therefore can influence decision making in every phase of the process. However, the DBM, DBMO and DBFM are also interesting for circularity due to the inclusion of the M component because, with good maintenance, the value of materials and products can be kept, which is decisive for its reuse, and therefore relevant for circularity. The DB and EC contracts are less powerful because they only influence the design and construction phase. However, decisions made at the beginning of the process are also important for the future exploitation of the building. But, these decisions can be enforced by including maintenance, finance, and/or operations to the contract. The finance component can be related to the CE, however, contracts integrating that component have high risks. This is confirmed in Castelein's (2018) research, in which is stated that the larger combinations, such as the DBFMO, bring many financial risks and are therefore less attractive for contractors.

Because the design and the maintain component are the most important components, contracts including both these components are the most valuable to influence the circular characteristics of the building (Van den Boogaard, 2018). In addition, since several research has shown that the financial component brings many risks, it is recommended to waive the financial element in circular tender project. In conclusion, multiple studies confirmed that the DBM(O) type of contract is most suitable for circular construction projects.

3.1.1.5 Publication phase

After the contracting authority has drawn up a procurement strategy and has chosen an appropriate procedure and form of contract, the publication phase follows in which the tender is requested. This means that the official tendering procedure starts with the publication of a notice in the Official Journal of the European Union via ted.europa.eu. The abbreviation 'TED' stands for Tenders Electronic Daily. In the Netherlands, TenderNed.nl can easily create an announcement and publish it both nationally and directly on TED. Tender documents can also be added to the publication via TenderNed. Interested suppliers can download these documents directly. This saves both the supplier and the contracting authority a lot of time.

The Public Procurement Act 2012 obliges contracting authorities to use the TenderNed publication module when making pre-announcements, announcing award decisions, rectifications and notifying the European Commission of the result of the procedure. The obligation only applies to contracts above the European tender thresholds and to (voluntary) publication of (national) assignments. The minimum deadlines prescribed by the procurement rules start to run from the date of dispatch of the notice (the day of dispatch is counted as day 0). The terms differ slightly from procedure to procedure. Sometimes it is possible to shorten the deadlines, for example, if market parties can register via TenderNed or if a prior information notice is used.

Intended orders above the European threshold value are announced in the Tenders Electronic Daily (TED). This is a supplement to the Official Journal of the European Union. The announcement includes:

- how suppliers can participate in the tender;
- what kind of assignment it is;
- which procedure is followed;
- a link to the tender documents;
- closing date for registration (request to participate) or registration;
- the selection criteria and award criteria.

As soon as a report appears in the official journal, suppliers can show their interest in a tender. This can be done by the contracting authority itself if it is a restricted procedure. In the case of a public procedure, the supplier can register on the order.

3.1.1.6 In-between conclusion

After analyzing the pre-procurement phase of a tender process in which different types of procedures and contract forms are discussed, some important decisions that influence the scope of the research are made. First of all, after the differences between an open, restricted and specific procedure were pointed out, a decision concerning the type of procedure to focus on is made.

The literature has shown that the tendering procedure must reflect what the contracting authority wants to achieve with the tender. If intensive collaboration is necessary, this must be radiated with the type of procedure. As mentioned in this part of the literature study, two principles can be added to the four current principles: collaboration and innovation. Two factors by which collaboration and innovation can be facilitated are I) divide the procedure into a selection and award phase and II) make

dialogue possible. Especially in a dialogue, market parties learn to better understand the client's ambitions. The dialogue makes it possible to coordinate supply and demand better. Moreover, personal conversations strengthen the relationship and mutual trust (Van Oppen et al., 2018). A crucial element in this is to provide sufficient capacity for cooperation. There should be enough space for parties to enter into a dialogue with both the client and each other. The competitive dialogue fits best with these requirements and therefore seems to be most likely for a circular tender process.

Within this paragraph, also the different forms of contract are discussed. From the literature, study can be concluded that there is a clear distinction between the different types of contracts with visible consequences for the relationship between the involved parties. Comparing the traditional models with the integrated models, it turns out that there is a clear shift between the tasks and responsibilities from the client to the contractor in which the contractor carries a greater share of the risks. This shift only increases within the life cycle model, in which also the maintenance, financing and/or operation faces are the responsibility of the contractor. On the one hand, the contractor, therefore, benefits if the work can be carried out as (cost) efficiently as possible and, on the other hand, if the work delivered is of such quality that it requires efficient maintenance over its entire life cycle. In contrast to the traditional and integrated model, the life cycle model has the most potential to be chosen for a circular tendering process.

3.1.2 The procurement phase

After the contracting authority has drawn up a procurement strategy and has chosen an appropriate procedure and form of contract, the procurement process follows in which the tender is requested and advertised and the assessment criteria are drawn on which the selection and awarding will take place. The procurement process can globally be described as depicted in Figure 10. In general, the procurement process consists of the process of assessing the selection awarding criteria requested in the pre-procurement stage.

3.1.2.1 Selection phase

The next step in the procurement process is to shorten down the short-list with tenderers to one party on the basis of selection. In doing so, the contracting authority has the opportunity to use various criteria for the selection of tenderers. According to Europa Decentraal (2017) and Chao-Duvis et al. (2013), there are four criteria that ultimately result in the work being awarded to one of the remaining parties;

- Grounds for exclusion
- Minimum requirements
- Suitability requirements
- Additional (selection) criteria

With regard to the criteria for selection, a distinction is made between grounds for exclusion, suitability requirements and selection criteria (Essers & Lombert, 2017). The terms grounds for exclusion, minimum requirements, suitability requirements, and additional criteria relate to the assessment of tenderers. Grounds for exclusion should ensure that non-integer companies are excluded from participation in European tendering procedures. The minimum requirements test whether the tenderer meets the qualitative requirements. The suitability requirements test whether the tenderer is able to carry out the assignment after awarding the contract. By means of selection criteria, the number of suitable tenderers is limited to a predetermined number.

During this selection process, there may be queries from contractors. If this is the case, responses should be sent to all contractors to provide fair and equal chances. The client may organize mid-tender interviews or site visits. This can be beneficial both to the client and to the tenderer as they allow

clarification of matters that might otherwise lead to an inaccurate tender being submitted, and they can give the client insights into potential problems or opportunities.

Grounds for exclusion

Grounds for exclusion are grounds based on the personal circumstances of the tenderers that may be a reason for a contracting authority to proceed to exclusion (Essers & Lombert, 2017). A tenderer must be excluded from the tendering procedure if a ground for exclusion applies to him. These grounds for exclusion are described in the selection guideline. A contracting authority has various instruments to exclude companies that are not integer. In doing so, governments are allowed to use criteria such as economic and financial capacity, technical competence and professional competence (Europa Decentraal, 2017) to exclude participation of certain parties. If tenderers do not meet these criteria, exclusion from participation may follow. According to the Proportionality Guide (in Dutch: Gids Proportionaliteit), the number and use of exclusion grounds must be proportional. In order to determine whether the other reasons for the exclusion are proportional, factors such as the seriousness of the conduct, the time that has elapsed since and the nature and scope of the contracted assignment play an important role. However, it is up to the tenderers to state in their own declaration whether exclusion grounds apply to them.

Depending on the type of procedure that is chosen, the Public Procurement Act 2012 or the Directive 2014/24/EU applies to the type of exclusion grounds. Both documents prescribe two types of grounds for exclusion: mandatory exclusion and optional exclusion (PIANOo, 2018b). In other words, those grounds that always apply (mandatory) and those that are optional. In addition to the mandatory and optional exclusion grounds, PIANOo (2018) states that 'other' exclusion grounds can also be included in the tender document, which is not laid down in the Public Procurement Act 2012, as long as they are not disproportionate in nature, and provided that the principles of equal treatment and transparency. An example of such a ground for exclusion can be to exclude, under certain conditions, tenderers who have been involved in the preparation of the assignment or who are related to each other.

In Art 57(1) of Directive 2014/24, four grounds for mandatory exclusion of economic operators convicted by final judgment are maintained, which include I) participation in a criminal organization, II) corruption, III) fraud, and IV) money laundering (Lichère, Caranta, & Treumer, 2015). In the Procurement Act 2012, these regulations can be found in Art 2.86. [Appendix 3: Directive 2014/24/EU Article 57](#) and [Appendix 4: Directive 2014/24/EU Article 2.93](#) show both Articles. If one of the mandatory exclusion grounds applies to a tenderer, the contracting authority must exclude this tenderer from participation in the tendering procedure (van Sleuwen, 2013).

In addition, the contracting authority is free to include one or more optional exclusion grounds in the invitation to tender. These optional exclusion grounds are set out in the Public Procurement Act 2012 but are not directly applicable. The contracting authority must explicitly declare them applicable to the announcement of the order in the tender document. On the basis of Article 2.87 ([Appendix 3: Directive 2014/24/EU Article 57](#)), the contracting authority may make optional grounds for exclusion which it deems necessary. As said before, it is not always necessary to set all exclusion grounds. The announcement and the tender documents must explicitly state which exclusion grounds apply. If a tenderer meets one of the optional grounds for exclusion, the contracting authority may exclude this tenderer from participation in the tendering procedure (Lichère et al., 2015). The optional exclusion grounds are not exhaustive. Bankruptcy or non-compliance with the tax liability are examples of optional grounds for exclusion.

Minimum requirements

Under minimum requirements is understood the requirements of a qualitative nature that a bidder must meet in order to be eligible to participate in the tender for a particular contract (Chao-Duivis et al., 2013).

Suitability requirements

A contracting authority applies suitability requirements, which are not mandatory, in order to determine whether a tenderer is able to execute the contract. It can be seen as a test whether the organization of the tenderer has a solid basis. The suitability requirements therefore always relate to the potential tenderer and not to the work. On the basis of the assessment of three aspects, it is checked whether the tenderer has this solid basis. The requirements test the I) technical and professional capacity, II) financial and economic capacity and III) professional competence (PIANOo, 2018; ISGV, 2018). Shortly said, a requirement is the lower limit determined by the contracting authority and that contractors must meet. These requirements are closed questions which can simply be answered with 'yes' or 'no' and, if necessary, supplemented with evidence

Contracting authorities have broad authority for setting suitability requirements. But there are some important starting points that these must meet:

- In order to ensure that the requirements are not open to different interpretations, the requirements must be objective (non-discriminatory) and unambiguous;
- The requirements must relate to the object of the assignment and be proportional;
- The requirements must be transparent;
- The same requirements must be applied to all tenderers and tenderers.

However, the regulations do not state how these principles should be applied. The Proportionality Guide provides further instructions on how to deal with suitability requirements.

The Public Procurement Act 2012 (Article 2.93) lists exhaustively a number of means of proof that a contracting authority may request to test the technical or professional capacity of a tenderer or tenderer. This means of proof consists of the request for references, certificates or environmental and personal management. The full list of evidence can be found in [Appendix 4: Directive 2014/24/EU Article 2.93](#).

Table 7: Examples of Technical competence requirements

Technical competence ²	
Core competence	Experience with the design and/or engineering of specific elements
	Experience with the realization of specific elements
	The chosen architect for the design work must be registered
Employees	Overview of the employees related to educational attainment, total number of employees
Environmental management	A statement about the measures to be taken must be submitted to the market party.
Subcontracting	Market participants can be asked for an explanation of what part they will subcontract
Technical equipment	This is important if the supplier is going to use certain tools, techniques, materials

Requirements in the area of financial and economic capacity are aimed at guaranteeing the continuity of the contractor. Evidence can be requested for this to prove solvency, liquidity, and profitability.

² The Public Procurement Act 2012 (Article 2.93) lists exhaustively a number of means of proof that a contracting authority may request to test the technical or professional capacity of a tenderer or tenderer.

Under the Public Procurement Act 2012 (Article 2.90), the imposition of turnover requirements is in principle not permitted.

Table 8: Examples of Financial and Economic capacity requirements

Financial and economical capacity ³	
Turnover	Total turnover or turnover of a specific business activity over a maximum of three financial years.
Bank statement	Appropriate bank statement or proof of insurance against occupational risks
Annual accounts	Submission of annual accounts or extracts from the annual accounts

With professional competence requirements, the contracting authority wishes to avoid that the contract is carried out by a company/person that is not competent under national law. The Public Procurement Act 2012 offers a lot of freedom in the professional competence requirements.

Table 9: Examples of Professional competence requirements

Professional competence ⁴	
Certificate	ISO 9001: 2015 or equal
	VCA** or equal

In addition, a suitability requirement may in principle not be used as a (sub) award criterion. Since prescribing this requirement can be quite complex, The Proportionality Guide provides further instructions on how the contracting authority should deal with suitability requirements (PIANOo, 2018; ISGV, 2018).

Selection criteria

The goal of drawing up selection criteria is to bring down the number of tenderers to a predetermined number of three to five before entering the award phase. The moment when these selection criteria are assessed depends on the type of procedure that is chosen in the pre-procurement phase as described in [3.1.1.1 Type of procedure](#). To be more specific, it depends on the fact if the type of procedure contains preselection or not. In the restricted procedure, the competitive dialogue, the competitive procedure with negotiation, life-cycle, and the innovation partnership, the contracting authority may limit the number of tenderers to invite for participation to the award phase. The major difference between suitability requirements and selection criteria is that the former is used in public tenders and that selection criteria are used in tenders with prior selection, for example in the case of non-public tenders. If a tenderer does not meet the suitability requirements in an open procedure, this means that it is excluded from the tender. In the case of tenders with preselection, failure to meet the selection criteria means that the tendering company will not be admitted to further registration.

The Public Procurement Act 2012 contains the minimum number of tenderers that must be invited. In the case of the restricted procedure, this number is five and in the other procedures, the number of tenderers is three. Within these procedures, the selection and award phase are clearly separated due to the reason that the tenderers are first selected on the basis of grounds for exclusion, suitability requirements and selection criteria before being allowed to participate in the latter phase (Van

³ Requirements in the area of financial and economic capacity are aimed at guaranteeing the continuity of the contractor. Evidence can be requested for this to prove solvency, liquidity and profitability. Under the Public Procurement Act 2012 (Article 2.90), the imposition of turnover requirements is in principle not permitted. If a tendering authority chose to do so, they will have to motivate this in the tender document.

⁴ With professional competence requirements, the contracting authority wishes to avoid that the contract is carried out by a company or person that is not competent under national law.

Haagen, 2018). These criteria are then included in the announcement document during the pre-procurement phase of the tender. In most cases, a procedure with preselection is chosen when, for example, in the preselection phase turns out that there are many tenderers on the specific market who can meet the described needs. With such a preselection, the contracting authority prevents unnecessary numbers of companies from making quotation costs and the need to assess unnecessary tenders.

In terms of content, the selection criteria are often in line with the above-described minimum suitability requirements, such as the degree of experience, but also the number and quality of references. Looking at the awarding, the selection of a tenderer should not be made purely on the basis of the lowest price. According to *Designing Buildings* (2018), it is generally more effective to identify the best value tender, based on pre-defined selection criteria that relate to the aspects of the contractor performance the client most values. This might include consideration of past performance, relevant experience, technical ability, sustainability, health and safety record, innovation, resource availability, management skills and systems, proposed methodology and so on (“Tender evaluation,” 2018).

In assessing the selection criteria, it is the organization that will be assessed while assessing the award criteria, it is the offer that will be assessed. In the research, a clear distinction is made between the selection criteria of linear projects and circular projects.

3.1.2.3 Awarding phase

After the tenderers have been checked against the preset norms, functional requirements and performance requirements, as included in the tender documents, the next step is to assess all and award one of the tenderers with the tender on the basis of applicable award criteria. On the basis of award criteria, a contracting authority must determine which offer is eligible for award. The award must be made on the basis of objective criteria, respecting the prohibition of discrimination and the principles of transparency and equal treatment. In addition, the assessment of tenders must be guaranteed under conditions of effective competition.

The award phase is part of the tender process and incorporated in all type of procedures. In a procedure without preselection, (i.e. the open procedure) the awarding phase includes both assessing the *tenderer* and the *tender*. In a pre-selection procedure, (i.e. the restricted procedure or competitive dialogue) this first assessment has already taken place in the previous, the selection, phase. The submission, evaluation, and valuation of the registrations take place on the basis of:

- the procedural stipulations as included in the descriptive document or the award instructions;
- the requirements for the registration;
- the (sub) award criteria.

Directive 2004/17/ EC, 2004/18/EC and its derivatives Dutch regulations provide that only two assessment options are possible: I) comparing the offers on the basis of the lowest price or II) assessing the award criteria on the basis of a combination of quality and price: the most economically advantageous tender (MEAT) (*in Dutch: EMVI*). Until 1 April 2013, tendering at the lowest price in the construction sector was the usual method of awarding. However, this method had a number of disadvantages including a limited degree of innovativeness and creativity for the market, which will not be further considered in this study. Summarizing, the bottom line is that the Public Procurement Act 2012 forces contracting authorities to tender in the construction sector on the basis of the award criteria of the MEAT method instead of awarding on the lowest price. However, when a contracting

authority can justify and motivate the fact that the contract should really be based on the lowest price, only then the work could be awarded to the lowest tenderer. Over the past few years contracting authorities have switched massively to contracting with MEAT in an astonishingly short period of time.

The use of MEAT in the construction sector has increased from about 20% to about 80% (PIANOo, 2013). The reason for this is that a growing number of contracting authorities consider quality to be more important compared to price.

Especially when it comes to circular (innovative) building projects, the quality aspect must prevail over the price.

The lowest price

The Public Procurement Act 2012 stipulates that if the contracting authority chooses the award criterion lowest price, this must be justified in the tender documents (ISGV, 2017). The choice for awarding based on the lowest price underlies the fulfillment of three conditions. It is customary to choose the lowest price when I) the requested performance is highly standardized in the market, II) large differences in quality are not be expected and III) the content and scope of the contract are unambiguously recorded. If one of these three conditions is not met, it is a more logical choice to opt for a BVP tender. Furthermore, it is important to record a minimum quality level in advance in the request for requirements in order to guarantee the quality.

MEAT (Most Economically Advantageous Tender)

MEAT is an assessment method that could be used in the award phase of (government) tenders. Within this method, not only the price is considered but (high) value is also attached to (qualitative) criteria such as public focus, sustainability and/or project management.



Figure 11: The MEAT assessment method

If the contract is awarded on the principle of the most economically advantageous tender, one keeps accounts with different award criteria in contrast to the award at the lowest price, where only the price is taken into account. In addition, the MEAT method must be assessed on the basis of I) price or II) costs, using a cost-effectiveness approach such as lifecycle costing, or III) the best price-quality ratio (BPQR). The MEAT method consists of at least two or more sub-criteria and can therefore also contain circularity criteria. However, the criteria should ensure an objective comparison of the offers in order to determine which tender is the most economically advantageous tender (2014/24/EU consideration 90; Aanbestedingswet 2012 art. 2.114).

Every project has its own history and knows other interests. For some projects, the contracting authority thinks the environment is very important; for other projects, for example, sustainability or collaboration is considered important. Every project, therefore, has other MEAT criteria, drawn up by the contracting authority itself. The tenderer can score points on each aspect and the tenderer with the most points will be awarded with the assignment. Despite the fact that the MEAT criteria are very dependent on the level of ambition of the contracting authority and are very project-specific, commonly used traditional MEAT criteria are:

- Cooperation with the client;
- Durability;

- Planning;
- Innovation;
- Quality management;
- Dealing with the environment.

In addition, in traditional tendering processes, it is customary to base the award criteria on past performance in the form of reference projects (Table 10 Table 9). Article 57 (g) of Directive 2014/24 stipulates that a tenderer may be excluded on the basis of this past performance (Bijleveld, 2016).

Table 10: Examples of award criteria within the Traditional tender process

Category	Award Criteria Traditional tender process
Past performance	Requirements regarding the maximum number of references
	The complexity of the reference must meet at least a certain Class
	The reference project must have obtained an EPC in relation to the requirement applying at the time of application for the building permit
	The tenderer must be able to submit three reference projects that meet the described core competences
	The reference project shows experience with a specific type of contract

The offers are assessed by the contracting authority based on the technical and functional requirements as stated in the award guideline (Aanbestedingswet 2012, art. 2.113). Because of the principles of non-discrimination and equal treatment, it is important that this assessment is done objectively. The assessment technique and the award criteria should be formulated in such a way that it is reasonably clear which award criteria should be fulfilled by the tenderer. The offers should be assessed objectively and the contracting authority should motivate the awarding of the contract in such way that it is traceable how the offers are assessed and why a certain score is given (Ten Haaf, 2017). Subsequently, the tenderer that has the most economically advantageous tender is awarded with the realization the contract (PIANOo, 2018b).

3.1.3 Contracting phase

3.1.3.1 Contract management

After the award, the signing of the contract follows. The result is simply a contract based on the registration, the tender documents and the conditions. The contract should state how the expectations regarding MEAT criteria are respected in the implementation.

Contract management or management is usually required to have some certainty and to keep a check on a good project result. How contract management is organized depends on how the market is approached. In the event of changes to the assignment, the consequences for requirements and wishes must be recorded. The result is the execution of the contract in accordance with agreement with assessment moments also on MEAT criteria. How and by whom testing is done depends on the predetermined role division. With traditional contracts, the responsibility lies almost entirely with the contracting authority. With integrated contracts, this largely shifts to the contractor.

3.2 Conclusion

3.2.1 Decisions and starting-point

This first part of the literature study serves as a basis in which general information on the circular economy and the traditional tendering process have been discussed. These insights have resulted in a number of important decisions which serve as boundaries for the research.

Decision 1: The definition of the Circular Economy (in relation to the construction sector)

The literature study has shown that in the current market there is no unequivocal definition of the concept of a circular economy. There are as many different definitions about the concept of the circular economy as people in this world. To create clarity and prevent misunderstandings for this research, the definition of the circular economy is analyzed and formulated as *'an economic system for the valuable use of resources, without loss of raw materials, products, capacity and people and with the aim of creating positive effects for climate, environment, employment and economy'*. If in the remainder of the report a reference is made to a circular economy, then the aforementioned is meant. The fact that there is no clear picture of the circular economy also causes misconceptions within the tendering of circular projects between contracting authorities and tenderers. For each contracting authority, the first step should, therefore, be to formulate a clear description of what circularity means to him/her and to outline its accompanying circular ambitions and to include these in the tender documents. In this way, a tenderer can demonstrate to what extent his/her circular ambitions match the contracting authority's perception.

Decision 2: Threshold value

A contracting authority is obliged by law to make the tender publicly available in Europe above certain contract values, the so-called European threshold values. In the literature is stated that the threshold value depends on the type of contracting authority and whether the tender is a good, service or work. Different threshold values apply for works and supplies or services under the classic procurement Directive, the concession directive, and the defense directive. In addition, there is a distinction between threshold values for orders from the central government, local authorities and special sector companies. In terms of content, it makes no difference in setting up and defining the selection and award criteria whether the tender is requested European or National. A contracting authority has a certain idea and vision and is looking for an organization who can best fulfill these ambitions. The level of the value of the assignment is therefore independent of the content of the criteria. In order to ensure that criteria that could give possible new insights are not excluded, the scope of the research is not limited to assignments above or below the European threshold, but both assignments will be considered.

Decision 3: Type of project

The literature has shown that public procurement can relate to goods, works and services. Given the practical framework of the research, there is opted for tenders focused on works. The literature has shown that within these works, projects can have different categories from different natures (industrial, residential, non-residential and infrastructure). Despite the largest call for circular construction projects is currently being issued by governments, the decision is made not to frame the research into a specific type of project.

Decision 4: The type of procedure

The fourth and fifth decisions are connected with each other. The literature study into the determination of the procurement strategy and tactics shows that the choice for the type of procedure depends on the value of the project, the number of suppliers in the market and whether cooperation between disciplines should be explicitly encouraged or not. From the literature, study can be concluded that the procedure that is most suitable to use for circular construction project is the competitive dialogue or the innovation partnership. Despite the fact that these type of procedures has been used very little in practice, it still has the most potential to be applied to circular building projects. The most important difference between the different procedures, for this research, is the fact whether the tender process has a (pre)selection phase or not. In the case of tenders with a selection phase, an extra step has been included in which the number of tenderers is reduced from 5

to 3 on the basis of selection criteria. Since the goal of the research is to define and specify criteria for both the selection and award phase, the research could be limited to only procedures with a pre-selection. However, lessons could be learned from the award criteria included in procedures with only an award phase. These award criteria can definitely lead to new insights that could be used for procedures with both selection and award phases. For this reason, it is decided not to frame the research to only the procedures with both selection and award phases, but also to look at procedures with only an award phase.

Decision 5: The type of contract

The literature study has shown that there is a clear distinction between the different types of contracts with visible consequences for the relationship between the involved parties. In contrast to the traditional and integrated model, the life cycle model has the most potential to be chosen for a circular tendering process. In particular, the Design, Build & Maintain (& Operate) type of contract offers advantages with regard to projects with a circular approach. However, the same goes on as the consideration for the type of procedure. Although there are indeed differences in the forms of cooperation, the literature study has shown that there are no essential differences between the selection and award criteria for different contract types. To ensure that useful information is not lost, it was decided not to limit the research to just one type of contract.

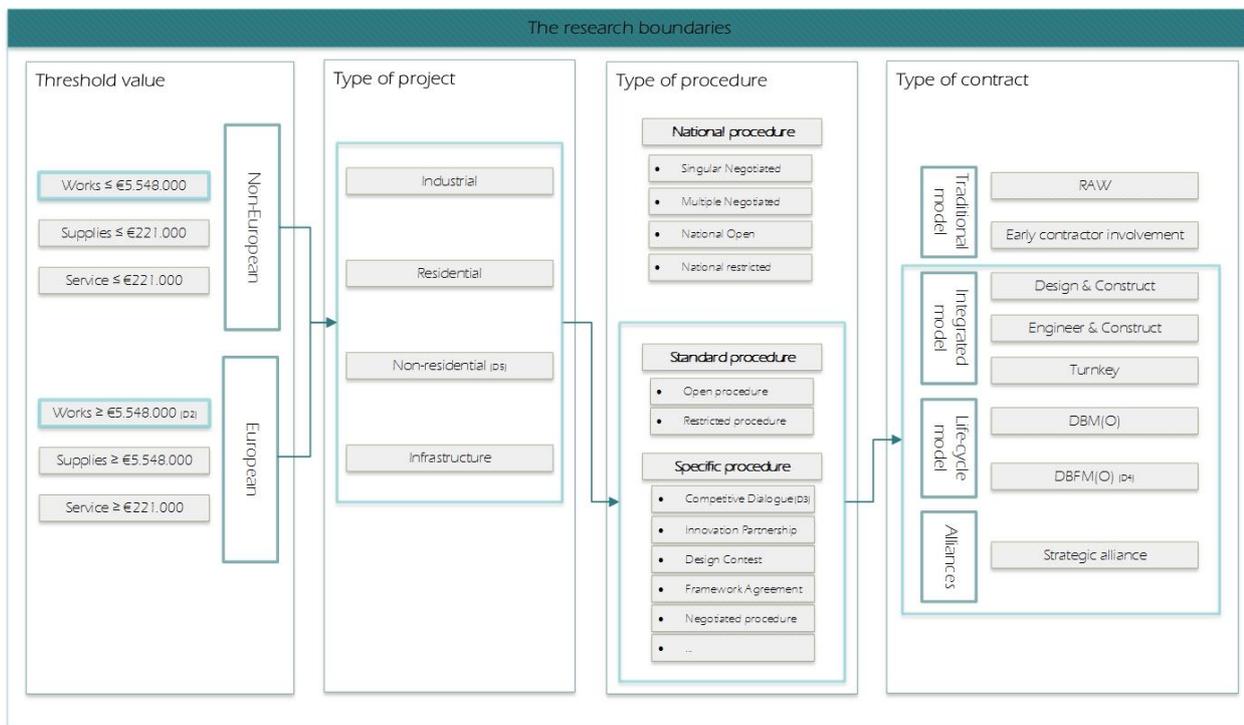


Figure 12: The research boundaries

The formulated research boundaries are visualized in Figure 12. The framework shows the boundaries with corresponding alternative options within which the research is fragmented. As described above, the framework also serves as the basis and starting point of the data collection of the following three studies. The aim is therefore to, especially, arrange the interviews in such a way that the answers of the respondents fall within the outlined framework. This requires careful attention during the selection of the participants. The framework, therefore, serves not only as a basis for the preparation of the interviews but also as an overview during the interviews.

Part THREE:

METHODOLOGY

“That’s really part of being a grounded theory researcher – putting names to concepts and experiences that people have.”

Brené Brown

4 The grounded theory

4.1 Introduction

The purpose of the study is to develop a theory that explains how the selection and award criteria can logically be classified into categories in order to develop a tool for tracing contracting authority's ambitions before translating them into suitable tender requests. Classifying data in categories lies at the foundation of a theory called 'grounded theory' (GT). The grounded theory is a structured approach to analyze qualitative data. In order to classify assessment criteria and develop the tool, a grounded theory approach, underpinned by a trinity of data collection was therefore chosen. Ford (2010) suggests that grounded theory is especially useful in situations where little is known about a topic or where a new outlook is needed. The introduction of the thesis has shown that limited research is conducted into the implementation of circular aspects with the selection and award phase of tendering processes.

4.2 Method

Grounded theory method emerged from sociologists Barney G. Glaser and Anselm L. Strauss's successful collaboration during their studies of dying in hospitals (Glaser & Strauss, 1967). GT is most often derived from data sources of a qualitative (interpretive) nature. Initial or open coding is the first step of data analysis. It is a way of identifying important words, or groups of words, in the data and then labeling them accordingly (Birks & Mills, 2015). Fundamental to a GT research design is the process of concurrent data generation or collection and analysis. To achieve this, a researcher should generate or collect some data with an initially purposive sample (Dick, 2014). An in-depth literature study is used for this initial sample. The data from these initial encounters is coded before more data is collected or generated and the process of analysis repeated. The next step is to translate these formed concepts into categories and generate theory from these findings. The generated theory need to be verified as much as possible during the research process. Figure 13 depicts the approach of the grounded theory globally.

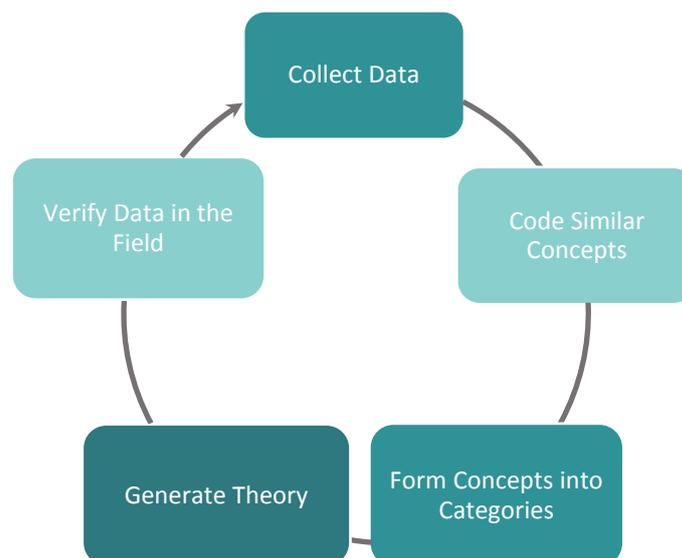


Figure 13: Grounded Theory Approach

Although the research methodology in this thesis has a lot of common ground with the grounded theory, it slightly deviates from the traditional GT approach. The literature study serves as an initial data source for the formulation of the categories. This means that the initial categories (of selection and award criteria) aren't derived completely in line with the grounded theory, in which categories

derives from coding data into concepts before forming them into categories. In this research, the categories are derived from an intensive literature study into circular tendering before elaborating and validating them based on expert interviews. The research design of the grounded theory used for this research is depicted in Figure 14.

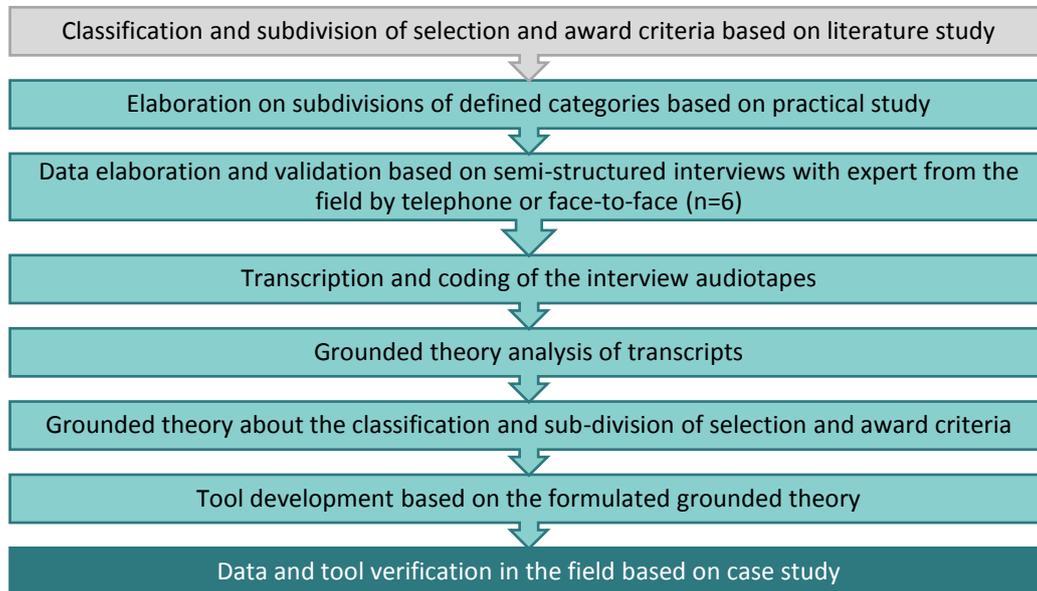


Figure 14: Research design of grounded theory approach

GT was initially conceptualized and remains to date as a suitable research method for the discovery or generation of new theory from data, as opposed to methods that aim to extend existing theories (Birks & Mills, 2015). The remainder of this chapter elaborates on this research design of the grounded theory.

4.2.1 Collect data

Sources of collecting data according to grounded theory can be based on interviews, observations or written materials (Dick, 2014). The grounded theory methodology is used in this effort to classify categories derived from the literature study. The literature study serves as an initial purposive sample for generating and collecting data. The aim of the data analysis is to classify both selection and award criteria into categories that serve as foundation for the tool to be developed that indicates contracting authority's ambitions. After the categories were formulated, a first subdivision of the categories is defined from the same literature data collection. A practical study, based on analyzing 29 circular tender documents, is used to gain data from practice to further elaborate on the subdivision of the categories by formulating sub-criteria. In addition, a first comparison between theoretical and practical findings is made here. Thirdly, in line with the grounded theory, interviews with experts from the field are conducted to elaborate on and validate the classification of the categories as derived from both theory and practice. Analyzing the categorized selection and award criteria hopefully lead to a new and structured way of organizing and setting up the tender documents for circular construction projects. Furthermore, the interview transcription and coding serves as input for the tool that is being developed. This will be explained more in detail in [Section 9.2 Defining statements](#).

4.2.2 Code similar concepts

The data (transcripts) derived from the interviews were analyzed in line with the grounded theory approach. After copying most important text fragments from each interview into a table and defining statements out of these statements, open coding was performed including the comparison between the subcategories to potentially connect the categories ([Appendix 9: Interview analysis](#)).

4.2.3 Concepts into Categories

A category is a theme or variable that aims to make sense of what is found in literature or a participant has said. It is interpreted in the light of the situation, and other interviews, and the emerging theory (Birks & Mills, 2015). Categories explicate ideas, events, or processes in the data. The early categories were considered provisional because, in keeping with the grounded theory method, it was important to remain open to further analytic possibilities. During the entire data analysis and coding process, the sub-categories were connected to one of the main categories and a final table was developed step by step, including new aspects and insights. In each step of the analysis, meetings with the supervisors of Alba Concepts were conducted and emerging categories were critically discussed and ambiguities or disagreements in coding were resolved by consensus.

4.2.4 Generate theory

Next, the emerged classification of both selection and award criteria categories were compared with the findings from practice and integrated into existing theories about circular tendering. This result in a final classification of both selection and award criteria into categories and related sub-categories. The formulated categories cover all optional circular possibilities for implementing circular aspects in construction projects. As explained in [Section 1.2 Problem definition](#), the circular economy can be interpreted differently by each individual. Therefore, a tool is developed to trace the main ambitions and preferences of contracting authorities. The classification of the criteria serves as the foundation of a tool that is developed in order to trace specific contracting authority's ambitions. Therefore, the analysis of collected data from the interviews is used again. This time for the development of the statements. The formulation of these statements is explained in detail in [Section 9.2 Defining statements](#).

4.2.5 Verify data in the field

Finally, the developed tool is validated to check whether it provides reliable outcomes that are in line with the ambitions of a contracting authority. By means of a (real) case study, the outcomes of the tool are compared to the outcomes of a questionnaire, both filled in by the case study participant. The aim of the validation is to trace possible deviations and shortcomings and determine the level of reliability of the tool.

Part FOUR:

DATA COLLECTION

“Data! Data! Data! I can’t make bricks without clay!”

Sir Arthur Conan Doyle

“If you can’t explain it simply, you don’t understand it well enough.”

Albert Einstein

“Contracting authorities often miss the ingredients in the request for a circular construction project.”

Alex Hesling

5 Circular Tendering: a theoretical study

Section 2 and 3 presented a purposefully broad literature review, which led to the rationale for this study. It has become clear what a tender process involves, what type of procedure and contract fits the best for projects with a circular approach and which requirements and criteria can be included in the selection and award phase within the tender documents like the selection and award guideline. Before diving deeper into the tender process of circular construction-related demand, it is important to note that:

Circular procurement and circular tenders do not exist (yet). There are no specific procedures or requirements described in the European Directives or in the Procurement Act 2012 regarding circularity. It must be seen as is a normal tender, which includes *circular aspects*. For the readability of this report, the term circular tender will still be used, even though it is not entirely correct.

In order to find out to what extent theoretical circular assessment criteria differ from practice, this chapter looks at both phases from different perspectives: both theoretical and practical point of view. First of all, an in-depth literature study will investigate what circularity means for the selection and award criteria. Can the criteria be divided, for example, under certain aspects? What are these aspects then, can they be categorized? The input of the theoretical part comes primarily from two recent studies; Van Oppen et al. (2018) and van Haagen (2018). Subsequently, on the basis of a practical and in-depth literature study, in which 29 recent published tender document is analyzed, it will be investigated whether and to what extent the current practice differs from the theoretical findings. In addition of the theoretical and practical studies, a third study is conducted focuses on the field by means of expert interviews. The goal of this chapter is, therefore, to compare both theoretical and practical findings, to investigate whether the selection and award criteria can be divided under certain aspects and to set up a list with selection and award criteria for circular tender processes. By comparing the studies, it is ascertained to what extent the practice differs from or complements the theory. How and what type of criteria should contracting authority request in the tender documents achieving their pre-set ambitions and in order to create a comprehensive tender?

During the selection phase, the requirements and criteria are about the organization, the provider. While in the award phase these criteria are about the offer, the registration. Based on a selection and award framework, a contracting authority selects the right parties and awards the contract to the party with the most circular offer. However, in addition to selection and award criteria, a tender process also contains requirements on which tenderers can firstly be selected or excluded. As explained in [Section 3.1.1 The pre-procurement stage](#), it can be seen as the first gate on which a contracting authority can check whether the tenderer accredited is competent enough to carry out the assignment. Before the three studies into the classification and implementation of circular selection and award criteria, the extent to which circularity can be included in the requirements is first briefly explained.

5.1 Selection requirements

Shortly said, a requirement is the lower limit determined by the contracting authority and that contractors must meet. These requirements are closed questions which can simply be answered with 'yes' or 'no' and, if necessary, supplemented with evidence. As discussed in [Section 3.1 The Tender process](#), there are different categories of requirements like technical competence, financial and (social) suitability requirements. Furthermore, based on the criteria, a market party can distinguish themselves from the other tenderers. In answering these questions, tenderers must qualify themselves or their offer by providing the best possible answer to the questions. In their book, Van Oppen et al. (2018) mentioned that when drawing up the criteria, the distinctive character of a

tenderer must be stimulated. This can be achieved by providing sufficient capacity in the questions and the associated assessment method.

As mentioned in [Section 3.1.2.1 Selection phase](#), the conditions of participation within the selection phase consist of grounds of exclusions, minimum requirements, and suitability requirements. It examines whether the tenderer has a solid basis to carry out the assignment. So, the selection requirements are requirements that provide more certainty that a tenderer is suitable to deliver the work(s). In contrast to other European countries, the selection requirements (ground for exclusion, minimum requirements and suitability requirements) are included as separate components in the selection guideline in the Netherlands.

The Public Procurement Act prescribes an exhaustive list of mandatory and optional exclusion grounds. These requirements are legally determined which makes it impossible to implement any circular aspects in it.

Within the suitability requirements, the contracting authority does have a few number of options when it comes to setting conditions for participation with regard to circularity (Van Haagen, 2018). [Section 3.1.2.1 Selection phase](#) has shown that suitability requirements can be divided into technical competence, professional competence, and financial and economic capacity. Particularly to the technical competence of the tenderer, requirements can be set regarding circularity. If this choice has been made, this often happens on the basis of possession or compliance with specific certificates.

Examples of requirements for circular construction processes can be based on innovation and combination of market parties (interconnection). The former requirement hardly differs when comparing linear construction processes with circular processes, because legally there is little room for freedom in this. The same applies in fact to the minimum requirements, although in these requirements there is more freedom for a contracting authority to indicate additions. In both requirements, hardly any requirements should be included about circularity. The simple reason for this is that it is necessary to guard against the early exclusion of parties. To a lesser extent, this also applies to the suitability requirements. When looking at circular construction projects, it is crucial that I) innovative parties are not (unnecessary) excluded and II) and interconnection is encouraged.

Van Oppen et al. (2018) mentioned that on a circular level, setting requirements for references of experience with the circular economy or circular projects does not always lead to the desired preselection. For this reason, a contracting authority should look carefully at setting up selection requirements if sufficient parties have gained experience with circular reference projects before including this as a selection requirement. In addition, interconnection can be stimulated by properly formulating the technical competence requirements, as described in [Section 3.1.2 The procurement phase](#). The Public Procurement Act states that technical competence can be demonstrated by means of references and accompanying certificates. According to the Public Procurement Act, a contracting authority may require certain certificates. There are two international certificates that have a relationship with circularity: BREEAM or Cradle2Cradle. In this way, a tenderer demonstrates that it has worked according to certain principles in the past and would, therefore, be technically competent to carry out the work in a similar circular manner.

However, circularity must not only be approached from a technical point of view. It should also be approached from a process-based organization, in which cooperation with the entire chain plays a crucial role. In the Public Procurement Act, the suitability requirements provide scope for requiring experience with chain collaboration. A contracting authority could, therefore, include in the suitability requirements that tenderers must be able to submit a number of projects using a supply chain

management system and encouraging different disciplines to subscribe with each other without explicitly asking for a combination (Van Haagen, 2018).

A third possibility to include circularity in the suitability requirements is through environmental management. Section 2.93 and 2.97 of the Public Procurement Act shows that a suitability requirement can be set in respect of environmental management in two possible ways. On the one hand, a declaration may be required that has been drawn up by an independent body, an example of this is the ISO14001 certification. On the other hand, Section 2.92 of the Public Procurement Act offers the possibility for a more specific suitability requirement for the tender itself. The tenderer does not have to submit an independent declaration, but only to mention which environmental management measures can be applied for the public contract (Van Haagen, 2018). An example of this is to define the circularity of the work to be performed as part of the environmental management.

To summarize, it can be said that contracting authorities have little freedom in setting up the selection requirements. In addition, implementing circular aspect regarding selection requirements may result in the early exclusion of parties that could have high potentials in the realization of circular projects. The suitability requirements will, therefore, fall outside the scope of this research since they offer too little potential for implementing circular aspects. The remainder of the research will, therefore, focus on the selection and award criteria.

5.2 Selection criteria

Selection criteria are often in line with the suitability requirements, but this is not mandatory. All requirements with regard to suitability requirements also apply to selection criteria: objective, unambiguous, transparent and proportional to the assignment. For all applicants, the criteria must be applied in the same way. Van Happen (2018) states that, contrary to the grounds for exclusion, minimum requirements and suitability requirements, selecting on the basis of selection criteria is the most appropriate way to separate the wheat from the chaff. A selection criteria is a criteria that provides a preselection of the best-qualified tenderers or combinations according to the contracting authorities' assessment. The criteria for selection are incorporated into the selection guideline of the tender. The contracting authority must state the number of tenderers that will be invited for participation in this selection guide. In example, the competitive dialogue procedure, at least three tenderers should be invited (Procurement Act 2012, article 2.99 par. 3). The Procurement Act only subscribe a limited number of requirements to the selection criteria. This means that a contracting authority has a lot of freedom in setting up the selection criteria.

The purpose of the selection criteria is to trace whether the tenderer's level of ambition matches that of the contracting authority, whether the tenderer has sufficient experience in-house to carry out the assignment and whether the tenderer has his/her affairs regarding their own organization up to par. It is therefore interesting to determine how future-oriented on the one hand and how experienced the tenderer is based on past results on the other hand. In order to trace these aspects, various studies indicate that the selection criteria, therefore, should be based on two aspects: the request for a vision (ambitions) and the request for references (experiences) (Van Haagen, 2018; Van Oppen et al., 2018).

In addition, over the past few years, some papers and a growing number of online published blogs write about the importance of shifting from linear to a more circular approach regarding one's own business operation (Doornewaard, 2017; Witjes & Lozano, 2016; Yosie, 2017). Implementing circular aspects within business operation could directly result in economic advantages for businesses (Doornewaard, 2017), but, and even more importantly, it reflects the circular capacity, ambitions, and willingness of a market party. Since the purpose of the selection phase is to find parties that not only have written down their specific vision but is also able to deliver their vision, three factors must be

taken into account: the tenderer's vision on the circular economy, their experience in circularity and the way in which the tenderer takes concrete adjustments to make its own operations more circular (Figure 15).

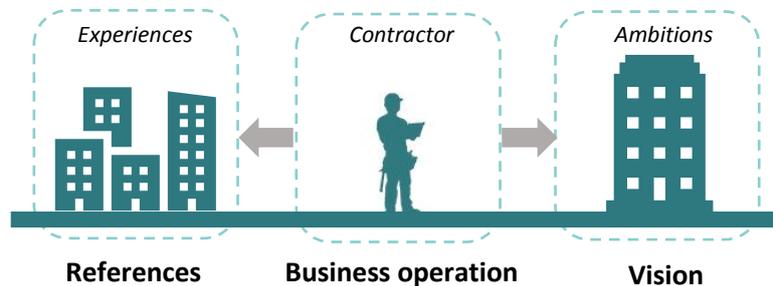
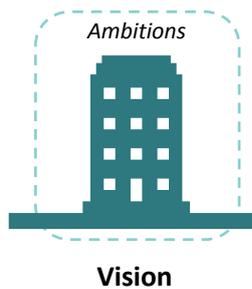


Figure 15: Classification of circular selection criteria

These three types of categories are discussed in terms of content and illustrative examples are given for each criterion. Over the past few years, a growing number of articles, thesis, and online blogs were published regarding circular tendering. However, none of these studies gave further interpretations to the selection and award criteria. The remainder of this section will give a further interpretation to these categories outlining the most important sub-criteria as found in the literature.

5.2.1 Selection criteria 1 (SC1): Request for a vision



In the first phase of a tendering process, the contracting authority should define an own vision in which circularity is the guiding principle. For the further course of the project, it is important that the vision of external partners corresponds with that of the contracting party. All partners must be prepared to pursue the same ambition level. The vision on circularity is one of the components in the assessment and the award of the contract. To make clear to the tenderers that circularity has a prominent place, it is advisable to consider the circularity vision of the tenderers sufficiently well. The

request for a vision is very project specific and often depends on the circular ambitions of the contracting authority. Because a contracting authority has a lot of freedom in setting up the selection criteria and so in the request for a vision, the criteria can be formulated precisely to the specific wishes of the contracting authority so that they fit exactly with the ambitions.

Requesting for a vision is mainly based on asking for the tenderer's ambitions relating to sustainability and circularity (Van Haagen, 2018). What does circularity mean to the tenderer? How does the tenderer intend to implement this? Answering this kind of question makes it possible to compare the extent to which the ambitions of the various market parties match the contracting authority's vision.

Secondly, contracting authority often asks for a company's vision on carrying out collaboration between the disciplines of a project (Witjes & Lozano, 2016; Van Haagen, 2018; Van Oppen et al., 2018). The tenderer must then make clear with his vision which roles he fulfills and how the quality is monitored in a comparable exercise by his company. A request for a vision for cooperation is more important when a contracting authority wants to stimulate cooperation between chain parties (Van Oppen et al., 2018). What is the importance of cooperation and how does the provider make this concrete? Despite the fact that smooth collaboration is time-consuming and a compelling process, it provides that goals can be lifted to a higher level. With a vision, a tenderer must at least make clear what this means in his expert opinion, how this works and how this can be organized to the intended end result, in particular, related to the assignment and management of expectations of the final result

of the contracting authority. A vision usually involves at least the skills that are essential according to the tenderer, the coherence and the interplay between the different implementation disciplines and the cooperation with the contracting authority and the designing parties.

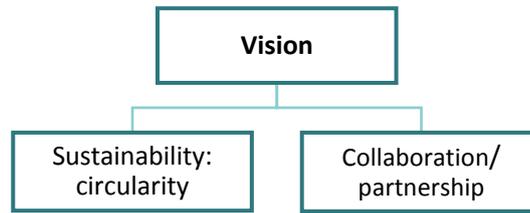


Figure 16: Subdivision of the request vision category according to theoretical study

Most of the criteria incorporated in the vision are related to circularity, sustainability, collaboration and transparency (Loppies, 2015; Van Haagen, 2018). Since sustainability and circularity, and collaboration and transparency have a large common ground with each other, it has been decided to include these two aspects under one sub-criterion (Figure 16). In general, a vision document often contains no more than 4 A4 pages, including visual material. [Appendix 12: Overview of suggested Selection and Award criteria](#) shows elaborated examples of criteria that are based on the request for a vision.

5.2.2 Selection criteria 2 (SC2): Request for references

This second selection criteria category aims to establish that a tenderer has sufficient experience to carry out the assignment adequately. A way to tests whether a tenderer is sufficiently skilled enough is to have the tenderers submit evidence by means of references showing that they have already put circularity into practice in the past. Requesting for references is very common in traditional tenders. It offers the contracting authority insight into the experiences of the tenderers, with the ultimate aim to test whether the tenderers are able to carry out the specific assignment. Various studies (Van Oppen et al., 2018; van Haagen, 2018; Veenen, 2018) have shown that requesting for circular elements in a tender document is relatively new and therefore unusual. However, despite the fact that few market parties have experience with this, it is an excellent method to assess the tenderers experiences. Incorporating and asking for references with a circular approach is not easy, is also confirmed by the study of van Haagen (2018). The study shows that it is recommended not to set circularity as a minimum requirement for the references, but to explicitly include them as an assessment aspect of the references (Van Haagen, 2018). In this way market parties that have proven experience with circularity, and thus have a small lead, can be rewarded. In addition, tenderers who do not yet have experience in the area of circularity are not immediately excluded from participation, but still have a chance through the other criteria, for example, specific conditions or future ambitions and plans.

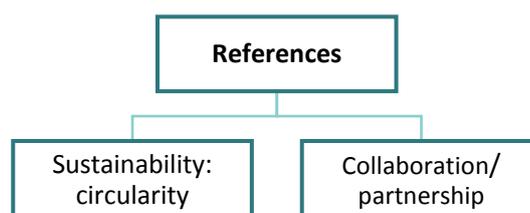
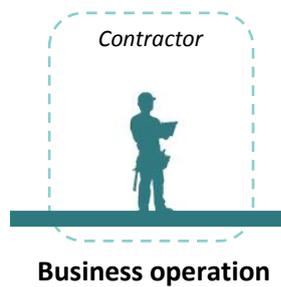


Figure 17: Subdivision of the request references category according to theoretical study

Secondly, since circular projects are quite complex smooth collaboration determines the level of success. In addition to including criteria regarding collaboration in the request for a vision, it is also possible to ask for experience with this new form of collaboration. The book by Van Oppen et al. (2018) indicates that cooperation between client and contractor does not arise from itself and can be better facilitated when there is some form of conversation. It is very valuable if a tender can show by means of references that he has already acted under certain forms of collaboration in the past. Does the tenderer, for example, has experience with the (competitive) dialogue procedure? And does the tenderer has permanent cooperation with suppliers? Can the contracting authority demonstrate how the cooperation was carried out under a previously executed circular project? All types of questions that may be answered requesting for references on collaboration and partnership. To conclude, from the literature two aspects emerged that focus on the request for references category (Figure 17).

5.2.3 Selection criteria 3 (SC3): Request for business operation



Thirdly, the literature shows that it may also be important to request for some specific conditions about the business operation of the tenderer itself. This is not completely incomprehensible since every tenderer is self-contained and often has its own and specific characteristics. This request for business operation offers a contracting authority the possibility to request specific subjects about the tenderer’s organization. It is an efficient way for a tenderer to distinguish themselves from the others. Why is their business operation better than others when looking at circularity? In what way are

they distinctive? Most of these specific conditions were based upon to what extent circularity is included or to what extent circularity is dealt with in the tenderer’s own business operations. The idea behind this is that when the tenderer himself is consciously occupied with circularity, the implementation of circularity and its circular appearance to the immediate environment and within the company's own operations, the tenderer is sufficiently skilled and has similar ambitions as the contracting authority.

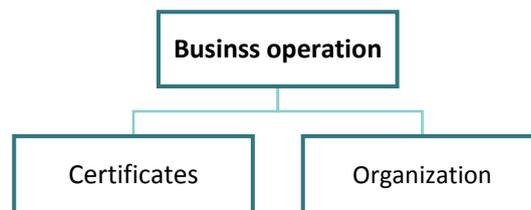


Figure 18: Subdivision of the request for business operations category according to theoretical study

But also the future plans of the business operation. The way in which a tenderer takes concrete measures that contribute to a more circular business operation makes their vision concrete. Which goals have they already achieved? How do the tenderers see themselves within 5-10 years? Are they innovative and openminded? On the one hand, a tenderer can be asked to look back on the measures taken and the past achievements in the field of circularity and on the other hand to the goals of the coming decade(s). A tenderer attaches value to their own business operations in a circular way, may lead to more confidence that the party not only has a vision but can and wants to fulfill that vision.

5.3 Award criteria

As described in Section 3.1.2.3 Awarding phase, in the award phase of the tender process, contracting authorities are only allowed to assess the content of the *tender* (the assignment), and it is no longer possible to look at the tendering companies themselves. The section also explained what the award phase entails and, based on a few examples, insight has been gained into the criteria of a traditional

tendering process. It turns out that a contracting authority has considerable freedom in the formulation of award criteria which offers many opportunities for including circular aspects in this phase.

The second part of the literature review shows that the MEAT assessment methodology consists of two aspects: quality and price. It is up to the contracting authority to find the right balance between them and to assess the quality of the tenders and compares the prices. In assessing the quality of the tenders, predetermined and published award criteria will be used. The trick is to find the right ratio between these two parts. An analysis of completed circular procurement processes (Phi Factory, 2017) shows that the weighting for quality:price often does not exceed 70:30. A heavier weighting for the price can lead to a disturbed balance between the desired quality (also with regard to circularity) and steering on costs. A contracting authority can ensure that the price is still within the desired bandwidth by including a ceiling price in the tender: this ensures that all offers remain affordable. The price aspect is therefore related to financial and economic considerations. It is important that contracting authorities realize that cost is more than the base price. Depending on the type of contract, it may include delivery, installation, and transportation if they are not specified separately. It is important to ask for any on-going operational costs, warehousing, maintenance, spares, consumables, licenses and various other costs that may be incurred (Vaqari, 2017).

Circular tendering is a relatively new concept for various market parties within the Dutch construction sector. In the introduction of the thesis, it was extensively explained why simply asking for a 'circular' building is not sufficient. It is not self-evident that market parties know how to react on, or are familiar with a circular construction and the related tendering process. Therefore, it is all the more important as contracting authority to set-up a well-formulated and comprehensive award guideline. The quality part of the MEAT assessment methodology covers all criteria (except for price) that can be accommodated and is therefore very broad and flexible. The quality part can be subdivided into three aspects covering all optional options regarding circularity aspects (Van Haagen, 2018; Van Oppen et al., 2018), summarized in the so-called IPF model by Copper8 (Figure 19). Both technical-content aspects and process-related aspects are important in a circular tender and therefore both must also be included in the award criteria (Van Haagen, 2018). The financial-economic aspect is more difficult to include so explicitly because it often involves other revenue models that cannot currently be used due to fiscal legislation.

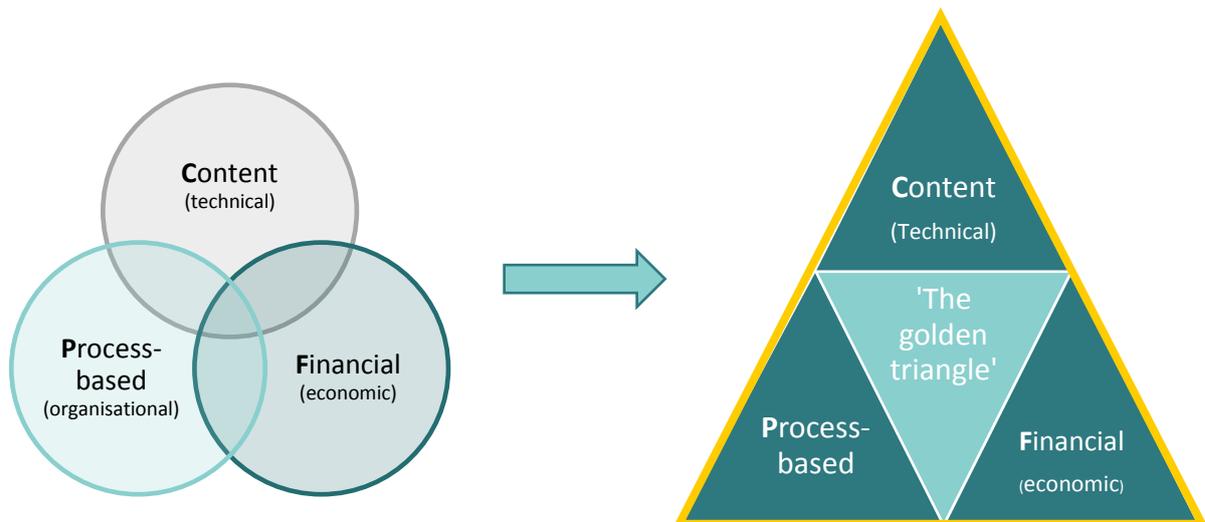


Figure 19: The Golden Triangle (based on the IPF-model by Van Oppen, Eising, 2011)

Contracting authorities should consider how they link the award criteria to each other in order to compare qualitative and quantitative award criteria. For a circular tender, giving quantitative criteria is of greater importance compared to a traditional tender. For example, price, planning, and communication can be looked at. In addition, the purpose of the award criteria is often to concretize the requirements set in the selection phase. This concretization of the selection criteria often occurs on the basis of quantitative requirements, i.e. making the promises demonstrable. An important aspect of the technical content category is then often based on measurability. If a tenderer can demonstrate measurable facts for the performance of the work, little discussion is possible: an objective assessment. The remainder of this section will look and dive deeper into at the three award criteria separately.

5.3.1 Technical-content level

As mentioned in [Section 2.4 Circular Economy in the Built Environment](#), the circular economy in the built environment is primary about bringing materials back into the cycle by thinking in advance about how a building or building element can become part of that cycle again at the end of its life. It turns out that the circular economy demands a change in design, better flexibility, disassembly of components at every building layer, and better energy usage. This new form of design means that products and buildings must be designed in such a way that they can be reused in the future and/or products and buildings that consist of recycled materials as much as possible. Four out of the five design principles by Cheshire (2016) serves as the basis for the subdivision of the award criteria on the technical-content level: design-out waste, design for adaptability, design for disassembly, selecting materials. In addition, other studies indicate that the way in which energy is handled and arranged (even this has a large interface with sustainability) is another component of a circular approach design (Korhonen et al., 2018; Tomić & Schneider, 2018). Korhonen et al. (2018) state that unlike traditional construction the circular economy approach emphasizes product, component and material reuse, remanufacturing, refurbishment, repair as well as solar, wind, biomass and waste-derived energy utilization throughout the product value chain and cradle-to-cradle life cycle.

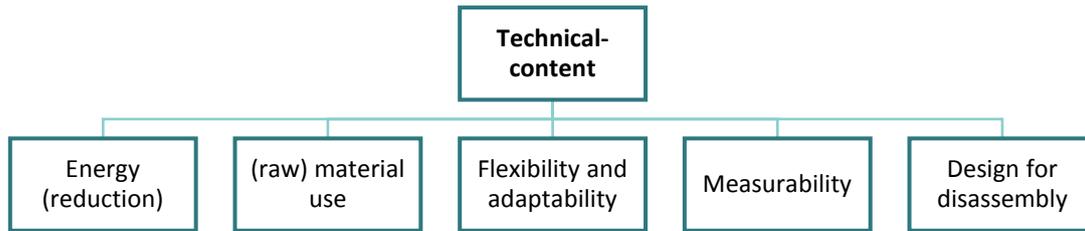


Figure 20: Subdivision of the Technical-content category according to theoretical study

Combining all investigated studies result in a sub-classification of the award criteria on technical-content level, relate to energy, (raw)material (re)use, flexibility, adaptability (Figure 20). Circular criteria based on technical content aspects must be included in the awarding phase. These criteria refer to buildings and products, where the production of waste and the use of raw materials is minimized (Van Haagen, 2018; Van Oppen et al., 2018; Castelein, 2018; Loppies, 2015), and both flexibility and level of disassembly of the construction (Verberne, 2016; Van Vliet, 2018). It, therefore, concerns the (in a new way) designing products and buildings on a technical level.

5.3.2 Process-based level

Circularity relates to a large extent to the lifespan of products and materials. The fifth design principle of Cheshire (2016) relates to the fact that a building consists of several layers (the layers of Brand), each with its own life span and therefore also depending on process-based aspects. This means that on a process-based level, care must be taken for the circular use of products. This means that an active collaboration must be stimulated between the client, the contractor and the chain partners with the ultimate aim of laying the foundation for a circular economy. The actual circularity of a product or building is temporal and therefore also dependent on process aspects. In a circular tender, attention must be paid to the process of actually using products circularly. It is important here that there is a more intensive collaboration between clients and contractors, but also between chain partners (Van Oppen et al., 2018). An integral interest must be formed whereby each person subordinates his individual interest to the common interest. A building that is circular in the future can still be demolished and end up as waste if no attention has been paid to process aspects (Van Haagen, 2018). This means that on the one hand, the process-based aspect relates to the future-oriented interaction of materials and products. And on the other hand, the process-based aspect relates to collaborations, since circulatory projects are accompanied by long-term partnerships. This long-term cooperation, therefore, flows directly from the handling of the materials and products in the long term. It is, therefore, crucial to include these cooperation aspects in the request.

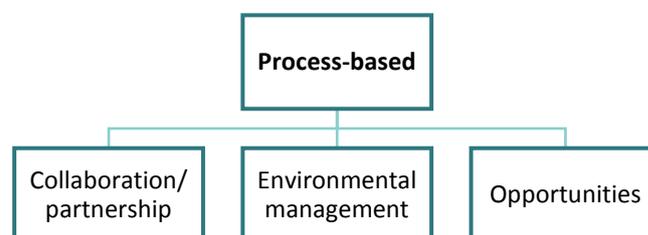


Figure 21: Subdivision of the Process-based category according to theoretical study

But how can these circular performance movements and long-term collaborations be included in the request? These circular process-based aspects are often included in the request by means of an action plan. In this plan of action, the tenderer should go into the process steps that will be taken in the construction and production process and during the lifetime to ensure circularity. In this way, firstly,

the tenderers are forced to think carefully about the consequences they have of the entire process surrounding the assignment. Furthermore, it ensures that certain aspects can eventually be converted into work agreements during the contract period. In addition, Van Haagen (2018) states that an action plan should be drawn up by the tenderers during, including the opportunities and risks, how the quality will be guaranteed during the realization, and finally how the (direct) environment can be involved in the process.

5.3.3 Financial-economic level

The 7 pillars of Circular construction (Section 2.5 The seven pillars of circular construction, Figure 8) explains that shifting from a linear to a circular approach regarding the construction industry also relates to a new way of financial and economic acting. The changes necessary for creating a more circular system require a fundamental system change, both on a financial level (business model, revenue model) and an economic level (economic growth). When the circular economy grows, the demand for organizations that facilitate the circulation of materials increases (Het Groene Brein, 2012). A financial model will have to be developed, in which the value of products and materials will continue to be guaranteed (Van Haagen, 2018). According to Van Oppen et al. (2018), this guarantees long-term value retention through a financial model. This can be done through circular revenue models, but it is more important to realize that suppliers and chain partners are being asked for a shift of business model and that this should also become an attractive model for both parties. Depending on the wishes of the contracting authority, criteria can be formulated relating to residual value or total cost of ownership. These specific criteria are of a qualitative nature and fall therefore under the quality component. Quality aspects must be built in the award guideline and must therefore explicitly be separated from the price component.

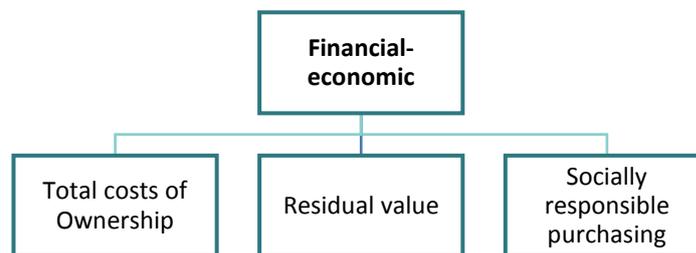


Figure 22: Subdivision of the Technical-content category according to theoretical study

If the contracting authority includes price as award criteria, that price must at least include the total life-cycle costs and not just the investment costs (Van Haagen, 2018). In addition, it is of great importance that a contracting authority also includes a (sub) award criterion in the price, whereby the applicants must substantiate the specified total life-cycle costs. One can think of substantiation of higher initial investment costs which are later recouped through lower maintenance costs. By determining the price on the basis of the total life-cycle costs, tenderers are encouraged more to deal with this in a circular way. Additional to the total cost of ownership and residual value sub-criteria, criteria can be set based on the purchase process. Socially responsible procurement (SRP) means that, in addition to the price of products, services or works, consideration is also given to the effects of purchasing on the environment and social aspects (PIANOo, 2018c). This means that SRP is actually the collective term for all options where extra attention can be paid to people and the environment during the procurement process (Van Oppen et al., 2018). A contracting authority can subscribe requirements to the way in which construction products and elements must be purchased. In the literature, only a limited amount of research has been spent on implementing these financial and

economic aspects into practice. The interviews will be used to identify criteria that should be included under the quality aspect of the financial-economic category.

To summarize, the above-mentioned three categories are important for a circular tender, and therefore all three must be included in the award criteria under the quality component of the MEAT assessment, separately from the price component. A contracting authority should classify all criteria under these three denominators, Figure 23. In addition, since these three denominators are necessary for the implementation of a comprehensive circular construction project (Van Oppen et al., 2018), at least one criteria per category should be included under these three denominators.

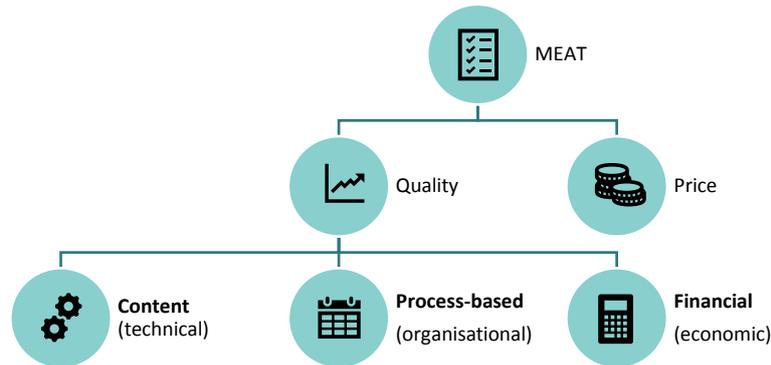


Figure 23: Overview of a circular MEAT assessment methodology

5.4 Construction of theoretical categories

In line with the grounded theory, the outcomes of the literature study result in the classification of both selection and award criteria. This categories of both selection and award criteria will be used in the further data collection and elaboration of the research. Both selection and award criteria are classified into three categories (Table 11a and b).

The first theoretical coding for the selection criteria recognized ‘Request for a Vision’ as several articles confirmed that it should be traced whether the vision of the tenderers matches that of the contracting authority. The second category is about the ‘Request for References’. Even though the literature has shown that cautious should be paid to ask for references from a tenderer, as this could unnecessarily exclude parties with high circular potentials. However, the level of valuing this category is up to the contracting authority. The third theoretical coding recognized ‘Request for Business Operation’ as the level of circular aspect within a tenderer’s organization says something about their understanding of circularity.

Table 11: a) Selection criteria categories b) Award criteria categories

Category	Category
SC 1 Request for a vision	AC 1 Technical-content
Sustainability: circularity	Energy reduction
Collaboration and partnership	Flexibility and adaptability
SC 2 Request for references	(raw) material (re)use
Sustainability: circularity	Measurability
Collaboration and partnership	Design for disassembly
SC 3 Request for business operation	AC 2 Process-based
Certificates	Collaboration and partnership
Organization	Environmental management
	Opportunities and improvement proposal
	AC 3 Financial-economic
	Total Cost of Ownership (TCO)
	Residual value
	Socially responsible purchasing

The literature study also results in the classification of the award criteria into categories (Table 11b). The first theoretical coding for the award criteria recognized ‘Technical-Content’ aspects focusing on buildings and products on a technical level regarding energy, (raw)materials, flexibility, disassembly, and measurability. The second formulated category refers to ‘Process-based’ aspect concerning long-term cooperation and relationships between the involved parties. The third category that was derived from the literature study is about ‘Financial-Economic’ aspects. For both selection and award criteria categories, some first sub-criteria were found during the literature study. The main categories together with this first sub-criteria are depicted in Table 11. The following practical and field studies will serve to validate the formulation of the main categories and to elaborate on the sub-criteria.

6 Circular tendering: an in-depth practical study

6.1 The research framework

In order to trace which selection and award criteria are used in practice, a thorough study into recently published tender documents is conducted. Of all European and national public tenders in the Netherlands, the announcement of the tender is published nationally and online. A next step is to get the substantive information about the tender (such as the selection and award criteria). In a large number of cases, these are published with the announcement, but it also happens that the announcement refers to a private platform on which the documents are published. In this in-depth practical study, therefore a research framework has been used.

To ensure an unambiguous research framework, a number of considerations have been made based on the decisions taken in [Section 3.2.1 Decisions and starting-point](#). The data gained in this practical and in-depth study is based on an own study into multiple tender documents that were published on TenderNed in the period 01-12-13 to 01-12-2018. From now on this in-depth practical study is referred as the ‘TenderNed-study’. In the study, the current state of circular construction projects in the Netherlands was inventoried. This inventory shows that circular building and the associated request is not yet common in the construction sector, but that interesting projects have already been realized that are inspired by circular ideas. In the search for the announcements published on TenderNed, a number of options can be filtered. These filters are set as follows:

- **Type of assignment (Service, suppliers and works)**

Only the categories for ‘works’ of tendering will be included in this study (Section 3.2.1 Decisions and starting-point). In addition, because different types of assignments are involved, the selection and award criteria will probably also differ, because totally different things have to be considered.

- **Nature of the assignment**

Assignments for works can be different in nature, namely: government contract, framework agreement, concession agreement, design contest, set approval scheme. In order not to disregard valuable information in the investigation, the filter is set to all nature of assignments.

- **CPV-code**

In the tendering process, so-called CPV (Common Procurement Vocabulary) codes are used, which are intended as a classification for all types of contracts for works, services and deliveries (PIANOo, 2018a). Every product, service or structure can be related to a CPV code. The CPV ensures that every European member state describes goods in the same way. For example, there are codes for mining, business machines, software and information systems, chemical products, etc. For each CPV code, different types of criteria are likely to be used as they cover different fields. The selected CPV code is 45000000-7 and concerns construction work.

- **Place of performance**

In addition, TenderNed also offers the possibility of selecting a specific place of performance, based on NUTS-codes. The NUTS (Nomenclature des Unités Territoriales Statistiques) is the regional classification of the European statistical office Eurostat. This has been introduced in order to have comparable regions throughout Europe so that European statistics are comparably comparable regionally. TenderNed limits the NUTS codes to national level. Because the research is also limited to the national level, no code has been selected in this filter option.

- **Publication date**

The publication date relates to the date on which the tender was officially published on TenderNed. The publication date is set to 01-12-2013.

- **Closing date**

The closing date refers to the date on which the tender is officially closed or has expired. The closing date is set to 01-12-2018.

- **National/European**

As was stated in Section 3 Tendering in the construction sector (Table 2), tenders above the threshold amount must be tendered at the European level. These tenders must also be published. Publishing is not mandatory under the threshold, but clients can choose to outsource publicly. Section 3.2.1 Decisions and starting-point explains why it was decided to focus the research on both European and national tenders.

- **Type of publication**

With regard to the type of publication, the choice can be made between market consultation, pre-announcement, announcement of assignment and/or announcement of awarded assignment. In this respect, it is possible that all selection and award criteria may be included in all the documents mentioned above. In order not to exclude possible (new and interesting) criteria, all types of publications are examined during the research.

- **Type of procedure**

As explained in detail in Section 3.1.1.1 Type of procedure of the literature study, different types of procedures are possible under which a tender can be requested. For the decision on the choice of the

type of procedure. The research is not limited to a limited number of types of procedures but is deliberately wide-ranging.

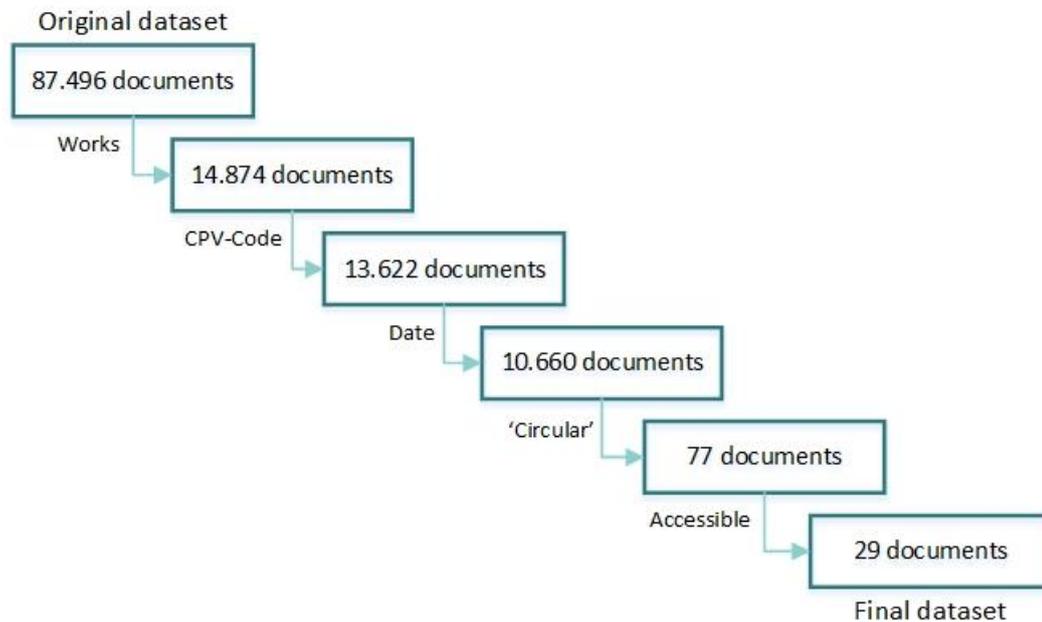


Figure 24: Data modeling

The list of these tenders with their characteristics, such as name, the used type of procedure and whether it has a pre-selection or not, can be found in [Appendix 5: List of TenderNed study documents](#). Over the past five years, almost sixty requests for tenders in the Netherlands that have a ‘circular’ approach for construction works (CPV 45000000-7) were published on TenderNed, Figure 25. As discussed in [Section 3.2.1 Decisions and starting-point](#), the research is focused on the type of assignment for works.

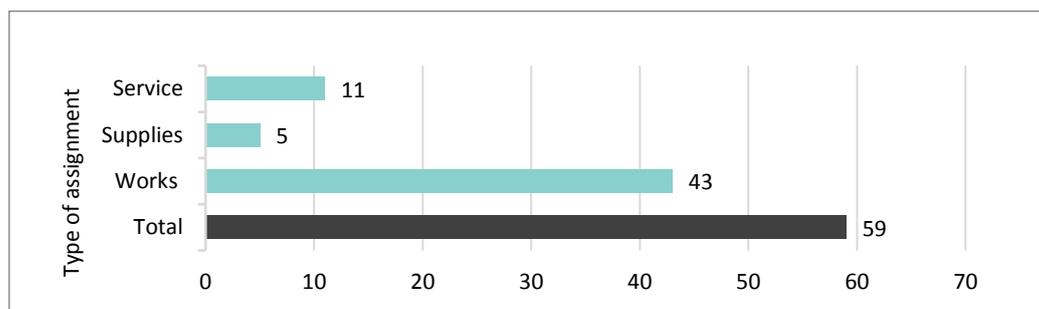


Figure 25: Total number of circular tender published on TenderNed

However, from these 43 circular tenders for construction works, the selection and award guideline of only 29 of them were published on TenderNed. For the other 14 tenders, only the preliminary announcement is given or the tender was imported from an external publisher which makes them not accessible for the researcher. After analyzing the tender documents of these projects, it appears that a number of fixed elements repeatedly come back in each document within the different aspects (suitability requirements, selection criteria, and award criteria). Figure 26 provides an overview of the number of suitability requirements, selection criteria and award criteria included in the tender documents that have a circular approach.

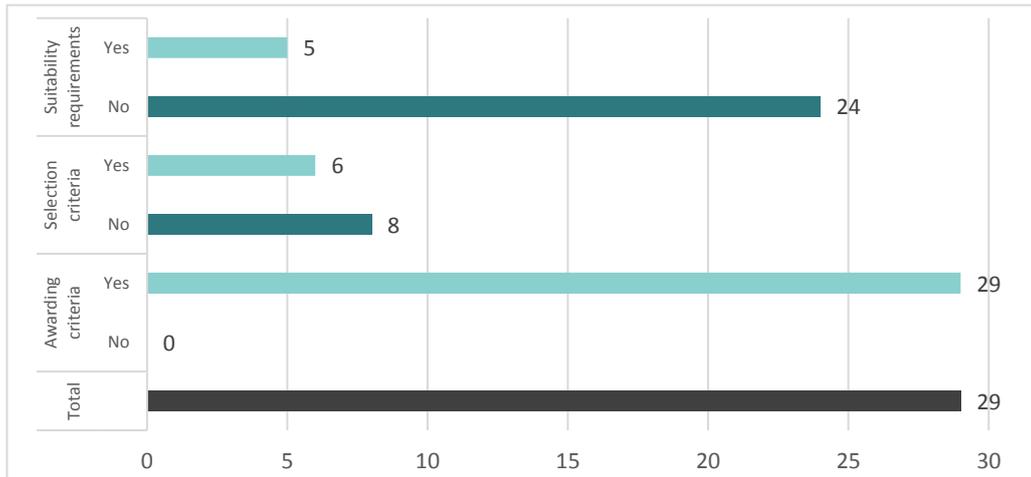


Figure 26: Total number of requirements and criteria including circularity

What is striking is the relatively few suitability requirements and selection criteria that focus on circularity. This is not entirely unexpected for suitability requirements, as the literature study has shown that contracting authorities have little freedom in drawing up these requirements. In addition, the early exclusion of tenderers with a lot of potentials should be prevented. What is more striking is the low number of selection requirements included in the tender documents. However, Figure 26 gives a somewhat distorted picture of the number of circular selection aspects in the tenders examined, because the tenders are included without selection phase (and therefore without selection criteria), the share of circular selection criteria is considerably low. In only 43% of the tender documents, selection criteria were included with a circular approach. The remainder of this chapter will provide a step-by-step explanation of the aspects that especially focus on circularity, starting with the selection requirements.

6.2 Conditions for participation: selection requirements

As the previous chapter shows, different studies (Van Haagen, 2018; Van Oppen et al., 2018) recommend that circularity should not be implemented within the selection requirements to not restrict the market unnecessarily. However, contrary to the grounds for exclusion, according to the laws and regulations it is indeed permitted to include circular criteria in the suitability requirements. The inclusion of circular requirements in the suitability requirements depends on the ambition level of the contracting authority. The TenderNed-study confirms that it is not likely to include requirements with a circular approach within the suitability requirements (Figure 27). Only 17% of the published tenders include suitability requirements relating to circularity. If a contracting authority really values specific circular aspects within technical competence, professional competence or financial and economic competence, he/she is allowed to set requirement. These requirements then usually relate to certificates or references. The contracting authority must then be aware of the fact that tenderers, which are open for circular ambitions, can be excluded at an early stage.

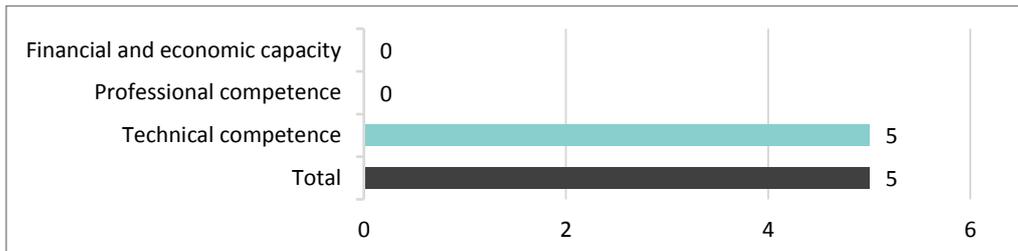


Figure 27: Total number of tender document including circular suitability requirements

In practice, it appears that in the suitability requirements only circular requirements are set that fall under the technical competence. Within the TenderNed study, the 5 suitability requirements all fall under the technical competences. Three of them focused on achieving a certain level of the CO₂ performance ladder while the other two asked for specific certificates: the ISO14001 and the Flora and Fauna certificate (Table 12: Specification of the circular suitability requirements Table 12).

Table 12: Specification of the circular suitability requirements

Tender ID	Type of suitability aspect	The suitability requirement
T16	Technical competence	- The Tenderer must have the following certifications at the time of submitting a Tender and during the term of the Contract: Certificate CO2 Performance Ladder.
T19	Technical competence	- Certificate CO2 performance ladder Level 3 or higher; - Certificate Flora and Founa Level 1 or Nature Conservation Act Management Level 1.
T20	Technical competence	- Sustainability ambitions: achieved EPC.
T25	Technical competence	- Quality assurance system.
T26	Technical competence	- Certificate CO2 performance ladder step 5.

The TenderNed study confirmed that implementing circular elements in the suitability requirements is not recommended and therefore unusual. The next section investigates whether the theory of Van Haagen (2018) and Van Oppen et al. (2018) connects to the practice regarding the implementation of circular elements in the selection criteria.

6.3 Selection criteria

Despite the fact that it appeared from the literature that it is important to already request circular aspects in the selection phase, this has hardly happened in practice. In only 43% of the tenders, selection criteria with a circular approach are included in the selection guideline. Contracting authorities apparently consider it as too risky imposing circular elements in their guideline during the selection phase. One reason for this may be that contracting authorities want to prevent premature exclusion from market parties. In addition, the data collection was obtained from a source that was set for the past 5 years. Especially in the past few years, the market had a surplus in the supply of orders resulting in less effort from tenderers to subscribe for circular projects (which are often time-consuming in the preparation) with the simple reason that there is plenty of work. However, the precise reason for this remains unclear for now and will hopefully become clear during the interviews.

The literature study shows that selection criteria can be subdivided under a so-called golden triangle: the request for a vision (80%), the request for references (67%) and the request for business operations (0%). In practice, it appears that it is unusual to include circular selection criteria that focus on the tenderer's own business operations. In spite of the fact that the company's own business

operation is eloquent on the impact of the level of their ambition, this is not yet taken into account in practice.



Figure 28: Total number of tender document including circular selection criteria

Almost all analyzed selection guidelines ask for a tenderers vision on certain aspects and almost all of them asks for the tenderers experience by making use of references. The request for a tenderer's vision regarding circularity has the small upper hand in relation to the call for experience (Figure 28). In addition, some tender documents request for both a vision and references.

Table 13: Specification of the circular selection criteria

Tender ID	Type of selection criteria	The suitability requirement
T14	Reference	- A reference on sustainability; - A reference on collaboration/partnership.
T18	Vision	- Vision with BREEAM, circular construction and BIM for renovation projects is a plus.
	Reference	- Experience with BREEAM, circular construction and BIM for renovation projects is a plus.
T20	Vision	- A business vision on circularity.
	Reference	- Experience with the realization of a healthy, Frisse school; - Experience with the realization of sustainable school, including an EPC <0.0; - Demonstrate by means of examples in what manner the tenderer has realized or will realize circularity in projects.
T23	Vision	- A vision on sustainability; - A vision on collaboration/partnership.
T25	Reference	- Experience with sustainability (renovation) works in combination with circularity.
	Vision	- A vision, for the purpose of good cooperation, towards effective quality management.
T26	Vision	- A vision to professionalize the cooperation between client and contractor on the basis of the CROW Past Performance system.

6.3.1 Selection criteria 1 (SC1): Request for a vision

Examining the requests for a vision and references in more detail appears that two aspects repeatedly comes back in both categories: sustainability/circularity and collaboration/partnership (Table 13). In the request for vision, a tenderer should provide a clear and concise description of the concept and the spatial quality of how they intend to deal with sustainability, circularity, and collaboration of the project and project team.

Circularity is a major ambition in circular tenders, where the contracting authority often wants to implement as much circularity as possible in the project. Because circularity is a broad concept, for which different interpretations are applied, a contracting authority wishes to be able to supplement and realize a party that subscribes to the thinking of this project. Figure 29 shows that requesting for visions is mainly about sustainability and circularity, and collaboration. Those two aspects also appear in the literature study.



Figure 29: Percentage of request for vision sub-criteria

In assessing the request of a vision on circularity, a number of points are central. Is there a company's own circular vision or is the story 'standard'? Is the tenderer familiar with various forms of circular material use? Does the tenderer show examples that he/she understands the concept circularity in relation to the construction sector?.

6.3.2 Selection criteria 2 (SC2): Request for references

Reference projects in which circularity is central have only been realized to a limited extent and should therefore not be set as a minimum (Section 5.1 Selection requirements). Examples of forms of circular material use have, however, been used for some time. Experience with circularity in the sense of material use can, therefore, be included in the request. Analyzing the selection guidelines it appears that requesting for references is also based upon two aspects (Figure 30), namely, again, sustainability/circularity and collaboration (Table 13). It turns out that 71% of the requested references are based on sustainability or circularity aspects and 29% on collaboration.

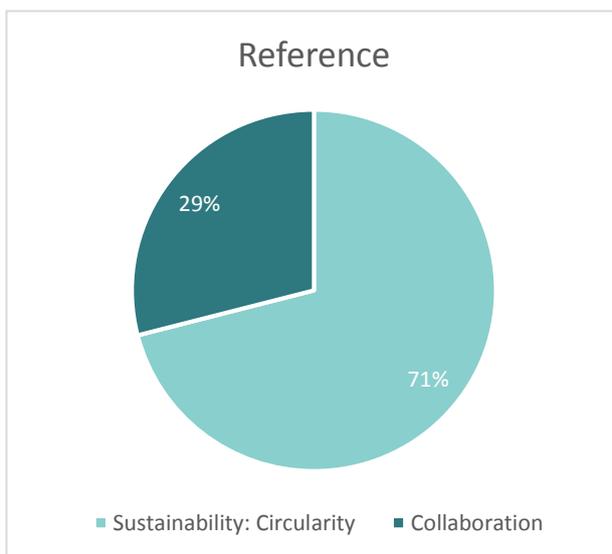


Figure 30: Percentage of request for references sub-criteria

In addition to qualitative aspects, there are limited references that are quantitative of nature to be included in the utilities. Important quantitative aspects may be requested based on references. The literature study has shown that by means of certificates and certain EPC values tenderer's experiences can be requested. Projects that are certified by means of a BREEAM-NL New Construction and Renovation certificate, a LEED certificate, a GPR score, or equivalent, represent the ambition measurably. A certification or sustainability measurement method is often not required and therefore serves only as an explanation to make the performance transparent. It is therefore customary for the tenderer, if no certificate or measurement has been carried

out, to at least describe which EPC value (in accordance with what has been achieved) has been achieved and which requirement was applicable to the EPC at the time of the building application, which additional sustainable measures in the areas of material, water consumption, and

environmental impact. Since these certificates are all related to sustainability or circular aspects, they can be placed under the sustainability/circularity sub-criteria.

6.3.3 Selection criteria 3 (SC3): Request for business operation

Regarding the third selection criteria aspect, the demand for the tenderer's own business operations, no criteria were found in the analyzed tender documents (Figure 28). This is a remarkable finding, since requesting for business operation offers the contracting authority the possibility to request specific subjects about the tenderer's organization. When the tenderer's organization is consciously occupied with circularity, the implementation of circularity and its circular appearance to the immediate environment and within the company's own operations, it can be expected that the tenderer is sufficiently skilled and has probably similar ambitions as the contracting authority. It is expected that the interviews provide more insight into why the request for business operation has not yet got off the ground in practice.

6.4 Award criteria

The literature study has classified the award criteria into three categories: technical-content, process-based and financial-economic. The outcomes of the TenderNed study regarding the award criteria is depicted in Table 14. Additional to the sub-criteria derived from the literature study, four more sub-criteria are found in analyzing the tender documents. Two of them, maintenance and social Return, can be placed under the process-based category. The other two, that deals with the way in which materials and products should be purchased or indicated, is placed under the financial-economic category. The reason for this will be explained more in detail in the remainder of this section.

The difficulty to impose criteria on circular revenue models for contracting authorities manifest itself in the low numbers for financial-economic aspects. Only a derisory number of three contracting authorities have called for the inclusion of financial-economic aspects in their requests. This means that a maximum of three contracting authorities have met the aforementioned statement that all three categories must be included in the request for tender. In [Appendix 6: TenderNed study outcomes award criteria](#), the overview of the analyzed tender documents related to the award criteria can be found.

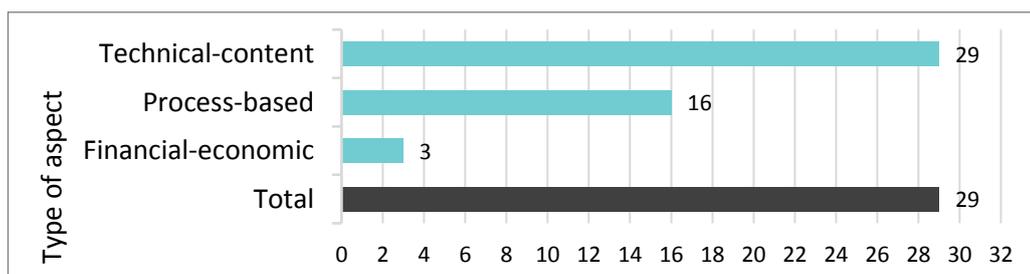


Figure 31: Total number of tender document including circular award criteria

6.4.1 Award criteria 1 (AC1): Request for technical-content aspects

The technical-content aspect is the broadest category of the three aspects since most criteria can be placed under this category. On the basis of requesting technical-content based aspects, the contracting authority can trace whether a tenderer has sufficient ambitions, knowledge, and experience in designing and constructing circular products and buildings. The technical-content aspect consists of the demand for specific performance formulations and a technical explanation of the design. The TenderNed study confirmed that criteria can be drawn up, on subjects such as the origin and future use of energy, (raw) materials, disassembly, adaptability, and measurability. Figure 31 has

shown that the fully 29 of the 29 investigated selection guidelines provide award criteria based upon technical-content aspects. Table

Table 14: Overview of total number of sub-criteria per award criteria category

	AC1: Technical-content aspect					AC2: Process-based aspect					AC3: Financial-economic aspect			
	Performance formulations				Design	Plan of Action					Future value			
	Energy reduction	Flexibility and adaptability	(raw) material (re)use	Measurability	Design for disassembly	Collaboration/partnership	Environmental management	Opportunities/improvement proposal	Maintenance	Social Return	Total Costs of Ownership	Residual value	Socially responsible purchasing	Environmental Performance Indicator
Total	24	8	21	2	6	14	9	8	7	3	0	0	4	2

Energy

Circularity and sustainability are two concepts that are very close to each other and have a large degree of common ground. Circularity, which is basically related to the way a person or company deal with materials and raw materials, is part of the sustainability theme. Within this sustainability theme, attention should also be paid to energy, energy saving, healthy climate, climate adaptation, biodiversity and so forth. Since sustainability is often seen as a container concept, the contracting authority runs the risk that circularity will not be the main focus, but other sustainability principles will get the upper hand. Despite the difference in the number of included requirements between circularity and sustainability is very limited, sustainability is just the worst of circularity. In 83% of the tender documents, award criteria are incorporated that asks for sustainability applications regarding energy management. Requirements should be defined functionally as much as possible in the demand specification. This gives the tenderer the space to come up with innovative solutions and smart designs with which he can distinguish himself from other tenderers in terms of environmental quality.

Criteria are mainly based upon writing a plan of action about specific sustainability aspects. Common aspects relate to concrete measures regarding CO₂ emissions. For example, reducing CO₂ emission, the level of CO₂ ambition and the achievement of a certain score on the CO₂ performance ladder. In addition, requirements can be set for the purchase of products and materials. An increasingly frequently used tool for this is the SRI criteria tool (*Dutch*: MKI-criteria tool). Socially responsible procurement (SRI) means that, in addition to the price of products, services or works, consideration is also given to the effects of purchasing on the environment and social aspects (PIANOo, 2018c). Sustainable purchasing is therefore also called socially responsible procurement. The energy concept is closely related to the sustainability concept. The requirements regarding energy are mostly related to the demand for energy-saving and/or stimulating measures or means whereby material, method, and effect meet other requirements. For a contracting authority, it is useful to know in which plan of which tenderer the project has the lowest attainable energy consumption from day 1.

Flexibility and adaptability

The degree of flexibility and adaptability is another important criteria within the technical-content aspects. Adaptable construction is the realization of living space which from the outset is more usable for everyone and which, moreover, can be adapted in a simple and therefore relatively inexpensive manner if there is a need for it for some reason. For example, in the request, criteria can be included that requires an object that can easily be adapted to meet functional requirements for future use that match the volume of use and possible changes of destination in relation to location. A concrete

example of this can be found in the circular requirements and wishes of one of the examined tender documents during the TenderNed-study. One of these documents includes a specific requirement that relates to the floor covering and associated floor finishing. The specific requirement here is that the possible change of floor finish and underlayer should be simple without any structural alterations.

Not only the principles of adaptability, but also principles of flexible (multifunctional) use of space are important. Flexible building implies possible re-use of spaces, the possibility to divide the residual unit, the adaptability of functions and possibilities for attaching tools. In addition, requirements can also be included regarding the degree of disassembly. [Section 2.4.4 Design for disassembly](#) of the literature study has shown that design for disassembly is one of the design principles of buildings (Cheshire, 2016) and therefore directly linked to circularity by making parts possible to be disassembled, replaced and/or reused, and create adaptable buildings. For example, in the request, criteria can be included that require the use of as many clicks, clamps and removable connections as possible. In 28% of the tender documents criteria that deals with flexibility and/or adaptability were found.

(raw) Materials

The economical handling of (raw) materials is of course directly linked to the circular economy. The criterion 'economical use of raw materials' can be operationalized in tenders for the processing of waste by defining a hierarchy of processing options for waste: the more 'economical' a tenderer deals with the raw material, the higher this score in the assessment. The circular economy assessment standard is used in tenders as a criterion for the efficient use of raw materials. A commonly used tool for making raw materials transparent is the raw materials passport. In addition, in the analyzed tender documents of the TenderNed study, 72% requests for specific criteria concerning the circular use of (raw)materials. For example, requirements are set for the total use of raw materials, the recovery of components and raw materials, the coordination between material properties and their application, and the environmental impact of raw materials.

Measurability

Requesting for quantitative aspects relating to the award criteria turn out to be unusual in practice. In only 7% of the analyzed award guidelines, specific criteria were requested regarding the measurability of certain aspect. This low number is quite strange since, over the last few years, more and more research has been conducted about how to measure the circularity of a (new) construction and/or building in making the transition from 'linear' to 'circular' models. In addition, Verberne (2016) has developed a model to assess the level of circularity which allows principals to initiate circularity by the design of a new product, internal reporting or during procurement decisions as performance indicators in the built environment. His so-called Building Circularity Index (BCI) assessment model, measures the level of circularity of a building on the basis of some indicators. Another researcher (Van Vliet, 2018) has elaborated on the BCI by adding the indicator 'disassembly' to the model. On the basis of this model, an element could be included in the criteria whereby a certain value of circularity must be met during the request.

A second element is about the plan of approach to continuously contribute to the circular economy during the contract. This plan of action could be in the form of writing a clear vision about different themes. The tenderer could be asked for a view on the circular development of the specific project. It could, for example, be requested that at least a number of sub-themes like raw materials and materials, flexibility and adaptability, energy and green and water be given a place and made concrete. Other elements in the vision may include, for example, putting the transition from ownership to use, the sustainable mobility concept, involving future users and residents with the circular elements. In addition, the vision of the intended future program of the project must be explained, including, for example, the total number of gross floor area to be realized, the percentage of mid-rent apartments,

the percentage of work functions, ideas about the interpretation of the work functions and housing size. In doing so, the tenderer should indicate how the parts of the vision are given a place in the development and how the tenderer makes this transparent for the municipality in the various development phases (preliminary design, final design, construction, and delivery). In addition, the tenderer could be asked to provide a quantitative target for the application of: I) the percentage of renewable material with minimal environmental impact and II) the percentage of recycled material.

Design for disassembly

Another aspect that was found in the study, was quite a unique one in advance and has to do with the design of the construction (elements). In this criteria is asked for specific conditions of the project's design regarding disassembly. [Section 2.4.4 Design for disassembly](#) of the literature study has shown that design for disassembly is one of the design principles of buildings (Cheshire, 2016) and therefore directly linked to circularity by making parts possible to be disassembled, replaced and/or reused, and create adaptable buildings. It turns out that 21% tenders in practice requested for design that is in some way disassemble. By means of this criteria, tenderers are not immediately excluded if they have no experience with this way of designing, but in their opinion and ideas, they are asked about how disassembly can be included in the design.

6.4.2 Award criteria 2 (AC2): Request for process-based aspects

The process-based aspect relates to the product level, often in combination with writing down a plan of action. There are different ways to contribute to the circular economy at product level. In doing so, it is necessary to strive for the highest possible reuse of the raw materials. That means that as little energy, operations and logistical processes as possible are needed for the reuse products and materials. A product can be designed and produced in accordance with the principles of circularity, but it must also be ensured that the product is used in a circular manner (Van Oppen et al., 2018). In the request, criteria can, therefore, be included regarding the elaboration of an action plan regarding the purchasing process. It is important to know I) or, II) what, III) with whom and IV) how the products are purchased. In addition, there is also the request of a plan of action or the process proposal, on which the most important opportunities and risks are discussed. How do the parties intend to achieve their goals? How does the party, for example, view phasing? The TenderNed research has shown that in addition to the product level, an action plan can also be asked about collaboration, partnership, environmental management, and opportunities. Figure 31 shows that 16 of the 29 selection guidelines provide award criteria based upon process-based aspects. Below the most frequently recurring parts are briefly explained.

Collaboration and partnership

Collaboration and partnership have never been more important than in circular construction projects where all parties often face new and innovative challenges. This also appears in practice since 48% of the tenders request for criteria dealing with collaboration and/or partnership. Collaboration can be about the equal cooperation between the individual partners on the part of the contractors within a consortium, the cooperation with the client, the competent authority, the legislative framework, stakeholders and users. In addition, collaboration always leads to further optimization, because parties gain insight into each other's opportunities and challenges.

In order to be able to optimally fulfill the ambitions of the contracting authority with regard to circularity and solidarity, close cooperation between the Tendering Department and Tenderers should be sought. Transparent communication and dialogue with the market parties will lead to an optimal building process. This transparent communication can be achieved by sharing ambitions, ways of thinking and integrating solutions, making optimum use of the knowledge of existing market parties and making a clear assessment of ambitions against responsible investment and exploitation.

Smooth collaboration does not come about automatically but requires effort from the client and the contractor. It is therefore desirable that the contracting authority pays attention to this subject during the award phase by defining the desired profile of the contractor. When the contracting authority has outlined this profile, criteria can be drawn up so the tenderer can demonstrate that it fits in the outlined profile. This usually takes place by means of a description or by means of references. How, for example, will the tenderer organize and guarantee the integrality between the various disciplines (architectural, installation-technical and constructive)?

Partnership relates to collaboration for a longer period of time with equal knowledge sharing of all partners. Knowledge sharing is about the broad communication of all relevant choices and steps through the process to inform the market in a broad way about the experiences gained and to accelerate the introduction of circular constructing. Does the tenderer communicate well in writing and orally? Is it a team player, who can work well together, is flexible and goes for an optimal project result with an eye for the interests of the parties involved? These questions, in which how the tenderer shares the knowledge can also be included in the requirements.

Environmental management

In 31% of the analyzed tender documents, criteria is included concerning the definition of the implementation and environmental management in the form of a plan of action. Since the immediate environment can contribute to circular ambitions in the development of a project, criteria can also be included regarding the way in which the tenderer communicates with the environment.

Opportunities

The process-based aspect also often includes criteria whereby the contracting authority requires a document with opportunities from each tenderer (28%). In this opportunity document, the tenderer must identify the (most important) opportunities for the assignment. These are also called 'value adding options'. An example can be that the tenderer must briefly describe the way in which the opportunity adds extra value to the realization of the ambitions, results and process objectives. It is advisable to include in the opportunity document only chances that are not yet part of the measures included in the tender.

Maintenance

As explained in [Section 3.1.1.3 Type of contract](#), the Maintenance component in life-cycle contract forms is getting more important in construction project with a circular approach resulting in long-term relationships between contracting authorities and contractors. This also appears in various tender documents, where criteria were found regarding maintenance (24%). In most cases, a maintenance plan was requested for the coming years, sometimes in relation to the demountability of building elements, such as the façade. This maintenance plan is long-term and can be seen as a process in which the client and the contractor are connected to each other for several years.

Social return

Another surprising sub-criteria that was found during the TenderNed study deals with social responsibility. The idea behind this is that circularity should not only express itself at a material level, but also at individual level. Here, for example, the social responsibility in the area of labor market participation can be implemented to create new marketplaces. Mainly government agencies such as national governments think this social aspect within the process category is important. However, with only 10% of the total number of tender documents requesting for social return, it appears not to be very usual in practice.

6.4.3 Award criteria 3 (AC3): Request for financial-economic aspects

Thirdly, in addition to the technical-content and process-based aspects, there is a financial-economical aspect. Within circular tenders, it is important that the market is triggered. There may be ambitions but how can be ensured that the market is triggered? How can a contracting authority give the market a positive boost? Companies are nevertheless focused on finances. The question is how to can give them a certain positive stimulus when they achieve something. By means of the financial-economic aspect, a financial incentive must be issued in order to work circularly. An example of such a financial incentive is that the supplier commits a take-back obligation of the product to a return value: a sort of deposit. Such an incentive ensures that the product physically returns to the supplier after the useful life (Van Oppen et al., 2018). In addition, reducing the use of raw materials can mean that the supplier can be asked to purchase fewer new products.

Since circularity influences the existing business and earnings models of suppliers, it is advisable to find out to what extent the tenderer is aware of this. For example, criteria can be included about the circular purchasing process. Circular procurement offers many opportunities both financially and socially. But circular purchasing also offers opportunities for one's own development in the field. Involving both the internal organization and the chain partners is also an important prerequisite for success. Despite the fact that circular procurement is still relatively new and therefore there is often insufficient knowledge available, it is nevertheless advisable to include in any case criteria in which the tenderers are made to think about how materials and products can be purchased circularly in combination with this impact within their function in the process. One of the most difficult parts of circular purchasing is comparing offers. A possible solution is to predefine a SMART assessment framework for each circular criteria that is drawn up.

However, the financial-economic aspect is more difficult to include explicitly, because it often involves other revenue models that have yet to find their right to exist. This is also confirmed by the TenderNed study since only 11% of the analyzed selection guidelines request for a financial-economic aspect. From this can be concluded that the financial-economic aspect with regard to circularity is less usual to include in a tender than the technical-content and process-based aspects, for now. Despite the fact that this third aspect needs to be included to some extent in the award criteria, it is advised to be somewhat cautious in drawing up award criteria for these new revenue models.

Socially responsible purchasing

Socially responsible purchasing (SRP) has to do with the effects that purchases have on the environment and social aspects. Despite the fact that from the literature study this aspect did not come forward to include in a request for circular projects, it somehow appears to be requested practice. In 14% of the analyzed tender documents, tenderers were asked which (socially) possibilities they see to purchase responsible products.

Environmental Performance Indicator

Another sub-criteria that was found during the practical study, was about the quantification of the environmental impact often aimed at the stimulation of a more circular and more sustainable waste chain. For example, a contracting authority wanted, through the request of this criterion, to stimulate a more circular and more sustainable asphalt chain, while maintaining or improving the technical characteristics and life span of the asphalt layers. A means to quantify the degree of environmental impact of waste is to determine the Environmental Performance Indicator (MPI value).

6.5 Discussion

The information gained in the first parts of the data collection was mostly derived from two recent studies (Van Oppen et al., 2018 and van Haagen, 2018) and a practical study (own TenderNed-study,

2018), in which 29 published tender documents were analyzed. Comparing both theoretical and practical studies, some remarkable findings emerge. It appears that the ideal image, which according to the theory has to be complied with in order to achieve a comprehensive circular tender, does not adhere with the current practice. This does not immediately mean that the realized circular projects are by definition incorrectly requested, but by means of (small) additions, the level of performance could be tightened up. The aim of this part of the literature study was therefore to (I) investigate the extent to which the practice fits in with the literature's ideal image and II) discover the possible gaps between theory and practice and to give substance to this.

The literature has shown that both selection and award criteria can be subdivided into three main categories. In order to create a holistic picture of the *tenderer*, the selection criteria should be drawn on the basis of a request for I) a vision, II) references and III) business operations. When all three of these categories have been specified in the selection guideline of the tender document, a total picture of the contractor is outlined. However, within each category, it is important that the tendering authority provides an explanation based on its own interpretations of each individual aspect within the categories. The TenderNed-study shows that the majority of the published tenders requested for a vision and/or references (84% and 67% respectively). Asking for the level of ambitions and experiences of the tenderer turns out to be customary. The inclusion of criteria relating to the tenderer's own business operations, on the other hand, appears to be a bridge too far. Whether this is because contracting authorities are not aware or do not understand the importance of requesting for business operations, has remained unclear on the basis of TenderNed-study and hopefully will be known through the interviews.

Secondly, the literature has shown that the award criteria should be subdivided into three main categories called the golden triangle. In order to create a holistic view of the *assignment*, all categories of the golden triangle must be included in the award criteria, which contain I) technical-content aspects, II) process-based aspects and III) financial-economic aspects. On the basis of requesting technical-content based aspects, the contracting authority can discover whether a tenderer has sufficient knowledge and experience in designing and constructing specific (circular) products and buildings. In practice, the majority of the tenders includes criteria in the request that could be classified under the technical aspects (79%). Process-based aspect relates to the product level and level of collaboration and requests for a Plan of Action about these subjects. With 38%, the TenderNed-study has indicated that process-based aspects are to a limited extent represented in the current tenders. In addition, the financial-economic aspect takes the negative cake with a meager 3% represented in the tenders. The TenderNed-study has shown that the financial-economic aspect is more difficult to include explicitly since it often involves other revenue models that have yet to find their right to exist.

Despite the fact that most of the tenders comply to a large extent with the inclusion of criteria under the request for a vision and the request for references (selection criteria) and the technical content category and the process category (award criteria), it appears that especially criteria are missing within the business operation category and the financial-economic category.

Through a structured broadening and in-depth literature comparison, an understanding of the subdivision of the selection and award criteria are developed. In the next section, findings of this theory- and practice developing study are validated and elaborated by means of interviews that in the end provide theoretical implications for the development of a profile model. The classifications will serve as input for the interviews, whereby the different categories will be presented to the interviewees.

7 Circular Tendering: a field study

The data collection of the interviews are in line with the grounded theory and serve as observations (the scientific proof) with the aim of confirming the theory and findings from the literature studies. Collecting these observations is done through interviews with several experts with knowledge and experience with I) the circular economy, II) circular tender processes and III) writing selection guidelines in order to verify and expand the outcomes of the literature review regarding the identification of assessment criteria of circular tender processes. The main goal of the expert interviews is to elaborate and validate the findings from the literature study and to define statements for both selection and award criteria based upon the aspects that were found during the literature study. These statements will be derived from the expertise and experience of people that are active in the (circular) construction sector in combination with the results of the literature study. The defined statements will be used for the development of the profile model which indicates and specify, on the basis of several contentions, the needs of the contracting authority when writing a tender document.

7.1 Interview methodology

7.1.1 Interview format

The knowledge and insights gained from the literature study serve as the basis for the data collection from the (expert) field, which is based on interviews. According to Miller & Rollnick (1991), an interview can be defined as: *“a face-to-face dyadic interaction in which one individual plays the role of the interviewer and the other takes on the role of interviewee, and both of these roles carry clear expectations concerning behavioral and attitudinal approach. The interview is requested by one of the participants for a specific purpose and both participants are willing contributors.”* In qualitative interviews, social scientists investigate varieties of human experience. They attempt to understand the world from the subjects’ points of view and to unfold the meaning of their lived world. Interviews give voice to common people, allowing them to freely present their life situations in their own words, and open for close personal interaction between the researchers and their subjects.

The interviews are executed in the form of semi-structured (in-depth) interviews. This qualitative research method offered insights into individual experience from practice, enabling to explore participants’ narratives of experience and views of radical changes (Galletta, 2013) within the selection and award phase of a circular tender process compared to the traditional tender process. The semi-structured method is used to add further details by gathering data, facts, attitudes, and opinions to the knowledge as found in the literature study. It is chosen in order to collect all relevant information during a one-by-one personal meeting based on a pre-defined interview guide. This guide is a list of questions and topics that need to be covered during the conversation, usually in a particular order. It is not a structured schedule or protocol. Rather, it is a list of general areas to be covered with each informant (Taylor, Bogdan, & DeVault, 2016). The interview guide includes I) an introduction to the purpose and topic of the interview, II) a list of topics and questions to ask about each topic, III) suggested probes and prompts and IV) closing comments (Wilson, 2014). Initially, the interviewer should follow the guide, however, is able to follow topical trajectories in the conversation that may stray from the guide when it feels this is appropriate.

In comparison with structured interviews which are often used to verify people’s behavior, opinions, beliefs and values at any given moment, the semi-structured interview gives more freedom to ask follow-up questions, which are not included in the interview guide, but seem to be relevant for the researcher (Cohen & Crabtree, 2006; Longhurst, 2009). In the end, the semi-structured interview promised to yield a more complete story as it related to the research focus. With a repertoire of possibilities, the method is sufficiently structured to address specific topics related to the

phenomenon of the study focus (Galletta, 2013). From a broad scope that focuses on the entire tendering process, these specific topics are focused on the selection and award criteria of both tendering processes. A key benefit of the semi-structured interview is its attention to lived experience while also addressing theoretically driven variables of interest. The goal of the interviews is to extend the list of selection and award criteria drawn up from the literature with the practical experiences from the experts.

However, various studies (Galletta, 2013; James, 2008; Wilson, 2014; Longhurst, 2009) have shown that the semi-structured form of interviews also contains some weaknesses that must be taken into account. The most crucial weakness is concerned with issues of the validity. As argued by James (2008), a researcher has no real way of knowing if the respondent is lying. The term 'lying' sounds more drastic than actually meant by James. In his research, James mentioned that a respondent may not consciously lie but may have imperfect recall. The explanation for this is that if a respondent is asked to remember things that happened days, weeks or months ago, it is likely that he or she would actually remember very little of what was happening. Much attention must be paid to selecting the appropriate respondents. It is therefore mandatory to select applicants with recent and sufficient experience in the field of circular tenders. In addition, care must be taken to ensure reliable questions since it is difficult to exactly repeat a focused interview. This means that respondents should be asked the same and non-standardized questions. This can occur in particular when the interviewer gives out unconscious signals or cues that guide respondents expected by the interviewer.

7.1.2 Interview participants

Constructivist grounded theory prompts the researcher to look for data where they are likely to find it (Charmaz, 2014). For this third data collection, the participants were therefore purposive selected carefully according to their expertise over the years and position in the company they work for. The criteria imposed on the participants is that they have, logically, experience and knowledge of circularity in relation to construction projects. The inclusion of criteria for the selection of participants was that they:

- Operates a profession from a(n) I) contractor, II) government, III) advisor or IV) lawyer;
- Were familiar with the organization of a tendering process;
- Were willing to participate in at least one interview for the purpose of the study;
- Were willing to allow the interview to be audio-recorded and then transcribed for the purposes of the data analysis.

Since each company often has its own starting points and conditions in the way of setting up and assessing criteria in the selection guideline, it is aimed to select participants from a wide variety of companies and from three different perspectives. Based on the triple helix approach by Etzkowitz & Leydesdorff (2000), in which collaboration is entered into between three or more organizations that share resources, risks, and benefits to realize individual organizational goals, joint cooperation goals and social goals, the interviews are inserted.

To create a holistic view of the tender process of circular construction processes, the interviews are therefore taken from three different perspectives: from the point of view of I) governments, II) consultancy firms (advisors) and III) contractors. A contracting authority like the municipality or government agency sometimes has the knowledge and experience available to compose a selection guideline herself. However, it is more common that these organizations outsource this by engaging a consultancy firm or specialist. For that reason, it is decided to conduct interviews with some advisors as well. The third category is the party who actually has to carry out the work, the constructors. Since the constructors are increasingly being involved at an early stage in the construction process in order to share their knowledge and experience early in the process and to be in constant dialogue with the contracting authority, their added value is becoming increasingly important during the entire process. For this reason, it was decided to add the constructors as a third category to the group of participants. Table 15 provides an overview of the interviews, the interviewees and their category. Because of privacy reasons of the participants, the table is numbered randomly in order to make the data of the participants untraceable.

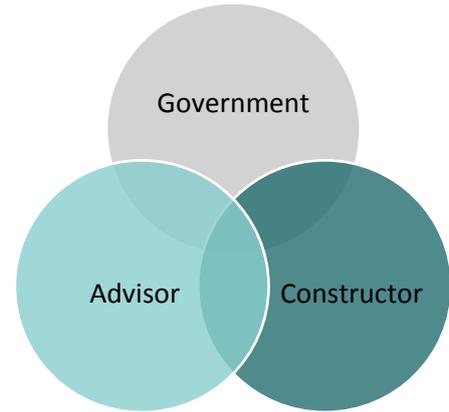


Figure 32: Triple helix interview participants

Table 15: Overview interviewee characteristics

Interview	Interviewee ID	Interviewee	Category
No. 1	P. 1	Jim Teunizen	Advisor
No. 2	P. 2	Jurriën de Jong	Advisor
No. 3	P. 3	Peter Eitjes	Contracting authority: government
No. 4	P. 4	Alexander Hesling	Constructor: installation
No. 5	P. 5	Onno Dwars	Constructor: contractor
No. 6	P. 6	Fanauw Hoppe	Lawyer

The interviewees were approached with help of the company Alba Concepts. In total there have been 7 expert interviews conducted and recorded on location or by phone. Recording the interviews allows the interviewer to capture more than he or she could by relying on memory. The interviewer’s data consist largely, although not exclusively, of words (Taylor et al., 2016). For this reason, it is decided to record all interviews to re-listen the conversations and transcript the dialogue. Further characteristics of the interviewees, such as date, location, category and type of interview can be found in [Appendix 7: List of interview participants](#).

7.1.3 Interview questions

One of the keys to successful interviewing is knowing when and how to probe. Asking appropriate questions during academic interviews is essential in that it allows the interviewer to collect the right data for research. There are a number of questions that can be posed at a meeting with participants that will provide a guiding procedure for the interview. As Taylor et al. (2016) noted, the general strategy of qualitative interviewing can be described as follows: ask open-ended, descriptive questions about general topics; wait for people to talk about meaningful experiences in their lives or what is important from their points of view; probe for details and specific descriptions of their experiences and perspectives. It is essential that interview questions “be carefully formulated to ensure that participants are given maximum opportunity to present events and phenomena in their own terms

and to follow agendas of their own choosing” (MacDonald, 2012). Furthermore, since many past events lay hidden deep within a person’s memory and remote from daily life, the interviewer should come up with questions that will help jar a person’s memory. The interview guide is a common method that serves to remind the interviewer to ask about certain things. Harvard (2016) poses certain guidelines for developing interview questions:

- Questions should be simple. Do not ask more than one question at a time.
- The best questions are those which elicit the longest answers from the participants and avoid questions that can be answered with one word;
- Do not ask questions that require the participants to do an analysis that would be the interviewer’s job;
- Likewise, do not ask for hearsay or opinions on behalf of the group they are a part of “What do people around here think of x?” Rarely anything interesting is gained from that;
- Don’t be afraid to ask embarrassing questions. If you don’t ask, they won’t tell (Harvard, 2016).

Before a first question is asked, the interviewer must lay the basis for the conversation on the basis of an introduction. This ensures that the participant receives a clear and complete picture of the interviewer and for which purpose the interview is held. In addition, it is useful for the course of the interview to provide a pleasant atmosphere. This pleasant atmosphere can be continued through the first question, which should be answered easily by the participant and thus will make the rest of the interview flow more smoothly. During the entire interview, there must be a logical flow of questions. After the ‘warming-up’ question, the core of the interview takes place in which “why” questions should establish a general focus for the investigator and stakeholders, reminding everyone what the purpose of the study originally was (De Swart, 2018). The remaining questions - what, how, who, where and when - enable participants to identify associated influences (Stringer, 1999). The last question should provide some closure for the interview, and leave the respondent feeling empowered, listened to, or otherwise glad that they talked to you (Harvard, 2016).

The interview is separated into two parts and is set up according to the structure just described. After a short introduction about the research topic, the purpose of the interview and seeking permission to record the conversation, the questions start with one that serves as a relevant conversation starter, where the interviewee is asked to give some information about him/herself, the company he/she worked for and what projects with a circular approach he/she is recently be involved. Since the literature study has shown that people do not observe the concept of CE in a uniform manner, Part I of the interview focusses on defining the circular economy in general and in relation to the construction sector. These questions, therefore, are about the interviewee’s opinion about the CE in relation to the construction sector and who is responsible for the implementation of the CE in the construction sector. On the basis of a smooth transition, Part 1 will be transferred to Part 2, which will focus on the different phases of a circular tender. The goal of the second part of the interview is to validate the findings of the literature study together with some potentially new insight and to define statements that will serve as input for the profile model. The following questions are about the tender process in general in which the selection and award phase are extensively discussed. The second part of the interview, therefore, contains a set of questions that are used to guide the interview towards a comprehensive view on how to specify the selection and award criteria of a circular construction process. The interview questions can be found in [Appendix 8: Interview Questions](#) (both English and Dutch version; which was used in all the interviews).

A pilot interview with a colleague from Alba Concepts was conducted to test interview questions and provide further interviewing practice. The participant of the pilot study was chosen according to the

pre-set criteria. Conducting the pilot interview allowed the researcher to receive feedback on interviewing skills and the interview format. After the pilot interview, some new questions were added to the protocol while others were sharpened.

7.1.4 Transcribing and Coding

The goal of the interviews is to validate the findings from the literature study, in which the subdivision of the selection and award criteria were defined, to give further substance to this subdivision and to define statements that serve as input for the profile model.

The results of the interviews are analyzed in three steps. First, the recordings are used for transcribing, where the conversation with the interviewee is literally copied into paper, without changing any words, grammar or content (University of Leicester, 2012). Transcribing the interviews helps to counter accusations that an analysis might have been influenced by a researcher's values or biases (Harvard, 2016). Since interviews have some specific purpose, it is necessary to store the responses in a relevant, usable, and accessible form to fulfill this purpose (Gordon, 1992). After the interviews were copied into paper, most controversial sentences are highlighted. By means of coding, it is attempted to find repetitive patterns in the answers of the participants. A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data (Strauss, 1987). Because each person often has different interpretations due to own experiences and thoughts, it is examined whether similar words or patterns can be found in the coding. Strauss (1987) noted that when a researcher search for patterns in coded data to categorize them, he should understand that sometimes he may group things together not just because they are exactly alike or very much alike, but because they might also have something in common – even if, paradoxically, that commonality consists of differences. The method of coding is thus relatively open to a researcher and attention must be paid to avoid an array of similar codes. Sometimes it makes more sense to code multiple things under the same group instead of making individual coding for each individual thing. To validate whether the criteria can be subdivided into the three aforementioned categories for both selection and awarding, the following set-up is compiled. After the interviews were translated into words and most controversial sentences were highlighted, a comprehensive table has been developed for the analysis of the interviews ([Appendix 9: Interview analysis](#)). This table represents the interviewer's ID, the highlighted sentences (as copied from the transcription), the statements (as formulated on the basis of the copied sentence) and the open code. Each row is specified with its own identical statement ID code. Coding the interviews has resulted in a total number of 175 statements, which are subdivided into six categories (Table 16).

Table 16: Interview coding classification

Statement ID	Aspect
S1.1 – S1.40	Circular construction
S2.1 – S2.30	The (circular) tender process
S3.1 – S3.10	Dialogue phase
S4.1 – S4.3	Suitability requirements
S5.1 – S5.31	Selection criteria
S6.1 – S6.53	Award criteria

[Appendix 9: Interview analysis](#) represents the overall table as derived from the interviews and which serves as the basis for the interview analysis.

7.2 The results

The overall table serves as input for the validation of the subdivision of both the selection and award criteria into categories and for defining the statements that serve as input for the profile model.

7.2.1 Selection criteria

The data gained from the interviews with regard to the selection criteria are categorized into the following open codes: vision, references and business operation. From the overall table, all statements with the abovementioned codes are combined into Table 17.

Table 17 shows that all three categories are mentioned several times within the interviews. However, the frequency of the number of codes that occurs in the interviews is not the only important aspect of the validation. After all, if one interviewer repeatedly returns a specific code, this does not automatically confirm that the data has been validated. More important in the validation is the distribution of the codes among the various interviewees confirms whether the coding is shared by several. Figure 33 represents the distribution of the statements for the selection categories. All interviewees agreed that requesting for a vision and references should be included in the selection guideline. 'Tenderers can be selected on the basis of a vision document in the further selection criteria', 'on the basis of a vision, it can be examined which tenderers are open to change' and 'by means of a vision, it can be checked whether a tenderer is suitable' are some examples of how the interviewees view the inclusion of a request for a vision in the selection guideline.

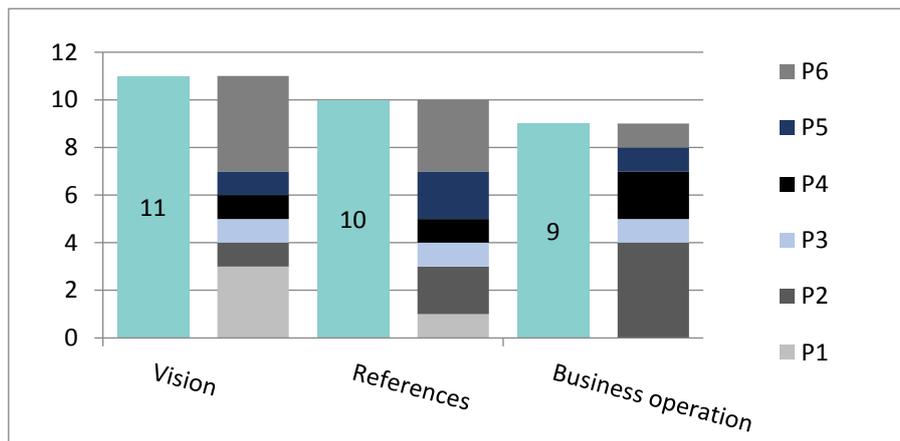


Figure 33: Overview of the selection criteria per category derived from the interviews

The majority of the interviewees mentioned that requesting for the level of sustainability and/or circularity in the own business operation of the tenderer an interesting way to find out to what extent the tenders are actually engaged with circularity themselves. Only one interviewee does not recommend to include this category specifically in the criteria because one does not necessarily exclude the other. There may be several reasons for the fact that a tenderer does not include circularity in his own organization, while he may have gained a lot of experience regarding circularity. Not enough capacity or financial resources are two examples of this. The interviewer, therefore, advises being cautious about including criteria regarding the company's own business operations.

Table 17: Selection categories per interviewee

	Vision	References	Business operation
P ₁	S5.2, S5.3, S6.4	S5.1,	
P ₂	S5.5	S4.1, S5.5	S5.4, S5.5, S5.6, S5.7
P ₃	S5.10	S5.8,	S5.9
P ₄	S5.11	S5.12	S5.13, S5.14
P ₅	S5.16	S5.15, S5.19	S5.21
P ₆	SS5.22, S5.23, S5.29, S5.30	S5.25, S5.26, S5.29	S5.24

In summary, all interviewees recommend to test the ambitions and experiences of the tenderers on the basis of a vision and references. In addition, six of the seven interviewees indicated that they are very positive about requesting for own business operations within the selection criteria. In the remainder of this paragraph, the findings per category are explained in more detail.

7.2.1.1 Requesting for a vision

The literature study has shown that the step from x to 5 tenderers is not only based on suitability requirements and grounds for exclusion, but also on the basis of a vision document within the selection criteria. In this document, the tenderers should show how they have thought about the combination of sustainability, circularity, partnership, collaboration and/or financial aspects (P₁, P₂, P₃, P₄, P₅, P₆). Despite the fact that the contracting authority can give its own interpretation to the aspects on which a vision is being requested, three aspects are repeatedly mentioned in the interviews: sustainability (including circularity), collaboration and partnership, and a vision on the form of financing (the business model). Since circularity is of course quite new for most market parties, on the basis of visions it can be examined which market parties are open to changes (P₄). The vision consists of the most important building blocks for a circular building project (P₅). So by means of a (short) vision, the contracting authority can ask and feel whether a tenderer is suitable (P₆).

7.2.1.2 Requesting for references

The selection phase also takes place on the basis of the assessment of experience, focused on collaboration, partnership, sustainability, and/or financial aspects and in which it can be demonstrated, for example, by references, whether the tenderer is competent (P₁, P₂). The selection is increasingly based on the type of parties. Innovative and circular projects usually require an initiator who is open to change and has the quality to stimulate others in the project. These are generally people who already have more experience and who have already encountered the impossibilities a few times.

The demonstration of experience is now often done on the basis of reference projects (P₂, P₄, P₅). What has a tenderer done before? What are his experience and knowledge? In traditional projects, this usually takes place on the basis of references. In the area of circularity, many parties have hardly any references (P₁, P₃, P₅, P₆). It should, therefore, be measured in a different way. It could be investigated whether a party is (or was) innovative enough and whether he can demonstrate with references that he has been innovating. In addition, the parties must, for example, receive the incentive that it will be a great project that may be used as a reference for the future. The tenderer must be just as proud of the project as the contracting authority (P₅, P₆). In the request for references, therefore, the balance must always be found between market exclusion and the stimulation of tenderers to actually start working and be openminded with circularity.

7.2.1.3 Requesting business operation

The majority of the interviewees indicated that they had thought to a limited extent about requirements related to the company's own business operations. When looking at the quality of the tender's company, criteria can also be set to what extent circularity is included in the company itself: in business operations (P2, P3, P4, P5, P6). Not only on the basis of a vision and references but on the basis of current achievements within the tenderers' own organization. For example, the tenderer can demonstrate whether and how they recycle materials and whether they handle raw materials carefully (P2). So, how does the organization view circularity? How did the tenderer include this in their own company? The selection should not only be on the basis of visions and references but also requesting current achievements (P2, P3, P4, P5, P6). In concrete terms, a requirement can be set for the degree to which the business operations are circular, the quality of their own organization. A second aspect within the business operation category could be requesting for some specific sustainability or circularity certificates (P2, P3, P5, P6) to which the tender should comply with. In recent years, a large number of certificates have been available that appeal to sustainability and circularity, such as ISO 14001, Cradle-2-Cradle and Environmental Product Declaration.

7.2.2 Award criteria

The data gained from the interviews are also used to verify the finding of the literature study with regard to the subdivision and completion of the award criteria. The literature has shown that the award criteria could be subdivided into three categories within the quality aspect: technical-content, process-based and financial-economic. For example, performance formulations and giving further explanation of the design are technical aspects. The process-based category is mainly about writing a Plan of Action on various topics while the financial-economic category often has to do with the future value and giving substance to a new (circular) business model. Because, for example, energy is directly related to the technical aspect within the award criteria, this has been taken into account with the elaboration of the codes. So suppose that a statement refers to the inclusion of energy aspects in the award phase, in the coding the link is made to the technical content category. This is explained with reference to the following example. Interviewee P2 stated that *in the award criteria a request must be included with regard to the material origin* (S48). In other words, this interviewee says that within the award criteria an element must be included in the request that relates to the origin of the materials included in the design. A request that relates to the origin of materials is a technical aspect and will, therefore, be included in the verification of the technical-content category. The same applies, for example, to the request for collaboration or partnership aspects within the process-based category. Table 18 provides all statements that in some way has to do with the technical-content, process-based or financial-economic category.

Table 18 shows that all three categories were discussed several times during the interviews. When looking at the distribution of the three categories among the different interviewees, the theoretical findings are confirmed here as well. Each interviewee identifies several aspects that fall under different categories (Figure 34). In addition, the majority of the interviewees mentioned literally the three categories before a subdivision of the award criteria was requested. The other interviewee confirms this subdivision spread over the interview.

Table 18: Overview of award categories per interviewee

	Technical-content	Process-based	Financial-economic
P ₁	S6.6	S1.6, S6.1, S6.2	S6.1, S6.3
P ₂	S6.13, S6.14, S6.16, S6.16, S6.19, S6.21	S6.18	S6.17, S6.20
P ₃	S6.24, S6.28	S6.24, S6.26, S6.27, S6.29	S6.24,
P ₄	S6.32, S2.14, S2.15	S6.32, S6.33	S6.34,
P ₅	S6.38, S6.42, S6.46	S6.40	S1.31
P ₆	S5.30, S6.53, S6.54	S1.38, S6.53, S6.54	S6.53, S6.58, S6.59

Figure 34 confirms that indeed all individual interviewees spoke in some way about the three categories. It shows that most often is discussed about aspects that fall under the technical content category. To a lesser extent, the process-based and financial categories were addressed. However, the figure shows that all interviewees agree that the specific aspects of the request can be divided into one of the three categories. In the remainder of this paragraph, the findings per category are explained in more detail.

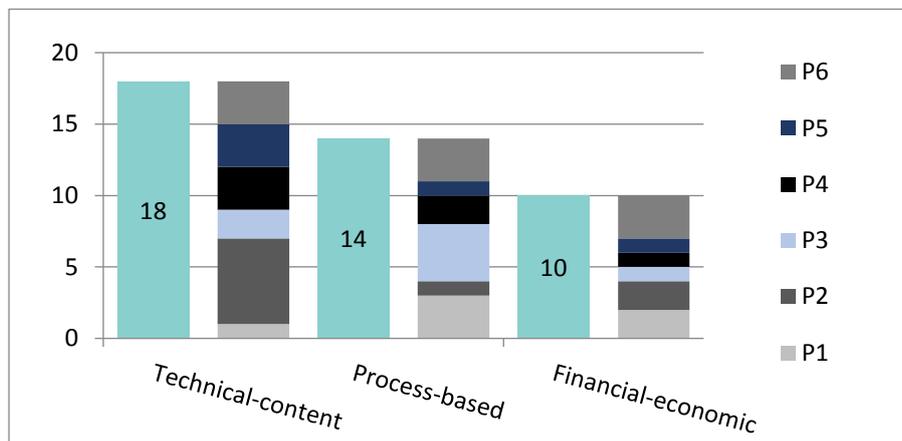


Figure 34: Overview of the award criteria per category derived from the interviews

7.2.2.1 Technical-content category

In the award phase, the promises of the tenderer become more and more concrete: from project level to product level, depending on what is being put out to tender. In principle, it does not matter which specific aspect within the technical content category is involved, if only to a certain extent it is made concrete and measurable. The most important of the award phase is, therefore, the question: how can you make it measurable (P2, P3, P4, P5, P6)? For raw materials, this could be done, for example, by asking how many percents of the materials is reused. But a calculation can also be made of energy management. What is the energy saving, for example? In addition, there is also the living and working comfort. This could be done, for example, on the basis of a WELL certification. Where BREEAM is more focused on sustainability, WELL looks more at, for example, the working environment within the building (P6). That might also be an instrument to make it more measurable.

However, making it measurable requires a great deal of expertise from both contracting authority and tenderers. The problem is that contracting authorities often cuts down on this. A contracting authority usually doesn't have enough or the right knowledge, which means that it has to be turned on by an external agency. This is very valuable and costs money. Furthermore, it is crucial that what is requested is also actually tested. What is often lacking in circular tenders now is that no monitoring

and/or checks take place. In the selection criteria, tenderers are often asked to describe how circular they are, but afterward it is not asked how these ambitions can be safeguarded or realized (P5). Tenderers can be promised at the front of everything because in practice this is almost never tested (P5, P6).

In the award phase, criteria should be included in the request that is of quantitative nature (P2, P3, P4, P5, P6). In this way, circularity can be made measurable and compared black on white with the others. In recent years, Alba Concepts has developed the Building Circularity Indicator (BCI) for this. The BCI is a model in which 4 steps determine the level of circularity of a building. A good score in this model strongly depends on the level of disassembly of connections and elements within the design. The BCI can be seen as an innovative and progressive model to make circularity measurable (P2, P3, P4). If all tenderer calculates the BCI of their design, the degree of circularity can be compared objectively. For example, a tenderer can demonstrate how a BCI of 0.7 could be achieved (P2, P3). Does the tenderer already have experience with this? In this way, a contracting authority can select from parties that already have experience with circularity, working with circular materials or releasable materials. In this way, it is possible to filter to a top 5 and then select the tenderer with the best plan, the best cooperation, the best process description, and so on. However, it does not mean that the contracting authority already has certainty that the required ambitions will be met during this phase of a tender, but they will have the most optimal solution (P6). A turning point of the BCI is that on the basis of only a structure design, the BCI can't be calculated, yet. It requires at least a preliminary design. A disadvantage of the BCI is that the process must be so advanced that there must be drawings with which the BCI can be calculated. However, aspects in the request can be included that relate to the disassembly of building components. Describing the level of disassembly, a tenderer should look at the detailing of the building, for example how the façade is connected to the floor.

In addition, requirements can be included in the request that asks for an approach to material usage or the way in which the energy is management (P1, P2, P3, P4, P5, P6). Interviewee P5 noticed that in a renovation project in which they were recently involved, the demolition work was carried out so carefully that the maximum reuse of materials had taken place. For this, agreements were made in close consultation with a specialist company about separating materials. Related to this is the possible introduction of market places for materials, such as Madaster (P4, P5). Thirdly, the choice of materials within the project can already be taken into account in the design process. For example, can the use of hazardous and/or polluting materials be dispensed with?

7.2.2.2 Process-based category

In the award criteria, cooperation and partnership is an important aspect to be included in the criteria. After all, it is the team that makes the project. Are the parties looking for creativity or do they always use the standard collaborations? It would be best if the parties were really looking for creativity. The search for creativity means that it is not always chosen for the standard collaborations, but that the right parties that are suitable for the specific assignment are sought. In practice, however, you see that the same parties always cooperate with each other because they have experience with each other (P2, P5, P6). The question here is whether they continue to challenge each other sufficiently. Tenderer must, therefore, be much more open to new parties. It has become much more of a network society in which parties have to work far more with other parties in order to eventually reach an even higher level. It is precisely the small parties that, for example, specialize in a specific subject and that can take you a step further, is very important.

A second aspect that was mentioned during the interviews was about the maintenance of the project (P1, P2, P3). Although the theme of maintenance is often pushed aside in tender documents, an integrated idea has to be created in which everyone thinks together with each other, the partners

(P1). The management costs and maintenance costs are often the neglected child (P3). In addition, interviewee 4 mentioned that disassembly is connected to maintenance since it can lead to lower maintenance costs during operation because elements can be removed from the building more easily when they have to be replaced (P2).

In addition, there is the opportunities proposal document, on which the most important opportunities and risks can be discussed (P3, P6). How do the parties intend to achieve their objectives? For example, how does the party view phasing? Therefore, a contracting authority should draw up a opportunity document on which tenderers can react and to tell how these opportunities can best be reached best (P3).

Aspects within the process-based category are usually asked by writing a Plan of Action about the specific topic (P1, P3, P5, P6). In addition, the Plan of Action can be used to refer to the process proposal of the tenderer, in which most important opportunities and risks can be discussed.

The interviews also show that within the process category a social aspect can be included that can be included in the request (P1, P2, P5). In order to set up a circular project, it usually concerns the reuse of materials and products. To find reused materials is quite difficult. The search for the right materials, products, and raw materials can be done by people with a disadvantage in the labor market. Jobs can be created. But requirements can also be set in the social-economic field. For example, stimulate local entrepreneurship by purchasing raw materials, materials, and products in the immediate vicinity of the project. In addition, the social level goes hand in hand with historical value. Every place or location has built something up, both culturally and historically (P6). In some cases, circularity means that certain elements within a project are not lost, but rather come back. This can also be seen as a form of reuse.

7.2.2.3 Financial-economic category

The financial-economic aspect is basically about formulating the future value (P1) of the elements and materials within the project. Future value is an incredibly broad concept and has many aspects. During the interrogation, it is the art to keep this consciously wide so that integral considerations take place. If the focus is only on a limited number of these aspects, the chance of an integral picture is limited. In the ideal circular tender, the entire economic model should, therefore, be redesigned (P2, P3, P5, P6).

Bringing financial benefit of a circular building into the award criteria is difficult since it is difficult to determine in advance what the financial income and expenses will be (P2, P3, P6). A starting point of the circular economy is that products have a residual value after their first use phase because of the reuse of the product and the components or materials used. The tenderer can therefore be asked which (financial) possibilities he sees to have the residual value (partially) benefit the user (P5, P6). However, interviewee 4 states that in his opinion, a product only has (residual) value when it can be (easily) detached and can be used again. In the area of financial economics, a requirement can be included based on the residual value (P2). This means that no award is made on the basis of price but on the most favorable net cash value. The problem with the financial aspect is that contracting authorities usually think from short-term reasoning, the investment.

But in the end, a TCO calculation should be made to see what it means for the long term (P5). When looking specifically at the investment, the implementation of circularity is very costly. But when these costs are spread over time, the costs supplement relatively. This is often not done because there is a short-term idea. Suppose that there is too little budget, it is recommended, for example, to calculate the lifespan and cost savings that are made over time so that the investment made at the front can

be somewhat higher (P6). In general, contracting authorities look at how much budget there is to build something, not how much do I need from the TCO. The trick is to get the TCO model into the tendering process, regardless of circularity. Although it is connected with circularity, since it has to do with energy saving, sustainability, product, maintenance costs, lifespan, etc. (P3).

Another aspect that was mentioned during the interviews was about the environmental impact of materials and products. A contracting authority can steer or draw up requirements regarding the process of purchasing the product and materials (P2) to stimulate the circular use of (sustainable) materials (P3). This is not necessarily something new, there are various indicators in the market to quantify the degree of environmental impact of used products. In practice, some contracting authorities set requirements for the purchasing process in order to stimulate the use of sustainable and circular materials. The value of socially responsible purchasing is in the long term, aimed at increasing the positive environmental impact (P5). In line with the sustainable and circular purchase of material and product, are the environment performance indicators. Through these indicators, the costs that should be incurred, if the negative environmental impact of the product should be avoided with regular solutions, can be mapped out (P2, P4). Interviewee P5 and P6 state that, in their opinion, requesting for environmental performance indicators are too little extend in practice since the score directly indicates the extent of the environmental impact. The Total Costs of Ownership (TCO), residual value, performance indicators but also the way in which product are purchased are aspects that can and should be requested in the award criteria under the technical-economic category.

7.2.2.4 Price

Another aspect that was discussed during the interviews has to do with the price component. As explained in [Section 3.1.2.3 Awarding phase](#), the MEAT method consists of a quality and a price component. The three aforementioned categories are covered by the quality component. The price component must be considered separately from the quality. Within each project, it is important to determine the right balance between quality and price. An important shift between traditional and circular tendering can be found in the weighing of the price component (P3). All interviewees agree with the fact that the price component should become less dominant in a circular tender. If a contracting authority places high demands on circularity or sustainability, it is important to determine how this relates to the price. Contracting authorities can have a very ambition level with regard to quality and sustainability or circularity, but that is accompanied by a certain amount. Therefore, a well-considered choice must always be made in the weighing of both price and quality.

According to the theory, tendering with a so-called ceiling price is gaining more and more ground in the construction sector ([Section 3.1.2.3 Awarding phase](#)). A ceiling price is nothing more than a contracting authority giving a maximum amount in the tender request that may not be exceeded. Contracting authorities, and especially governments, often have a certain budget reserved for a project. The budget is determined at the beginning of the project, from which the design is implemented. It is still up for discussion whether or not to include a ceiling amount within the price component of the request for tender. The interviews show that the opinions are divided about whether or not giving a ceiling amount.

Opponents argue that the creativity and freedom of the market are losing ground because too much is directed at finding a suitable solution within the pre-set budget (P1, P4). A frequently recurring argument is that constructions such as ceiling prices make all kinds of initiatives impossible that would really help to achieve the goals (P1, P4). The creativity and level of innovativeness of the tenderers could get constrained. So when there is a request with a ceiling amount, there is often a very detailed description of what is demanded (P4). Proponents, on the other hand, argue that because governments, in particular, are often tied to a certain budget, time and costs are not unnecessary be

lost on ambitions that are never feasible with the current budget (P2, P3, P5). The ceiling amount thus determines how much space there is to offer opportunities. After all, it makes little sense to offer opportunities that the contracting authority can't afford.

The interviews have shown that whether or not to give ceiling amounts in the request is dependent on the circular ambitions of the contracting authority. High ambitions are accompanied by higher costs, logically. Even when a contracting authority is limited by a budget, circular ambitions can be set. A ceiling amount can be given, provided that they are equivalent to the circular ambition of the contracting authority. If there are too high ambitions from the contracting authority together with an unrealistic maximum amount, tenderers will logically not go into the tender.

7.2.3 Conclusion

The expert interviews confirmed that both selection and award criteria can be subdivided into the three categories as derived from the literature. Firstly, it turns out that within the selection criteria, a balance must be found between market connection and the stimulation of tenderers to actually start working with circularity. Therefore, it is important that the contracting authority has its own clear vision of circularity and all aspects that are linked to it. This own vision must be formulated in the request and serves as a stepping-stone on which the tenderers can base their ambitions and visions. This also immediately creates an objective assess method for the contracting authority. How progressive are the parties? Do the parties meet the client's ambitions? Are there even parties that exceed the ambitions? The interviews have confirmed that besides the request for the tenderer's vision (which deals with the sustainability, collaboration/partnership or financial future plans), the selection criteria consist of the request for references. The contracting authority may, for example, attaches more value to achieved results or experience instead of the ambition level of a tenderer. By means of requesting references, a contracting authority can test whether a tenderer meets certain requirements. Again, this really depends on the contracting authorities own ambitions and personal preferences. Finally, the contracting authority should request for the tenderer's business operation. To what extent is circularity actually included in the tenderer's own organization? The degree of circular appearance of the tenderer's organization can suggest whether the tenderer has experience or ambitions about circularity. However, it is advisable to be cautious in request for the business operations, since there may be several reasons that a tenderer does not include circularity in his own organization, while he may have gained a lot of experience regarding circularity.

Secondly, the expert interviews confirmed that the award criteria can be subdivided into I) technical-content, II) process-based, and III) financial-economic categories. The technical-content is mainly about making the promises more concrete by means quantitative aspects. The concept of measurability plays a crucial role here. It is very valuable when a tenderer can prove his promises on the basis of measurement facts. Because circularity is still a vague and unambiguous concept, it is difficult to objectively assess the criteria that are based only on the tenderer's ambitions and promises. If a tenderer can demonstrate with measurable facts that he is able to meet the stated ambitions or to guarantee that he can achieve a certain degree of circularity, this can, of course, be assessed objectively. In practice, it turns out that it is still very difficult to make circularity more measurable. Various construction related elements such as (raw) materials (re)use, energy management, and living and working comfort are already be made measurable. However, in practice, it appears that it is still very difficult to make the total picture around circularity more measurable. A model that Alba Concepts has developed in recent years is the Building Circularity Indicator (BCI). The BCI is an assessment model to calculate the circular potential of a building. Methods and models for making circularity more measurable, like the BCI, have gained ground in recent years. As the developments continue, it is expected that in the coming years it will become increasingly common to include

quantitative criteria in the award phase. The second category, the process-based, is mainly about writing a plan of approach, in particular on collaborative partnership. The interviews show that, in addition, criteria could be requested about social aspects, like social return. For example, stimulate local entrepreneurship by purchasing raw materials, materials, and products in the immediate vicinity of the project. In the area of financial economics, criteria can be included based on the residual value, the total costs of ownership, or socially responsible purchasing.

Furthermore, the study shows that a contracting authority must not be too reticent in the request and it should not be feared that too few parties register. If a contracting authority considers circularity to be important, then it must be accepted that some parties do not register because they do not have sufficient knowledge. The most important aspect here is that a contracting authority always departs from its own ambitions and is not guided too much by what is available in the market. Therefore, a contracting authority must clearly define its own ambitions in the tender.

8 Results

8.1 Comparing the three studies

The information gathered for the research was collected from different angles by means of three different type of studies. The goal of this holistic research method was to investigate whether and how the theory differs from the practice looking at the assessment criteria within circular tenders.

First, an in-depth literature study was conducted in order to investigate the ideal theoretical situation of how both selection and award criteria could be classified and specified for circular tenders. This theoretical study was mainly based upon two recent studies (Van Oppen et al., 2018; Van Haagen, 2018) and provides some first interesting findings in the division and interpretation of the selection and award criteria. The most interesting finding in this study was the classification of both selection and award criteria. Van Oppen et al. (2018) states in their research that looking at the circular economy, three aspects need to be changed: technical, organizational and financial. They have translated these aspects into the so-called IPF-model, which forms the trinity of the circular economy. This trinity is all-encompassing and is therefore taken as the starting point for the classification of the award criteria since these criteria are related to the *assignment*. This means that the award criteria can be categorized under technical-content, process-based and financial-economic categories. Within the award guideline of the tender, at least one aspect per categories must be implemented in order to guarantee a proper request. In the selection procedure, tenderers are selected for the next phase of a circular tender on the basis of selection criteria. Van Oppen et al. (2018) and Van Haagen (2018) both recommend that this selection must be made on the basis of a vision regarding circularity and explicitly include circularity as one of the assessment aspects of references. In this way, both the ambitions and the experiences regarding circularity of tenders can be requested.

Secondly, by means of an in-depth practical study in which 29 published tender documents were analyzed, is investigated to what extend the practice confirms and is connected to the theory. Basically, two types of aspects were requested in the selection guidelines. All analyzed selection guidelines asks for a tenderers vision on certain aspects and the majority of the documents asks for the tenderers experience by requesting references. Visions and references related to subjects like sustainability, circularity, collaboration and partnership were requested. Which of the two categories or in what proportion the two categories should be requested depends strongly on the contracting authority's own ambitions. The question whether the contracting authority attaches particular value to the ambitions *or* experience of the tenderer is the key question here. To summarize, the practical study confirmed that requesting for a tenderers vision and references is a common method to assess

the degree of ambitions and experiences. In contrast, in practice, there is no clear subdivision between the categories present in the award guidelines, as defined in the theory. Although subjects are requested that can be classified under the categories, there is no clear distribution between the categories within the investigated documents. In order to draw up a complete tender, at least one aspect of all three categories must be included. The practical study indicates that this is hardly applicable right now. The majority of the award criteria focusses on technical-content aspects, like energy, flexibility, (raw) material (re)use and concretizing the stated circular ambitions. In addition to these qualitative criteria, also some quantitative criteria focusing on the measurability and level of disassembly came forward. To a lesser extent, criteria are set that are based on process-based aspects. Most of the process-based aspects deal with collaboration, opportunities and improvement proposals. In addition, it appears that in practice it is still very unusual to request for financial aspects, whereas this is strongly recommended from the literature. Since circularity in the construction sector is mainly about creating future value, including financial and economic aspects in the award guidelines makes it possible to steer and ask for the long-term vision of the tenderers.

The third research was conducted through expert interviews with (relevant) experience from the field. Since selection criteria are mainly about obtaining information about the *tenderer*, criteria should be set, in addition to requesting for ambitions and experiences, that indicates the quality of the company itself. Looking at the quality of the company, criteria can be set to determine the extent to which circularity is included in the company itself, for example, the organization of the business operations. So, the selection categories should not only be based on a vision and references, but also on the basis of current achievements or certificates. In concrete terms, a criterion can be set for the degree to which the tenderer's business operations are circular. Table 19 provides an overview of the selection criteria categories and their sub-criteria as derived from the three studies.

Table 19: Overview of the selection criteria classification outcomes

Main categories	Number of participants/studies endorsing theory		
	Theoretical study	Practical study (6)	Field study (6)
SC 1 Request for a vision	(Van Haagen, 2018; Van Oppen et al., 2018)	5	6
SC 1.1 Sustainability: circularity	(Van Haagen, 2018; Van Oppen et al., 2018)	3	6
SC 1.2 Collaboration and partnership	(Witjes & Lozano, 2016; Van Haagen, 2018; Van Oppen et al., 2018; Loppies, 2015)	3	6
SC 1.3 Revenue/financing model	0	0	3
SC 2 Request for references	(Van Haagen, 2018; Van Oppen et al., 2018; Veenen, 2018)	4	6
SC 2.1 Sustainability: circularity	(Van Haagen, 2018)	5	4
SC 2.2 Collaboration and partnership	(Van Oppen et al., 2018)	2	4
SC 2.3 Revenue/financing model	0	0	2
SC 3 Request for business operation	(Van Oppen et al., 2018)	2	6
SC 3.1 Certificates	0	2	4
SC 3.2 Organization	(Van Oppen et al., 2018; Doornewaard, 2017; Witjes & Lozano, 2016; Yosie, 2017)	0	5

Comparing the three studies show that the field study results in some new insight regarding the interpretation of all three categories resulting in the addition of one sub-criteria in each category. Since circular construction is related to a relative new form of business models, requesting for some first ideas about the revenue or financing model is suggested by some interviewees. In addition, some interviewees dare to go one step further by requesting for references regarding this new form of circular business model. However, this should be handled with a little caution, since in this way premature parties can be excluded as it is such a new process. The final conclusion is that everything

depends on the ambition level of the contracting authority. Additional to the organization sub-criteria in the request for business operation category, the field study shows that there could be requested for some specific sustainability or circularity certificates to which the tender should comply with. Overall can be concluded that comparing the three studies, no major differences can be found within the selection criteria categories. Compared to the literature and practical studies, the field study has led to the validation and a limited number of additions to the current criteria (categories).

In addition to the validation of selection criteria classification, the field study also leads to some new insight regarding the award criteria within the process-based and financial-economic categories. Table 20 shows that the field study did not lead to new insights on a technical-substantive level but, more interesting are the findings concerning the interpretation of the process-based and financial-economic category.

Table 20: Overview of the award criteria classification outcomes

Main categories	Number of participants/studies endorsing theory		
	Theoretical study	Practical study (29)	Field study (6)
AC 1 Technical-content category	(Van Haagen, 2018; Van Oppen et al., 2018)	29	6
AC 1.1 Energy reduction	(Korhonen et al., 2018; Tomić & Schneider, 2018)	24	6
AC 1.2 Flexibility and adaptability	(Cheshire, 2016)	8	3
AC 1.3 (raw) material (re)use	(Van Haagen, 2018; Van Oppen et al., 2018; Castelein, 2018; Korhonen et al., 2018; Loppies, 2015; Cheshire, 2016)	21	6
AC 1.4 Measurability	(Verberne, 2016; Van Vliet, 2018)	2	5
AC 1.5 Design for disassembly	(Verberne, 2016; Van Vliet, 2018; Cheshire, 2016)	6	4
AC 2 Process-based category	(Van Haagen, 2018; Van Oppen et al., 2018)		6
AC 2.1 Collaboration and partnership	(Van Haagen, 2018; Van Oppen et al., 2018; Cheshire, 2016; Loppies, 2015)	14	6
AC 2.2 Environmental management	(Van Haagen, 2018)	9	3
AC 2.3 Opportunities and improvement proposal	(Van Haagen, 2018)	8	2
AC 2.4 Maintenance	0	7	3
AC 2.5 Social return	(Van Oppen et al., 2018; PIANOo, 2018)	3	3
AC 3 Financial-economic category	(Van Haagen, 2018; Van Oppen et al., 2018)		6
AC 3.1 Total Cost of Ownership (TCO)	(Van Haagen, 2018; Van Oppen et al., 2018)	0	4
AC 3.2 Residual value	(Van Haagen, 2018; Van Oppen et al., 2018)	0	5
AC 3.3 Socially responsible purchasing	(Van Oppen et al., 2018; PIANOo, 2018)	4	5
AC 3.4 Environmental Performance Indicator	0	2	4

Within the process-based category, in addition to sub-criteria such as cooperation, environmental management, and opportunities, criteria can also be set relating to maintenance and on a social level. For example, local entrepreneurship can be stimulated by purchasing raw materials, materials and products in the immediate vicinity of the construction site. Criteria could also be set relating to creating more employment for people with a large distance to the labor market: social return. In addition, although this aspect has a slight interface with both technical and financial-economic categories, criteria can be set regarding the maintenance of the building. The degree of disassembly can have a positive effect on the maintenance costs. Furthermore, the field study shows that within the financial-economic category could be requested for criteria that focus on how the tender responds

on creating future value. For example, what options does the tenderer propose regarding the Total Cost of Ownership or residual value? In addition to this, criteria could be set regarding proposing options for the material- and product purchasing process. Socially responsible purchasing and requesting for environmental performance indicators are examples of this.

Combining the outcomes of the three studies results in an overall view on the classification and specification of both selection and award criteria. The results of the studies led to the formulation of the so-called golden triangle for the classification of both the selection and award criteria, Figure 35 and Figure 36. Which category should be requested together the type and amount of sub-criteria that are set up under a certain category depends strongly on the ambition level of the contracting authority.

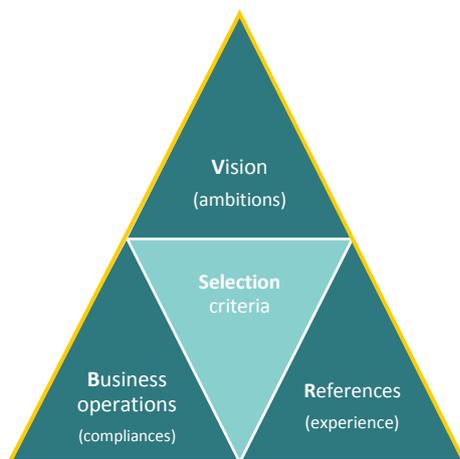


Figure 36: The VBR-model

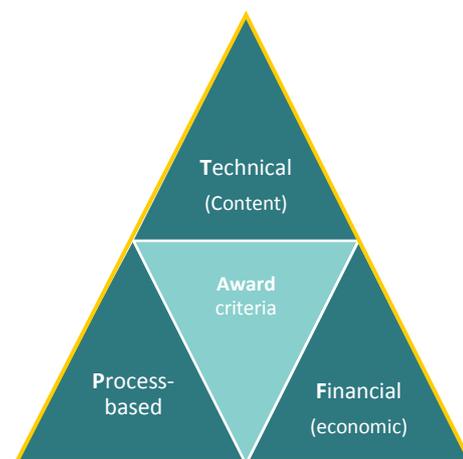


Figure 35: The TPF-model derived from Oppen et al. (2018)

The theoretical and the field study shows that the degree of ambition of the contracting authority has a direct influence on where the focus of both selection and award criteria should be laid. For example, the more ambitious the contracting authority, the more it is recommended to mainly request criteria for providing a vision instead of references or request for business operations. In addition, it could also be possible that the contracting authority values both ambitions and experience as well as the organization of a tenderer. In such a case, the VBR model guides a contracting authority to include sub-criteria in the request that covers all three categories.

In contrast to the selection criteria categories, where not all categories need to be asked necessarily, it is strongly recommended to request at least one criteria from all three categories in the award criteria. In this way, the award guideline is comprehensive and therefore justified. Generally, an award guideline consists of 3 to 5 criteria. This offers the contracting authority the possibility, in addition to the 'mandatory' criterion under each category, to request two (extra) criteria under categories to emphasize their preferences, if desired.

Table 21: Selection criteria categories and aspects

Selection criteria							
SC1: Request for a vision			SC2: Request for references			SC3: Request for business operation	
SC1.1 Sustainability : circularity	SC1.2 Collaboration/ partnership	SC1.3 Revenue/financing model	SC2.1 Sustainability : circularity	SC2.2 Collaboration/ partnership	SC2.3 Revenue/financing model	SC3.1 Certificates	SC3.2 Business organization

Combining the three studies results in a broad view of the interpretation of both the selection and award categories. These findings are translated into two tables (Table 21 and Table 22) that reports for each category the optional aspects on which the criteria could be based.

Table 22: Award criteria categories and aspects

Award Criteria															
Quality (max. 70%)													Price (max. 30%)		
AC1: Technical-content aspect				AC2: Process-based aspect					AC3: Financial-economic aspect				Price		
Performance formulations			Design	Plan of Action					Future value				Ceiling amount		
AC1.2 Energy reduction	AC1.3 Flexibility and adaptability	AC1.4 (raw) material (re)use	AC1.5 Measurability	AC1.6 Design for disassembly	AC2.1 Collaboration/ partnership	AC2.2 Environmental management	AC2.3 Opportunities/ improvement proposal	AC2.4 Maintenance	AC2.5 Social Return	AC3.1 Total Costs of Ownership	AC3.2 Residual value	AC3.3 Socially responsible purchasing	AC3.4 Environmental Performance Indicator	Yes	No

Comparing the three studies show that, in addition to the fact that contracting authorities often have difficulties in defining their motives and drivers for starting circular projects (which are important for defining the criteria), they often make wrong choices due to limited knowledge of the possibilities for including circular elements in their project. In addition, contracting authorities often think with blinkers and do not know that there are even more possibilities, besides the options that they themselves have in mind. In order to cover all possibilities, the results of the three studies regarding the interpretation of both selection and award categories are therefore reported in the above-mentioned tables.

The next step is to trace which criteria is valued as most important by the contracting authority for a specific project. Instead of simply presenting the subdivision of the criteria to the contracting authority, a tool has been developed which is more specific and detailed by sub-criteria as to which the contracting authority's preferences lie. It trace the contracting authority's ambitions before translating them into suitable selection and award criteria. The goal of the profile-model is to clarify the contracting authority's ambitions for implementing circular elements in their tender document. Table 21 and Table 22, therefore, serve directly as a basis for the model, which will be explained more in detail in the [Section 9 A Tool for tracing Circular ambitions](#).

Part FIVE:

THE PROFILE-TOOL

"From drivers and ambitions to requests and results!"

Wouter Roemaat

9 A Tool for tracing Circular ambitions

9.1 Introduction

Comparing the three studies, it turns out that the willingness of implementing circular aspects within construction projects is not necessarily the critical factor why circularity is not really getting off the ground, but rather the lack of knowledge together with the undefined ambitions of the contracting authority to actually draw up a correct request. A growing number of contracting authorities want to include circularity in their project, but often do not have a clear idea of what their own motives and precise ambitions are to actually do this while these motives and ambitions are the basis for drawing up a suitable tender document. This gap between the willingness and actual implementation of circular aspects is the critical factor. In order to make the request as good and fitting as possible for a contracting authority, it is important to know what motivates the client has and therefore also the ambition to tender the project on a circular basis. To fill this gap, a tool has therefore been developed to identify both the main motivation and the contracting authority's ambitions. This tool, the so-called profile model, clearly identifies the contracting authority's ambitions and automatically link the appropriate selection and award criteria in order to fulfill these ambitions during the tender and realization process.

The tool must be used in the preparation phase of the pre-procurement stage of the tender process. As explained in [Section 3.1 The Tender process](#), within the pre-procurement stage, the announcement form, selection guideline and award guideline is set up by or on behalf of the contracting authority. The tool helps a contracting authority to trace and translate their specific and personal ambitions into suitable selection and award criteria. It offers a contracting authority the opportunity for discussion and insight into all possibilities for implementing circular aspects within his building. It is therefore recommended to use the tool at an early stage in the preparation phase in order to save enough time for discussions and further interpretations.

In order to sketch the ambition profile of a contracting authority, the contracting authority must fill in the model, which consists of filling in 10 rounds of statements for determining the selection criteria and 15 rounds of statements for the award criteria. Within each round 3 statements are presented in which a score must be given with a ranking of 1, 2 or 3 points for each statement (3 points = very important/applicable, 2 points = important/applicable and 1 point less important/applicable). Looking at the selection criteria, the statements within each round deals with I) request for vision (ambitions), II) request for references (experiences) and III) request for business operations (compliances). Within the award criteria, each statement within each round is linked to the technical-content category, the process-based category and the financial-economic category. After ranking all statements within each round, the total score will indicate which categories and within the categories which aspects are most important for the contracting authority for a specific project. Does the contracting authority specifically value the achieved results, or is he/she looking for more future-oriented tenderers, or perhaps both? The model provides a full disclosure in this.

The results with the composition and preference of the contracting authority's ambitions are visualized on the basis of both a radar chart and three column charts. Providing the results in a radar chart, it will become clear under which category the principal ambitions of the contracting authority fall. Radar charts, also known as spider charts, polar charts, web charts or star plots, are two-dimensional chart types designed to visualize multivariate data by providing an axis for each variable, arranged radially as qui-angular spokes around a certain point (Nowicki & Merenstein, 2016; Odds, 2011). Radar charts are especially good for visualizing comparisons of quality data. Many attributes can be easily compared each along their own axis, and overall differences are apparent by the size and

shape of the polygons. Figure 37 provides an example of how data can be easily displayed by radar charts.

Each variable is provided with an axis that starts from the center. Looking at defining the selection criteria, this means for the profile model that there are three main variables: vision, references and business operation. These variable are subdivided under the sub-variables as found in the three studies (Section 8.1 Comparing the three studies). The axes are arranged radially, with equal distances between each other, while maintaining the same scale between all axes. Grid lines that connect from axis-to-axis are often used as a guide. Each variable value is plotted along its individual axis and all the variables in a dataset and connected together to form a polygon.

Radar charts are useful for seeing which variables have similar values or if there are any outliers amongst each variable. In addition, radar charts are also useful for seeing which variables are scoring high or low within a dataset, making them ideal for displaying ambitions. The combination of those two findings makes the radar chart a very valuable method for representing the results. The chart can, therefore, be the means to represent at a glance the complete (ambition) profile including the associated preferences of a contracting authority.

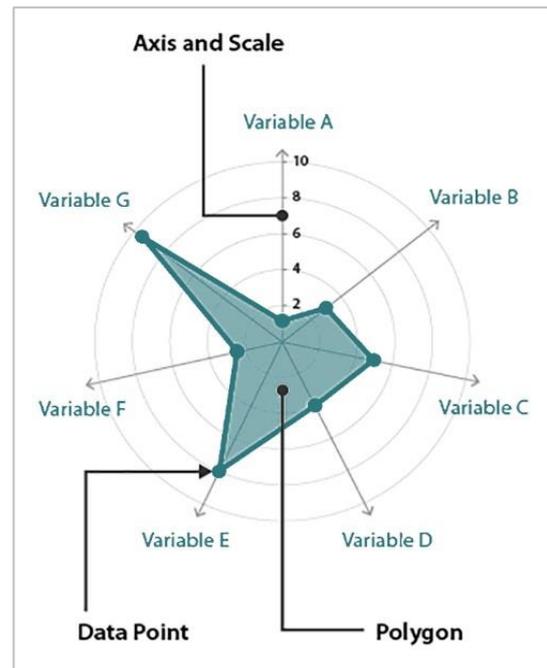


Figure 37: Example of a radar chart

However, there are also some major flaws with radar charts that must be considered. The comparison of observations on a radar chart can become confusing once there are more than a couple webs on the chart, or if there are too many variables, and therefore too many axes, crowding the data. Having too many variables creates too many axes and can also make the chart hard to read and complicated. So a radar chart should be kept simple and the number of variables should be limited. This problem will not be the case with the profile model since each profile sketch is individual. This means that the profile model will only be presented by one polygon per profile. Secondly, by definition, there is nothing prohibiting axes representing wildly different scales since they are nominally independent (Odds, 2011). This makes it possible that the axes can be classified under other scales, which makes comparison across variables is pointless. Unfortunately, even with a common scale between axes, comparing values across them remains cumbersome and error-prone. In order to help general perception and, in particular, comparison across axes, radar charts usually display gridlines connecting axes when they share a common scale. A third flaw is that looking at a radar chart, viewers could potentially think that the area of the polygons is the most important thing to consider. However, the area and shape of the polygons can change greatly depending on how the axes are positioned around the circle. Though there is no ordering to a radar chart, since the variables are usually nominal and there is no explicitly stated start and end to a circle, ordering is important in a way because it has such a great effect on the way the shapes appear (Nowicki & Merenstein, 2016). This has been considered in the development of the profile model. As already mentioned, the profile chart is represented by three variables for both selection and award criteria, which are both subdivided into multiple sub-variables. Since the specific sub-variables are grouped under one of the three main variables (categories), an ordered structure is automatically guaranteed. This and more will become clear in Section 9.3.1 Defining the selection criteria profile and Section 9.3.2 Defining the award criteria profile.

In conclusion, despite that there are in general some flaws by using a radar chart for representing data or results, the radar chart will still be used for two reasons. Firstly, the way in which data is represented in radar charts is very valuable for sketching a profile model. The combination of making it both possible to see which variables have similar values or if there are any outliers amongst each variable together with which variables are scoring high within the dataset makes radar charts perfect for displaying performances. Secondly, most critiques are about the readability and comparability of the chart when multiple polygons are represented. However, these problems do not apply to the profile model as the model only represents one polygon.

9.2 Defining statements

The field study also serves in another way as input for the profile model. By means of the data gained from the interviews, statements are defined which form the basis of the profile model. The literature studies have shown that due to a lack of knowledge and ignorance within the own ambitions, contracting authorities have difficulties in formulating proper functioning tender documents. In addition, contracting authorities often think with blinkers and do not know that there are even more possibilities, besides the options that they themselves have in mind. Instead of just compiling a list with selection and award criteria from which contracting authorities can choose from, a model is developed to identify the motivations and ambitions of a contracting authority. In this way, advice can be given about the preparation of the criteria in line with the ambitions of the contracting authority.

The goal of the profile model, therefore, is to sketch the contracting authority's ambition profile. What are their ambitions? Which (circular) aspects are most important for them? Do they value proven technology or innovations? Experiences or ambitions? Based on the profile model, the ambitions of the contracting authority become clear after which the right selection and award criteria will be suggested. These criteria have emerged from both theoretical and practical studies and can be found in [Appendix 12: Overview of suggested Selection and Award criteria](#).

To summarize, the whole model is about ranking statements for both selection and award criteria which results in a unique profile sketch of a contracting authority, showing their drivers and ambitions. As mentioned in the first paragraph of this Section, the statements are derived from the data gained in the expert interviews. The complete list of the interview outcomes, ID numbers, aspects, and codes can be found in [Appendix 9: Interview analysis](#). The statements are formulated in such a way that they can be traced as little as possible to the category under which the statement falls. The way in which the statements are derived and formulated from the interview outcomes will be explained by the following example.

Interviewee P5 states in the interview that:

- *'The contracting authority must clearly formulate its own vision and ambitions in the request' (S2.20);*
- *'Contracting authorities need to know what circularity means for themselves' (S2.23).*

Interviewee P6 stated in the interview that:

- *'The vision consists of the most important building blocks for a circular construction project' (S3.9);*
- *'In circular tenders, more is left to the market by means of ambitions' (S5.23);*
- *'The selection can be asked for a vision' (S5.29)*

Combining those findings (quotes), these two interviewees mentioned that it is important that a contracting authority have their own ideas about circularity and should figure out if the market party's

ambitions are in line with their ideas since matching visions are important for the course of a construction project.

The essence of this formulation is about the importance that the tenderer's circular vision comply with the contracting authority's ideas regarding to circularity. The next step is to shape the essence into a summarizing statement:

'I think it is important to find out whether the circularity ambitions of the tenderer are in line with my own circular ambitions of the contracting authority'. (V1.1)

This example was about a statement based on the sub-criteria 'circularity' within the request for vision category. For each sub-criteria within each category of the selection criteria classification, ten statements were formulated. The same applies to the three categories of the award criteria. However, since the award categories consist of multiple sub-criteria, fifteen statements were formulated for each category. The complete overview

9.3 The conceptual model

In the introduction of this section, the importance of developing the profile model is explained and background information about the radar chart's structure is given. This Section will explain how the model is developed by clarifying the model content for both selection and award categories. The model is developed in Microsoft Excel 2016.

9.3.1 Defining the selection criteria profile

The statements formulated in the previous paragraph serves as input for the profile model. Each round provides one statement of each category. The statements are picked randomly and are implemented in the model. [Appendix 10: The profile tool statements](#) provides an overview of the grouping of the statements round. The Excel sheet is arranged in such a way that each round has its own tab. Table 23 shows the three statements of the first round together with the corresponding category and sub-criteria. Of course, the model doesn't show this corresponding information. It is up to the contracting authority to rank the statements according to preferences from 1 (less important/relevant) to 3 (important/relevant).

Table 23: Statements round 1 of the selection criteria model

Round 1		
Statements	Category	Sub-criteria
'I think it is important to find out whether the circularity ambitions of the tenderer are in line with my own circular ambitions of the contracting authority.'	SC1: Vision	SC1.1 Circularity
'I think it is important that the tenderer has experience with new (combined) collaboration methods so that eventually new results can be achieved.'	SC2: Reference	SC2.2 Collaboration
'Circularity and awareness about the use of materials can have a positive effect on the outside world. It is therefore important to me that the organization of the tenderer has a circular appearance.'	SC3: Business operation	SC3.2 Organization

After ranking the statement of all rounds, the total scores per category and even the sub-criteria within the categories are displayed both statistical and visual in by means of a table and charts. Table 24 shows how the results are represented in a statistical way. The total point scored for the categories are represented through a column chart. In this way, it is easy to see which category the contracting authority considers the most important.

Table 24: Overview of the selection criteria model's total scores

		Categories							
		SC1: vision			SC2: references			SC3: Business op.	
		SC1.1	SC1.2	SC1.3	SC2.1	SC2.2	SC2.3	SC3.1	SC3.2
Statements	Round 1	<...>				<...>			<...>
	Round 2	<...>			<...>			<...>	
	Round 3	<...>			<...>		<...>		<...>
	Round 4		<...>						<...>
	Round 5			<...>			<...>		<...>
	Round 6		<...>		<...>			<...>	
	Round 7			<...>		<...>			<...>
	Round 8		<...>		<...>				<...>
	Round 9	<...>			<...>				<...>
	Round 10	<...>				<...>			<...>
Total score		<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>
Total score (reduced)		<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>

The outcomes are also visualized through a radar chart, as explained in the introduction of this section. The sub-criteria are structured under the categories. Figure 38 shows the structure of the radar chart.



Figure 38: Structure of the Selection criteria profile sketch (blank)

The radar chart is structured in such a way that the contracting authority’s preferences appear at a glance. For example, if the data points are mainly positioned on the right upper side of the radar chart, this means that the contracting authority has a strong preference for asking for visions in order to discover the ambitions of the market parties instead of tenderer’s experiences. In the next section, this will become clear through the validation performed by means of a case study.

9.3.2 Defining the award criteria profile

The profile sketch of the award criteria is constructed in the same way as the selection profile. Except for the number of rounds and sub-criteria. Instead of ten rounds, the contracting authority’s profile sketch of the award criteria is determined by means of fifteen rounds. Table 25 shows the three statements of the first round together with the corresponding category and sub-criteria. A complete

overview of all award criteria statements together with the corresponding round number can be found in [Appendix 10: The profile tool statements](#).

Table 25: Statements round 1 of the award criteria model

Round 1		
Statements	Category	Sub-criteria
'I think it is important that high demands are placed on energy management. For example, the building must be self-sufficient in energy management.'	AC1: Technical-content	AC1.1 Energy (re)use
'In an environmental process, sincere attention for the other is important. To this end, the tenderer must make known to the environment what is going on and what is important to the other person and, above all, why this is important.'	AC2: Process-based	AC2.2 Environmental management
'It is important that the tenderer come up with a plan that takes into account the residual value of the building.'	AC3: Financial-economic	AC3.2 Residual value

After a contracting authority ranked all statements within the fifteen rounds, the total scores are presented by the model again in both statistical and visual way. In order to guarantee an equal comparison, the total scores per sub-criteria are divided by the number of statements regarding that sub-criteria (Table 26: Overview of the award criteria model's total scores).

Table 26: Overview of the award criteria model's total scores

		Categories													
		AC1: Technical-content					AC2: Process-based					AC3: Financial-economic			
		AC1.1	AC1.2	AC1.3	AC1.4	AC1.5	AC2.1	AC2.2	AC2.3	AC2.4	AC2.5	AC3.1	AC3.2	AC3.3	AC3.4
Statements	Round 1	<...>						<...>					<...>		
	Round 2			<...>						<...>					<...>
	Round 3				<...>		<...>					<...>			
	Round 4					<...>			<...>					<...>	
	Round 5		<...>								<...>				<...>
	Round 6			<...>					<...>				<...>		
	Round 7		<...>						<...>			<...>			
	Round 8				<...>			<...>						<...>	
	Round 9	<...>									<...>	<...>			
	Round 10		<...>				<...>								<...>
	Round 11			<...>						<...>			<...>		
	Round 12					<...>	<...>							<...>	
	Round 13	<...>						<...>					<...>		
	Round 14				<...>				<...>				<...>		
	Round 15					<...>					<...>			<...>	
Total score	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	
Total score (reduced)	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	<...>	

The results are represented visually in the form of, again, a radar chart. The structure of the radar chart is based on the division of the categories as represented in Table 26. The radar chart provides in one clear overview which variables have similar values and if there are any outliers amongst each variable (Figure 39). This makes it useful for seeing which variables are scoring high or low within the dataset.

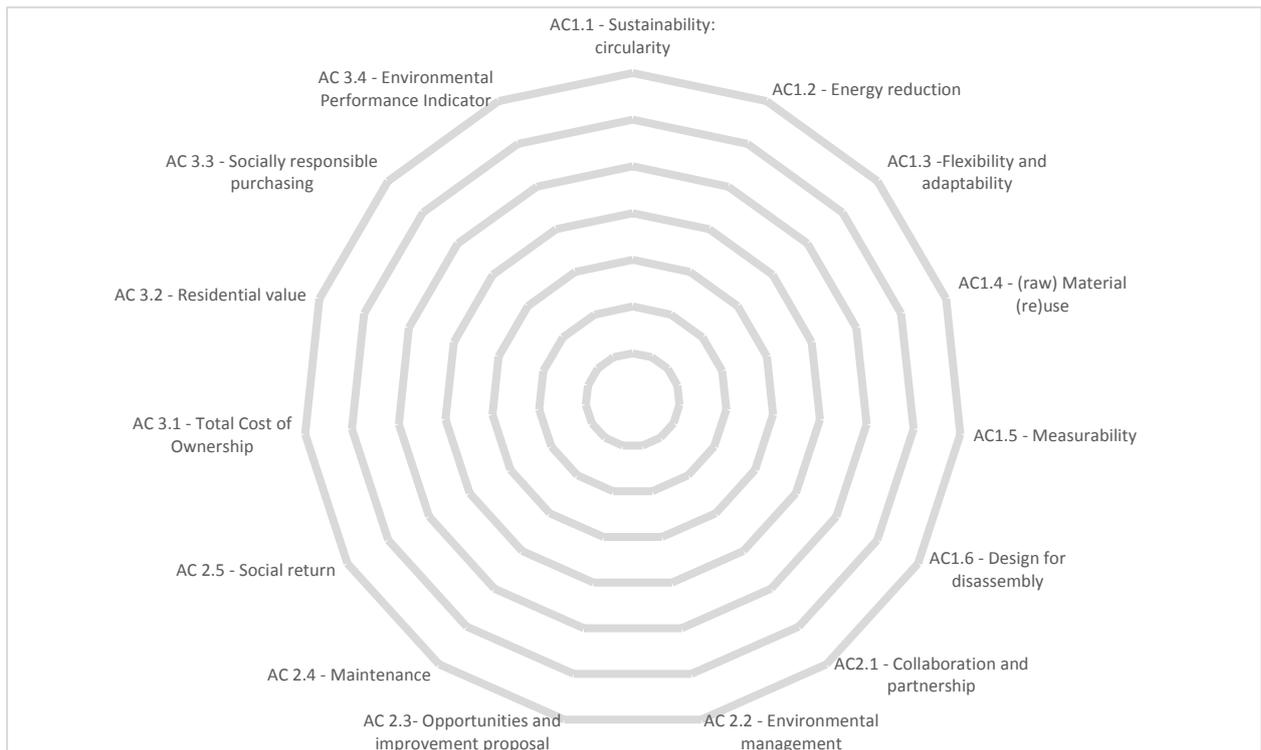


Figure 39: Structure of the Award criteria profile sketch (blank)

9.4 Tool validation: Case study

The conceptual profile model was developed, and validation was needed in order to see if the created profile is realistic and can be applied in practice to some degree. In the previous chapter, the development of the conceptual model is already explained. As mentioned in [Section 1.4.3 Tool Development](#), the conceptual model is empirically tested by a case study and in line with the grounded theory. A real case study which strives for the transition towards a circular economy in the construction sector is used to validate the model.

The case study research design has evolved over the past few years as a useful tool for investigating and validating trends and specific situations in many scientific disciplines and is especially useful for trying to test theoretical models by using them in real-world situations. (Shuttleworth, 2008). The case study method is used to narrow down the very broad field of research into one easily researchable topic. Basically, on the one hand, a case study is an in-depth study of a particular situation rather than a sweeping statistical survey. On the other hand, Shuttleworth (2008) argued that a case study provides more realistic responses than a purely statistical survey. The advantage of the case study research design is that a specific and interesting case can be used to test the (theoretical) profile model with a typical case. The goal of this validation is, therefore, to test whether the conceptual model results in the same outcomes as the case study panel verbally indicates. The tool validation is designed in such a way that all collected data is relevant for the validation.

9.4.1 Case selection

First of all, a suitable case is selected for the validation of the profile model. The main criteria for selecting a suitable case study was that fact that the case must concern a construction project with a circular approach and is put out or will be put out for tender (soon). In principle, for the validation of the tool, it does not matter whether the contracting authority already has its ambitions in mind or

not. If the contracting authority already has the circular objectives in mind, the validation will show whether the tool outcomes are in line with its ambitions. If a contracting authority is not yet aware of the possibilities for the implementation of circular aspects, the mutual comparison of the tool and the questionnaire will still result in a reliable validation. In both situations, the outcomes of the tool and the questionnaire will be compared with each other, independent of (an advance) strong ambition of the contracting authority. This means that in addition to the above set criteria for the case selection, no other criteria need to be set resulting in the following case.

Within the network of Alba Concepts a project was found that was put out for tender for just 2 months and is still open for registration. The project of case study is the first circular industrial building in Belgium and is called 't Center'. To initial goal of contracting authority is to integrate as many as possible of the seven pillars in the building. This was also found during the literature study in [Section 2.5 The seven pillars of circular construction](#). The model validation is conducted in close collaboration with the project director, who will be referred as 'case study panel' from now on. More general information about the case study is displayed in Table 27.

Table 27: Case study 1 characteristics

General information Case 1	
Project name	't Centrum, Kamp C – Provinciaal Centrum Duurzaam Bouwen
Contracting authority	APB Kamp C
Location	Westerlo
Director	Peter-Paul van den Berg
Type of procedure	Competitive dialogue
Type of contract	DBM
Publication date	30 November 2018

With the project, the contracting authority wants to make maximum use of circularity in the construction sector and must become the hotspot for circular construction in Flanders and beyond. 'T Center must be placed in a broader framework that focuses on mobility, environment, accessibility, waste management, health, the use of energy, water. Around this hotspot, a circular business park will be developed step by step over the next few years. The building will be sustainable and energy-positive, with lots of light and surrounded by greenery. It contains a modular office design and transformable workstations. Adjustments can easily be made without using a lot of extra energy and adding new materials. If the building is outdated, it can be completely disassembled and materials are reusable.

9.4.2 Data collection

The data for the validation of the conceptual model is collected in two different ways: through a customized model and a simple questionnaire. First, a customized version of the profile model was filled in by the case study panel. The outcomes of both selection and award profile are shown in Figure 41: Profile model outcomes Selection category.



Figure 41: Profile model outcomes Selection category

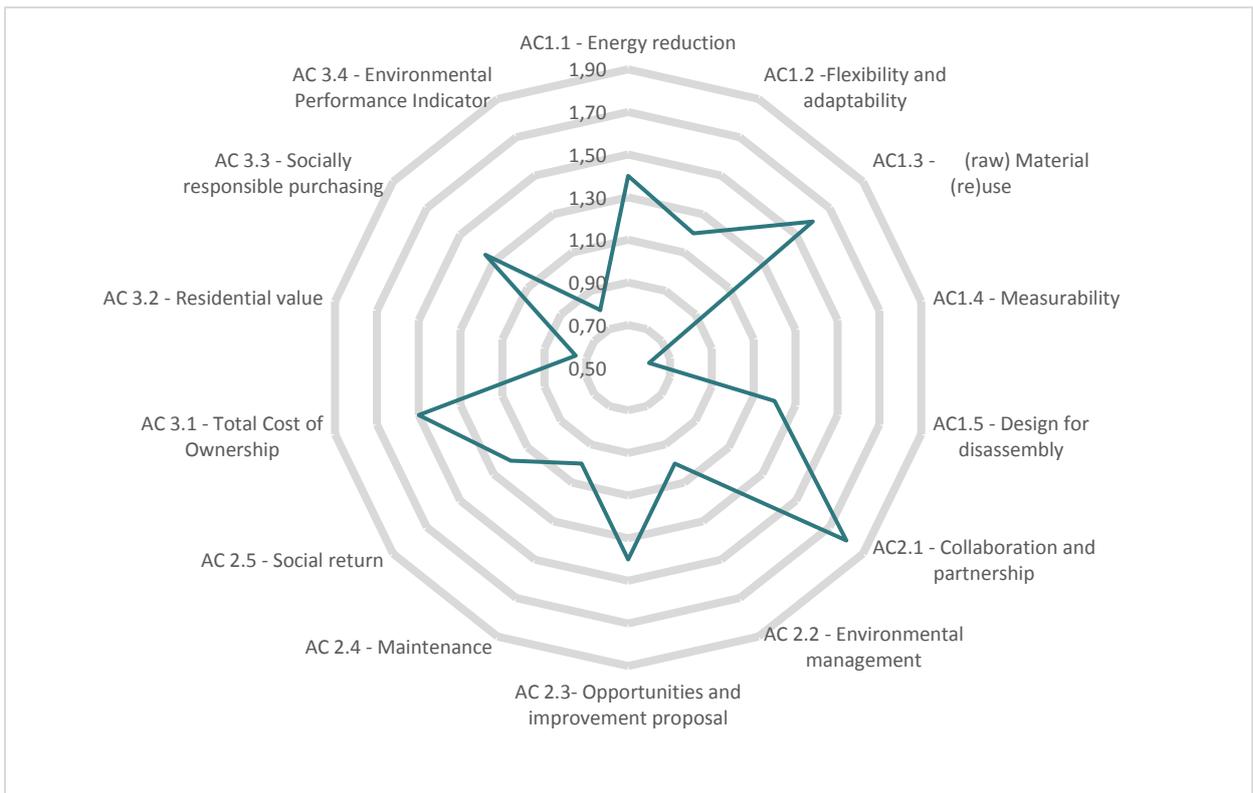


Figure 40: Profile model outcomes award category

With customized is meant that the tabs which show the profile tool's outcomes is removed from the original tool. This order was given one week before the questionnaire was shown to the case study panel for the reason that this data acquisition influences the second data collection as less as possible. Table 21 and Table 22 (8.1 Comparing the three studies) serves as basis for the questionnaire. In the questionnaire is asked to rank the 29 categories and sub-criteria on a scale from 1 to 10 of importance.

Appendix 11: Case study questionnaire presents the complete questionnaire. How the outcomes of both tool and questionnaire are analyzed, is explained in the following Section.

9.4.3 Data analysis

The data collection has resulted in two different datasets: I) from the tool and II) from the questionnaire. The outcomes of the tool are based on a scale from 1 to 3, while the results of the questionnaire are based on a 1 to 10 scale. A conversion factor is used in order to compare both datasets in a reliable way. Figure 42 shows the outcomes of both selection and award categories after the conversion. For this figure, the conversion means that the *tool* outcomes were divided by a conversional factor of 3.34 in order to acquire comparable outcomes. For the selection criteria category, this means that the request for vision is valued as most important in both tool and questionnaire (Figure 42a). The same applies to the process-based category within the award criteria categories (Figure 42b).

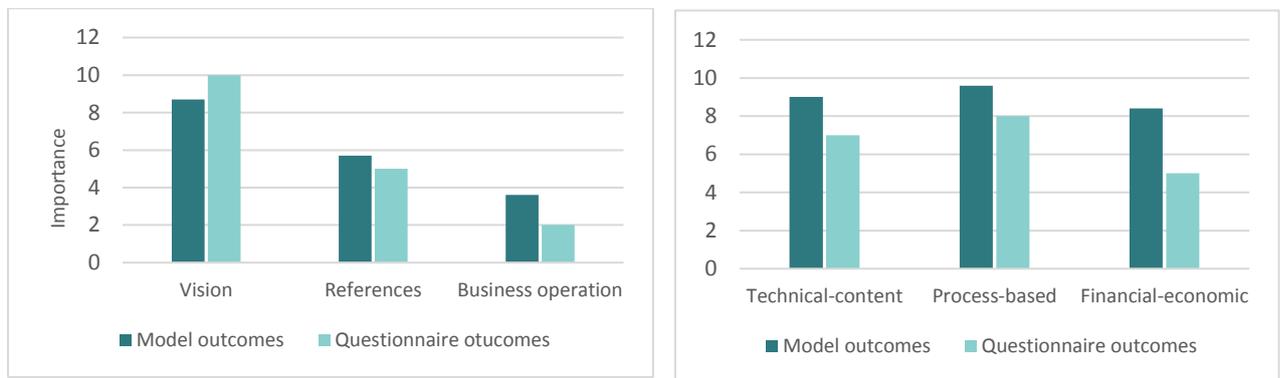


Figure 42: Model validation outcomes of a) selection criteria and b) award criteria

In particular, the selection criteria category almost shows a one-to-one connection between the tool and questionnaire outcomes. The peak in Figure 42a means that the case study panel values to a large extend the tenderer’s ambitions, in contrast to tenderer’s experiences or an own circular organization. The results represented by Figure 42b are closer to each other. However, both tool and questionnaire outcomes still comply with each other (Table 28).

Table 28: Selection criteria categories tool outcomes vs. Questionnaire outcomes

	tool outcomes	Questionnaire outcomes
Selection criteria		
Vision	#1	#1
References	#2	#2
Business operation	#3	#3
Award criteria		
Technical-content	#2	#2
Process-based	#1	#1
Financial-economic	#3	#3

To validate the sub-criteria within the different categories, Figure 43 and Figure 44 represent the outcomes of all sub-criteria of the selection criteria category. The degree of relationship between both bars and lines in Figure 43 and Figure 44 is of less importance. The mutual relationship between the individual sub-criteria, on the other hand, is much more relevant. This ratio determines which sub-criteria within the individual data sets score highest and thus are most important for the contracting

authority. Table 29 shows the relevance of each sub-criteria within the different categories for both the tool and questionnaire outcomes. The rows that are highlighted in green confirm that the results of both datasets match each other. The orange rows indicate that there is a difference in outcomes that require attention.

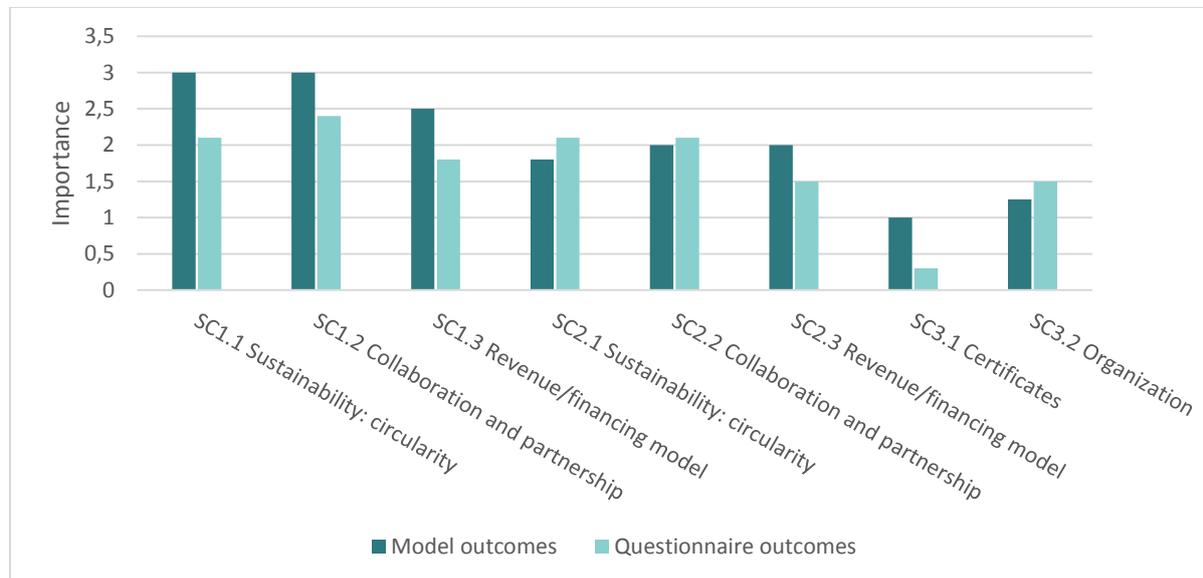


Figure 43: Importance of Selection sub-criteria factors

For example, the request for a vision with regard to sustainability/circularity and collaboration/partnership both scores the best according to the tool outcomes (green). However, the outcomes of the questionnaire (Table 29) shows that requesting a vision with regard to collaboration and partnership has slightly the upper hand (orange). Because this difference in outcomes is minimal and unencumbered, it is left untidy. However, another deviant outcome is represented in Table 29 within the request for references category. The request for references regarding sustainability/circularity and collaboration/partnership both appear to be most important according to the tool outcomes. In contrast to the questionnaire outcomes, in which the collaboration/partnership sub-criteria turns out to be second best. However, again this deviation is such minimal that it is negligible.

Table 29: Overview of the Selection criteria Tool outcomes vs. Questionnaire outcomes

	tool outcomes	Questionnaire outcomes
SC1: Request for vision		
SC1.1 Sustainability: circularity	#1	#2
SC1.2 Collaboration and partnership	#1	#1
SC 1.3 Revenue/financing model	#3	#3
SC2: Request for references		
SC2.1 Sustainability: circularity	#1	#1
SC2.2 Collaboration and partnership	#1	#2
SC2.3 Revenue/financing model	#3	#3
SC3: Request for business operation		
SC3.1 Certificates	#2	#2
SC3.2 Organization	#1	#1

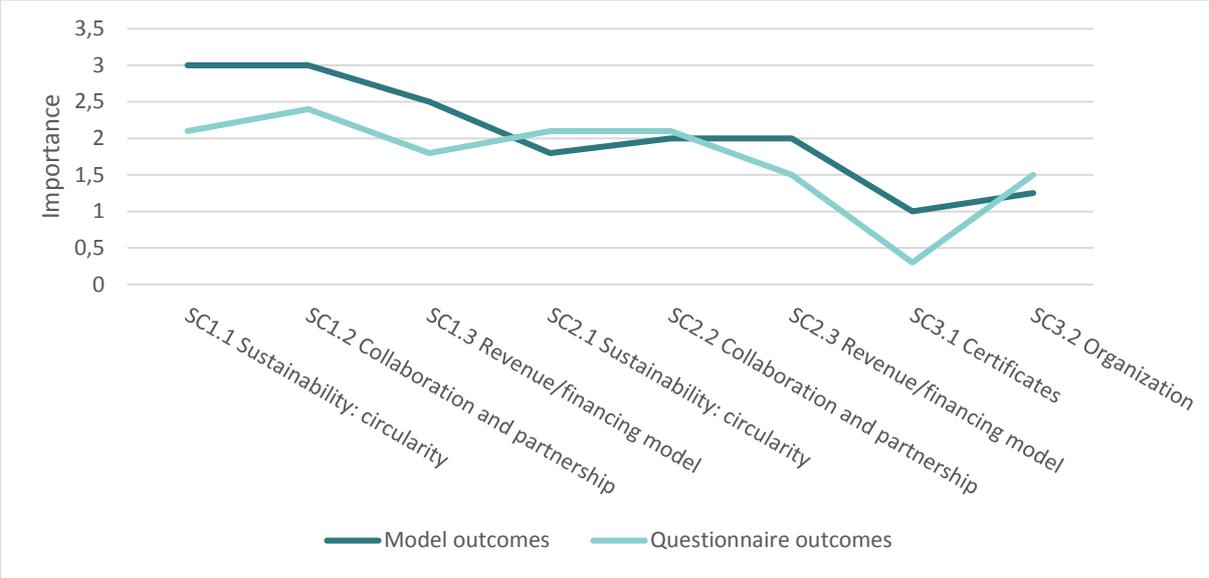


Figure 44: Importance of Selection sub-criteria factors

Figure 42 shows the results of both case study and questionnaire outcomes. The top three of sub-criteria with the highest level of importance (AC1.1, AC2.1 and AC3.1) turns out to be the same for both outcomes. The same applies to the three sub-criteria that are least important according to the case study panel (AC1.4, AC2.5 and AC3.2).

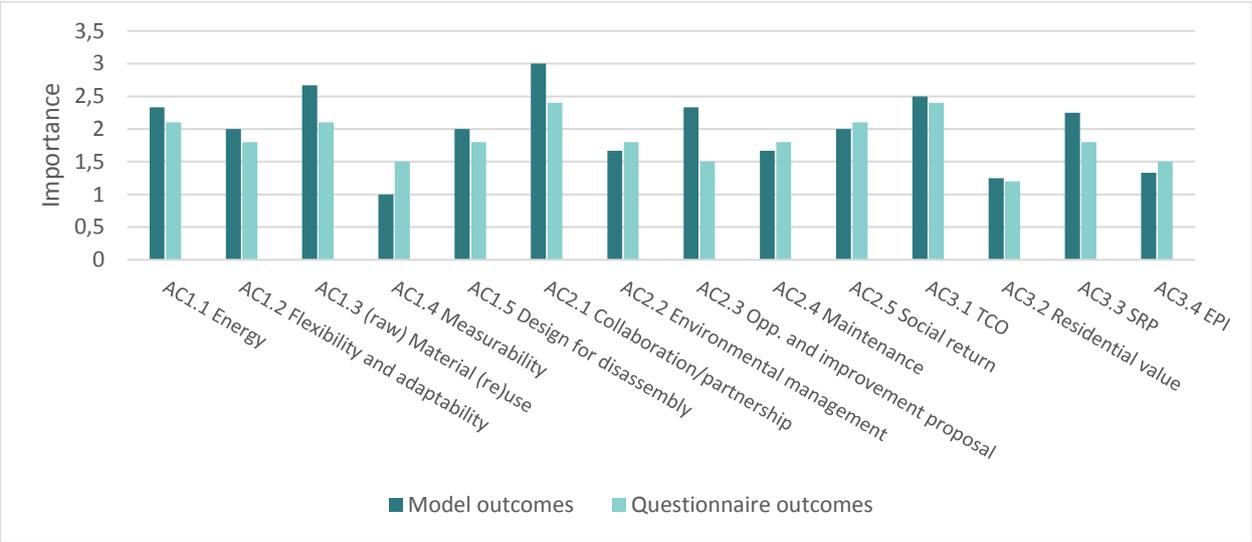


Figure 45: Importance of Award sub-criteria factors

However, within the technical-content and financial economic categories, some slight differences appear (Table 30). The deviation in outcomes, however, differs such a little that it has no major consequences for the final scores per sub-criteria within the specific category. The difference in outcomes results in a maximum of one place on the scale of importance.

Table 30: Overview of the Award criteria Tool outcomes vs. the questionnaire outcomes

	Tool outcomes	Questionnaire outcomes
AC1: Technical-content		
AC1.1 Energy	#2	#2
AC1.2 Flexibility and adaptability	#3	#3
AC1.3 (raw) Material (re)use	#1	#2
AC1.4 Measurability	#4	#4
AC1.5 Design for Disassembly	#3	#3
AC2: Process-based		
AC2.1 Collaboration and partnership	#1	#1
AC2.2 Environmental management	#3	#3
AC2.3 Opportunities and imp. prop.	#2	#2
AC2.4 Maintenance	#3	#3
AC2.5 Social return	#4	#4
AC3: Financial-economic		
AC3.1 Total Cost of Ownership	#1	#1
AC3.2 Residual value	#4	#4
AC3.3 Socially Responsible Purchasing	#2	#3
AC3.4 Environmental Performance Indicator	#3	#2

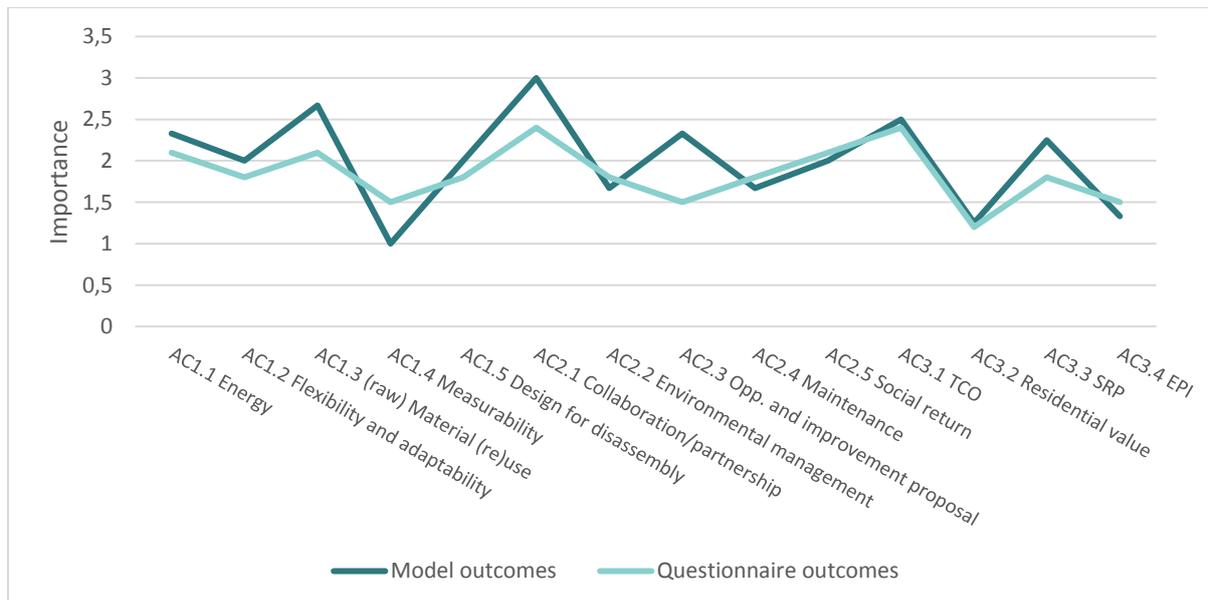


Figure 46: Importance of Award sub-criteria factors

The case study outcomes of both tool and questionnaire are represented in Table 29 and Table 30. It turns out that especially both results of the classification of the selection and award categories strongly equate with each other. The selection categories as well as the award categories provide the same results in both outcomes. In addition, looking at the sub-criteria within the categories, it turns out that the outcomes of eighteen out of twenty-three sub-criteria are the same in both datasets. However, the differences between the results that did not correspond with each other are relatively low. Summarizing the above-mentioned outcomes, it can be said that the tool is reliable enough to

put into practice. The outcomes of the tool provide insight into which circular aspects a contracting authority must focus primarily on in the tender documents.

9.4.4 Case study recommendations

The sketched ambition profile of the participant as derived from the tool is not the endpoint of this research. Basically, it is actually the starting point of a tender process from which the selection and award criteria can be drawn up. Looking at the outcomes of the participant's profile, it turns out that he has a very strong preference for a request based on a vision (Figure 42a). To be more specific, the participant attaches 48% of the points to vision-related criteria, 32% to references and 20% to business operation-related criteria. Since [Section 2.4 Circular Economy in the Built Environment](#) has shown that CE is often interpreting personally, a contracting authority should formulate its own vision in the selection guideline first as tenderers' can connect to this vision. Especially since the participant has a strong preference for requesting for a tenderer's vision, it is even more important and therefore strongly recommended to draw up an own's vision of circularity.

In [Section 8.1 Comparing the three studies](#) it became clear that, in contrast to the award criteria categories, selection criteria may be requested that focus on just one of the three categories. This allows a contracting authority with a strong preference for one of the categories to prescribe selection criteria that are purely based on that specific category. Looking at the sub-criteria within the request for vision category, it turns out that the participant adds equal value to both sustainability/circularity and collaboration/partnership. [Appendix 12: Overview of suggested Selection and Award criteria](#) provides an overview of the optional selection criteria per sub-criteria as found during this research. The literature has shown that basically no more than 2 sub-criteria about circularity should be requested in the selection guideline. Despite the fact that it is up to the participant to choose suitable selection criteria from this list, the following selection criteria based on a vision on sustainability: circularity and collaboration/ partnership are suggested:

SC1: Vision on Sustainability: Circularity

The Contracting Authority wishes to hear from the Tenderer what its vision is regarding circularity in construction:

- To what extent does the Tenderer's vision match the vision of the Contracting Authority?
- To what extent does this vision fit in with the project ambitions?
- To what extent is this vision actually feasible/realistic?
- What is the degree of creativity of the ambition?

And secondly:

SC2: Vision on Collaboration/partnership

The Contracting Authority wishes to hear from the Tenderer what its vision is on the collaboration and partnership between the various execution disciplines and the cooperation with the client and the designing parties.

In addition, the outcomes of the tool indicate that the participant has a slight preference for requesting process-based criteria regarding the assessment of the assignment (award criteria). However, the results are very close to each other. The participant attaches 36% of the points to process-based criteria 33% to technical-content criteria and 31% to financial-economic criteria. In [Section 5.3 Award criteria](#) [8.1 Comparing the three studies](#) was found that at least one criteria within each category and a maximum number of 5 award sub-criteria should be requested in the assessment criteria of the award phase.

Looking at the sub-criteria within the process-based category, it turns out that the participant has strong preferences for requesting for collaboration and partnership, and opportunities and improvement proposals in second place (Table 30). Within the technical-content category, requesting for (raw) material (re)use and energy management are indicated as most important to the participant. Despite the financial-economic category is addressed as least important, the literature (Van Haagen, 2018; Van Oppen et al., 2018) states that still, one sub-criteria of this category should be requested in order to achieve a comprehensive award guideline. Combining these findings together with the results of the participant's profile, resulted in the following suggestions for the implementation of circular award criteria within the award guideline:

Process-based aspects

AC1: Collaboration and partnership

The Tenderer describes the process to arrive at a circular building according to the pre-set circular ambitions and building process and what role both collaboration and partnership play in this.

AC2: Opportunities and improvement proposals

The Tenderer must submit an action plan with regard to the opportunities and possible risks. In addition, if the Tenderer sees any point of improvement on any aspect (like design, collaboration, material usage, energy management) this should be described.

Technical-content aspects

AC3: (raw) material usage

The Tenderer makes an overview of the reuse of existing materials through the reuse of products, material parts or recycled materials.

AC4: Energy management

The construction process will have to have a minimal CO₂ footprint as possible. The Contracting Authority requires that the Tendering Parties achieve this by first working on prevention, then looking for (cleaner) alternatives, and finally proceeding with compensation. To determine the footprint, account must be taken off, but not limited to, all logistic movements related to the construction site and/or the construction process, the energy demand, the deployment of people, the use of equipment and material.

Financial-economic aspects

AC5: Total Costs of Ownership

The Tenderer must develop and describe the direct and potential indirect financial consequences (investments and/or returns) associated with the proposed measures for the concept and the process, and how these are proportionate to each other.

9.5 Discussion

Over the past few decades, it has become clear that current ways of production and consumption of materials in the construction sector are putting a big burden on the environmental capacity of the planet Earth. This growing awareness is also taking place in the construction sector. Fortunately, because 32% of solid waste in the economy derives from construction and demolition work (Figure 4). In addition to this social aspect, the upcoming tighter legislations also leads to political motives for the transition to a circular economy. The problem is that despite a growing number of contracting authorities are open for implementing circular elements in their projects, they have problems formulate their own ambitions properly and translate them into suitable assessment factors. While a

clear formulation of one's own ambitions is the foundation of a suitable selection and award criteria set-up. The research intends to mitigate this problem by classifying the assessment criteria in a new and structured way and providing a profile tool that will enhance a suitable formulation of the assessment criteria subsequent to the contracting authority's ambitions. To execute the research, an extensive literature study, expert interviews, and a case study were used to get all the necessary information. The literature study and the expert interviews together has resulted in a holistic view of circular tendering in the construction sector. Comparing those three angles has led to some striking findings.

The results of these three studies point out that the theory quite differs from the ideal picture sketched according to the theory. The difference is mainly in the financial-economic category of the award criteria. In practice, it seems to be quite unusual to implement financial aspects within the award criteria. This is remarkable since these outcomes are in conflict with the recommendation of the experts from the field who indicates that circular economy mainly involves a long-term vision: the creation of closed loops. The problem is that contracting authorities usually assume short term reasoning, which is usually based on the investment only. In general, it seems that contracting authorities really want to make the step towards a more circular approach, however, ignorance through which wrong decisions are taken, play an obstructive role.

The tool that has been developed to eliminate these obstacles plays an important role in the formulation of the suitable assessment criteria. However, this theoretical approach towards a practical tool creates a tension field. Just as in any other research that wishes to serve both theoretical and practical interests, this study also has a continuing tension between control, external validity, and practical manageability. In strictly fundamental research, as many conditions as possible must be under the control. The applied validity, on the other hand, requires completeness and practical handling, which requires simplicity and quick execution. To a large extent, the validation is based on interpretations and opinion of the case study panel. Since the tool has been developed to define the preferences and interpretations of contracting authorities, this, however, hampers the reliability of the validation method. The validation could gain reliability when the number of rounds with statements within the tool is expanded.

The development of the tool also brings some points of discussion relating to the tool set-up and the allocation of weighting factors. An attempt is done to incorporate weighting factors for relative importance to the tool. However, the results of the interviews showed that, because the formulation of assessment criteria is so subjective and personal, the allocation of weighting factors is strongly discouraged. However, the literature studies have confirmed the importance of a re-proportionate distribution of the assessment categories. In concrete terms, this means that at least one criteria of each category must be included in the award criteria of the tendering document. The tool provides this.

Another important discussion point related to this was about the set-up of the tool. Especially within the award criteria, this results in discussion since each category consists of multiple sub-criteria. This means that the award criteria could, in fact, be arranged in two different ways. The consideration had to be made whether to rank the statements for each sub-criteria within a category (so each round consists of five statements about the different sub-criteria within, for example, the technical-content category) or ranking statements per round from one of each category (which is the case in the tool). Despite both considerations brings advantages and disadvantages, the latter solution was chosen. By means of this set-up, it offers the respondent the opportunity to express a preference for one particular category and at the same time the preference for sub-criteria within this category.

Part SIX:

CONCLUSION

“We’re playing Champions League, all the time”

Alba Concepts

10 Conclusion

The previous chapters have shown the application and limitations of a tool that can be used as a guideline by contracting authorities to perform circular tender documents more effectively and subsequent to their needs and ambitions. This final chapter of the graduation thesis concludes the research that was performed, in line with the grounded theory, on the assessment criteria of tenders of circular construction projects in the Netherlands. The aim of this chapter is to formulate the answer to the research question: *How to define, specify and classify suitable assessment criteria during the tender process of circular construction-related demand in the Dutch construction sector in order to fill in the existing gap between contracting authority's circular ambitions and the requested criteria within tender documents?* This research question is answered by answering all the research sub-questions throughout this research and incorporating the results. Thereafter, both scientific and societal relevance will be discussed.

10.1 Conclusion

The conclusion of this research is that effective preparation of assessment criteria in circular tender documents plays a crucial role in achieving the circular ambitions of contracting authorities in their projects. The results have shown that classifying both selection and award criteria leads to an effective classification. By developing a tool to uncover and map the contracting authority's ambitions regarding their circular thoughts, in line assessment criteria can be formulated. To support these findings, the sub-questions established at the start of the thesis are answered below.

What is meant with a circular economy in the construction-related demand in the Netherlands?

There are as many interpretations of the circular economy as people in this world. Although an increasing number of publications are written, there is no definite definition of the circular economy in both literature and practice. Common aspects within different definitions of the CE are: economic system, resources, loss of materials, climate effects, environment, and closed loops. The essence of the circular economy is that the use of virgin raw materials will be minimized, as will all forms of wastage and other negative environmental impacts throughout material cycles. A circular construction connects past, present and future with each other. Buildings from the past serve as raw materials for buildings of the present, buildings from the present are raw materials for buildings of the future. The circular economy in the construction sector is primary about bringing materials back into the cycle by thinking in advance (during the design phase) about how a building or building element can become part of that cycle again at the end of its life. This is called 'resource-efficient' and starts with designing the building. The circular economy demands a change in design, better flexibility, disassembly of components at every building layer, and better energy usage. Five design principles for buildings are overlaid as a method to achieve a most resource-efficient building:

- Building in Layers (Brand 1994);
- Design-out waste;
- Design for adaptability;
- Design for disassembly;
- Selecting materials.

A building consists of different construction layers (from the structure to stuff). Based on the assumption that these layers have different life cycles, design decisions can be made regarding their end of life scenarios. Design out of waste is a principle developed to reduce waste during the entire building development process, but is mostly focused on the engineering side. An adaptable building is able to easily evolve together with shifting user requirements, increasing the potential use of lifecycle.

Design for disassembly intends to maximize materials conservations from building end-of-life management by making parts possible to be disassembled, replaces and/or reused, and create adaptable buildings to avoid building removals altogether. Finally, the materials used in a building are an important factor when building for the circular economy. There are many different properties to consider when selecting the materials. Applying these principles will result in less waste during and at the end of the lifecycle in a building.

Using these design principles sounds simple, but relating this to the construction-related demand will be a major challenge for the Dutch construction market. To implement a circular economy in the construction sector, a crucial shift of the short-term vision towards the long term is required. This is not only rendered difficult because of the conservative attitude in the construction industry but also due to the short-term financial objectives and the new responsibilities that come into play in this new economic form.

What different types of contracts and procedures fit the best for requesting circular aspects within the tender documents?

Requesting (specific) substantive circular aspect within tender documents is independent of the type of contract or the type of tender procedure. Despite the fact that there is a clear distinction between the different types of contracts with visible consequences for the relationship between the involved parties, specific selection and award criteria can be applied separately or together in all contract forms.

Circularity involves long-term visions and reasoning. Contractual recording of long-term agreements is therefore strongly recommended. In addition, a contract with, for example, the Maintenance component offers major benefits in the exploitation phase. In fact, when Maintenance is added to the contract, decisions in the design process will be made with the maintenance of the building in mind. The type of contract therefore strongly depends on the design choices and concerns the way in which the contracting authority wishes to involve executive market parties in the realization of the construction project. These are largely related to the role that a client sees for himself and the contractor in the realization: doing a lot of things themselves or standing at a distance, carrying a lot of risks themselves or handing it over to the market. However, the role of contracting authorities and the contractual agreements have no direct influence on the interpretation of the circular criteria. For example, if a contracting authority attaches a great deal of importance to aspects like the origin of the materials or product, collaboration or the clarifying of residual value, it is free to request this independently of the contract type.

The choice for the type of procedure depends on the value of the project, the number of suppliers in the market and whether collaboration between disciplines should be explicitly encouraged or not. The Public Procurement Act 2012 obliges contracting authorities to choose the type of tendering procedure and the market parties who are admitted to the procedure when awarding the contract on objective grounds. The choice not only depends on the regulations but also on the available budget. In addition to a number of legal provisions, contracting authorities have the freedom to choose for a specific type of procedure. The main difference in the type of procedures is the presence of a pre-selection phase or not. In the case of tenders with a selection phase, an extra step has been included in which the number of tenders is reduced from 5 to 3 on the basis of selection criteria. The advantage of a procedure with a selection phase is that it offers contracting authorities the opportunity to draw up selection criteria to assess the *tenderers*. These criteria, for example, can relate to the ambitions or the experiences of the tenderer before assessing the parties on their suggested *assignment*. This is in contrary to procedures that only offer the possibility to assess the assignment offered by the

tenderers by means of award criteria. The type of procedure does not affect the circular aspects on a substantive level within the selection or award criteria but determine the use of selection *or* award phase, or both.

Which phase(s) of the tender process allows the inclusion of circular aspects?

Basically, the tender process consists of two phases in which requirements and criteria can be formulated: grounds of exclusion, minimum requirements, suitability requirements, selection criteria, and award criteria. The Public Procurement Act prescribes an exhaustive list of mandatory and optional exclusion grounds, within which there is no scope for the implementation of circularity. Within the other aspects, on the other hand, it is permitted to implement circular elements. However, it is not recommended to include circularity in the minimum and suitability requirements in order to prevent an unnecessary strong restricted market. Within the selection and award criteria, contracting authorities do have a lot of freedom and thus the possibility to request circular aspects without restricting the market. For this reason, it is strongly recommended to include only circular components in the selection and award criteria.

How can the selection and award criteria be classified? Which circular aspects can be requested in the selection and award phase?

Selection criteria can be classified under three categories: vision, references and business operation (Table 31). By means of requesting for a vision can be checked whether the tenderer is openminded and future-oriented through asking for their ambitions. It offers the contracting authority the opportunity to compare its own ambitions with those of the market parties.

Table 31: Selection criteria categories specification

Selection criteria category		
Request for vision	Ambitions	Future-oriented
Request for business operation	Compliances	Present time
Request for references	Experiences	Past results

Do the tenderer's ambitions fit in with the contracting authority's own ambitions? Are their own ambitions exceeded by those of the market parties? Requesting for references, on the other hand, checks whether a tenderer is sufficiently competent on the basis of obtained achievements in the past. It offers contracting authorities the opportunity to compare the experiences of the market parties. For example, some contracting authorities place little value on promises or ambitions, but rather on the tenderer's experiences. Asking for a tenderer's vision and references are both based on sustainability, circularity, collaboration, partnership and/or revenue/financing models. In addition to asking for a tenderer's ambitions or experiences, a contracting authority can assess a tenderer for current achievements regarding the tenderer's own business operation, which is the third category. Criteria can be set for the extent to which the business operations or the quality of the tenderer's own organization are circular. This means, for example, that the company is only fed with sustainable energy and the tenderer can demonstrate whether and how they recycle materials and whether they handle raw materials carefully within their business operation. The idea behind this third category is that a circular appearance of a company directly affects the awareness of the circular basis principles. The request for business operations is covered by the level of circularity of the tenderer and whether the tenderer has sustainability and/or circularity certificates. The inclusion of the categories in the selection guideline strongly depends on the preference of the contracting authority. In the selection criteria, it is possible to place the full focus on only one of the categories and not to include the other two in the guideline because the selection criteria relate to the tenderer and not the assignment.

Award criteria are related to the assignment and can be classified under three categories as well: technical-content, process-based, and financial-economic. Since circularity in the construction sector is yet complex and an uncommon aspect, implementing comprehensive circular aspect within the award guideline is therefore important. In contrast to the selection criteria classification, the award guideline must at least cover one criterion of each category. The technical-content criteria refer to buildings and products, where the production of waste and the use of raw materials is minimized and concerns the (in a new way) designing products and buildings on a technical level. Sub-categories that are covered by the technical-content category are: energy, (raw) material, flexibility, adaptability, measurability and disassembly (Figure 47).

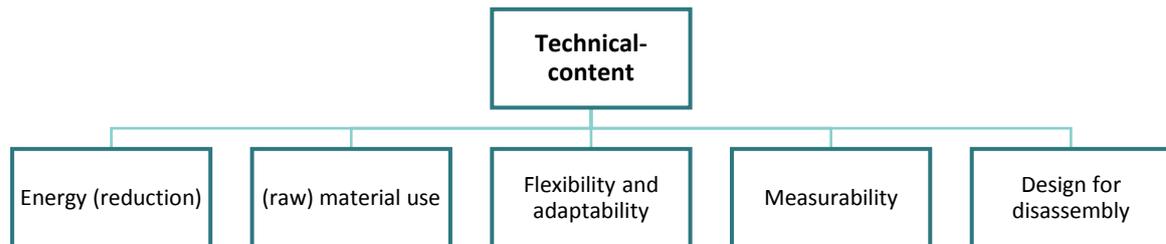


Figure 48: Technical-content category

A building consists of several layers (the layers of Brand), each with its own life span and therefore depending on process-based aspects. This means that on a process level, care must be taken for the circular use of products. This means that an active collaboration must be stimulated between the client, the contractor and the chain partners with the ultimate aim of laying the foundation for a circular economy. There are five sub-categories covered by the process-based category: collaboration and partnership, environmental management, opportunities and improvement proposal, maintenance, and social return (Figure 48).

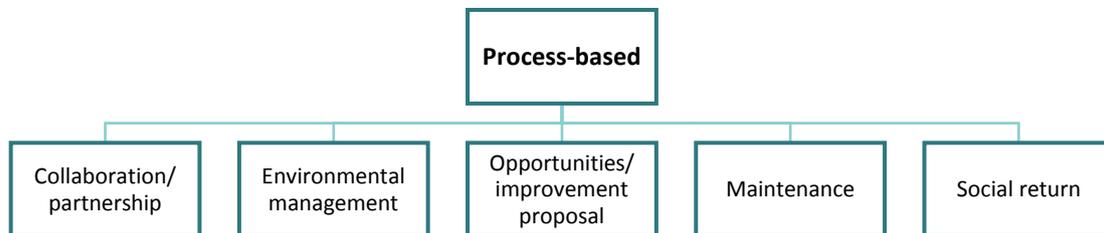


Figure 49: Process-based category

Thirdly, in addition to the technical-content and process-based aspects, there is a financial-economical aspect. The financial aspect is derived directly from the price aspect and an incentive must be built in to actually stimulate circularity. This can be done through circular revenue models, but it is more important to realize that suppliers and chain partners are being asked for a shift of business model and that this should also become an attractive model for both parties. Since circularity influences the existing business and earnings models of suppliers, it is advisable to find out to what extent the tenderer is aware of this. Sub-categories that are covered by the technical-content category are: Total Cost of Ownership, residual value, Socially Responsible Purchasing and Environmental Performance Indicator (Figure 49).

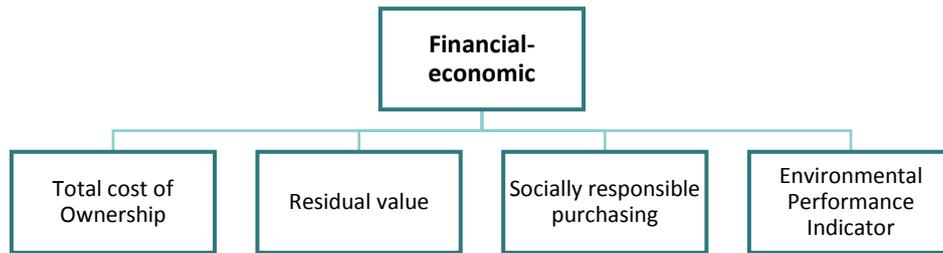


Figure 50: Financial-economic category

How can the circular ambitions of contracting authorities translated to selection and award criteria?

The set-up of the selection and award criteria strongly depends on the specific needs and ambitions of the contracting authority. In practice, due to a number of limiting factors, the formulation of the selection and award criteria by the contracting authority appears to be distorted. Contracting authorities often do not have sufficient knowledge about how to request certain circular aspects in order to fulfill their specific needs. They are not familiar with the wide range of possibilities when it comes to including criteria that refer to circularity. On the other hand, in the search of contracting authorities for the correct interpretation of the assessment criteria, other aspects are often observed from one preferred field, as a result of which other (important) aspects are overlooked. This gap between the contracting authority's ambitions and the actual formulation of subsequent criteria is filled up by means of the developed tool. The tool must be used in the preparation phase of the pre-procurement stage of the tender process since within this stage, the announcement form, selection guideline and award guideline is set up by or on behalf of the contracting authority. By filling in twenty-five rounds with the three statements per round, a profile sketch of the contracting authority can be made that directly reflects their ambitions. It immediately shows the aspects within the various categories that the contracting authority considers as most important and to which the correct selection and award criteria can then be drawn up. Additional to the contracting authority's sketched ambition profile, a tailored list of selection and award criteria is offered in accordance with the specific outcomes of the contracting authority's outlined profile. A contracting authority must pick a maximum of 5 award criteria from the tailored list. In this way the tool leads a comprehensive selection and award guideline translated from the personal contracting authority's ambitions resulting in a successful circular construction project.

10.2 Research relevance

The aim of this research was to fill the knowledge gap about the relationship between the contracting authority's ambitions and the actual formulation of the assessment criteria within circular construction projects in the Netherlands. Now the research is finished, it can be reflected on how this research has contributed to the knowledge gap. Therefore, in this section, the research will be discussed with a critical view by the scientific and practical relevance of the research. It indicates why the existing knowledge is expanded by the research and who or what benefits from the research. In addition, the social relevance of the developed tool will be explained.

10.2.1 Scientific relevance

The scientific relevance of this research consists of the fact that the research attempts to fill a gap in the literature regarding the different assessment criteria options, finding a structured way to request them, and provide recommendations of their importance. From a scientific point of view, this research is a contribution to the existing literature. Even though a lot has been written about the circular economy, both in general (Hartman, 2014; Homrich et al., 2018; Jonker et al., 2018; Kirchherr et al., 2017; Leising, 2016; Nasir et al., 2017; van Sante, 2017) and in relation to the construction sector

(Adams et al., 2017; Cheshire, 2016; Jager, 2016; Loppies, 2015), and to a growing extend about the seven pillars of circular construction (Van den Berg, 2018), less research was conducted into the classification and formulation of the selection and award phase of circular approached tenders. In the data comparison part of this research, both selection and award criteria regarding circularity were classified. Although there are some articles written on classifying the purchasing process (Van Haagen, 2018; Van Oppen et al., 2018), there was never a connection made with the classification of the selection and award criteria. This research indicates the importance of classifying both selection and award criteria under different categories.

In addition, the research contributes to the scientific context of procurement of circular construction processes. Where (the small number of) previous studies are limited to the formulation of guidelines on circular tenders, this research offers a deeper level. It covers a broad range of possibilities within the formulated assessment categories. In addition, it provides recommendations about the importance of implementing at least one sub-criteria per category within the tender documents.

Finally, the research offers the possibility for follow-up research on this topic. The developed tool can be further expanded in order to guarantee reliability even more. It can be investigated if adding extra rounds to the tool, leads to a more substantial profile sketch of the respondent.

10.2.2 Societal relevance

Besides the scientific relevance, this research is also directly linked to practical relevance. It aims to fill the gap in the current practice in the formulation of suitable assessment criteria in order to fulfill the contracting authority's wishes. The research thus creates direct benefits for clients who want to implement circular aspects in their project but do not know how to do this in a suitable way. In order to make the request as proper and fitting as possible for a contracting authority, it is important to know what motives the client has and therefore also the ambition to tender the project on a circular basis. The research made a step forward in this gap between the contracting authority's ambitions translated to a suitable formulation of the assessment criteria, which forms the foundation of a circular tender process.

Based on the profile tool, the drivers and ambitions of contracting authorities in order to formulate suitable selection and award criteria will be uncovered. Societally, the tool actually works two fold. On the one hand, it creates value for contracting authorities that are unknown in the field of circular tenders by unraveling their ambitions. And, on the other hand, it creates new insights for contracting authorities who think they already know everything about circularity and therefore often act with blinkers.

10.3 Limitations

Every research has a limited amount of value as not everything can be examined and therefore not all relevant aspects are included in the research. This also applies to this research. Now that the research has been completed, the gaps in scientific knowledge have become visible. The main topic of the research was about investigating the quality aspects of the assessment criteria. However, as derived from the literature and as depicted in Figure 23, tender documents are not only about quality components, even though they became increasingly important within circular projects. The price component is still important as well. Although the emphasis should not lie on the latter component within circular projects, it remains an important part of the process when it comes to the investment. The research leaves some sticking in this since the main focus was on the quality components. Despite the fact that a number of recommendations are made regarding the price component, the relationship between the two components is lacking a bit in this research.

Furthermore, the reader should bear in mind that the study is mainly focused on formulating criteria for contracting authorities aimed at governments. The research did not take into account whether the findings also match the needs of other types of clients, such as private individuals. However, this could be the input for interesting follow-up research.

Thirdly, the research focuses on *circular* aspects that can be implemented in the tender documents. The final outcomes do not lead to a complete tender document that is ready to put out for tender. The findings are purely focused on the inclusion of circular aspects within a tender and therefore do not constitute a complete tender. In addition to the circular elements in the selection and award criteria, there are of course also traditional elements that together form a comprehensive tender. However, the study was limited to the formulation of circular elements without establishing a link to the total picture of the tender documents. This must be taken into account by the readers and especially by the users of the results.

10.4 Recommendations

The research has shown that unraveling the drivers and ambitions for implementing circular element within a construction project is at the root of the formulation of the selection and award criteria. On basis of the research results is concluded that both selection and award criteria can be classified under three categories each. It is recommended that at least one sub-criteria of each category regarding the award criteria should be included in the tender documents. Formulating the selection criteria, separate preferences in the categories may be chosen, however, this is definitely not the case setting-up the award criteria. In addition, since it is recommended to include a maximum of five criteria in the award guideline, there is enough room to express the preferences for a certain category. Since this study is focused on formulating circular criteria, a follow-up study could investigate what the classification of the circular aspects means for the whole tender process. In this study, the relationship with traditional aspects that can be included as well in tenders is not established. It can be interesting if, for example, the traditional aspects (criteria) of a tender can also be subdivided into the developed categories.

In addition, further research is recommended towards the importance of adding weighting factors to the drafted sub-criteria. From the practical studies it was concluded that, since the formulation of ambitions is so subjective, no weighting needs to be linked to criteria. However, in some articles, it was mentioned that certain criteria are of greater importance regarding circular tenders. Therefore, follow-up research could include investigating the general importance of circular assessment criteria, in particular, the award criteria.

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Appendices

Appendix 1: Type of procedures

Open procedure

During an open procedure, there are no restrictions to the participation of the tender procedure. Therefore, all willing contractors can submit a proposal. The advantage of this procedure is the possibility to assess the participants and proposals simultaneously. The assessment of a large number of participants can be a disadvantage of this procedure (Chao-Duivis et al., 2013). In the open procedure, the tender takes place in one round. The entire market is free to participate in the procedure and to submit an offer. The advantage of this is that there is great competitive pressure on the tenderers. All offers are assessed at the same time for minimum requirements and award is made on the basis of the chosen award criterion.

The disadvantage is that (too) many offers may be submitted. As a result, the transaction costs for the contracting authority can increase considerably. Other disadvantages associated with this procedure include that bargaining is not allowed and that there is little freedom to organize the procedure (Opps, 2015).



Figure 51: Traditional tendering: The open procedure

Restricted procedure

The restricted procedure is often framed as an open procedure with pre-selection. This means that a contractor, supplier and/or service provider may submit a request to be part of that preselection (Hebly & Manunza, 2017). So contrary what the name suggests, this part of the procedure is therefore open. In reference to the open procedure, the restricted procedure involves an extra step of limiting the number of participants based on previously announced selection-criteria. This procedure offers the advantage of pre-selecting a number of qualified participants before assessing the proposals (Opps, 2015).



Figure 52: Traditional tendering: The restricted procedure

In the restricted procedure, the tender takes place in two rounds. The first round concerns the competence of the tenderer, while the second round relates to the tender itself. The advantage of this is that the number of bidders can be limited. As a result, the total transaction costs are lower for both the municipality and the providers than for the public procedure, with each participant submitting a detailed plan. Furthermore, in the restricted procedure, the same advantages and disadvantages apply as in the public procedure. There is competitive pressure on the tenderers, communication is formalized and there is little freedom to organize the procedure (Opps, 2015).

In this procedure, just as with the public procedure, it is problematic that the tenderer and the municipality cannot assess in the interim whether the plan actually meets the requirements and wishes of the municipality. There is a risk that a sub-optimal plan will be chosen (Opps, 2015).

Competitive dialogue

The competitive dialogue is intended for complex assignments, which means that it is not possible to determine in advance the technical, financial or legal means to meet the need or the goal. For example when certain topics are still unclear and in need of further exploration. The competitive dialogue offers the opportunity to enter into discussions with the market parties about the options to be chosen prior to registration. As a contracting authority, a dialogue with the market parties that leads to optimization between supply and demand can be conducted. Using this form of procedure, the creativity of the market can thus be optimally used to apply innovative solutions.



Figure 53: Traditional tendering: The competitive dialogue

The tender starts with a selection procedure on the basis of which at least three tenderers are selected. Subsequently, dialogue is conducted with the selected tenderers in one or more rounds. The awarding of the contract is based on the EMVI award criterion (Opps, 2015). The competitive dialogue is regularly applied in combination with Design, Build, Finance and Maintain constructions (DBFM).

Innovation partnership

The innovation partnership is a new procurement procedure in the European Directive 2014/24/EU and mainly implemented in art. 2.71 paragraph 3 (deadline for submitting requests to participate is at least thirty days) and 2.126b (awarding) of the Public Procurement Act, which has been introduced in Dutch procurement law on July 1st 2016 and is specially designed by the European Commission to combat challenges such as climate change, energy and resource efficiency and health and demographic change, the European Union faces (van Mierlo, 2018; Europa Decentraal, 2017). It is introduced to help contracting authorities to use public procurement as strategically as possible to promote innovation and enable them to enter into a partnership (Europa Decentraal, 2017). The procedure is used for the purchase of products, works and services that are not yet available on the market. The procurement consists of three phases (competition phase, research and development phase and commercial phase) and is mainly on the basis of which at least one company is selected.



Figure 54: The innovation partnership

The suitability requirements used must relate to the capacity of the tenderers to carry out research and development work, to develop the innovative solutions and to implement them (PIANOo, 2018b). Tenderers describe in their tender as clearly as possible the innovative solution to the problem of the contracting authority and indicate how they intend to develop this solution in the innovation partnership together with the contracting authority.

Appendix 2: Type of contracts

Traditional models

As described by Chao-Duivis et al. (2013), the traditional model is characterized by a classic triangle in which the client, contractor and the client's agent (designers) has a (in)direct relationship with each other. In addition, the client is in general responsible for design and demand specification and the contractor is responsible for execution of the demands (Van Mierlo, 2018).

In the model, often two forms of contracts are distinct: the early contractor involvement (in Dutch: Bouwteam) and the RAW specifications and conditions. Both models are almost always governed by the Uniform Administrative Conditions for the Execution of Works and Technical Installation Works 2012 ('UAC 2012') (Dutch: 'UAV 2012'). In addition, the contractual relationship for the design phase, is usually based on The New Rules 2011 (in Dutch: De Nieuwe Regeling (DNR 2011)) and for the execution phase almost always on the UAC 2012. The UAC 2012 are the general terms and conditions that apply to the building contract (Chao-Duivis et al., 2013). Governed by the UAC 2012, a common problem is that additional work needs to be commissioned when the specification proves inadequate.

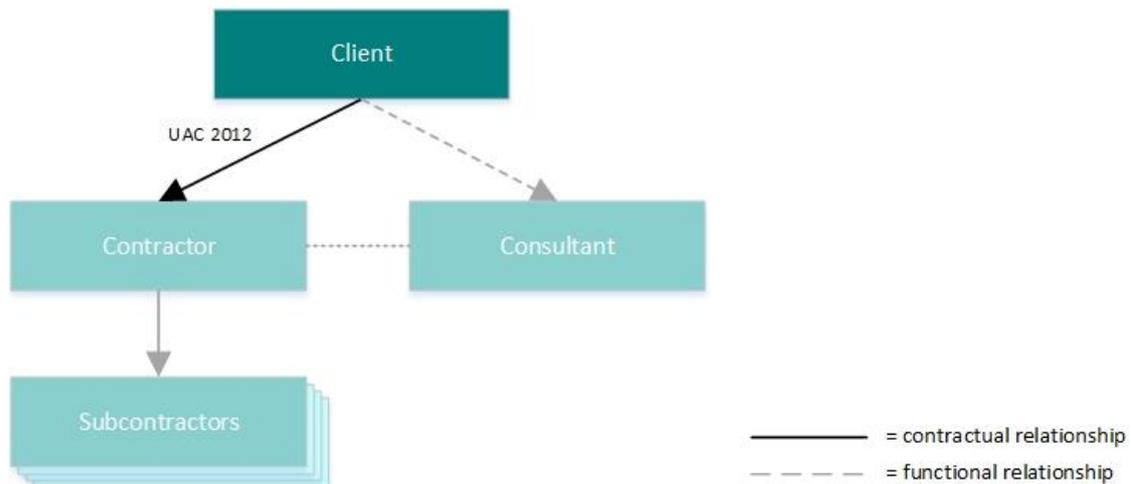


Figure 55: Schematic representation of the traditional construction process

The advantage of the traditional model is that the client only commits itself contractually with the executing parties at the very last moment and therefore has freedom of action in various respects for as long as possible, from starting points to costs. A disadvantage, however, is that it is only at a late stage that there is definite certainty about price formation and that the chosen starting points for the design sometimes turn out to be very costly to implement in the realization phase (Lwutech, 2018). Below, the two traditional contract forms are explained more in detail. In the explanation of the contract forms below, only the information relevant to this research is provided. Here, the emphasis is mainly based on general contract information such as under what type of General Terms and Conditions the contract is provided. Issues such as liability, payment terms, conflicts and end of contract are not taken into account since they are not relevant for the continuation of the research.

▪ Early contractor involvement

Within an early contractor involvement model, there is more cooperation between the different parties. In addition to a contractor and client, an architect, a consulting engineer, an installation company and/or a specialized company can also be part of a construction team to further develop a preliminary design (PIANOo, 2018b). The early contractor involvement model has the characteristic these different parties do not (has to) work at the same company. They are not in a continuous

permanent organization and do not work under central management but are largely independent of each other.

An early contractor involvement construction is customary for complicated projects where many disciplines and intensive collaboration is needed. In addition, it is obvious to opt for a design team construction when early on in the process there is already a need for the specific technical knowledge that contractors and advisors can contribute. A disadvantage of a design team contract is that there is no competitive advantage during pricing, which means that working in a construction team is not the cheapest solution. A contractor will therefore not come up with an innovative solution to reduce the price, after all the emphasis is mainly focused on quality.

- **Collaboration with RAW specifications and conditions**

The RAW specifications system is a system of legal, administrative and technical conditions with which contracts are put together. In a RAW specification, the result obligations are described in detail on all project components. A contract form based on the RAW System is well applicable for projects, of which it is known in advance exactly what the result should be or which materialization should be applied.

Integrated models

In the integrated model, the client generally delegates the design, execution, (and possibly management and operations) to a single party. However, this does not automatically mean that the contractor takes responsibility of the design and/or execution. If the contractor does not have the right expertise, he has the option to bring in designer(s), consultant, architect or (sub)contractor(s). On the one hand, if the contractor is forced to do this, it makes sense to make the design contract subject to The New Rules 2011. On the other hand, if the contractor needs to use an external building contractor, it is conceivable to apply the UAC 2012 to this relationship: in the client-UAC-GC-contractor relationship, a building contractor contracted in this way a subcontractor or independent auxiliary person (Chao-Duivis et al., 2013).

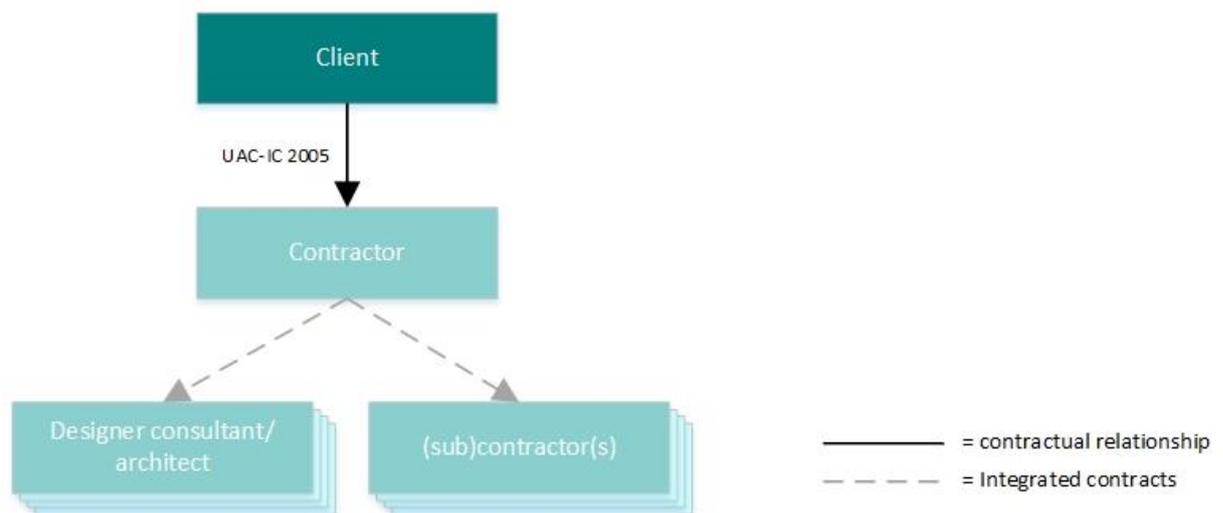


Figure 56: Schematic representation of the integrated contract

In the model often three forms of contract are distinct: Design & Construct, Engineer & Construct and Turn-key contracts. Those three contract forms are almost always governed by the Uniform Administrative Conditions for Integrated Contracts 2005 (UAC-IC 2005). The reason for these standardized conditions, is that these types of contracts are so commonly used that it requires homogeneity by its users (Chao-Duivis et al., 2013).

The advantage of integrated models is also its disadvantage: a lot of reliance is placed in one party with whom the client has to work together for a long time. This trust has little chance of growing before the contract is concluded. This has a strong legal effect on contract formation and on the rest of the process. In the explanation of the contract forms below, only the information relevant to this research is provided. Here, the emphasis is mainly based on general contract information such as under what type of General Terms and Conditions the contract is provided. Issues such as liability, payment terms, conflicts and end of contract are not taken into account since they are not relevant for the continuation of the research.

- **Design & Build**

The Design & Build (D&B) contract is a contract form between two parties, the client and the contractor, whereby both the design and the construction are under the responsibility and performance of the contractor. The client draws up a functionally specified request after which the contractor is given the space to optimize the design and realization itself and to apply innovations in the design and execution. However, this does not automatically mean that the client has no obligations. Besides the payment of the agreed contract sum, the client has responsibilities for the design and the work that needs to be carried out and also has the responsibility of the clerk of works to supervise the works. On the other hand, the contractor is required to carry out the works with no entitlement to set-off, additional payment or compensation unless otherwise laid down in the UAC 2012 (Chao-Duivis et al., 2013).

The major advantage of a Design & Build contract is that the contractor is given the space to optimize design and realization and to apply innovations. The major disadvantage is the limited possibility for optimization of the design with the maintenance phase, so that it does not necessarily look at life-cycle costs (PIANOo, 2018b).

- **Engineer & Construct**

The Engineering & Construct (E&C) contract is generally used for construction projects and maintenance projects that have no or only a small design component. The form of contract is very similar to the D&B contract, the only difference is in the engineering part. The contractor carries out work with a minimal share of detail engineering. In an E&C contract, the client draws up a functionally specified request whereby the functional requirements are usually at a lower level of abstraction than with D&B contracts since the design space is much more limited. In the case of an E&C contract, it is the contractor's responsibility to determine which activities he must perform to carry out the assignment. (PIANOo, 2018b). E&C contracts are mainly focused on variable maintenance of roads and structures with a small volume, low risk profile and a large repetitive character, and is therefore not very representative for the continuation of the research.

- **Turnkey**

The Turnkey contract is a contract under which the contractor is responsible for both the design and construction of a work. The client puts his demands and wishes on the market early in the project. In principle, the client only comes into the picture again when the project can be put into use. Shortly said, the basic concept is that in a Turnkey contract the contractor shall provide the works already for use at the agreed price and by a fixed date (Llamazares, 2016). The form of contract is very similar to the D&C contract, though with this contract, the contractor bears all the risks.

The life-cycle model

A Life-cycle model is similar to the integrated models where the client delegates the design, execution, (and possibly management and operations) to a single party. However, compared to D&C and E&C

contracts, in the life-cycle models also the maintenance, financing and/or operation faces are included.

In life-cycle models several model combination can be differentiated, with the Design, Build & Maintain and Design, Build, Finance & Maintain are mostly used. The contracts are almost always governed by the Uniform Administrative Conditions for Integrated Contracts 2005 (UAC-IC 2005) and are often used in Public Private Partnerships between government agencies and private-sector organizations for spatial development projects. The goal of these contracts is to integrate life-cycle costs in financing decisions and increase the level of sustainability (Van Mierlo, 2018).

- **Design, Build & Maintain (& Operate)**

A Design, Build & Maintain (& Operate) (DBM(O)) contract is in fact very similar to a D&C and E&C contract form in which again both the design and the construction are under the responsibility and performance of the contractor. However, an agreement for maintenance and facility services for a certain period is included in the DBM(O) contract. In this way, the costs that are saved on the construction part do not precede via increased maintenance costs. The functional requirements for the use of the building are discussed and contractually recorded prior to the project. This is also referred to as the output specifications of the project. These requirements are then worked out entirely by the contractor in the final building.

The advantage of this construction is that the initial investment of the client is often lower. Another positive aspect of a DBMO contract is that the contractor can not only work more efficiently, but also gains certain long-term income when concluding the contract. This allows clients to negotiate a lower price for design and realization (Onderwater, 2017).

- **Design, Build, Finance & Maintain (& Operate)**

The Design, Build, Finance & Maintain (& Operate) (DBFM(O)) is an integrated contract form in which the design, construction, maintenance and in the case of an operation, also the operation are carried out by the same contractor. DBFM(O) is a contract form that simplifies and relieves. The building is in fact not supplied as a product, but as a service. Both parties get something in return; the client can better spread his investment and has the certainty that the operation is in good hands for a longer period of time, while the contractor has maximum control over the realization of the project and is assured of stable income over the life of the building (Onderwater, 2017). One important difference between the DBFM(O) contract and the DBMO contract is that the financing at DBMO is not accountable for the contracting party, but remains the responsibility of the client.

Alliances

In an alliance form of contract, the contracting authority and the market party enter into a partnership and jointly carry out one or more tasks of the construction process and also share associated risks. An alliance is not governed by a construction contract, however it can be built up from so-called cooperation contracts. Salama (2017) mentioned that in such contract form all participants work under a contract that aligns their commercial interests with the outcome of the project in which they share all the pain and the gain. In other word, there is a risk share across all parties and collective ownership of opportunities and responsibilities associated with delivery of the whole project or service. In contrast to traditional contracts in which the contractor has separate contracts and objectives with each party, collaboration under an alliance contract means that there is one contract, one performance framework and always shared risks. The success in an alliance contract relies on strong relationships and trust. The determination of the legal form of the cooperation is important in this context. A good contractual basis ensures that both parties experience positive outcomes in

fulfilling their agreements. The alliance model is particularly suitable for large, complex construction projects.

- **Strategic alliance**

The contracting authority and the market party each have their individual factual and legal responsibility for the tasks that they have to perform separately. The form is often used in combination with the integrated model and is often limited to a task of which the risks are inadequate to oversee and no other parties can benefit from wearing these risks themselves, nor can these risks only be borne by the other party.

Appendix 3: Directive 2014/24/EU Article 57

Grounds of exclusions

Uitsluitingsgronden

1. Aanbestedende diensten sluiten een ondernemer uit van deelname aan een aanbestedingsprocedure wanneer zij hebben vastgesteld, door verificatie overeenkomstig de artikelen 59, 60 en 61, of anderszins ervan op de hoogte zijn dat deze ondernemer bij onherroepelijk vonnis veroordeeld is om een van de volgende redenen:

- a) deelneming aan een criminele organisatie in de zin van artikel 2 van Kaderbesluit 2008/841/JBZ van de Raad (32);
- b) omkoping in de zin van artikel 3 van de Overeenkomst ter bestrijding van corruptie waarbij ambtenaren van de Europese Gemeenschappen of van de lidstaten van de Europese Unie betrokken zijn (33) en van artikel 2, lid 1, van Kaderbesluit 2003/568/JBZ van de Raad (34), alsmede corruptie als omschreven in het nationale recht van de aanbestedende dienst of de ondernemer;
- c) fraude in de zin van artikel 1 van de Overeenkomst aangaande de bescherming van de financiële belangen van de Europese Gemeenschappen (35);
- d) terroristische misdrijven of strafbare feiten in verband met terroristische activiteiten in de zin van respectievelijk de artikelen 1 en 3 van Kaderbesluit 2002/475/JBZ van de Raad (36), dan wel uitlokking van, medeplichtigheid aan of poging tot het plegen van een dergelijk misdrijf of strafbaar feit als bedoeld in artikel 4 van genoemd kaderbesluit;
- e) witwassen van geld en financiering van terrorisme in de zin van artikel 1 van Richtlijn 2005/60/EG van het Europees Parlement en de Raad (37);
- f) kinderarbeid en andere vormen van mensenhandel in de zin van artikel 2 van Richtlijn 2011/36/EU van het Europees Parlement en de Raad (38).

De verplichting tot uitsluiting van een ondernemer is ook van toepassing wanneer de bij onherroepelijk vonnis veroordeelde persoon lid is van het bestuurs-, leidinggevend of toezichthoudend orgaan van deze ondernemer of daarin vertegenwoordigings-, beslissings- of controlebevoegdheid heeft.

Appendix 4: Directive 2014/24/EU Article 2.93

Hoofdstuk 4.1.1

Een ondernemer toont zijn technische bekwaamheid of beroepsbekwaamheid aan op een of meer van de volgende manieren, afhankelijk van de aard, de hoeveelheid of omvang en het doel van de werken, leveringen of diensten:

- a. door middel van een lijst van de werken die in de afgelopen periode van ten hoogste vijf jaar werden verricht, welke lijst vergezeld gaat van certificaten die bewijzen dat de belangrijkste werken naar behoren zijn uitgevoerd, zowel met betrekking tot de wijze van uitvoering als met betrekking tot het resultaat;
- e. door middel van een vermelding van de systemen voor het beheer van de toeleveringsketen en de traceersystemen die de ondernemer kan toepassen in het kader van de uitvoering van de overheidsopdracht;
- h. door middel van de vermelding van de maatregelen inzake milieubeheer die de ondernemer kan toepassen voor de uitvoering van de overheidsopdracht;

Artikel 2.97 lid 1 AW

Indien een aanbestedende dienst de overlegging verlangt van een door een onafhankelijke instantie opgestelde verklaring dat de ondernemer aan bepaalde systemen of normen inzake milieubeheer voldoet, verwijst hij naar:

- a. het milieubeheer- en milieuauditsysteem van de Europese Unie,
- b. een ander milieubeheersysteem dat is erkend overeenkomstig artikel 45 van verordening (EG) nr. 1221/2009 van het Europees Parlement en de Raad van 25 november 2009 inzake de vrijwillige deelneming van organisaties aan een communautair milieubeheer- en milieuauditsysteem (EMAS), tot intrekking van verordening (EG) nr. 761/2001 en van de Beschikkingen 2001/681/EG en 2006/193 EG van de Commissie (PbEU 2009, L 342), of
- c. andere normen inzake milieubeheer die gebaseerd zijn op toepasselijke Europese of internationale normen en die door conformiteitsbeoordelingsinstanties zijn gecertificeerd.

Appendix 5: List of TenderNed study documents

ID	Name of project	Type of procedure	Publication date	Suitability requirement	Selection criteria	Award criteria
T ₁	Aanpassing influent- en retourslibvijzels, roostergoed en zandvanginstallatie - Hoogheemraadschap van Rijnland	Open	13-01-2015	No	n.a.	Yes
T ₂	Circulair slopen Winkelerlaan 369, 371 en 373 (Voormalige huisvesting Rietveldcollege en twee woningen) - Gemeente Utrecht	Open	06-02-2015	No	n.a.	Yes
T ₃	Design & Build Galileo Reference Centre - Rijksvastgoedbedrijf	Restricted	19-01-2016	No	No	Yes
T ₄	Marktconsultatie/-verkenning circulaire inkoop Sporthal te Wageningen - Gemeente Wageningen	Open	18-10-2016	No	n.a.	Yes
T ₅	Ontwerpen en realiseren van een geluidswerende constructie te Hoofddorp - Gemeente Haarlemmermeer	Open	15-12-2016	No	n.a.	Yes
T ₆	30.11054 - Realisatie Pieter Baan Centrum in de Oostvaarderskliniek te Almere - Rijksvastgoedbedrijf	Restricted	01-02-2017	No	No	Yes
T ₇	Onderhoud asfaltverhardingen - Gemeente Leidschendam-Voorburg	Open	27-02-2017	No	No	
T ₈	Design en Build opdracht voor de Sporthal aan de Marijkeweg te Wageningen - Gemeente Wageningen	Restricted	19-04-2017	No	n.a.	Yes
T ₉	AI 2017-0226 Nieuw clubgebouw AFC - Gemeente Amsterdam, Ingenieursbureau	Restricted	06-09-2017	No	No	Yes
T ₁₀	N212, reconstructie van de aansluitingen bij de Geerbrug en de rotonde Mijdrechtse Dwarsweg - Provincie Utrecht	Open	28-09-2017	Yes	n.a.	Yes
T ₁₁	Bestek 1023 Grond- en verhardingswerken t.b.v. aanleg rotonde en verbreden fietspad N204 Montfoort - Provincie Utrecht	Open	14-11-2017	No	n.a.	Yes
T ₁₂	Bouwteam- & Uitvoeringsopdracht t.b.v. "Groot Onderhoud+ Regenboogbuurt" m.b.v. RAW-Raamovereenkomst - Gemeente Almere	Open	13-12-2017	No	n.a.	Yes
T ₁₃	AI 2017-0418 Raamovereenkomst Asfaltverhardingen Gemeente Amsterdam, Stadsdeel Oost - Gemeente Amsterdam, Ingenieursbureau	Open	02-02-2018	No	n.a.	Yes
T ₁₄	Selectieleidraad: Engineer & Build & Maintain recycleplein Circulus-Berkel te Deventer - Circulus-Berkel B.V.	Restricted	05-04-2018	No	Yes	Yes
T ₁₅	Onderhoud en reconstructie N409 en N410 - Provincie Utrecht	Open	06-04-2018	No	No	Yes
T ₁₆	Groot onderhoud wegen 2018 - Provincie Utrecht	Open	14-05-2018	No	n.a.	Yes
T ₁₇	AT-2018-03: Marktconsultatie A27 Houten-Hoopolder - Rijkswaterstaat Grote Projecten en Onderhoud (GPO)	Competitive dialogue	15-05-2018	No	No	Yes?
T ₁₈	Renovatie Het Arsenaal - Universiteit Leiden - Universiteit Leiden	Restricted	24-05-2018	No	Yes	Yes
T ₁₉	90-2017 Maaien bermen en sloten gemeente Groningen en gemeente Ten Boer 2018 - Gemeente Groningen, Afdeling Stadsingenieurs	Open	19-06-2018	Yes	n.a.	Yes
T ₂₀	Engineer & Build Nieuwbouw Sterrenschool Hilversum - Stip Hilversum	Restricted	27-06-2018	Yes	Yes	Yes

T ₂₁	Realisatie parkeergebouw Berlijnplein Leidsche Rijn Centrum Oost - Gemeente Utrecht	Open	02-07-2018	No	n.a.	Yes
T ₂₂	Selectie Ontwikkeling Knooperf - Buurtschap de Tuunen in Den Burg op Texel - Gemeente Texel	Restricted	04-07-2018	No	Yes	Yes
T ₂₃	Herontwikkeling locatie Blok van Gendt - Gemeente Venlo	Open	11-07-2018	No	No	Yes
T ₂₄	NRR Circusplein tot Zwarte Pad - Gemeente Den Haag	Open	04-08-2016	No	n.a.	Yes?
T ₂₅	15065 - Renovatie Rijkskantoor Surinameweg 4 te Haarlem - Rijksvastgoedbedrijf	Competitive dialogue	25-09-2018	Yes	Yes	Yes
T ₂₆	Europese Openbare Aanbesteding Vervanging Oevertraject 20 - Provincie Noord-Holland	Open	27-09-2018	Yes	Yes	Yes
T ₂₇	Marktverkenning Duurzaamheid/circulair inkopen in de GWW - Gemeente Hendrik-Ido-Ambacht	unknown	24-10-2018	No	n.a.	Yes
T ₂₈	Circulair fietspad Azieweg PoA - Havenbedrijf Amsterdam N.V.	Competition with negotiation	13-11-2018	No	No	Yes
T ₂₉	MFA Boezemsingel en Stal - Gemeente Oud-Beijerland	Open	30-11-2018	No	n.a.	Yes

Appendix 6: TenderNed study outcomes award criteria

Quality (max. 70%)														
AC1: Technical-content aspect					AC2: Process-based aspect						AC3: Financial-economic aspect			
Performance formulations				Design	Plan of Action						Future value			
Energy reduction	Flexibility and adaptability	(raw) material (re)use	Measurability	Design for disassembly	Collaboration/ partnership	Environmental management	Opportunities/ improvement proposal	Maintenance	Social Return	Total Costs of Ownership	Residential value	Socially responsible purchasing	Environmental Performance Indicator	
T ₁					X		X							
T ₂			X		X	X			X			X		
T ₃	X		X		X				X					
T ₄	X	X	X	X				X						
T ₅	X		X	X	X		X						X	
T ₆	X				X	X								
T ₇	X	X	X		X	X								
T ₈	X	X	X	X				X						
T ₉		X	X					X						
T ₁₀	X		X			X								
T ₁₁	X		X				X					X		
T ₁₂			X		X		X							
T ₁₃	X							X					X	
T ₁₄	X	X	X		X			X						
T ₁₅	X		X			X			X			X		
T ₁₆	X		X			X	X							
T ₁₇			X		X	X								
T ₁₈	X		X		X	X								
T ₁₉	X							X						
T ₂₀	X		X	X								X		
T ₂₁	X				X		X							
T ₂₂	X		X	X	X									
T ₂₃	X		X		X		X							
T ₂₄	X					X								
T ₂₅	X	X		X	X									
T ₂₆	X		X	X			X							
T ₂₇	X							X				X		
T ₂₈	X	X	X											
T ₂₉	X		X	X										
Total	24	8	21	2	6	14	9	8	7	3	0	0	4	2

Appendix 7: List of interview participants

ID	Name	Category	Name of company	Function	Date	Type of interview
P1	Jim Teunizen	Advisor	Alba Concepts	Partner	30/11/2018	On location
P2	Jurriën de Jong	Advisor	<i>abcnova</i>	Managing partner	14/12/2018	On location
P3	Peter Eitjes	Central government real estate agency	Rijksvastgoed-bedrijf	Senior Process Manager	28/11/2018	Phone
P4	Alexander Hesling	Installation	Kuijpers	Director Lifecycle Partners	05/12/2018	On location
P5	Onno Dwars	Construction	Ballast Nedam	Director	13/12/2018	On location
P5	Fanauw Hoppe	Lawyer	AT Osborne	Lawyer	04/12/2018	On location

Appendix 8: Interview Questions

Interview questions in English

Part 1: Circular economy

The circular economy is a much discussed concept in recent years and which you undoubtedly also had to deal with. Terms such as the **layers of Brand**, the **closing of cycles** (cradle to cradle), **the 7R model** (rethink, reduce, repair, reuse, refurbish, recycle and recover) are common terms when we speak of the circular economy. One of the trends within the circular economy is the focus on circular building.

If we make the concept CE more concrete and relate it to the construction sector:

1. What do you understand by circular building, when is something (a) circular building (d)?
2. What are the biggest challenges for the implementation of circularity in the construction sector?
3. In your opinion, where is the responsibility for implementing circularity in construction? Is this with the government, the client or with the builders?

Own vision of the circular economy: "Circular economy is an economic system for the valuable use of resources, without loss of raw materials, products, capacity and people and with the aim of creating positive effects on climate, the environment, employment and economy: a closed cycle. . "

Own vision circular construction: "Circular building means designing, realizing and efficiently demolishing buildings so that cycles remain closed. For example, by designing reusable or high-grade recyclable parts, the use of re-used, reworked or local re-growable materials and raw materials, the maximum adaptability and disassembly of buildings and the exclusion of hazardous substances. "

If we now focus more on the tendering of the circular construction projects described earlier, it appears that not every procedure is equally suitable for this. Various studies have shown that for the tendering of a circular construction project, a separate selection and award phase where the contracting authority and the selected tenderers enter into dialogue between the phases offers many advantages. (Competitive dialogue, The negotiated procedure without notice and The competition procedure).

Part 2: Circular tendering

4. Looking at the tender process in general, are there differences between the tendering process of a traditional construction project compared to a circular construction project? What do you actually understand by circular tendering?
5. For you, as <...>, what are the bottlenecks in the request (the drafting of the selection guideline) of a circular building project? What are you running into?
6. Looking at the (pre-) selection (phase) of the tenderers, how can circularity be included in the conditions for participation (exclusion grounds (personal circumstances of participants who are for the AD reason to exclusion) and suitability requirements (go into the competence of the participant to carry out the assignment)?
7. Is the dialogue phase of added value for a circular construction project? If so, how can the dialogue sessions be used? How can we guard against the principles of equality and transparency?

The further selection criteria within the selection phase of a tender relate to the tenderer, whereby mainly the viewer of the tenderer is asked and on the basis of reference projects it is checked whether the tenderer is technically competent for the execution of the contract.

8. How can circularity be included in the further selection criteria? What are crucial criteria for this?
 - Are things promised that cannot be made true in advance?

The next phase of a tendering process, the award phase, focuses on the assessment of the tender (the contract).

9. Looking at the award of the work, how can circularity be included in the award criteria? What are crucial criteria (both subjective and objective)?
10. How should the component 'price' relate to the other criteria? Is setting a ceiling budget an option? Tenderers with a quotation that is 20% higher than the average price quotation will be excluded from further participation.

Disclosure

11. Looking back at the projects you have attended in recent times, have you learned lessons from this?
12. Is there something that has remained undiscussed during the interview but what may be important for my research?

Interview questions in Dutch

Deel 1: Circulaire economie

De circulaire economie is een veel besproken concept de afgelopen jaren en waar u ongetwijfeld ook mee te maken heeft gehad. Termen zoals de **layers of brand**, **het sluiten van kringlopen** (cradle to cradle), **het 7R model** (rethink, reduce, repair, reuse, refurbish, recycle en recover) zijn veelvoorkomende begrippen als we spreken over de circulaire economie. Een van de trends binnen circulaire economie is de aandacht voor circulair bouwen.

Als we het concept CE wat meer concretiseren en relateren aan de bouwsector:

1. Wat verstaat u onder circulair bouwen, wanneer is iets (een) circulair gebouw(d)?
2. Wat zijn de grootste uitdagingen voor het implementatie van circulariteit in de bouwsector?
3. Waar ligt volgens u de verantwoordelijkheid voor het implementeren van circulariteit in de bouw? Is dit bij de overheid, de opdrachtgever of bij de bouwers?

Eigen visie circulaire economie: "Circulaire economie is een economisch systeem voor het waardevolle gebruik van hulpbronnen, zonder verlies van grondstoffen, producten, capaciteit en mensen en met het doel positieve effecten te creëren voor klimaat, milieu, werkgelegenheid en economie: een gesloten kringloop."

Eigen visie circulair bouwen: "Circulair bouwen betekent het zodanig ontwerpen, realiseren en efficiënt slopen van gebouwen zodat kringlopen gesloten blijven. Bijvoorbeeld door het ontwerpen van herbruikbaar of hoogwaardig recyclebare onderdelen, het inzetten van hergebruikte, herwerkte of lokale hergroeibare materialen en grondstoffen, het maximaal aanpasbaar en demontabel maken van gebouwen en het uitsluiten van gevaarlijke stoffen."

Als we ons nu meer richten op de aanbestedingen van de eerder omschreven circulaire bouwprojecten, blijkt dat niet iedere procedure hier even geschikt voor is. Uit verschillende onderzoeken is gebleken dat voor de aanbesteding van een circulair bouwproject, een gescheiden selectie- en gunningsfase waar de aanbestedende dienst en de geselecteerde inschrijvers tussen de fasen met elkaar in gesprek gaan, veel voordelen biedt. (Concurrentiegericht dialogoog, De onderhandelingsprocedure zonder aankondiging en De mededingingsprocedure).

Deel 2: Circulair aanbesteden

4. Kijkend naar het tenderproces in het algemeen, zijn er verschillen tussen het aanbestedingstraject van een traditioneel bouwproject ten opzichte van een circulair bouwproject? Wat verstaat u eigenlijk onder circulair aanbesteden?
5. Voor u, als <...>, wat zijn nu de knelpunten bij de uitvraag (het opstellen van de selectieleidraad) van een circulair bouwproject? Waar loopt u tegenaan?
6. Kijkend naar de (pre-)selectie(fase) van de gegadigden, hoe kan circulariteit worden opgenomen in de *voorwaarden voor deelneming* (uitsluitingsgronden (persoonlijke omstandigheden van deelnemers die voor de AD rede zijn tot uitsluiting) en geschiktheidseisen (gaan in op de bekwaamheid van de deelnemer tot het uitvoeren van de opdracht)?
7. Is de *dialogofase* van meerwaarde bij een circulair bouwproject? Zo ja, hoe kunnen de dialoogsessies worden ingezet? Hoe kan er gewaakt worden voor de beginselen van gelijkheid en transparantie?

De nadere selectie criteria binnen de selectiefase van een aanbesteding hebben betrekking op de inschrijver, waarbij voornamelijk gevraagd wordt naar de visie van de inschrijver en aan de hand van referentieprojecten wordt er gekeken of de inschrijver technisch bekwaam is voor het uitvoeren van de opdracht.

8. Hoe kan circulariteit opgenomen worden in de *nadere selectie criteria*? Wat zijn hierbij cruciale criteria?
 - Worden er dingen beloofd die op voorhand al niet waar kunnen worden gemaakt?

De volgende fase van een aanbestedingsproces, de gunningsfase, richt zich op de beoordeling van de inschrijving (de opdracht).

9. Kijkend naar de gunning van het werk, hoe kan circulariteit worden opgenomen in de *gunningscriteria*? Wat zijn hierbij cruciale criteria (zowel subjectief als objectief)?
10. Hoe dient het component 'prijs' zich te verhouden tot de andere criteria? Is het instellen van een plafondbudget een optie? Gegadigde met een prijsopgave die 20% hoger is dan de gemiddeld prijsopgave worden uitgesloten van verdere deelname.

Afronding

11. Terugkijkend op de projecten waar je de afgelopen tijd aan hebt deelgenomen, heb je hier nog lessen van geleerd?
12. Is er iets dat nog onbesproken is gebleven tijdens het interview maar wat van belang kan zijn voor mijn onderzoek?

Appendix 9: Interview analysis

Interviewer ID	Statement ID	Aspect	Text fragment (cited)	Statement	Open code
P1	S1.1	Circulair bouwen	'Ik heb hierbij drie invalshoeken: 1. Materialen, 2. Van leveranciers naar partners en 3. Gebiedsgerichte nadenken over circulariteit.'	Circulair bouwen heeft drie invalshoeken: materialen, van leveranciers naar partners en gebiedsgericht nadenken over circulariteit.	Herinzetbaarheid materialen.
P1	S1.2	Circulair bouwen	'Ik heb hierbij drie invalshoeken: 1. Materialen, 2. Van leveranciers naar partners en 3. Gebiedsgerichte nadenken over circulariteit.'	Circulair bouwen heeft drie invalshoeken: materialen, van leveranciers naar partners en gebiedsgericht nadenken over circulariteit.	Van leveranciers naar partners.
P1	S1.3	Circulair bouwen	'Ik heb hierbij drie invalshoeken: 1. Materialen, 2. Van leveranciers naar partners en 3. Gebiedsgerichte nadenken over circulariteit.'	Circulair bouwen heeft drie invalshoeken: materialen, van leveranciers naar partners en gebiedsgericht nadenken over circulariteit.	Gebiedsgerichte circulariteit.
P1	S1.4	Circulair bouwen	De invalshoek van leveranciers naar partners zie ik hierin als de grootste uitdaging. Als je erin slaagt om van leveranciers juist jouw partners te maken, dan blijven ze op de hoogte van wat ze inbrengen en worden ze betrokken bij het product dat ze als tussenresultaat opgeleverd hebben (gekregen)	Bij circulair bouwen is de invalshoek om van leveranciers partners te maken de grootste uitdaging.	Van leveranciers naar partners.
P1	S1.5	Circulair bouwen	Zo kunnen we onze projecten bijvoorbeeld samen nemen met projecten van andere stakeholders uit de regio. Waarbij er wordt gekeken naar hoe je elkaar kunt helpen, bijvoorbeeld met benodigd materiaal.	Bij circulair bouwen dient er gekeken te worden naar hoe (bestaande) materialen (uit de omgeving) opnieuw ingezet kunnen worden.	Herinzetbaarheid materialen.
P1	S1.6	Circulair bouwen	Circulariteit is ook iets wat te maken heeft met sociale/procesmatige componenten. Hoe zorgen we er bijvoorbeeld voor dat er geen uitval is.	Circulariteit heeft ook iets te maken met sociale/procesmatige componenten.	Sociale aspecten. Procesmatig.
P2	S1.7	Circulair bouwen	Wanneer we spreken van een circulair gebouw en hoe je met circulair bouwen omgaat, is er geen eenzijdig antwoord, maar dit betreft een aantal aspecten.	De definitie van circulair bouwen is niet eenduidig.	Niet eenduidig.
P2	S1.8	Circulair bouwen	Hierbij is circulariteit, wat gerelateerd is aan de manier waarop je omgaat met materialen en grondstoffen, onderdeel van het duurzaamheidsthema.	Circulariteit, onderdeel van duurzaamheid, is gerelateerd aan de manier waarop er om dient te worden gegaan met materialen en grondstoffen.	Materiaalherkomst.
P2	S1.9	Circulair bouwen	De definitie die ik hanteer voor circulariteit bestaat uit drie elementen. 1. Wat is de herkomst van het materiaal dat je toepast? 2. Wat ga je er in de toekomst mee doen. 3. Hoe losmaakbaar is het materiaal?	Circulariteit heeft drie invalshoeken: materiaalherkomst, toekomstwaarde en losmaakbaarheid.	Materiaalherkomst..
P2	S1.10	Circulair bouwen	De definitie die ik hanteer voor circulariteit bestaat uit drie elementen. 1. Wat is de herkomst van het materiaal dat je toepast? 2. Wat ga je er in de toekomst mee doen. 3. Hoe losmaakbaar is het materiaal?	Circulariteit heeft drie invalshoeken: materiaalherkomst, toekomstwaarde en losmaakbaarheid.	Toekomstwaarde.
P2	S1.11	Circulair bouwen	De definitie die ik hanteer voor circulariteit bestaat uit drie elementen. 1. Wat is de herkomst van het materiaal dat je toepast? 2. Wat ga je er in de toekomst mee doen. 3. Hoe losmaakbaar is het materiaal?	Circulariteit heeft drie invalshoeken: materiaalherkomst, toekomstwaarde en losmaakbaarheid.	Losmaakbaarheid.
P2	S1.12	Circulair bouwen	Hierbij zijn de drie zojuist genoemde elementen gekoppeld aan de economische basisprincipes vertaald naar andere financieringsmodellen, de financiële cyclus zoals verdienmodellen.	De drie invalshoeken van circulariteit zijn gekoppeld aan de economische basisprincipes.	Financieel. Economisch.
P2	S1.13	Circulair bouwen	Op drie verschillende gebieden valt er nog een slag te maken als we kijken naar circulariteit in de bouwsector: de kennis, de opschaalbaarheid en de meetbaarheid.	Kijkend naar circulariteit valt er op het gebied van kennis, opschaalbaarheid en meetbaarheid nog een slag te maken.	Opschaalbaarheid Meetbaarheid.
P2	S1.14	Circulair bouwen	Voor eenieder geldt dat de verantwoordelijkheid hiervan bij jezelf ligt, onafhankelijk van de rol die je hebt.	De verantwoordelijkheid voor het implementeren van circulariteit in projecten ligt bij ieder individu.	Algemene verantwoordelijkheid.
P2	S1.15	Circulair bouwen	Maar de verantwoordelijkheid moet ook primair worden gelegd bij de Universiteiten en Hogescholen.	De verantwoordelijkheid voor het implementeren van circulariteit in projecten ligt bij het onderwijs.	Onderwijs.
P3	S1.16	Circulair bouwen	Als we het hebben over een circulair gebouw, betekend dat feitelijk een gebouw die zo min mogelijk impact heeft op de natuur en aan de milieudoelstellingen. Dit is zowel op materiaal, als energiegebruik als biodiversiteit, als het watergebruik.	Bij circulair bouwen gaat het feitelijk om het realiseren van een gebouw met zo min mogelijk impact op de natuur en milieudoelstellingen.	Milieu impact minimaliseren.
P3	S1.17	Circulair bouwen	Maar als we kijken naar de grootste uitdagingen omtrent het implementeren van circulariteit in de bouwsector is mijn beeld dat we nu nog te veel bezig zijn met circulariteit als ultieme doelstelling zien.	Tijdens een aanbesteding dient circulariteit niet als ultieme doel gezien te worden, maar als een van de standaarden.	Circulariteit als standaard.
P3	S1.18	Circulair bouwen	We zijn nu nog heel erg bezig met een circulair gebouw, en dan merk je dat dat heel erg níet aansluit op degene die het gebouw moeten realiseren.	Tijdens een aanbesteding dient circulariteit niet als ultieme doel gezien te worden, maar als een van de standaarden.	Circulariteit als standaard.
P3	S1.19	Circulair bouwen	Ik zie het als een algemeen belang. Degene die uiteindelijk primair belast worden met het algemeen belang, is de overheid.	De verantwoordelijkheid voor het implementeren van circulariteit in projecten ligt bij overheden.	Overheden.
P3	S1.20	Circulair bouwen	Dit neemt niet weg dat ieder ander zijn eigen verantwoordelijkheid hierin zou moeten nemen: het individuele persoon. Maar het is de verantwoording van de overheid om het aan te jagen, te reguleren en te stimuleren.	Het is de verantwoording van overheden om het implementeren van circulariteit in projecten aan te jagen, te reguleren en te stimuleren.	Overheden.
P4	S1.21	Circulair bouwen	Binnen circulair bouwen is voor mij heel belangrijk dat de dingen die nu gebruikt worden om een gebouw te bouwen of renoveren, in hoge mate herbruikbaar zijn.	Circulair bouwen draait voornamelijk op de herbruikbaarheid van materialen.	Herbruikbaarheid materialen.

P4	S1.22	Circulair bouwen	<i>Bij renovatie is het van belang om duidelijk in beeld te krijgen wat er nu in het gebouw aanwezig is en eventueel hergebruikt kan worden. Het op een andere plek inzetten van elementen/materialen.</i>	Bij een circulair renovatie project staat het in kaart brengen van materialen/onderdelen van het gebouw centraal	Herinzetbaarheid materialen.
P4	S1.23	Circulair bouwen	<i>Ik geloof dus ten eerste in het vroegtijdig nadenken van de manier waarop materialen ingezet kunnen worden.</i>	Bij circulair bouwen ligt vroegtijdig de focus op samenwerking.	Vroegtijdige samenwerking.
P4	S1.24	Circulair bouwen	<i>Ten tweede de losmaakbaarheid en het niet vervuilen van bouwstoffen.</i>	Circulair bouwen draait voornamelijk op losmaakbaarheid van bouwelementen en het niet vervuilen van bouwstoffen.	Losmaakbaarheid.
P4	S1.25	Circulair bouwen	<i>Wat ik als enorm probleem ervaar, is dat er achter de bouwwereld een enorme keten aan producenten en fabrikanten van producten. Wij zijn dan dus ook afhankelijk van een hele keten aan leveranciers. Bij het kiezen van de geschikte toeleveranciers kun je echter wel bewuste keuzes maken: hoe duurzaam/circulair zijn zij?</i>	Bij het implementeren van circulariteit in de bouw zijn bouwers sterk afhankelijk van hun (toe)leveranciers.	Toeleveranciers.
P4	S1.26	Circulair bouwen	<i>Daarnaast zie ik ook dat er een stukje kennisgebrek is bij aanbestedende diensten.</i>	Aanbestedende diensten hebben veelal een gebrek aan kennis wanneer het gaat om de aanbesteding van circulaire projecten.	Kennisgebrek.
P4	S1.27	Circulair bouwen	<i>De ontwerpfilosofie is de basis van een circulair ontwerp, vanuit hier kan gestuurd worden op de controleerbaarheid van het demontageconcept en de milieu-impact.</i>	De ontwerpfilosofie is de basis van een circulair gebouw, waarbij gestuurd kan worden op demontabiliteit en de milieu-impact.	Overheden verantwoordelijk.
P5	S1.28	Circulair bouwen	<i>Voor mij betekend circulariteit wanneer iets terug gebracht kan worden naar de oorspronkelijke staat.</i>	Bij circulariteit gaat het om het terugbrengen van iets naar zijn oorspronkelijke staat.	Herbruikbaarheid materialen.
P5	S1.29	Circulair bouwen	<i>Puur gekeken naar de circulaire economie, betekend het voor mij een bio-based economie, waarbij je ook de grondstoffen terug kan brengen naar de natuur en zodat er iets anders mee kan ontstaan.</i>	Bij een circulaire economie gaat het om een bio-based economie waarin grondstoffen teruggebracht worden naar de natuur.	Herinzetbaarheid materialen.
P5	S1.30	Circulair bouwen	<i>Als je dit een stuk pragmatisch bekijkt, heeft dit te maken met de losmaakbaarheid van producten en dat niets wordt vermengd zodat het goed hergebruikt kan worden.</i>	Circulair bouwen gaat om de losmaakbaarheid en vervuiling van producten.	Losmaakbaarheid.
P5	S1.31	Circulair bouwen	<i>Het aspect wat nu heel erg in de discussie over de circulaire economie ontbreekt, is de financiering ervan.</i>	Het financieringsmodel van de circulaire economie is op dit moment nog een ondergeschoven kind.	Financieringsmodel. Financieel.
P5	S1.32	Circulair bouwen	<i>Je moet dus ook je hele economische model herinrichten. Het introduceren van tijdelijkheid met een einddatum is dus cruciaal voor circulaire projecten.</i>	Het introduceren van tijdelijkheid met een einddatum is cruciaal.	Tijdelijkheid
P5	S1.33	Circulair bouwen	<i>De aluminium kozijnen zijn volledig losmaakbaar en terug te brengen in de keten en eventueel her te gebruiken.</i>	Circulair bouwen gaat om de losmaakbaarheid van elementen.	Losmaakbaarheid
P5	S1.34	Circulair bouwen	<i>We moeten dus maar één instrument hebben. En er moeten eisen komen.</i>	Er moet een eenduidig meetinstrument voor circulariteit komen.	Eenduidig meetinstrument.
P5	S1.35	Circulair bouwen	<i>Toen moesten we het aantonen, en daar is ook het grondstoffenpaspoort vandaan gekomen, dat we wel echt 85% circulair waren. Dus zo hebben we die stappen gemaakt. Maar je kan ook Madaster of de BCI gebruiken.</i>	Madaster of de BCI zijn methodieken voor het meetbaar maken van circulariteit.	Meetbaarheid. Madaster. BCI.
P6	S1.36	Circulair bouwen	<i>Wat ook altijd erg belangrijk is, en dat behoort ook eigen bij circulair, is dat historie een hele belangrijke is, om die weer terug te laten komen en in tact te houden.</i>	De historische waarde van het project is een belangrijk aspect binnen circulariteit.	Historische waarde.
P6	S1.37	Circulair bouwen	<i>Langzamerhand wordt duurzaamheid en circulariteit steeds belangrijker en komt het steeds vaker naar voren, maar of het echt doorleefd wordt daar heb ik zo mijn twijfels over.</i>	Duurzaamheid en circulariteit zijn aspecten die steeds belangrijker worden.	Duurzaamheid.
P6	S1.38	Circulair bouwen	<i>Daarnaast vind ik ook het sociale aspect een hele belangrijke. Elke plek/locatie heeft iets opgebouwd, zowel cultureel als historisch. Dit kan ook onder het procesmatige aspect vallen.</i>	Sociale aspecten zoals de culturele en historische waarde is belangrijk binnen circulaire projecten.	Sociale aspecten. Procesmatig.
P6	S1.39	Circulair bouwen	<i>Maar circulariteit gaat ook over andere thema's, zoals water en energie. Het staat nog wel echt in de kinderschoenen.</i>	Water en energie zijn belangrijke thema's binnen circulariteit.	Energie. Water.
P6	S1.40	Circulair bouwen	<i>Het grondstoffenpaspoort hebben we al een aantal keer mee te maken gehad, maar daar blijft het wel zo'n beetje bij.</i>		Grondstoffenpaspoort.
P6	S1.41	Circulair bouwen	<i>Bij renovatieprojecten moet vanuit een historisch en sociaal manier gezorgd worden dat het zoveel mogelijk in tact blijft. En dat is de uitdaging. En met hergebruik van materialen.</i>	Zorgvuldig hergebruik van materialen is een belangrijke uitdaging bij renovatie projecten.	Materiaal hergebruik.
P1	S2.1	Het aanbestedingsproces	<i>Het gedachtegoed achter een nieuwe vorm van aanbesteden waarin partnerschap en toekomstwaarde centraal staat, door vroeger in het proces partners te selecteren, en er samen naartoe te kunnen werken om de ambities in te invullen zodat we van te voren hebben geregeld hoe de oplossing eruit ziet.</i>	Bij circulair aanbesteden staat partnerschap centraal.	Partnerschap.
P1	S2.2	Het aanbestedingsproces	<i>Het gedachtegoed achter een nieuwe vorm van aanbesteden waarin partnerschap en toekomstwaarde centraal staat, door vroeger in het proces partners te selecteren, en er samen naartoe te kunnen werken om de ambities in te invullen zodat we van te voren hebben geregeld hoe de oplossing eruit ziet.</i>	Bij circulair aanbesteden staat toekomstwaarde centraal.	Toekomstwaarde.
P1	S2.3	Het aanbestedingsproces	<i>Voordat je de inrichting van het aanbestedingsproces vastzet, moeten er onderling en met de markt veel gesprekken gevoerd worden. Daarbij vormt de vroegtijdige focus op samenwerking die al bij de eerste fase van een aanbesteding ingezet dient te worden, als rode draad tijdens het hele proces.</i>	Bij circulair aanbesteden ligt vroegtijdig de focus op samenwerking en moeten er veel gesprekken gevoerd worden.	Vroegtijdige samenwerking.
P1	S2.4	Het aanbestedingsproces	<i>Vroegtijdige focus op samenwerking die al bij een aanbesteding ingezet dient te worden, zou een rode draad moeten vormen tijdens het hele proces.</i>	Bij circulair aanbesteden ligt vroegtijdig de focus op samenwerking.	Vroegtijdige samenwerking.

P1	S2.5	Het aanbestedings-proces	<i>Daarnaast is continuïteit wat betreft de bij het project betrokken personen belangrijk.</i>	Bij een circulair aanbestedingsproces is continuïteit van de betrokken personen belangrijk.	Continuïteit betrokken personen.
P2	S2.6	Het aanbestedings-proces	<i>Kijkend naar bijvoorbeeld de aanbesteding van circulair ingerichte renovatie projecten, wordt er veelal eerst een traject doorlopen waarbij er inventarisaties worden gedaan van de bestaande materialen en bouwelementen en wordt er gekeken naar welke her-inzetbaar zijn die vervolgens onderdeel wordt van de gunningsleidraad.</i>	Bij de aanbesteding van renovatie projecten dient er in kaart te worden gebracht welke materialen en bouwelementen herinzetbaar zijn.	Herinzetbaarheid materialen.
P2	S2.7	Het aanbestedings-proces	<i>Een ander punt zit hem in het meetbaar maken van circulaire gebouwen.</i>	Een groot vraagstuk van circulair bouwen zit hem in het meetbaar maken van de circulariteit.	Meetbaarheid.
P2	S2.8	Het aanbestedings-proces	<i>Maar ook in het ontwerptraject. In het project Eigen Haard hebben we verschillende constructies (staal, beton en hout) naast elkaar gezet en de BCI berekend en zijn er afwegingen gemaakt op basis van circulariteit.</i>	In het ontwerptraject dient er al gebruik gemaakt te worden van de BCI.	Meetbaarheid. BCI.
P3	S2.9	Het aanbestedings-proces	<i>Als je kijkt naar de door jou geschetste ideaal oplossing voor een circulaire aanbestedingsproces, dus een het concurrentiegericht dialoog onder een DBM(O) contract, dan ligt er een groot vraagstuk bij Capex (investeringskosten) versus Opex (beheerkosten).</i>	Bij de procedure van het concurrentiegericht dialoog onder een DBM(O) contract ligt er een vraagstuk bij de Capex versus de Opex.	Concurrentiegericht dialoog. DBM(O). Capex. Opex.
P3	S2.10	Het aanbestedings-proces	<i>Daarnaast vraag je bij een circulaire aanbesteding om een heel andere vorm van partnerschap. Waarbij je bij een traditionele manier van aanbesteden vaak puur om een uitvoerende partij vraagt en bij een circulaire aanbesteding meer een toekomstgericht en meedenkend persoon.</i>	Een circulaire aanbesteding vraag om partnerschap met toekomstgerichte en meedenkende actoren.	Partnerschap.
P3	S2.11	Het aanbestedings-proces	<i>Daarnaast vraag je bij een circulaire aanbesteding om een heel andere vorm van partnerschap. Waarbij je bij een traditionele manier van aanbesteden vaak puur om een uitvoerende partij vraagt en bij een circulaire aanbesteding meer een toekomstgericht en meedenkend persoon.</i>	Een circulaire aanbesteding vraag om partnerschap met toekomstgerichte en verdiepende actoren.	Toekomst denken.
P4	S2.12	Het aanbestedings-proces	<i>Wanneer er bijvoorbeeld een lijst met producten gepubliceerd zou worden met daarin de meest belastende producten, maar belangrijker nog, de eventuele alternatieven voor deze producten. Anderzijds zou je dit in de uitvraag ook aan de gegadigden kunnen vragen om met alternatieven te komen voor deze producten.</i>	Om aanbestedende diensten bij de uitvraag te stimuleren zou er een lijst met belastende producten inclusief alternatieven openbaar moeten worden gemaakt.	Initiator.
P4	S2.13	Het aanbestedings-proces	<i>Daarnaast is er bij dit soort innovatieve projecten altijd een initiator nodig die open staat voor verandering en de kwaliteit heeft om andere in het project hierin te stimuleren.</i>	Voor de implementatie van circulair bouwen dient altijd een initiator, die open staat voor verandering, bij het proces betrokken te zijn.	Initiator.
P4	S2.14	Circulair bouwen	<i>Bij een renovatieproject waar we onlangs bij betrokken zijn geraakt, zijn de sloopwerkzaamheden dusdanig zorgvuldig uitgevoerd, dat er maximaal hergebruik van materialen heeft plaatsgevonden.</i>	Het inspelen op het scheiden van sloopafval bevordert circulariteit.	Herbruikbaarheid materialen. Technisch.
P4	S2.15	Circulair bouwen	<i>Daarnaast hebben we bij dit project een experiment uitgevoerd waarbij we een soort marktplaats hebben ingericht voor materialen, waar ook daadwerkelijk gebruik van is gemaakt.</i>	Marktplaatsen voor materialen, zoals het Madaster, bevordert circulariteit.	Herbruikbaarheid materialen. Technisch.
P5	S2.16	Het aanbestedings-proces	<i>Wat heel vaak ontbreekt is dat er geen monitoring en checks plaatsvindt. Dit wordt niet in aanbestedingen opgenomen.</i>	In de aanbesteding moet een monitoring opgenomen worden en plaatsvinden.	Monitoring.
P5	S2.17	Het aanbestedings-proces	<i>Dit vraagt echter wel ook vanuit de opdrachtgever deskundigheid. En daar wordt vaak op bezuinigd. De kennis is er bij de opdrachtgeverskant veelal niet en zal ingeschakeld moeten worden, en dat kost geld.</i>	Gebrek aan deskundigheid leidt tot het uitvragen van verkeerde methodieken.	Deskundigheid. Meetbaarheid.
P5	S2.18	Het aanbestedings-proces	<i>Ik zeg altijd: zo veel geld je als opdrachtgever bereid bent om tot gunning uit te geven en te komen tot een selectie, die moet je ook bereid zijn, en dat heeft Alliander heel goed gedaan, uit te geven tijdens de realisatie.</i>	Het totale aanbestedingstraject is net zo belangrijk als de realisatie.	Belang aanbestedingstraject.
P5	S2.19	Het aanbestedings-proces	<i>Dus als je echt tot circulaire aanbestedingen wil komen, moet je net zo veel geld uitgeven in de aanbesteding, om te komen tot de beste partij, dan aan toetsing en begeleiding.</i>	Het totale aanbestedingstraject is net zo belangrijk als de realisatie.	Belang aanbestedingstraject.
P5	S2.20	Het aanbestedings-proces	<i>Circulariteit is nog te veel wollig, dus als je zegt: wat voor verbeterpunt. Dan zeg ik: maak het zo concreet mogelijk en schrijf als opdrachtgever op basis van je eigen visie een meetinstrument voor.</i>	De aanbestedende dienst moet de eigen visie en ambities duidelijk formuleren in de uitvraag.	Eigen visie. Eigen ambities.
P5	S2.21	Het aanbestedings-proces	<i>De uitvraag is belangrijker dan het antwoord. De uitvraag bepaald namelijk het antwoord. Dus wil je een goed product hebben, kies en neem tijd voor een goede uitvraag.</i>	De uitvraag is belangrijker dan het antwoord doordat deze direct het antwoord bepaald.	Belang aanbestedingstraject.
P5	S2.22	Het aanbestedings-proces	<i>Wat bij mijn omtrent circulaire economie blijft hangen, is dat opdrachtgevers te weinig hun eigen visie hebben over wat de circulaire economie is.</i>	Aanbestedende diensten hebben te weinig een eigen visie over wat de circulaire economie is.	Eigen visie.
P5	S2.23	Het aanbestedings-proces	<i>Dus als je zegt: ik wil circulair gaan aanbesteden, help dan eerst de klant met wat circulariteit echt is.</i>	Aanbestedende diensten moeten zelf weten wat ze verstaan onder circulariteit.	Eigen visie.
P6	S2.24	Het aanbestedings-proces	<i>Meestal, wanneer je een uitvraag doet, stel je kwaliteitseisen en prijseisen.</i>	In een uitvraag worden kwaliteitseisen en prijseisen gesteld.	Kwaliteitseisen. Prijs.
P6	S2.25	Het aanbestedings-proces	<i>Vanuit de aanbestedende dienst wordt er een doel gesteld en het is aan de partijen om daar zo dicht mogelijk bij te komen.</i>	Aanbestedende diensten moeten zelf een doel stellen.	Eigen Visie.

P6	S2.26	Het aanbestedings-proces	<i>Zo wordt de uitdaging getriggerd en is er veel meer flexibiliteit. Dat is het grootste verschil.</i>	De markt moet getriggerd worden aan de hand van flexibiliteit.	Markt. prikkels.
P6	S2.27	Het aanbestedings-proces	<i>Opdrachtgevers vergeten vaak dat wanneer er iets eenmaal gerealiseerd is er dan nog meer bij komt kijken. Wij proberen daar vaak in te prikkelen.</i>	Opdrachtgevers moeten ook na de realisatie geprikkeld blijven.	Prikkels.
P6	S2.28	Het aanbestedings-proces	<i>Het is belangrijk dat wanneer je een aanbesteding doet, je de markt triggerd. Dus je kan wel ambities neerleggen, maar hoe zorg je er nou voor dat de markt ook getriggerd wordt.</i>	De aanbestedende dienst dient altijd de markt te triggeren.	Markt. Prikkels.
P6	S2.29	Het aanbestedings-proces	<i>Ook in de leidraad is het meegeven van een positieve prikkel aan de partijen van groot belang. De leidraad moet zo geschreven zijn dat partijen zin krijgen om het proces met je aan te gaan.</i>	Een leidraad moet zo geschreven zijn dat het de markt prikkelt.	Markt. Prikkels.
P6	S2.30	Het aanbestedings-proces	<i>Partijen moeten bijvoorbeeld de prikkel krijgen dat het een heel mooi project gaat worden die wellicht ter referentie voor de toekomst gebruikt kan worden. Zij moeten daar ook trots op kunnen zijn.</i>	Marktpartijen moeten geprikkeld worden.	Markt. Prikkels.
P1	S3.1	Dialoofase	<i>Dit betekent dat het dialoog, na voorlopige gunning, die wordt in feite een continue dialoog waarbij we bij wijze van spreken met elkaar in de bouwkeet zitten om uitwerking te plegen van het schetsontwerp. Op deze manier kan er gezamenlijk en als één team uitwerking worden gegeven aan het voorlopige schetsontwerp.</i>	Bij een circulaire aanbesteding onder concurrentiegericht dialoog verandert het dialoog, na de voorlopige gunning, in een continue dialoog, waardoor er als één team uitwerking kan worden gegeven aan het voorlopige schetsontwerp.	Samenwerking. Continuïteit.
P2	S3.2	Dialoofase	<i>Concluderend zou je een circulair bouwproject altijd in hand en hand moeten gaan met een geïntegreerde contractvorm over een langere periode (minimaal 15 jaar).</i>	Een circulair bouwproject dient altijd hand in hand te gaan met een geïntegreerde contractvorm over een langere periode.	Geïntegreerd contract.
P3	S3.3	Dialoofase	<i>Terwijl juist deze procedure uitermate geschikt is voor circulaire en innovatieve bouwprojecten, die toch ook vaak gezien worden als complex, omdat dit in dialoog met de markt wordt gedaan.</i>	Het concurrentiegericht dialoog is een uitermate geschikte procedure voor circulaire, innovatieve en complexe projecten.	Concurrentiegericht dialoog. Complexe projecten.
P4	S3.4	Dialoofase	<i>Maar dit geeft de aanbestedende diensten ook de ruimte om met partijen aan tafel te gaan. Al is dit ook sterk afhankelijk van de economische situatie waarin de markt zich bevindt.</i>	De dialoofase biedt aanbestedende diensten de ruimte om vroegtijdig met partijen aan tafel te gaan.	Dialoofase. Vroegtijdige samenwerking
P5	S3.5	Dialoofase	<i>Wat ik het beste vind is gewoon de dialoogsessies met de opdrachtgever.</i>	Dialoogsessies met de opdrachtgever zonder concurrentie is het beste.	Dialoogsessie.
P5	S3.6	Dialoofase	<i>Je ziet niet meer veel dat er plenaire sessies worden gehouden. Ik ben van mening dat het één groot theater is. Doordat je direct met je concurrenten zit, probeer je elkaar te kakken te zetten. Door middel van bijvoorbeeld verkeerde visies of voorstellen naar elkaar toe te geven. Doe het dus zeker in dialoog, maar stap af van het concurrentie gedeelte.</i>	Er moet afgestapt worden van het concurrentie gedeelte binnen de dialoogsessies.	Dialoogsessie.
P6	S3.7	Dialoofase	<i>Een type procedure waarbij een dialoog met de betrokken partijen aanwezig is, is een must wanneer we het hebben over circulaire projecten</i>	Het dialoog is een must bij circulaire projecten.	Dialoog.
P6	S3.8	Dialoofase	<i>Als opdrachtgever kun je in een dialoog ook daarmee bij sturen.</i>	Aan de hand van een dialoog, kan een opdrachtgever sturen in de aanbesteding.	Dialoog.
P6	S3.9	Dialoofase	<i>Daar hebben we een aantal verschillende sessies met de omgeving gehad, waarbij zowel in groot groepsverband als in kleine schaal waarbij je dan met experts zit en samen tot de belangrijkste bouwstenen komt: de visie</i>	De visie bestaat uit de belangrijkste bouwstenen voor een circulair bouwproject.	Visie.
P6	S3.10	Dialoofase	<i>Duurzaamheid kwam eigenlijk bij de eerste sessie al aan tafel vanuit de bewoners.</i>	Duurzaamheid is een belangrijk aspect binnen circulaire projecten.	Duurzaamheid.
P2	S4.1	Geschiktheidseisen	<i>In de geschiktheidseisen is het het makkelijkst om circulaire criteria op te nemen aan de hand van referenties.</i>	In de geschiktheidseisen dienen voornamelijk eisen opgenomen te worden op basis van referenties.	Referenties.
P3	S4.2	Geschiktheidseisen	<i>De geschiktheidseisen zijn veelal gericht op kennis en ervaring van de organisatie. Hierin lopen aanbestedende diensten nog een beetje vast wanneer het gaat om circulaire aanbestedingen.</i>	Geschiktheidseisen zijn gericht op de kennis en ervaring van de organisatie van de gegadigde.	Kennis en ervaring. Referentie.
P3	S4.3	Geschiktheidseisen	<i>De geschiktheidseisen meestal erg veilig opgezet om niet al een grote groep kandidaten uit te sluiten. De criteria zijn dan ook vaak in de vorm van wat competenties zijn voor het project: je moet bekwaam genoeg zijn om te bouwen.</i>	De geschiktheidseisen dienen veilig opgezet te worden, in de vorm competenties.	Ruime opzet geschiktheidseisen.
P1	S5.1	Selectie criteria	<i>De stap van 5 naar 3 op basis van assessment, puur gericht op partnerschap en waarin door middel van bijvoorbeeld referenties aangetoond kan worden dat de gegadigde hierover beschikt.</i>	In de selectie criteria kan ervaring aangetoond worden door middel van referenties.	Referenties.
P1	S5.2	Selectie criteria	<i>De stap van x naar 5 gebeurt niet alleen op basis van geschiktheidseisen en uitsluitingsgronden maar ook op basis van een visiedocument. In dit document dienen de gegadigden te laten zien hoe ze hebben nagedacht over de combinatie partnerschap en toekomstwaarde.</i>	In de nadere selectiecriteria kunnen gegadigden geselecteerd worden op basis van een visiedocument waarin onderwerpen zoals partnerschap en toekomstwaarde besproken kunnen worden.	Visiedocument. Partnerschap.
P1	5.3	Selectie criteria	<i>De stap van x naar 5 gebeurt niet alleen op basis van geschiktheidseisen en uitsluitingsgronden maar ook op basis van een visiedocument. In dit document dienen de gegadigden te laten zien hoe ze hebben nagedacht over de combinatie partnerschap en toekomstwaarde.</i>	In de nadere selectiecriteria kunnen gegadigden geselecteerd worden op basis van een visiedocument waarin onderwerpen zoals partnerschap en toekomstwaarde besproken kunnen worden.	Visiedocument. toekomstwaarde.
P2	S5.4	Selectie criteria	<i>Als je kijkt naar de kwaliteit van de onderneming, dan kijk je bijvoorbeeld een criteria stellen aan hoeverre circulariteit in de onderneming zelf is opgenomen, de bedrijfsvoering bijvoorbeeld.</i>	In de selectie criteria dient een eis gesteld te worden in hoeverre circulariteit in de onderneming zelf is meegenomen.	Bedrijfsvoering.

P2	S5.5	Selectie criteria	<i>Niet alleen op basis van een visie en referenties, maar juist op basis van actuele wapenfeiten.</i>	De selectie criteria dienen ingedeeld te worden op basis van visies, referenties en bedrijfsvoering.	Referenties. Visie. Bedrijfsvoering.
P2	S5.6	Selectie criteria	<i>Maar ook door middel van de aanwezigheid van certificeringen die appelleren aan het thema circulariteit: ISO14001 / Cradle-2-Cradle (C2C) / Environmental Product Declarations.</i>	Een organisatie kan d.m.v. de aanwezigheid van certificeringen die appelleren aan het thema circulariteit: ISO14001 / Cradle-2-Cradle (C2C) / Environmental Product Declarations aantonen zelf ook met circulariteit bezig te zijn.	Bedrijfsvoering. Certificaten.
P2	S5.7	Selectie criteria	<i>Concreet gezegd kan er een eis gesteld worden aan de mate waarin de bedrijfsvoering circulair is, de kwaliteit van de eigen organisatie.</i>	In de selectie criteria dient een eis gesteld te worden aan de mate waarin de bedrijfsvoering circulair is.	Bedrijfsvoering.
P3	S5.8	Selectie criteria	<i>De nadere selectie criteria hebben altijd betrekking op de inschrijver en worden meestal gevraagd in de vorm van referenties.</i>	In de nadere selectiecriteria worden veelal eisen opgesteld in de vorm van referenties.	Referenties.
P3	S5.9	Selectie criteria	<i>Daarnaast zegt de mate waarin de eigen bedrijfsvoering van de gegadigde omgaat met circulariteit veel over het ambitieniveau.</i>	De mate waarin de eigen bedrijfsvoering van de gegadigde omgaat met circulariteit is belangrijk.	Eigen bedrijfsvoering.
P3	S5.10	Selectie criteria	<i>Wanneer we kijken naar circulaire aanbestedingen, is dat voor de gegadigde een moeilijke criteria. Simpelweg doordat het gros van de gegadigden weinig tot geen ervaring heeft met dit type bouwprojecten. Hierin moet er een balans gevonden worden tussen marktsluiting en de stimulatie van gegadigden om daadwerkelijk met circulariteit aan de slag te gaan.</i>	In de eisen van de nadere selectiecriteria dient een balans gevonden te worden tussen marktaansluiting en de stimulatie van gegadigden om daadwerkelijk met circulariteit aan de slag te gaan.	Marktaansluiting. Visie
P4	S5.11	Selectie criteria	<i>Het ambitie level van de markt is dus belangrijk. Aan de hand van visies kan gekeken worden welke marktpartijen open staan voor veranderingen.</i>	Aan de hand van een visie kan gekeken worden welke partijen open staan voor veranderingen.	Visie.
P4	S5.12	Selectie criteria	<i>Dit zijn over het algemeen dan ook mensen die al wat meer ervaring hebben en die al een paar keer tegen de onmogelijkheden zijn aangelopen. Het aantonen van ervaring gebeurt veelal aan de hand van referentie projecten.</i>	Het aantonen van ervaring gebeurt veelal aan de hand van referentie projecten.	Ervaring. Referenties
P4	S5.13	Selectie criteria	<i>Maar ook wanneer partijen binnen hun eigen organisatie bewust bezig zijn met duurzaamheid.</i>	In de selectie criteria dient een eis gesteld te worden aan de mate waarin de bedrijfsvoering duurzaam/circulair is.	Bedrijfsvoering.
P4	S5.14	Selectie criteria	<i>Dit kan bijvoorbeeld ook betrekking hebben op de manier waarop ze eigen afvalstromen verwerken of met de eigen energiehuishouding omgaan.</i>	Selectie criteria kunnen gebruikt worden om te achterhalen hoe duurzaam de eigen bedrijfsvoering van de organisatie is.	Bedrijfsvoering.
P5	S5.15	Selectie criteria	<i>Iedereen had destijds al duurzaamheidsreferenties. Circulariteit in mindere mate.</i>	Het opnemen van duurzaamheidsreferenties is op dit moment gebruikelijker dan referenties omtrent circulariteit.	Referenties.
P5	S5.16	Selectie criteria	<i>Een visie is gewoon gelul, en dat moet je ook zo zien. Dat gaat meer over wie het mooiste verhaal kan vertellen.</i>	Een visie gaat puur over wie het mooiste verhaal kan vertellen.	Visie.
P5	S5.17	Selectie criteria	<i>Het gaat over meetbaarheid. Ik vind dat deze ook al in de selectie eisen opgenomen moeten worden.</i>	Meetbaarheidscriteria moeten in de selectie eisen al opgenomen worden.	Selectie criteria. Meetbaarheid
P5	S5.18	Selectie criteria	<i>Zelf je eigen lat bepalen, maar wel aantoonbaar kunnen maken dat je deze ambities kunt waarmaken.</i>	De gestelde ambities moeten aantoonbaar gemaakt worden.	Ambities. Meetbaarheid.
P5	S5.19	Selectie criteria	<i>Dat gaat over aantoonbaarheid op basis van referenties en het SMART maken.</i>	Aan de hand van referenties kunnen de ambities aangetoond worden.	Referenties.
P5	S5.20	Selectie criteria	<i>Hoe meer SMART je antwoord is, hoe hogere punten je haalt en hoe meer referenties je hebt, hoe aannemelijker het is dat je het ook kan doen.</i>	Een methodiek voor de meetbaarheid kan zijn op basis van SMART.	Meetbaarheid. SMART.
P5	S5.21	Selectie criteria	<i>Onderzoeken in hoeverre de eigen bedrijfsvoering van de partijen duurzame of circulaire aspecten vertonen kan ook een methode zijn om ambities te achterhalen.</i>	In de selectie criteria dient een eis gesteld te worden aan de mate waarin de bedrijfsvoering circulair is.	Bedrijfsvoering.
P6	S5.22	Selectie criteria	<i>Met een visie kan je ook heel snel een ruimtelijk ordeningstraject in.</i>	Met een visie kan een aanbestedende dienst snel het ruimtelijke ordeningstraject in.	Visie.
P6	S5.23	Selectie criteria	<i>Dat betekent dat je veel meer aan de markt moet overlaten. Je gaat dus eigenlijk minder eisen stellen en meer ambities.</i>	Bij circulaire aanbestedingen wordt meer aan de markt overgelaten door middel van het stellen van ambities.	Ambities. Visie.
P6	S5.24	Selectie criteria	<i>Maar ook de manier waarop marktpartijen zelf bezig zijn met circulariteit zegt iets over hoe innovatie gericht te zijn.</i>	De mate waarin de eigen bedrijfsvoering van de gegadigde met circulariteit bezig is, zegt veel over hoe innovatief een organisatie is ingesteld.	Eigen bedrijfsvoering.
P6	S5.25	Selectie criteria	<i>Selectie doe je steeds meer op de type partijen. Wat heb je al een keer gedaan? Wat zijn je ervaringen en kennis? Dit gebeurt veelal op basis van referenties.</i>	Op basis van referenties kan een aanbestedende dienst achterhalen of de kandidaat voldoende kennis en ervaring heeft.	Referenties.
P6	S5.26	Selectie criteria	<i>Op het gebied van circulariteit, hebben veel partijen niet veel referenties. Dus dat zou je op een andere manier moeten meten.</i>	Referenties op het gebied van circulariteit zijn schaars.	Referenties.
P6	S5.27	Selectie criteria	<i>Dan moet je denk ik gaan zoeken naar het feit of een partij innovatief genoeg is en kan hij met referenties komen waarbij hij innovatief bezig is geweest. Innovatiever dan bijvoorbeeld het huidige bouwbesluit, wat gebruikelijk is.</i>	In de selectie criteria moet er onderzocht worden of de partij innovatief is.	Visie. Innovatief.
P6	S5.28	Selectie criteria	<i>Daarmee kan je wel toetsen of partijen buiten hun comfort zone innovatief en creatief aan het nadenken zijn. Ik denk dat dat essentieel is.</i>	Er kunnen referenties gevraagd worden die aantonen dat een gegadigde buiten de comfort zone is getreden.	Referenties.
P6	S5.29	Selectie criteria	<i>Naast het stellen van dit soort referenties, kun je bij de selectie altijd vragen naar een eerste visie.</i>	Bij de selectie kan er gevraagd worden naar een visie.	Visie.
P6	S5.30	Selectie criteria	<i>Maar door middel van een korte visie kun je daar wel naar vragen en aanvoelen of een partij geschikt is.</i>	Door middel van een visie kan gekeken worden of een partij geschikt is.	Visie.
P1	S5.30	Gunningscriteria	<i>De stap van 3 naar 1 gegadigden kan onderverdeeld worden onder procesmatige en technische aspecten en een prijscomponent.</i>	De stap van 3 naar 1 gegadigden kent drie aspecten: procesmatig, technisch en financieel.	Technisch, procesmatig en financieel.

P1	S6.2	Gunningscriteria	<i>Deze gunning vindt plaats op basis van een schetsontwerp met een plan van aanpak op prijs en partnerschap. Hierin speel bij het prijscomponent ook een belangrijke rol.</i>	Gunning vindt plaats op basis het schrijven van een plan van aanpak op het schetsontwerp waarin prijs en partnerschap toegelicht worden.	Prijs. Plan van aanpak.
P1	S6.3	Gunningscriteria	<i>Toekomstwaarde is een ontzettend breed begrip en kent allerlei aspecten. Tijdens de uitvraag is het de kunst om dit bewust breed te houden zodat er integrale afwegingen plaatsvinden.</i>	Tijdens de uitvraag van een aanbesteding dient het begrip 'toekomstwaarde' bewust breed te worden gehouden zodat integrale afwegingen plaatsvinden.	Procesmatig Toekomstwaarde. Integrale afwegingen. Financieel.
P1	S6.4	Gunningscriteria	<i>Door integrale afwegingen te vragen wordt in de gunningsfase gevraagd een uitwerkingen te geven aan de opgestelde visie.</i>	In de gunningscriteria dient een eis opgenomen te worden met betrekking op het geven van een verdere uitwerking aan de (eerder) opgestelde visie.	Verdere uitwerking visie. Plan van aanpak. Procesmatig.
P1	S6.5	Gunningscriteria	<i>Hierin willen we zien dat de gegadigde trade-off-matrix (TOM) opgesteld waarbij de door hen gemaakte keuzes tegen elkaar worden afgewogen die belangrijk zijn in het thema toekomstwaarde.</i>	In de gunningscriteria dient een eis opgenomen te worden met betrekking op het opstellen van een trade-off-matrix (TOM).	Trade-off-matrix. Keuzes afwegen.
P1	S6.6	Gunningscriteria	<i>De opdrachtgever moet er bij de beoordeling altijd voor zorgen dat deze objectief is en niet te vaag wordt. Zeker als het gaat om partnerschap, kunnen gegadigden de zorg hebben omtrent de meetbaarheid ervan.</i>	In de beoordeling van de gunningscriteria dient er eenduidigheid te zijn (in de meetbaarheid).	Objectieve beoordeling. Partnerschap. Meetbaarheid. Technisch.
P1	S6.7	Gunningscriteria	<i>Het is jammer als, wanneer er bijvoorbeeld constructies zoals plafondprijzen worden gehanteerd, allerlei initiatieven onmogelijk worden gemaakt die wel heel erg zouden helpen om de doelen te bereiken.</i>	Het risico van het hanteren van plafondprijzen is dat initiatieven onmogelijk worden gemaakt.	Plafondbedrag.
P1	S6.8	Gunningscriteria	<i>Het staat dus nog ter discussie om het prijscomponent wel of niet mee te geven in de uitvraag. Met de voornaamste rede om dit niet te doen het beperken van creativiteit van de inschrijvers.</i>	De voornaamste rede om plafondbedragen niet mee te geven in de uitvraag is dat de creativiteit van de inschrijvers wordt beperkt.	Plafondbedrag. Beperking creativiteit.
P2	S6.9	Gunningscriteria	<i>Wanneer je lange termijn contracten/relatie met elkaar aan gaat, zoals een DBFM(O) contract, dan is het belangrijk om vroegtijdig en consequent met elkaar te spreken en gedachtes uit te wisselen.</i>	Bij een contract met een lange termijn relatie, is het belangrijk om vroegtijdig en consequent met elkaar gedachtes uit te wisselen.	Lange termijn. Vroegtijdig. DBFM(O). Contract.
P2	S6.10	Gunningscriteria	<i>In een traditioneel proces gaat het dan ook vaak niet om het sluiten van de financiële cyclus. Er wordt dan geen restwaarde gekapitaliseerd, in mindere mate garantie-afspraken, geen lange termijn afspraken.</i>	Bij circulaire projecten gaat het om het sluiten van de financiële cyclus, het kapitaliseren van restwaarde, het maken van garantie en lange termijn afspraken.	Financiële cyclus. Restwaarde. Lange termijn.
P2	S6.11	Gunningscriteria	<i>De toekomstwaarde kan behoorlijk hard worden gemaakt door een Net Present Value (NPV) te laten afgeven waarin de restwaarde van producten in is opgenomen.</i>	De toekomstwaarde kan behoorlijk hard worden gemaakt door een Net Present Value (NPV) te laten afgeven waarin de restwaarde van producten in is opgenomen.	Toekomstwaarde. Restwaarde. NPV.
P2	S6.12	Gunningscriteria	<i>Daarnaast is ook de impact van circulair bouwen op de onderhoudslasten van belang. Dit plan moet zo vroeg mogelijk op tafel liggen.</i>	Er dient zo vroegtijdig mogelijk een onderhoudsplan op tafel te liggen.	Onderhoudslasten. Vroegtijdig.
P2	S6.13	Gunningscriteria	<i>Het is de kunst om criteria in de uitvraag op te nemen die kwantitatief van aard zijn. Op deze manier kun je circulariteit meetbaar maken en zwart op wit vergelijken met anderen.</i>	In de gunningscriteria dient er een eis opgenomen te worden die kwantitatief (meetbaar) van aard is.	Kwantitatieve eis. Meetbaarheid. Technisch.
P2	S6.14	Gunningscriteria	<i>De BCI is een model waarbij in 4 stappen worden bepaald wat het level van circulariteit is van een gebouw.</i>	Om circulariteit meetbaar te maken dient in de gunningscriteria de BCI opgenomen te worden.	Meetbaarheid. BCI. Technisch.
P2	S6.15	Gunningscriteria	<i>Op de basis van alleen een structuur ontwerp, kun je vooralsnog geen BCI uitrekenen. Hiervoor heb je eigenlijk op zijn minst een Voorlopig Ontwerp hebben.</i>	Voor het uitrekenen van de BCI van een gebouw is op zijn minst een Voorlopig Ontwerp nodig.	Meetbaarheid. BCI. Technisch.
P2	S6.16	Gunningscriteria	<i>Bij losmaakbaarheid kijk je naar de detaillering van het gebouw, hoe is bijvoorbeeld de gevel verbonden met de vloer.</i>	In de gunningscriteria dient er een eis opgenomen te worden omtrent de losmaakbaarheid van gebouw(elementen).	Losmaakbaarheid. Technisch.
P2	S6.17	Gunningscriteria	<i>Op gebied van financieel economisch kan er een eis worden opgenomen op basis de restwaarde. Dus niet gunnen op basis van prijs, maar gunnen op de meest gunstige netto contant waarde.</i>	In de gunningscriteria dient er op financieel economisch gebied een eis opgenomen te worden met betrekking op restwaarde.	Financieel economisch. Restwaarde.
P2	S6.18	Gunningscriteria	<i>Naast de technisch inhoudelijk, procesmatig en financieel economisch zie ik als derde aspect voor gunningscriteria het sociale aspect. Deze kan ondergebracht worden onder het procesmatige aspect.</i>	In de gunningscriteria dienen er, naast de technisch inhoudelijk en financieel economisch gebied, onder het procesmatige vlak eisen opgenomen te worden met een sociale insteek.	Procesmatig. Sociale aspecten.
P2	S6.19	Gunningscriteria	<i>Om hergebruikte materialen te vinden, is best lastig. Het zoeken van de juiste materialen, producten en grondstoffen kan gedaan worden door mensen met een achterstand op de arbeidsmarkt. Er kunnen arbeidsplaatsen gecreëerd worden.</i>	In de gunningscriteria dient er een eis opgenomen te worden met betrekking op de materiaalherkomst.	Materiaalherkomst. Technisch.
P2	S6.20	Gunningscriteria	<i>Maar ook op sociaal economisch vlak kunnen er eisen gesteld worden. Bijvoorbeeld lokaal ondernemerschap stimuleren door het afnemen van grondstoffen, materialen en producten in de directe omgeving van het project.</i>	In de gunningscriteria dient er een eis opgenomen te worden onder sociaal en economisch vlak.	Materiaalherkomst. Procesmatig. Economisch.
P2	S6.21	Gunningscriteria	<i>Daarnaast is het belangrijk, zeker wanneer het om renovatieprojecten gaat, dat inzichtelijk wordt gemaakt welke materialen, producten en grondstoffen die in het gebouw aanwezig is, meegeeft aan de markt om er wat mee te doen.</i>	In de gunningscriteria dient er tijdens de uitvraag een document meegestuurd te worden met de beschikbare grondstoffen en materialen van het (renovatie) project zodat gegadigden hierop kunnen inspelen.	Herinzetbaarheid materialen. Technisch.
P2	S6.22	Gunningscriteria	<i>Ten tweede is het interessant om de Opex in relatie met de losmaakbaarheid inzichtelijk te maken.</i>	Het is interessant om de Opex in relatie met losmaakbaarheid inzichtelijk te maken.	Losmaakbaarheid. Opex.
P2	S6.23	Gunningscriteria	<i>Ik ben een voorstander van om de prijs in mindere mate dominant wordt in een aanbesteding.</i>	In de gunningscriteria dient prijs in mindere mate dominant te zijn	Prijscomponent.
P3	S6.24	Gunningscriteria	<i>De criteria waarop gunning plaatsvindt zijn gebaseerd op drie verschillende aspecten: techniek, proces en financieel.</i>	De gunningscriteria zijn onder te verdelen in: techniek, proces en financiën.	Technisch inhoudelijk, procesmatig, financieel economisch.

P3	S6.25	Gunningscriteria	<i>Circulariteit zou eigenlijk minder zwaar moeten meewegen in vergelijking met andere criteria.</i>	In zowel de selectie als gunningscriteria dient circulariteit minder zwaar meegewogen te worden in vergelijking met andere criteria.	Circulariteit als standaard.
P3	S6.26	Gunningscriteria	<i>Als we het hebben over de gunningscriteria, dan is dit partnership, zeker wanneer je uitgaat van dit proces, een belangrijke.</i>	In de gunningscriteria dient een eis gesteld te worden met betrekking op partnerschap.	Partnerschap. Procesmatig.
P3	S6.27	Gunningscriteria	<i>Daarnaast het opstellen van een kansendossier, waarin de aanbestedende partij een document opstelt waarin ze stellen dat ze zo duurzaam mogelijk, en het formuleren van de ambities en doelstellingen maar met de vraag aan de gegadigden om te vertellen hoe dit het beste gedaan kan worden.</i>	In de gunningscriteria dient een eis gesteld te worden met betrekking op een kansendossier.	Kansendossier. Procesmatig.
P3	S6.28	Gunningscriteria	<i>De BCI is een mooi model om de circulariteit meetbaar te maken. Een nadeel hiervan is echter dat het proces al dermate ver gevorderd moet zijn dat er tekeningen moeten liggen waarmee de BCI berekend kan worden.</i>	Om circulariteit meetbaar te maken dient in de gunningscriteria de BCI opgenomen te worden.	Meetbaarheid. BCI. Technisch.
P3	S6.29	Gunningscriteria	<i>Dus partnership raad ik aan, en daar is ook ruimte voor, om op te nemen in de gunningscriteria. Dit komt terug in zowel de plan van aanpak en het kansendossier.</i>	In de gunningscriteria dient een eis gesteld te worden met betrekking op partnerschap.	Partnerschap. Procesmatig.
P3	S6.30	Gunningscriteria	<i>Ik ben er zelf voorstander van om het budget mee te geven en plafondprijzen, vooral in de circulaire en dus complexere projecten.</i>	In de gunningscriteria dient een eis opgenomen te worden met betrekking op plafondbedragen.	Plafondbedragen.
P4	S6.31	Gunningscriteria	<i>Waar vroeger de gunning van werk was gebaseerd op de laagste prijs, is dat nu uitgesloten. Tegenwoordig vindt dit voornamelijk plaats op basis van EMVI.</i>	Gunning vindt tegenwoordig bijna altijd plaats door middel van EMVI, waarin de kwaliteit bepalend is.	EMVI
P4	S6.32	Gunningscriteria	<i>Onder kwaliteit vallen technische eisen (duurzaamheid/circulariteit) en procesmatige eisen (samenwerking).</i>	Technische en procesmatige aspecten vallen onder de kwaliteitseis.	Technisch. Procesmatig
P4	S6.33	Gunningscriteria	<i>Dan weegt de kwaliteit mee. Naarmate de uitkomst en de oplossing onzekerder wordt, zoals bij circulaire projecten veelal het geval is, gaat men vaak over om samenwerkingsmodellen.</i>	Bij onzekere oplossingen zijn samenwerkingsmodellen van groot belang.	Procesmatig. Samenwerking.
P4	S6.34	Gunningscriteria	<i>Maar onder kwaliteit vallen ook financiële aspecten zoals een nieuw (circulair) businessmodel of het meenemen van restwaarde.</i>	Onder kwaliteit vallen ook financiële aspecten.	Financieel. Business model. Restwaarde.
P4	S6.35	Gunningscriteria	<i>Acties zoals het invoeren van een plafondbudget vind ik gevaarlijk, zeker in deze tijd.</i>	In de gunningscriteria dient geen eis opgenomen te worden met betrekking op plafondbedragen.	Plafondbedragen.
P4	S6.36	Gunningscriteria	<i>Maar wat je dan vaak ziet, is dat er te veel gestuurd wordt door de aanbestedende dienst en de 'vrijheid en creativiteit' van de gegadigden terrein verliest. Dus wanneer er een aanvraag is met een plafondbedrag, wat je dan vaak ziet is dat er heel gedetailleerd in de aanvraag staat wat er geëist wordt.</i>	Door het invoeren van plafondbedragen worden gegadigden beperkt in hun vrijheid en creativiteit.	Plafondbedragen.
P5	S6.37	Gunningscriteria	<i>De MPG is door de overheid bepaald. En dan kun je zeggen ik ga het Madaster toepassen of wat dan ook, maar de kunst zit hem ook in het stellen van de juiste vragen.</i>	De kunst van een goede aanvraag is het stellen van de juiste vragen.	Vraag formulering.
P5	S6.38	Gunningscriteria	<i>De meeste kwaliteit aspecten gaan over de technische zaken, zoals energie en CO2 reductie.</i>	De meeste kwaliteitseisen gaan over technische zaken.	Technisch.
P5	S6.39	Gunningscriteria	<i>Daaruit kan je opmaken wie het wel heel SMART heeft gedaan en dan weet je ook echt wat je krijgt. En dan heb je geen wolvenpraterij. Dit is direct een combinatie van visie en referentie.</i>	De SMART methodiek is een combinatie van visie en referenties.	Meetbaarheid. SMART. Referentie. Visie.
P5	S6.40	Gunningscriteria	<i>Het concretiseren van de gestelde ambities en het uitwerken van het proces gebeurt veelal door middel van een plan van aanpak.</i>	Het uitwerken van de ambities en proces gebeurt op basis van een plan van aanpak.	Procesmatig. Plan van aanpak
P5	S6.41	Gunningscriteria	<i>In de gunningsfase worden de beloftes van de gegadigden steeds concreter: van projectniveau naar productniveau, afhankelijk van wat je aanbesteed.</i>	De gunningsfase staat in het teken van het concretiseren van ambities.	Ambities. Concretiseren.
P5	S6.42	Gunningscriteria	<i>Het maakt in principe niet uit of het gaat om losmaakbaarheid, bio-based etc., maar maak een berekening: hoe ziet het er dan uit?</i>	De methodiek is in mindere mate belangrijk, het gaat om de uiteindelijke score.	Meetbaarheid. Technisch.
P5	S6.43	Gunningscriteria	<i>Het prijscomponent is heel sterk afhankelijk van wat je aanbesteed.</i>	Het prijscomponent is afhankelijk van wat je aanbesteed.	Prijs.
P5	S6.44	Gunningscriteria	<i>Wil je bijvoorbeeld een bieding hebben op een gebouw of een locatie, dan zou ik nooit een plafondbedrag meegeven.</i>	Bij een bieding moet er geen plafondbedrag meegegeven worden.	Plafondbedrag. Prijs
P5	S6.45	Gunningscriteria	<i>Maar wil je een prijs hebben voor een gebouw, en je hebt bepaalde ambities en kan niet meer betalen, dan is het eventueel wel meegeven van een plafondbedrag een optie.</i>	Het wel of niet opnemen van een plafondbedrag is afhankelijk van de ambities en budget.	Plafondbedrag. Prijs
P5	S6.46	Gunningscriteria	<i>De GPR wordt nu weleens gebruikt, die meet de MPG en de CPG. Die werken op die manier samen. Daarmee kun je het meetbaar en vergelijkbaar maken.</i>	Met de GPR software kan duurzaamheid meetbaar en vergelijkbaar gemaakt worden.	Meetbaarheid. GPR software. Technisch.
P6	S6.47	Gunningscriteria	<i>Daar ligt nu ook vooral de discussie bij tenderingen en aanbestedingen van circulaire projecten: de prijs moet niet doorslaggevend zijn ten opzichte van de kwaliteit.</i>	De prijs moet niet doorslaggevend zijn ten opzichte van de kwaliteit.	Prijs. Kwaliteit.
P6	S6.48	Gunningscriteria	<i>Hier moet altijd de juiste balans in gevonden worden. Zo ben ik nu ook bezig met het opstellen van een selectieleidraad en gunningsleidraad met een hoge mate van duurzaamheid.</i>	Tussen prijs en kwaliteit moet een juiste balans gevonden worden.	Prijs. Kwaliteit.
P6	S6.49	Gunningscriteria	<i>Één is daarbij, en dat is de makkelijkste en meest tastbare, de grondstoffen en materialen. Eigenlijk alles hergebruiken.</i>	Hergebruik van grondstoffen en materialen is belangrijk thema binnen circulariteit.	Grondstoffen hergebruik.
P6	S6.50	Gunningscriteria	<i>Daarnaast, omdat het nog in de kinderschoenen staat, moet prijs minder doorslaggevend zijn bij de selectie en beoordeling van de partijen.</i>	De prijs moet minder doorslaggevend zijn bij de selectie en beoordeling van partijen.	Prijs.
P6	S6.51	Gunningscriteria	<i>Dus probeer wel richting de markt de communiceren wat die ongeveer is. Dat kan in de vorm van indicatief plafondbedrag of indicatieve grondprijs.</i>	Het budget dient in de vorm van een plafondbedrag aan de markt kenbaar gemaakt te worden	Prijs. Plafondbedrag

P6	S6.52	Gunningscriteria	<i>In het dialoog zou het het mooiste zijn wanneer partijen echt de creativiteit zoeken. Dat betekent het niet altijd de standaard samenwerkingen moeten gaan zoeken, maar specifiek voor die opgave partijen gaan zoeken die daarvoor nodig zijn.</i>	In het dialoog moet er gezocht worden naar de juiste samenwerking.	Dialogoog.
P6	S6.53	Gunningscriteria	<i>Bij de criteria voor de gunning vallen alle eisen onder het (technisch) inhoudelijke, sociale/procesmatige en financieel/economische vlak.</i>	Bij de criteria voor de gunning vallen alle eisen onder het (technisch) inhoudelijke, sociale/procesmatige en financieel/economische vlak.	Technisch-inhoudelijk. Procesmatig. Financieel-economisch.
P6	S6.54	Gunningscriteria	<i>Als je een locatie in de markt zet, dan deel je het inhoudelijke vlak op in beeldkwaliteit (hoe ziet iets eruit), duurzaamheid/innovatie (afhankelijk van de eisen die er gesteld worden) en ambities.</i>	Het inhoudelijk vlak kan onderverdeeld worden in beeldkwaliteit, duurzaamheid/innovatie en ambities.	Technisch-inhoudelijk.
P6	S6.55	Gunningscriteria	<i>Daarnaast heb je nog de vraag naar een plan van aanpak of het procesvoorstel, waarop je ingaat op wat de belangrijkste kansen en risico's zijn.</i>	Aan de hand van een plan van aanpak wordt er invulling gegeven aan het procesmatige aspect.	Procesmatig.
P6	S6.56	Gunningscriteria	<i>Dan heb je ook nog de prijs. Maar ook bij de prijs kun je ook weer onderverdelingen maken. Dat je niet alleen kijkt naar de totaalprijs, maar ook kijkt naar bepaalde onderdelen.</i>	Het prijscomponent kan onderverdeeld worden waarbij niet alleen gekeken wordt naar de totaalprijs.	Prijs.
P6	S6.57	Gunningscriteria	<i>Je kunt een heel ambitieniveau hebben ten aanzien van kwaliteit en duurzaamheid of circulariteit, maar wat voor bedrag staat daar dan tegenover.</i>	Er dient een juiste verhouding gevonden te worden tussen het prijs en kwaliteit component.	Prijs. Kwaliteit.
P6	S6.58	Gunningscriteria	<i>Het probleem is dat we meestal op de korte termijn redenering, dus meestal alleen naar de investering. Maar uiteindelijk zou je een TCO berekening moeten maken om te kijken wat het betekent voor de lange termijn.</i>	Onder het prijsaspect moet TCO berekening uitkomst bieden wanneer we kijken naar de langere termijn.	Prijs. TCO berekening. Financieel.
P6	S6.59	Gunningscriteria	<i>Stel dat er te weinig budget is, raden wij aan om bijvoorbeeld de levensduur en de kostenbesparing die in de loop der tijd wordt gedaan te berekenen zodat de investering die aan de voorkant wordt gedaan wat hoger kan liggen.</i>	Het berekenen van de levensduur en kostenbesparing leiden tot een groter budget aan de voorkant van het project.	Prijs. Levensduur. Kostenbesparing. Financieel.
P6	S6.60	Gunningscriteria	<i>Naast kwalitatieve eisen, zijn kwantitatieve eisen een must. De belangrijkste hierbij is: hoe kun je het meetbaar maken?</i>	In de gunningscriteria moeten er naast kwalitatieve eisen ook kwantitatieve eisen opgenomen worden: het meetbaar maken.	Kwantitatieve eisen. Technisch.
P6	S6.61	Gunningscriteria	<i>Bij grondstoffen zou je dat bijvoorbeeld kunnen doen door middel van te vragen hoeveel procent van de materialen wordt hergebruikt. Dat zou je heel meetbaar kunnen maken.</i>	Het materiaalhergebruik kan eenvoudig meetbaar gemaakt worden.	Materiaalgebruik. Meetbaarheid. Technisch.
P6	S6.62	Gunningscriteria	<i>Maar ook van de energiehuishouding zou je een berekening kunnen maken. Wat is bijvoorbeeld de energiebesparing. Dat is ook goed meetbaar</i>	De energiehuishouding kan eenvoudig meetbaar gemaakt worden.	Energiehuishouding. Meetbaarheid. Technisch.
P6	S6.63	Gunningscriteria	<i>Maar het gaat ook over woon- en werkcomfort. Ook daar zou je een berekening in kunnen uitvoeren. Dat zou bijvoorbeeld kunnen aan de hand van een WELL certificering.</i>	Het woon- en werkcomfort kan eenvoudig meetbaar gemaakt worden.	Woon- en werkcomfort. Meetbaarheid. Technisch.

Appendix 10: The profile tool statements

Request for Vision statements

Vision				
Aspect	ID	Statement	Derived from	Round
Duurzaamheid: circulariteit	V1.1	Ik vind het belangrijk om te achterhalen of de circulariteitsambities van de gegadigde aansluit op mijn eigen circulaire ambities van de aanbestedende dienst.	S2.20, S2.23, S3.9, S5.23, S5.29	1
	V1.2	Ik hecht meer waarde aan hoe ambitieus de marktpartijen zijn ingesteld en hun meedenkend vermogen dan aan hun ervaring omtrent circulariteit.	S2.10	3
	V1.3	Het is belangrijk dat de circulariteitsvisie van de gegadigde een verdiepingsslag maakt ten opzichte van de eigen visie van de aanbestedende dienst.	S2.11	9
	V1.4	De gegadigde moet voldoende open staan voor vernieuwingen en innovaties op het gebied van duurzaamheid en circulariteit.	S5.11	2
	V1.5	Ik verkies een innovatief karakter en meedenkend vermogen boven ervaring.	S5.27, S5.28	10
Samenwerking en partnerschap	V1.6	Bij circulair aanbesteden ligt vroegtijdig de focus op samenwerking. De gegadigde moet dus met regelmaat het dialoog aangaan met de aanbestedende partij.	S5.2, S5.3	6
	V1.7	Bij circulair aanbesteden is continuïteit van de betrokken personen belangrijk. Het is belangrijk om te weten hoe de gegadigde hier invulling aan denkt te geven.	S2.1, S2.5	8
	V1.8	Circulair bouwen is voor veel partijen een nieuw concept. Samenwerking is dus erg belangrijk. Het is daarom belangrijk om te weten hoe de gegadigde zijn rol ziet binnen het proces.	S1.14	4
Revenu/financings model	V1.9	De gegadigde moet al een bepaald beeld hebben bij een circulair financieringsmodel.	S1.31	5
	V1.10	Het is belangrijk dat de gegadigde uitleg kan geven op hoe hij omgaat met de verschuiving van een lineaire business model naar een circulair business model.	S1.31	7

Request for Reference statements

References				
Aspect	ID	Statement	Derived from	Round
Duurzaamheid: circulariteit	R1.1	Aantoonbaar bewijs dat de gegadigde ervaring heeft met circulariteit is belangrijker dan zijn ambities.	S5.12, S5.25	8
	R1.2	Voor de uitvoering van de werkzaamheden dient de gegadigde aan te tonen dat hij/zij ervaring heeft met het uitvoeren van circulaire projecten.	S5.12, S5.24	2
	R1.3	Een gegadigde moet verschillende keren buiten zijn comfort zone geacteerd hebben.	S5.24, S5.27	9
	R1.4	Wanneer een gegadigde in de afgelopen 5 jaar bij een project betrokken is geweest bij duurzame/circulair ingestoken projecten, kan ervan uit worden gegaan dat de gegadigde bekwaam genoeg is voor de uitvoering van circulaire projecten.	S5.12, S5.15	4
	R1.5	Een gegadigde zonder ervaring met duurzame/circulaire projecten is per definitie niet geschikt.	S5.1, S5.15	6

Samenwerking en partnerschap	R1.6	Een gegadigde dient ervaring te hebben met het houden van regie op de (samenwerkings)keten met gelijkwaardigheid.	S1.25, S5.1	7
	R1.7	Ik vind het belangrijk dat de gegadigde ervaring heeft met nieuwe (samen)werkwijzen zodat uiteindelijk gekomen kan worden tot nieuwe resultaten.	S2.1, S2.3, S2.4, S5.1	1
	R1.8	De gegadigde moet in het verleden projecten hebben uitgevoerd waarbij structureel dialogosessies zijn gehouden.	S3.5, S3.7	10
Verdien en financieringsmodel	R1.9	Ik vind het belangrijk dat de gegadigde ervaring heeft met de inrichting van een alternatief (circulair) verdien- of investeringsmodel.	S1.12, S5.12	5
	R1.10	Ik vind het belangrijk dat de gegadigde minimaal 1 keer betrokken is geweest bij een project waarbij de producent de eigenaar is gebleven van (een deel van) de producten.	S5.1, S5.12	3

Request for Business operation statements

Business operation				
Aspect	ID	Statements	Derived from	Round
Certificaten	B1.1	De gegadigde moet in het bezit zijn van certificeringen die appellieren naar het thema circulariteit.	S5.6	2
	B1.2	Ik vind het belangrijk dat de gegadigde in het bezit is van certificeringen zoals ISO 14001, Cradle-2-Cradle (2C2) of Environmental Product Declarations (EPDs).	S5.6	6
Organization	B1.3	Circulariteit en bewustwording rondom het gebruik van materialen kan een positieve uitstraling hebben naar de buitenwereld. Ik vind het daarom belangrijk dat de organisatie van de gegadigde een circulaire uitstraling heeft.	S5.14	1
	B1.4	De gegadigde moet de maatregelen en doelen voor de komende 10 jaar op het gebied van de circulaire economie scherp hebben.	S1.9, S2.11	5
	B1.5	De rol waarin de gegadigde zichzelf ziet binnen de circulaire economie zegt veel over het circulaire ambitieniveau van de gegadigde.	S5.24	4
	B1.6	Ik vind het belangrijk dat het project wordt uitgevoerd door een partij wiens eigen bedrijfsvoering circulair is.	S5.5	3
	B1.7	De gegadigde dient te kunnen omschrijven welke concrete maatregelen ze heeft getroffen om de eigen bedrijfsvoering meer circulair te maken.	S5.13, S5.14	8
	B1.8	Binnen de organisatie van de gegadigde moet een aparte R&D, innovatie of business development afdeling zijn.	S5.24, S5.27	7
	B1.9	De gegadigde moet de toekomstige plannen om de eigen organisatie meer circulair te maken concreet kunnen aantonen.	S5.24	9
	B1.10	Ik kies alleen gegadigden wiens eigen organisatie circulaire aspecten bezit.	S5.24	10

Technical-content statements

Technical-content			
Aspect	Statement	Derived from	Round
Flexibiliteit en aanpasbaarheid	Het ontwerp dient eenvoudig aanpasbaar te zijn om te voldoen aan functionele eisen voor toekomstig gebruik (passend bij het gebruiksvolume en mogelijke aanpassingen van bestemming in relatie met locatie).	S1.27	10
	Ik vind het belangrijk dat het gebouw zo is ontwerpen dat het eenvoudig aanpasbaar is en gebouwelementen flexibel aan te passen zijn.	S1.27	7
	Het is belangrijk om te weten hoe de flexibiliteit en aanpasbaarheid in de ontwikkeling een plaats heeft gekregen.	S1.27	5
Energie reductie	Ik vind het belangrijk dat er hoge eisen worden gesteld aan de energiehuishouding. Zo dient het gebouw bijvoorbeeld zelfvoorzienend te zijn in de energiehuishouding.	S6.38, S6.62	1
	In het ontwerp dienen verschillende vormen van duurzame energieopwekking gebruikt te worden om het energieverbruik te compenseren.	S6.38, S6.62	9
	Het project dient als energieneutraal ontworpen te zijn en kent een EPC van <0,0.	S6.62	13
Materialen en grondstoffen	In de gunningscriteria dient er een eis opgenomen te worden met betrekking op de herkomst van materialen en producten	S1.8, S6.49, S6.61	2
	In het ontwerp dient er aandacht besteed te worden aan de herkomst van toe te passen materialen en of producten (% virgin, % recyclaat, % hergebruik).	S6.19	6
	De ontwikkeling dient aantoonbaar gebruik te maken van gezonde, duurzame, bouwmaterialen die onderdeel zijn van een circulaire kringloop en geeft invulling aan (een deel van) de genoemde elementen.	S6.19	11
Meetbaarheid	Ik vind het belangrijk dat de mate van circulariteit van het ontwerp meetbaar gemaakt worden zodat ik de verschillende ontwikkelingen objectief met elkaar kan vergelijken.	S6.13, S6.60	8
	Naast kwalitatieve (beloftes) aspecten vind ik het belangrijk dat de gegadigde ook met kwantitatieve (meetbare) aspecten zijn ideeën kracht bij zet.	S6.13, S6.60	3
	Gegadigden kunnen van alles beloven, maar ik hecht de meeste waarde aan aantoonbare feiten, zoals het aantoonbaar/meetbaar maken van de beloftes.	S6.60, S6.42	14
Losmaakbaarheid	In het ontwerp dient er aandacht besteed te worden aan het toekomstig gebruik van uit het project te nemen materialen en/of grondstoffen.	S6.16	12
	In het ontwerp dient er aandacht besteed te worden aan de losmaakbaarheid van het type verbindingen.	S1.9, S1.30, S6.16	4
	Het ontwerp moet zo ontworpen zijn dat gebouwdelen/elementen gemakkelijk demontabel zijn en er dus een mogelijkheid is tot herinzet.	S6.16	15

Process-based statements

Procesmatig				
Aspect	ID	Statement	Derived from	Round
Samenwerking en partnerschap	P1.1	Er moet een duidelijk plan liggen van het proces om te komen tot een circulair gebouw en bouwproces en welke rol samenwerking en transparantie hierin speelt.	S6.26, S6.29	12
	P1.2	De gegadigde dient door middel van een goede samenwerking tot een kwalitatief gewenst proces en resultaat te komen.	S2.1, S2.2	3
	P1.3	Voor het verloop van het project is het van meerwaarde dat partijen elkaar begrijpen en weten welke belangen er spelen, zodat daar risicogestuurd naar kan worden gehandeld.	S2.10	10
Omgevings-management	P1.4	Er moet een duidelijk plan liggen voor de uitvoering en omgevingsmanagement.	S1.5	13
	P1.5	In een omgevingsproces is oprechte aandacht voor de ander belangrijk. De gegadigde dient daartoe kenbaar te maken aan de omgeving wat er speelt en wat belangrijk is voor de ander en vooral waarom dat belangrijk is.	S3.9, S6.20	1
	P1.6	Historische waarde van de projectomgeving is onderdeel van circulariteit. Hoe deze waarde behouden kan worden moet duidelijk omschreven worden.	S1.36, S1.38	8
Kansen en verbeteringsvoorsel	P1.7	De marktpartijen dienen een plan te maken voor het creëren van meerwaarde ten opzichte van het PvE.	S2.11	14
	P1.8	Ik vind het belangrijk dat gegadigden uitgedaagd worden door verder te denken dan de gegeven eisen. Aan de hand van verbetervoorstellen op bijvoorbeeld herkomst van materialen, toekomstscenario en losmaakbaarheid. De onderbouwing hiervan kan plaatsvinden door bijvoorbeeld details aan te passen, andere materiaalvoorstellen te doen of hergebruik of recycling in de toekomst te garanderen.	S6.27, S6.55	6
	P1.9	Het is belangrijk dat de gegadigde, naast het geven van invulling aan de gestelde eisen, ook een aantal belangrijkste kansen/optimalisaties op het gebied van duurzaamheid/circulariteit kan geven tezamen met een inzicht in de bijbehorende maatregelen.	S6.27, S6.55	4
Maintenance	P1.10	Het ontwerp moet zo ontworpen zijn dat het gedurende 50 jaar onderhoudsvrij is, of indien (voor delen) niet mogelijk dan een zo klein mogelijke afwijking van 50 jaar onderhoudsvrij.	S6.12	7
	P1.11	Al voor de realisatie moet er een plan liggen moet de wijze waarop invulling wordt gegeven aan preventief onderhoud aan het gebouw.	S6.12	2
	P1.12	De wijze waarop de ontwikkeling is ontworpen moet bijdragen aan een eenvoudig onderhoud. Denk bijvoorbeeld aan eenvoudig te demonteren gebouwelementen.	S6.12, S6.16	11
Social return	P1.13	Ik vind het belangrijk dat lokaal ondernemerschap gestimuleerd wordt door bijvoorbeeld het afnemen van grondstoffen, materialen en producten in de directe omgeving van het project.	S6.20	9
	P1.14	Het vinden van materialen voor hergebruik kan lastig zijn. Deze zoektocht naar de juiste materialen, producten en grondstoffen kan gedaan worden door mensen met een achterstand op de arbeidsmarkt. Ik vind het belangrijk dat er op deze manier arbeidsplaatsen gecreëerd wordt.	S6.19, S6.20	5

	P1.15	Binnen het project dient social return opgenomen te worden gericht op het vergroten van kennis en expertise ten behoeve van mensen met een grote(re) afstand tot de arbeidsmarkt door bijvoorbeeld opleidingen en trainingen.	S6.19	15
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Financial-economic statements

Financieel-economisch			
Aspect	Statement	Derived from	Round
Total Costs of Ownership	Ik ben meer van de lange termijn visie in plaats van de korte termijn redeneringen. Daarvoor dient door middel van een berekening inzichtelijk te worden gemaakt wat de investering betekend voor de lange termijn.	S6.10, S6.58	13
	Ik vind het belangrijk dat de gegadigde actief stuurt op Total Cost of Ownership. Wat is bijvoorbeeld zijn lange termijn visie omtrent onderhoud?	S6.58	3
	Er moet niet zo zeer gefocust worden op een lage inkoopprijs. In plaats daarvan moet er naar het gehele plaatje gekeken worden, zodat de investering op lange termijn de moeite waard wordt.	S6.10	9
	Ik vind het belangrijk dat niet alleen de aanschafkosten maar ook de gehele economische levensduur van producten inzichtelijk wordt gemaakt.	S6.59	7
Residual value	De toekomstwaarde dient hard te worden gemaakt door een Netto Contante waarde (NPV) af te geven waarin de restwaarde van producten is opgenomen.	S6.17	14
	Het is belangrijk dat de gegadigden met een plan komen waarin rekening wordt gehouden met de restwaarde van het gebouw.	S6.17, S6.34	1
	De waarde van de binnen het ontwerp toegepaste elementen, producten en/of materialen, gerelateerd aan een volgende gebruik, dienen te worden vastgesteld.	S6.14	11
	De restwaarde van materialen en/of elementen na de technische levensduur en waarbij leveranciers bereid zijn initieel de restwaarde te kapitaliseren dienen in kaart gebracht te worden.	S6.17, S6.34	6
Socially responsible purchasing	Producten en materialen dienen in het gehele project maatschappelijk verantwoord ingekocht te worden.	S1.25	15
	Bij de inkoop van producten dient de inkoop benut te worden voor het realiseren van meer duurzaamheid en het voorkomen van negatieve effecten op milieu en sociale aspecten.	S1.25	4
	Bij de inkoopbeslissingen vind ik de prijs, kwaliteit en levertijd van de producten van bepalendere factor dan de effecten op het milieu en sociale aspecten die de producten met zich mee brengen.	S1.25	8
	De gegadigden dienen hun inkopen te doen bij duurzame toeleveranciers.	S1.25	12
Environmental Performance Indicator	Ik vind het belangrijk dat de invloed van de gekozen producten en de menselijke activiteiten op het milieu in kaart worden gebracht.	S6.37	10
	Om meer inzicht te krijgen van de mileu-impact die het ontwerp heeft en zodat ik eventueel tijdig maatregelen kan treffen, wil ik dat er een mileuprofiel (= een scorelijst van milieueffecten die een rol spelen in de levenscyclus) wordt gemaakt.	S6.37, S6.46	2
	Per 1 januari 2018 geldt voor de MPG een maximum grenswaarde van 1,0. Ondanks dat dit de minimale eis is, streef ik er naar om een veel lagere MPG te behalen.	S6.46	5

Appendix 11: Case study questionnaire

Selection criteria profile

Request for **vision**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **references**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **business operations**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **vision** on sustainability/circularity

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **vision** on collaboration/partnership

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **vision** on revenue/financing model

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **reference** on sustainability/circularity

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **reference** on collaboration/partnership

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **reference** on revenue/financing model

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **business operation** on certificates

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **business operation** on organization

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Award criteria profile

Request for **Technical-content** aspects

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Process-based** aspects

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Financial-economic** aspects

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Sustainability/circularity**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Energy (reduction)**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Flexibility and adaptability**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **(raw) Material (re)use**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Measurability**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Design for disassembly**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Collaboration/partnership**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Environmental management**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Opportunities and improvement proposal**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Maintenance**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Social return**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Total Cost of Ownership**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Residential value**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Socially Responsible Purchasing**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Request for **Environmental Performance Indicator**

<input type="checkbox"/>									
1	2	3	4	5	6	7	8	9	10

Appendix 12: Overview of suggested Selection and Award criteria

Selection Criteria suggestions per category

SC 1: Visie	Bron
SC 1.1 Duurzaamheid: circulariteit	
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat haar visie is aangaande circulariteit in de bouw: o In hoeverre sluit de visie van de Gegadigde aan op de visie van de Aanbestedende Dienst? o In hoeverre sluit deze visie aan op de projectambities? o In hoeverre is deze visie ook daadwerkelijk uitvoerbaar/realistisch? o Wat is de mate van creativiteit van de ambitie?	(Van Haagen, 2018)
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat haar visie is ten aanzien van BREAAAM, circulair bouwen en BIM in combinatie met een renovatieproject zijn een pre.	T18
Omdat circulariteit een ruim begrip is, waar verschillende invullingen voor worden toegepast, wenst aanbestedende dienst een partij die de denkwijze van het project onderschrijft, kan aanvullen en kan realiseren.	T20
De Aanbestedende Dienst wenst te vernemen van de Gegadigde, naast een heldere en bondige beschrijving van het concept en de ruimtelijke kwaliteit, hoe zij beogen om te gaan met duurzaamheid, samenhang en het beheer en onderhoud.	T22
SC 1.2 Samenwerking en partnerschap	
De Aanbestedende Dienst wenst te vernemen hoe de Gegadigde haar rol ziet binnen de circulaire economie.	(Van Haagen, 2018)
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat haar visie is op de samenhang en het samenspel tussen de verschillende uitvoeringsdisciplines en de samenwerking met de opdrachtgever en de ontwerpende partijen.	T18
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat haar visie is aangaande samenwerking en transparantie.	(Van Haagen, 2018)
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat haar visie is aangaande samenwerkingspartners en het team.	T22
SC 1.3 Verdien en/of financieringsmodel	
Inschrijver dient aan te geven hoe hij voldaan heeft aan de geformuleerde doelstelling tijdens de uitvoering van een referentieopdracht. Inschrijver dient hiertoe in te gaan op het volgende onderwerpe: van eigendom naar gebruik door het aangaan van alternatieve verdien- en/of financieringsmodellen.	Alba Concepts
SC2: referentie	
SC 2.1 Duurzaamheid: circulariteit	
De Gegadigde dient drie (3) soortgelijke opdrachten voor te leggen, welke in de afgelopen vijf (5) jaren voorafgaande aan de uiterste datum van Aanmelding zijn verricht en naar tevredenheid van de opdrachtgever op vakkundige, tijdige en regelmatige wijze zijn verricht.	(Van Haagen, 2018)
De Aanbestedende Dienst wenst te vernemen van de Gegadigde wat mate is waarin referenties als voorbeeld kunnen dienen voor: duurzame huisvesting, C2C gebouw en bouwproces, positieve energiebalans. Hoe beter de referenties als voorbeeld kunnen dienen voor duurzame huisvesting, C2C gebouw en bouwproces en positieve energiebalans, hoe meer punten worden toegekend.	(Van Haagen, 2018)
De gegadigde dient één referentieproject op te geven, die door gegadigde is gerealiseerd. Het referentieproject moet (x)bouw betreffen van een inzamelpunt voor grof huishoudelijke afval of gemeentewerf, recycleplein en in de laatste vijf jaar, gerekend vanaf de uiterste aanmeldingsdatum van onderhavige aanbesteding zijn opgeleverd.	T14
Referentieprojecten waarin circulariteit centraal staat zijn slechts beperkt gerealiseerd en worden derhalve niet als minimum gesteld. Voorbeelden van vormen van circulair materiaalgebruik zijn echter wel al langer toegepast.	T20
Voor de nieuwe Sterrenschool is een ambitie van verschillende aspecten van duurzaamheid met o.a. een EPC < 0,0 neergelegd, hetgeen invloed heeft op het engineeren en bouwen van het project. Aanbestedende dienst wenst een partij te selecteren die deze ambitie kan waarmaken en ervaring heeft met het realiseren van een dergelijke ambitie. Hiertoe dient gegadigde een vergelijkbare referentieopdracht voor de realisatie (nieuwbouw) van een onderwijsgebouw met een duurzaamheidsambitie die ruim verder gaat dan de (ten tijde van de realisatie geldende) eisen van het bouwbesluit op te geven.	T20

Een bekwame Opdrachtnemer selecteren die zijn meerwaarde heeft bewezen in het verduurzamen van renovatieopgaven in combinatie met circulariteit. de wijze waarop gewerkt is met circulaire materialen en het aantonen dat hergebruik efficiënt kan worden ingezet.	T25
SC 2.2 Samenwerking en partnerschap	
De gegadigde toont met het referentieproject te beschikken over het vermogen integraal te ontwerpen en op vakkundige wijze samen te werken met de overige ontwerpende en adviserende disciplines (constructeur, installatie-adviseur en duurzaamheidsadviseur). Onderbouw dit met een schriftelijke motivatie waaruit blijkt op welke wijze de verschillende ontwerpende disciplines tot een integraal ontwerp zijn gekomen.	T14
SC 2.3 Verdien- en/of financieringsmodel	
Inschrijver dient aan te geven hoe hij voldaan heeft aan de geformuleerde doelstelling tijdens de uitvoering van een referentieopdracht. Inschrijver dient hiertoe in te gaan op het volgende onderwerpen: van eigendom naar gebruik door het aangaan van alternatieve verdien- en/of financieringsmodellen.	Alba Concepts
SC 3: Bedrijfsvoering	
SC 3.1 Certificaten	
De gegadigde wordt gevraagd een document aan te leveren met daarin certificeringen die appelleren aan het thema duurzaamheid/circulariteit: ISO 140001, Cradle-2-Cradle (C2C), Environmental Product Declarations (EPDs) etc.	Alba Concepts
SC 3.2 Organisatie	
De Gegadigde wordt gevraagd te beschrijven hoe het bedrijf concrete maatregelen neemt om haar eigen bedrijfsvoering meer circulair te maken.	Alba Concepts
De Gegadigde wordt gevraagd een document aan te leveren waarin hij de organisatiestructuur weergeeft met daarin eventuele aanwezigheid van een R&D, innovatie, business development afdeling/team etc. op circulariteit	Alba Concepts
De Gegadigde dient de maatregelen en behaalde resultaten van de afgelopen 5 jaar op het gebied van CE te beschrijven.	(Van Haagen, 2018)
De Gegadigde dient de maatregelen en doelen voor de aankomende 10 jaar op het gebied van duurzaamheid en CE te beschrijven.	(Van Haagen, 2018)

Award Criteria suggestions per category

AC 1: Technisch-inhoudelijk	Bron
AC 1.1 Energie reductie	
De Gegadigde wordt gevraagd om een indicatie te geven van de te behalen EPC.	T4, T20
De Gegadigde biedt een concept van de positieve energie balans van het ontwerp.	T22
Het bouwproces zal een zo minimaal als mogelijke CO ₂ footprint moeten hebben. De Aanbestedende Dienst verlangt dat de Inschrijvende partijen dat bereiken door allereerst te werken aan preventie, vervolgens uit te kijken naar (schonere) alternatieven, en als laatste over te gaan tot compensatie. Voor het bepalen van de footprint dient rekening gehouden te worden met, maar niet beperkt tot, alle logistieke bewegingen gerelateerd aan de bouwplaats en/of het Bouwproces, de energievraag, de inzet van mensen, de inzet van materieel en materiaal.	T16
AC 1.2 Flexibiliteit en aanpasbaarheid	
De Gegadigde wordt gevraagd een korte visie en globale aanpak te schrijven op hoe de flexibiliteit en aanpasbaarheid in de ontwikkeling een plaats heeft gekregen.	Alba Concepts
AC 1.3 Materialen en grondstoffen	
De Gegadigde maakt een overzicht van het hergebruik van bestaande materialen door middel van het hergebruik van producten, materiaalonderdelen of gerecyclede materialen.	T5
De Gegadigde moet een overzicht maken van het gebruik van snel opnieuw groeibare materialen, waarbij de groeisnelheid korter is dan de nuttige levensduur, en het leidt niet tot schade aan mens of milieu.	T5
De Gegadigde moet een kwantitatieve doelstelling specificeren voor de toepassing van het percentage hernieuwbaar materiaal met minimale milieu-impact.	T8
De Gegadigde moet een kwantitatieve doelstelling specificeren voor de toepassing van het percentage gerecyclede materialen.	Alba Concepts
De Gegadigde moet aangeven op welke manier of met welk instrument het gebruik van grondstoffen en materialen, inclusief de doelstellingen, transparant zijn gemaakt.	Alba Concepts
AC 1.4 Meetbaarheid	
De Gegadigde dient de circulariteit meetbaar te maken door middel van bijvoorbeeld de Building Circularity Index (BCI).	Alba Concepts
AC 1.5 Losmaakbaarheid	
De Gegadigde wordt gevraagd de wijze waarop het ontwerp is afgestemd op specifieke omstandigheden zoals demontabele constructie, assemblage bouw, tijdelijke constructie, bijzondere duurzaamheidsaspecten of technische eisen, te beschrijven.	(Van Vliet, 2018)
AC 2: Procesmatig	
AC 2.1 Samenwerking en partnerschap	
De Gegadigde biedt een concept van de integrale samenhang binnen het project.	T20
De Gegadigde beschrijft het proces om te komen tot een circulair gebouw en bouwproces en welke rol samenwerking en transparantie hierin speelt.	T20
AC 2.2 Omgevingsmanagement	
De Gegadigde wordt gevraagd de wijze waarop de directe omgeving betrokken is bij het project, te beschrijven. Te denken aan: lokale ondernemers, materialen/producten.	Alba Concepts
AC 2.3 Kansen en verbetervoorstellen	
De Gegadigde dient een plan van aanpak in te dienen met betrekking op de kansen en mogelijke risico's.	(Van Haagen, 2018)
Welke risico's ziet u ten aanzien van financiële aspecten en/of financiële innovatie en hoe gaat u deze risico's beheersen? Welke financiële of juridische risico's wilt of kunt u lopen, hoe groot mogen die zijn?	Alba Concepts
AC 2.4 Onderhoud	
De Gegadigde dient in een plan van aanpak te beschrijven hoe invulling wordt gegeven aan preventief onderhoud aan het gebouw. Hiertoe dient de Gegadigde een preventief onderhoudsplan op te stellen bedoeld voor de duur van de order (gebaseerd op de Raamovereenkomst) inzake het project. Uit het preventief onderhoudsplan dient duidelijk te worden welke onderdelen van het gebouw worden gecontroleerd tijdens een preventieve controle en wat hiervan de kosten zijn op jaarbasis. Uit de toelichting op het preventief onderhoudsplan dient te blijken hoe de door de Gegadigde beschreven handelingen bijdragen aan het voorkomen van correctief onderhoud.	(Van Haagen, 2018)
AC 2.5 Social return	
De Gegadigde dient een plan van aanpak te beschrijven hoe invulling wordt gegeven aan social return. Hoe kunnen bijvoorbeeld extra werk(ervarings)plaatsen gecreëerd worden voor mensen met een grote(re) afstand tot de arbeidsmarkt?	T3
AC 3: financieel economisch	

AC 3.1 Total Cost of Ownership (TCO)	
De Gegadigde dient de directe en mogelijke indirecte financiële consequenties (investeringen en/of rendementen) horende bij de voorgestelde maatregelen voor het concept en het proces, en hoe deze in verhouding staan tot elkaar, te ontwikkelen en beschrijven.	Alba Concepts
De Gegadigde dient een onderbouwing te geven van de totale levenscycluskosten.	Alba Concepts
De Gegadigde dient op kwalitatieve wijze een integraal financieel model voor de opgave te beschrijven en/of illustreren.	Alba Concepts
AC 3.2 Restwaarde	
Een uitgangspunt van de circulaire economie is dat producten na hun eerste gebruiksfase een restwaarde hebben vanwege hergebruik van het product en/of de gebruikte componenten of materialen. Welke (financiële) mogelijkheden ziet u om deze restwaarde (deels) ten goede te laten komen aan de gebruiker?	Alba Concepts
AC 3.3 Maatschappelijk Verantwoord Inkopen (MVI)	
De Gegadigde dient te beargumenteren hoe het inkoopproces vorm wordt gegeven. Gegadigde dient hierbij toelichting te geven op het selecteren van leveranciers, aannemers of dienstverleners die voldoen aan de gestelde duurzaamheidscriteria.	Alba Concepts
AC 3.4 Milieu Prestatie Gebouwen	
De Gegadigde dient de circulariteit meetbaar te maken door middel van het uitvoeren van een LCA analyse waarbij circulariteit wordt uitgedrukt in milieukostenindicator (MKI).	Alba Concepts

