

1 **Developing a framework to understand the contribution of**  
2 **sustainable procurement to the development of more**  
3 **sustainable business models**

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7 **Abstract**

8 The concept of sustainable development has encouraged companies to re-asses the  
9 way they do business. The integration of sustainability requirements into the  
10 procurement process, leading to sustainable procurement, can motivate companies to  
11 develop more sustainable business models.  
12 Although there has been increasing research on sustainable procurement and business  
13 models alike, attention for the contribution of sustainable procurement to the  
14 development of more sustainable business models is lacking. This paper provides an  
15 in-depth analysis on the links between the procurement process and the development  
16 towards more sustainable business models. By the application of the constant  
17 comparative analysis, initially categories and concepts were taken from the fields of  
18 procurement, business models and corporate sustainability, leading to the  
19 development of a preliminary framework. Validation by experts in the fields gave  
20 input to further develop the framework as it is showed in this paper. This framework  
21 helps to better understand the contribution of a sustainability focus during the  
22 procurement process on the development of more sustainable business models. It is  
23 suggested to test this framework further by applying it to generate empirical data.

24 **Key words:**

25 Sustainable procurement, sustainable business models, collaboration.  
26

**Comment [SW1]:** What about mentioning circularity here?

27 **1 Introduction**

28 Corporate sustainability (CS) has evolved from a reductionist approach, used for  
29 improving the environmental performance of business processes, towards a more  
30 systematic approach for multi-issue (i.e. economic, social and environmental)

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1 compliance coming from the broadening scope of in- and external, direct and indirect  
2 stakeholders (Dyllick and Hockerts, 2002). The latest step in this evolution has lead to  
3 a holistic systemic approach, used for the search for the optimum linkages between  
4 parts of the life cycles of materiales and sub-products motivating companies to  
5 contribute to a circular economy. In this evolution the synergy of the engagement of  
6 the different company's processes with CS catalyses the integration of CS into the  
7 company's business models (Baumgartner, 2009a; Dunphy et al., 2006; Linnenluecke  
8 and Griffiths, 2010). In order to do so, the different company's business models have  
9 to be reframed and aligned with CS (Boons et al., 2012) to serve as a vehicle for the  
10 coordination of technological and social innovations with system-level (i.e. societal)  
11 sustainability (Bocken et al., 2014, p. 44) and improve the overall company's  
12 sustainability impact and compliance with the multi-issue stakeholder demands.

13 The United Nations Environmental Programme (UNEP) proposed sustainable  
14 procurement to be an important incentive for companies to integrate sustainability  
15 requirements in their procurement processes (UNEP, 2014). Accordingly, several  
16 governments (e.g. Danmark, The Netherlands, Great Britain) have been applying a  
17 strategy to incentive the application of sustainable procurement (SP) to motivate  
18 companies to develop more sustainable business models (Brammer and Walker 2011).  
19 However, up to date this has only resulted in the compliance with stakeholder  
20 demands instead of CS integration in other company's processes and consecutively its  
21 business models. To improve the understanding of how SP can lead to more  
22 sustainable business models a system dynamics research approach is needed  
23 (Melissen and Reinders, 2012).

24 This paper's aim is to develop and propose a holistic framework for understanding the  
25 contribution of SP to the development of more sustainable business models. Grounded  
26 theory's constant comparative analysis was applied to develop this framework: the  
27 integration of categories and concepts of the literature on, initially, procurement,  
28 business models and CS lead to a preliminary understanding of the link between  
29 sustainable procurement and sustainable business models. This was validated with  
30 experts from the fields of purchasing, sales, business models, change management and  
31 CS integration from the academy, government and companies leading to a final  
32 framework.

## 1 **2 Grounded theory's constant comparative analysis**

2 Grounded theory was developed responding to the lack of effective tools for theory  
3 discovery (Glaser and Strauss, 1999), the concerns over the predominance of  
4 quantitative methods in social sciences, and the tendency to test existing grand  
5 theories (Jupp, 2006). As a research design it emphasises on the development and  
6 construction of theory from data and observations (Jupp, 2006; Saunders et al., 2007;  
7 Glaser and Strauss, 1999; Strauss and Corbin, 1998) and has the goal to develop a  
8 theory that emerges from and is therefore connected to the reality the theory is  
9 developed to explain (Glaser and Strauss, 1999). Grounded theory helps to frame  
10 exploratory research, where the researcher has little control over the phenomena being  
11 studied (in this paper on how sustainable procurement leads to the development of  
12 more sustainable business models). Besides, it permits the detection of the existence  
13 of causal connections between phenomena, and to generalise from a specific context  
14 (Bryman, 2004; Yin, 1984). It is based on deriving conceptual categories or their  
15 properties based on evidence gathered. The evidence is then used to further  
16 characterise the tentative conceptual categories. Grounded theory provides the  
17 capacity to perform a systematic analysis of theory, which can be useful in detecting  
18 if there are any categories or issues that have not been explicitly considered in the  
19 theories already used or if there is a need to restructure them. From the four grounded  
20 theory approaches that Glaser and Strauss (1999) propose to help analyse qualitative  
21 data the constant comparative analysis offers the potential to generate theory more  
22 systematically than the other ones. It uses explicit coding and analytic procedures that  
23 help to identify, develop, and relate the concepts that make the building blocks for  
24 theory more systematic and creative. Besides, it offers the potential to generate  
25 theory by explicitly coded and analytic procedures that help to identify, develop, and  
26 relate the elements that make the parts of the framework more systematic and creative  
27 (Glaser and Strauss, 1999). Using the constant comparative analysis makes it highly  
28 probable to achieve a relevant theory that corresponds closely to the data (Strauss and  
29 Corbin, 1998). Constant comparative analysis exists of four stages: Firstly, comparing  
30 concepts applicable to each category, i.e. classifying the data into meaningful  
31 categories that may be derived from the data, from the theoretical framework, or from  
32 the researchers' readings, life experiences, research, and scholarship. The categories  
33 are further clarified and defined based upon literature review, and in some cases from

1 the researcher's experience. For this paper the categories used to start with the  
2 constant comparative analysis were the fields of procurement, business models and  
3 CS. Secondly, a literature review lead to the development of categories' concepts and  
4 integrating categories and their properties. For this research a Computer Aided  
5 Qualitative Data Analysis Software (CAQDAS) was used to analyse these categories  
6 and concept. The CAQDAS used for this research was the NVivo software (QSR,  
7 2015), which is recognised as a valuable support tool for researchers investigating the  
8 processes and strategies for constructing arguments derived from the literature or  
9 primary data as arguments for or against the evolving theory of the casual relations to  
10 the observed data (di Gregorio, 2000). Thirdly, experts from the field (see section 7.1)  
11 validated these categories and concepts. This validation was useful in supporting the  
12 researchers to clearly recognise relationships and to develop new categories by  
13 juxtaposing data from the categories or modifying the categories to provide new  
14 insights into how future case study interviews can be compared against the fields of  
15 procurement, business models and CS, and how the SP process influences the  
16 development of more sustainable business models. Fourthly and finally, developing  
17 the new or modified framework, which can then be used to develop or test hypotheses  
18 (Saunders et al., 2007; Glaser and Strauss, 1999; Strauss and Corbin, 1998; Corbin  
19 and Strauss, 1990), such as the theory about the parameters linking sustainable  
20 procurement and the development of more sustainable business models. This theory is  
21 presented in the conclusions section. The constant comparative analysis offered the  
22 researchers a systematic way to analyse the field study as well as a basis to analyse  
23 future case study data. Besides, it helped to discover categories and concepts and to  
24 recognise relationships among these, and finally propose linking parameters for the  
25 SP process and the development of more sustainable business models. The following  
26 sections explore the fields of corporate sustainability, business models and  
27 procurement and present the categories derived from these fields as basis for the  
28 framework.

### 29 **3 Companies' quest for its contribution to the circular** 30 **economy**

31 Companies' awareness of their impact on the direct and indirect context has been  
32 increasing (Searcy, 2014). The consequent corporate responsibility to improve this

1 impact has been debated over many years. Historically and culturally more corporate  
2 rights than responsibilities have been identified, at least in Western societies  
3 (McIntosh et al. 1998), where the two most recognised expectations from companies  
4 are wealth and job creation (Cannon 1994; CEC 2002). According to McIntosh et al.  
5 (1998), the company has responsibilities that ‘go beyond compliance with legislation,  
6 economic prudence, ethical behaviour and philanthropy’. Companies’ considerations  
7 of their social role and the aims of their activities (Bowen, 1953) are founded on  
8 stakeholder theory (Dunfee, 2008), business ethics (Brenkert, 2010) and the social  
9 license to operate (Kurucz et al. 2008). In this broad scope of considerations one of  
10 the main contributions of companies on the welfare of society lies in the impact of  
11 final products and/or services companies produce (Caroll and Shabana, 2010, p.113).  
12 In their intent to improve this impact there has been a growing attention for the multi-  
13 issues this impact implies over time: economic, social and environmental (Lozano,  
14 2008, p. 1844). Tackling this multi-issue impact of product and/or services is a next  
15 step in a progressive widening of the horizon of pollution prevention and waste  
16 reduction (Crul et al., 2006); a widening which has gone from a limited focus on  
17 production processes (e.g. cleaner production), to include products (e.g. eco design),  
18 product-systems (e.g. design for sustainability incorporating logistics, end-of-life  
19 collection and reuse or materials recycling) and systems innovation (e.g. design for  
20 society). Over the last couple of years, and especially in Europe, companies and  
21 governments are trying to broaden this horizon even further in motivating companies  
22 to contribute to a circular economy (Geet et al., 2015, p. 3; Vermeulen et al., 2014).  
23 Where in the beginning the circular economy-emphasis only took into account the  
24 relationships between the elements of sub-systems of the economy (e.g. life cycles of  
25 products and/or services) that would allow a return to the initial starting position  
26 (Leontief, 1991), currently it is the redesign of processes, leading to “an economic  
27 model wherein planning, resourcing, procurement, production and reprocessing are  
28 designed and managed, as both process and output, to maximize ecosystem  
29 functioning and human well-being” (Murray et al., 2015). The contribution of these  
30 redesigned processes to this economic model depends on the sustainability focus of  
31 company’s processes (e.g. procurement) and therefore on the influence of these  
32 redesigned processes on the integration of CS in the business models of the  
33 subsequent company (Murray et al., 2015).

## 1 **4 Business models**

2 A business model reveals and summarizes the way of creating value (i.e. economic,  
3 social and environmental) in a business (Afuah, 2004). More accurately, it supports  
4 managers to conceive the different company processes to comply with the multi-issue  
5 stakeholder demands. Since the end of the 90s business models as a term has been  
6 augmented in the management literature with several scholars having critically  
7 examined different aspects in the business model field (e.g. Casadesus-Masanell and  
8 Ricart, 2010; Morris et al., 2005; Zott and Amit, 2008; Zott et al., 2011). Although  
9 there have been recent developments towards the use of a dynamic perspective on  
10 business models, permitting the link with the ever-changing internal and external  
11 company context, its use is incongruously often static (Demill & Lecocq, 2009).  
12 Despite of these dedications, the strategic management community has not been able  
13 to define business models theoretically neither within practice (DaSilva and Trkman,  
14 2014). Within this uncertain business model-field Boons and Lüdeke-Freund (2013)  
15 propose the following three basic elements of a static business model:

16

### 17 1. The value proposition

18 A company delivers value to stakeholders, in the form of its products and  
19 services (Demill and Lecocq, 2009, p. 231). To extend the scope of traditional  
20 business models to more sustainable business model this research integrates  
21 the functional value with social and environmental stakeholder interests  
22 (Garvare and Isaksson, 2001) leading to the aforementioned multi-issue  
23 stakeholder demand-scope.

### 24 2. The configuration of value creation

25 The way in which the company links to suppliers, customers and other  
26 stakeholders by, for example, internal processes will present different direct  
27 consequences influencing the overall efficiency of the company's compliance  
28 with multi-issue stakeholder demands (Casadesus-Masanell and Ricart, 2010,  
29 p. 199).

### 30 3. The revenue model

31 Value propositions reflect the content of the transactions with stakeholders,  
32 and the deployment of resources that each organization manages so as to  
33 generate its offers (Amit and Zott, 2001). It is how costs and benefits of the

1 multi-issues are divided over stakeholders in the system that constitutes the  
2 revenue model of the specific business model.

3  
4 This static view of business models remains useful to insist on the systematic  
5 consistency of these different basic elements (Osterwalder, 2004). From a dynamic  
6 perspective it is necessary to see business models as an element of the ever changing  
7 internal and external context of the company that operates on the business model  
8 (Achtenhagen et al., 2013). A company can have more business models with their  
9 hierarchical relationship (Thomas Burkhart, 2012) and therefore different levels of  
10 abstraction (Demil and Lecocq 2010, p. 232). In the end, all business models present  
11 in a company should synergize to meet the company's strategic objectives (Thomas  
12 Burkhart, 2012). All three business model basic elements can be related to one  
13 specific product or service up until all the products or services the company puts in  
14 the market: an organisational business model. This business model can be seen only  
15 including the organisation and its processes taking into account the interaction with  
16 internal stakeholders (i.e. core business model) and on a higher level of abstraction  
17 including the surroundings of the company (i.e. meta surroundings; Thomas Burkhart  
18 2012) taking into account the interaction with external stakeholders. It is therefore  
19 that a combination of the static and dynamic view on the company's business model  
20 will enable the understanding of the extent the company contributes to the circular  
21 economy. The integration of the multi-issues in all three business model elements (i.e.  
22 integration of CS) at core business model and meta-surrounding level is an important  
23 step towards this contribution (Baumgartner, 2009; Hahn et al., 2014) generating to a  
24 more sustainable business model.

#### 25 **4.1 More sustainable business models**

26 As a business model is the way a company operates to ensure its sustainability (Demil  
27 and Lecocq, 2010, p. 233), societal developments like the circular economy have  
28 motivated companies to rethink their business models (Murray et al., 2015). Besides,  
29 the integration of CS in many processes within or outside of the company can lead to  
30 an adjustment of the business model or parts of it (Hart and Milstein, 2003; Lovins et  
31 al., 2007). The late increase of research activity in the field of more sustainable  
32 business models has resulted in the development of several theories and models  
33 (Bocken et al., 2014; Boons and Lüdeke-Freund, 2013; Esslinger, 2011; van Tulder et

1 al., 2013). In order to understand the development towards more sustainable business  
2 models the research done by Bocken et al (2014) shows an overall of 8 more  
3 sustainable business model-archetypes when CS is integrated in the companies'  
4 processes:

- 5
- 6 1. To maximise material and energy efficiency
- 7 2. To create value from 'waste'
- 8 3. To substitute with renewables and natural processes
- 9 4. To deliver functionality, rather than ownership
- 10 5. To adopt a stewardship role
- 11 6. To encourage sufficiency
- 12 7. To re-purpose the business for society/environment
- 13 8. To develop scale-up solutions
- 14

15 The consideration of a value-chain perspective (e.g. resources, procurement,  
16 production, distribution, sales, marketing, end-of-life) for the above mentioned  
17 categorisation of more sustainability model-archetypes has resulted not to be  
18 applicable (Bocken et al., 2013). Nevertheless, Lozano et al. (2013, p. 54) concluded  
19 that more sustainable business models archetypes should be integrated into the  
20 processes of the company system as well as to the overall organisational business  
21 model in order to be successful. In both cases the integration of CS into the  
22 company's processes determines the sustainability of a business model and therefore  
23 its compliance with the societal developments like the circular economy.

**Comment [SW2]:** We should add a remark that the archetypes are still very mechanistic, leaving the socio cultural part out.

## 24 **5 Company processes**

25 Models of company processes have been proposed within the management literature.  
26 For example, Hill and Jones (2007) divide the system into primary processes (e.g.  
27 procurement, production, logistics and sales) and supporting processes (e.g. facilities,  
28 human resources, finances). From an management system perspective steering or  
29 management processes (including policy and strategy development) are added  
30 (Cramer, 2005). The goal of the primary processes is to convert the customer's  
31 demands into a product and/or service. The supporting processes support the primary  
32 processes in complying with this conversion from demands into satisfaction. The

**Comment [SW3]:** Why still a paragraph on company's processes when we already made clear that the focus is on procurement?

1 steering processes define what the focus of the company is and will be with its  
2 different business models. However, this model of company processes has limitations  
3 in covering the broad scope of different company processes (Lozano, 2012). The  
4 following classification (by ibid) does not distinguish between primary neither  
5 secondary processes. This clasificsation gives the possibility to each company to  
6 prioritize these processes according to their core competences. Besides, it clarifies the  
7 sustainability intitaitive sto integrate CS into these processes in order to develop more  
8 sustainable business models.

9

10 1. Operations and production

11 Cleaner production, ecodesign

12 2. Management and strategy

13 The development towards integrated management systems, vision creation

14 3. Organisational systems

15 Sustainable human resources

16 4. Procurement and marketing

17 Sustainable procurement and sustainability marketing

18 5. Assessment and communication

19 sustainability reporting and sustainability assessments (for example LCA)

20

21 Of the above mentioned elements of the organizational business model, the  
22 contribution of the procurement process to the sustainability of the company has seen  
23 little attention of researchers. The role of procurement in motivating companies to  
24 integrate CS in their processes and therefore changing towards a more sustainable  
25 business model is critical, due to the ability of the procurement process to connect  
26 several company's processes with external stakeholder requirements (Green et al.,  
27 1996; Seuring, 2004). In contrast the attention in research on the contribution of the  
28 procurement process on the development of more sustainable business models has  
29 been limited,

30 **6 The process of procurement**

31 The traditional procurement process can be seen as existing of three stages (Dutch  
32 Ministry of Infrastructure and the Environment, 2011; see figure 1):

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1. Preparatory stage

Each procurement process starts with the inventory of stakeholder demands. These demands can be found in all sustainability issues. The procurer makes a choice to focus on a selection of these demands and will convert these selected demands in the first concepts of a product or service that will be procured.

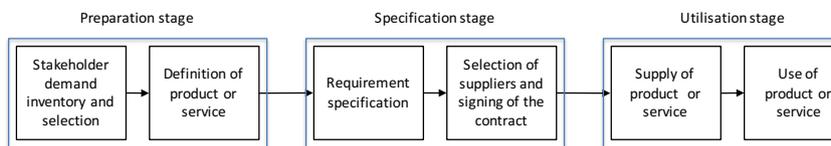
2. Specification stage

In this stage the selection of multi-issue stakeholder demands are translated into a specification of the requirements. This specification can determine for example the supplier qualification criteria, the minimum requirements to supply and a statement of the contract provisions is included as well.

This stage ends with the selection of the supplier and the signature of the contract.

3. Utilisation stage

After the contract is signed and the product and/or service is being supplied, the procurers choice for the multi-issue demands can be being seen in practice.



18  
19

Figure 1 The traditional procurement process

20 As can be seen in figure 1, the traditional procurement process is linear leading from:  
21 1. The determination of the multi-issue stakeholder requirements, via 2. the  
22 prioritisation of the suppliers, towards 3. the measurement of the compliance with the  
23 requirements/satisfaction. the inventory of a selection of stakeholder demands,  
24 through supplier selection towards the satisfaction of these demands by the use of the  
25 product or service. This stakeholder focus supports the contribution of the  
26 procurement process to the circular economy. Besides, there is an increase in the  
27 importance of the procurement process as a contribution to the broader organisational  
28 CS vision and goals by the inclusion of social and environmental criteria within  
29 procurement processes (Srivastava, 2007; Preuss, 2009 as mentioned in Brammer and  
30 Walker 2011). Besides, the procurer’s choice specifically for the multi-issue  
31 stakeholder-demands can have an influence on the company’s products or services

1 and processes leading to changes of the business model (Lozano et al., 2014, p. 54) of  
 2 the subsequent company. A business model occurs when a company formalizes their  
 3 relationship with stakeholders in order to do business with the company's products or  
 4 services. Therefore a business model is a reflection of the company's realized strategy  
 5 (Casadesus-Masanell and Ricart, 2010). It is for all three business model elements  
 6 (i.e. value proposition, configuration of the value capture, and the revenue model) that  
 7 the company is intertwiningly linked to stakeholders generating a dependency  
 8 relation: the multi-issue demanded requirements by stakeholders external of the  
 9 company are converted in the supplied characteristics constituting the product or  
 10 service by the company.

Comment [SW4]: Include circularity?

11  
 12 The contribution of the procurement process on the company's business models and  
 13 the continuous stakeholder interaction counts results in a linear process as well (see  
 14 Figure 2). The supplier uses the raw materials to produce the specified product. When  
 15 ready the product is delivered and paid. After its period of use the product is  
 16 converted in waste. In this traditional scenario both supplier and procurer determine  
 17 the price of product according the amount of units sold.

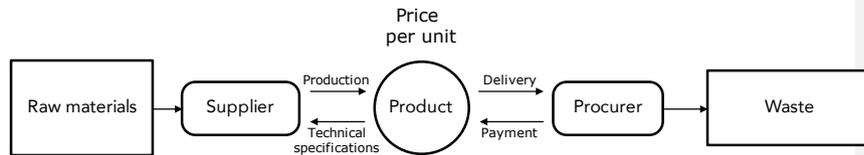


Figure 2 The influence of the traditional procurement process on the business model

## 19 7 Changing the procurement process

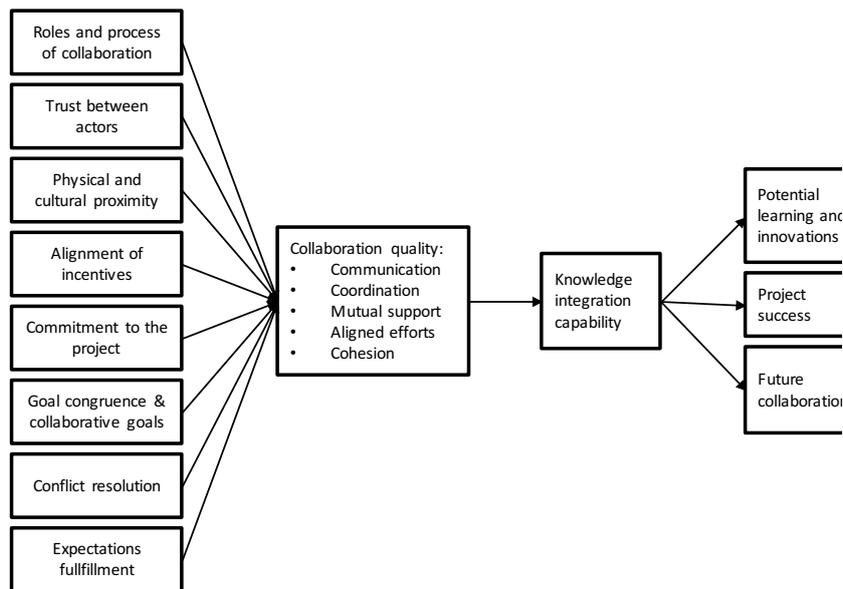
20 Research has shown that the influence of the procurement process on the business  
 21 model has been more on a strategic level resulting in adjusted company's policies,  
 22 rather than touching upon the development of other company's processes; at the same  
 23 time the focus of suppliers on delivering standards as a reaction on client's  
 24 requirements shows that procurement staff is not necessarily fully committed to the  
 25 CS topic (Meehan and Bryde, 2011; Preuss, 2007). This commitment is the  
 26 prerequisite to enable short or long term organisational changes (Wilkinson et al.,  
 27 2001) enabling CS integration in business models. Besides, a shared commitment

1 between the supplier and procurer is specifically significant in cases where  
2 sustainability is critical to the organisational values of all stakeholders involved in the  
3 procurement process. Therefore collaboration is seen as a key enabler to promote this  
4 commitment creation process between the procurement-company and stakeholders in  
5 the value chain (Veleva et al., 2003).

## 6 **8 Collaboration for more sustainable business models**

7 The assurance of the compliance of stakeholder demands (e.g. by technology and  
8 products, excellent workforce, good governance and leadership) is unlikely to result  
9 in sustainable profitability if the configuration of a business model is not adapted to  
10 the competitive environment (Teece, 2010, p. 174). Therefore companies have  
11 recently shown stakeholder engagement strategies where the integration of external  
12 stakeholders is not just on technological issues but on all issues contributing to the  
13 development of more sustainable business models. This growing amount of issues  
14 also results in a growing amount of stakeholders companies have to take into account  
15 when developing more sustainable business models. Therefore companies take up the  
16 challenge of collaborating multi-issue profits with critical external stakeholders  
17 (Boons and Lüdeke-Freund, 2013). Hienerth et al (2011) concluded that collaboration  
18 approaches can have heavy effects on the company's business model elements.  
19 Collaboration has been researched from different fields. From the field of project  
20 management, Dietrich et al., (2010) developed a framework that clarifies the process  
21 of collaboration. It explains how collaboration mediators (project-collaboration  
22 quality and knowledge-integration capability) connect the eight identified  
23 collaboration antecedents to the collaboration outcomes (project success, potential for  
24 learning and innovations, and future collaboration). Five elements of collaboration  
25 quality are proposed: communication, coordination, mutual support, aligned efforts,  
26 and cohesion (see Figure 3).  
27

**Comment [SW5]:** The socio-cultural elements are still not present enough in this section. Besides the concept of stakeholder proximity has to be introduced and explained.



1  
2 Figure 3 The collaboration process, its antecedents, mediators and outcomes (adopted from Diettrich et al. (2010)

3 The eight collaboration antecedents are to be taken into account before and during the  
4 project of collaboration. Besides the multi-issue stakeholder requirements, these more  
5 socio-cultural oriented elements can be seen as project specific requirements. The  
6 collaboration mediators assure the quality of the collaboration assuring the best  
7 possible outcomes: the success of the procurement project itself, the learning and  
8 innovations can be seen within the same procurement process or somewhere else in the  
9 company, and/or potentials for future collaboration with stakeholders related to the  
10 procurement process.

11 During the procurement process collaboration influences the efficiency, scope, and  
12 flexibility of knowledge integration, which Grant (1996) identified as critical for  
13 organizational competitiveness, and therefore an important element of the company's  
14 business models. It generates common knowledge and a coordination between  
15 stakeholders related to the procurement project. The collaborative capability of a  
16 procurement project supports to maintain clarity on the compliance with the level of  
17 integration efficiency. Besides it enables to continuously innovate and maintain  
18 competitive advantage by linking lessons learned from the procurement process with  
19 the company's business model (Diettrich et al., 2010; see figure 5) which increases  
20 the aforementioned commitment of the stakeholders related to the procurement

1 project. Taking the influence of the collaboration with external stakeholders as an  
2 important concept in the framework of this research might shed light on how the  
3 procurement process leads to the development of more sustainable business models.

## 4 **9 Validation of the framework**

Comment [SW6]: To elaborate...

5 To explore the contribution of the sustainable procurement process on the  
6 development of more sustainable business models, the fields of procurement,  
7 business models and corporate sustainability were taken as the categories needed for  
8 applying grounded theory. The exploration of these fields generated the above  
9 mentioned concepts enabling the construction of the background of the framework to  
10 be set up. These categories and its concepts were explained and presented for a group  
11 of experts in the field.

### 12 **9.1 Expert validation**

13 A framework or model is valid if it is clearly accepted as 'credible' for its purpose  
14 (Law and Kelton, 2000 ; Schellekens et al, 2010). Expert validation is a method  
15 applied in several fields of study by using experts from the field where the data is  
16 collected to value the outcomes of the analysis of the data collected. For example in  
17 the medical field validation systems are applied: doctors or nurse, as experts in the  
18 field, are asked to validate empirical data or models (Griffith Whitley, 1994).  
19 Whereas, in the field of systems engineering validation is used to determine the  
20 correctness of the final program or software produced with respect to the needs and  
21 requirements of the user (Adrion et al., 1982), using the end users as the experts.  
22 Because these programs are seen as the system, the validation means a confirmation if  
23 the right system was built (O'Keefe et al., 1987). In this way the people carrying out  
24 the validation are interested in the quality of the decisions made by the system  
25 (O'Keefe and O'Leary, 1993). Therefore the full validation of a system comprises the  
26 testing of the different aspects of its performance (Buydens et al., 1990). In order to  
27 validate the framework for this research, experts in the field of procurement, business  
28 models, organisational change management for sustainability and CS integration were  
29 asked to give their contribution in a session to answer the question: 'Does the  
30 framework offer a valid representation of the elements/conditions that have to be  
31 taken into account when analysing/describing the influence of the sustainable

1 procurement process on the development of more sustainable business models in The  
2 Netherlands?' The experts validated the framework on a range of operational  
3 characteristics. The research approach and the contribution of the framework to the  
4 understanding of the influence of SP on the development of more SBMs were  
5 evaluated by means of a guided group discussion (Schellekens et al, 2010). In this  
6 discussion theoretical issues and practical challenges, related to the research field,  
7 were explored. The results of this expert validation can be found in the appendix.

Comment [SW7]: To be included by Mendeley

#### 8 9 9.1.1 *The experts*

10 Seven experts were involved in the expert validation: a professor in procurement, a  
11 university professor in impact assessment, a university professor in sustainability  
12 reporting, two consultants on Corporate Sustainability, a governmental agent on  
13 procurement and a consultant on business models. Together these experts represented  
14 more than a century of national and international work experience in the field of  
15 sustainable procurement and more sustainable business models in The Netherlands.

#### 16 9.1.2 *Materials*

17 The materials for this study consisted of a description of the research project, 4  
18 scientific articles<sup>2</sup> and a whitepaper on the link between procurement and the  
19 development of more sustainable business models<sup>3</sup>. The expert validation process  
20 started off with two project presentations focusing on the categories subtracted from  
21 the literature review on the fields of CS, more sustainable business models and  
22 sustainable procurement as included in this paper. This was followed by a brainstorm  
23 session on the different categories in which the experts could recommend adjustments  
24 to existing categories or come up with totally new categories. The following overall  
25 discussion had sections for the research approach, validation of the categories,  
26 flexibility of the model, and evaluation of the model. Each section contained  
27 questions on related topics. Each question consisted of statements regarding section-  
28 relevant aspects (see Appendix A Main remarks from the Expert Meeting for an  
29 overview).

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<sup>2</sup> Brammer and Walker, 2011; Lozano et al, 2014; Bocken et al., 2014 and Boons et al, 2012

<sup>3</sup> "Using product-service systems to enhance sustainable public procurement", UNEP, 2014

1 The group discussion addressed a set of general questions on the possible contribution  
2 of the model for exploring the contribution of the procurement process on the  
3 development of more sustainable business models and underlying concepts and  
4 principles, theoretical and practical implications, and consequences for future  
5 development and research. Additional presentations were used for a general  
6 introduction, to present the categories and the model, and to introduce the brainstorm  
7 session and the group discussion.

### 8 *9.1.3 Expert validation procedure*

9 The experts were invited for a four-hour meeting. In advance, they received the case  
10 project's description and the scientific articles and UNEP report. The meeting started  
11 with a plenary presentation of the project and the first version of the framework (30  
12 minutes). Next, the experts had the opportunity to ask for additional information (15  
13 minutes). After a break a group discussion focussed on the main structure of the  
14 framework and its elements (45 minutes). After a break this was followed by a  
15 plenary discussion (75 minutes) synthesizing the outcomes of the group discussions.  
16 This discussion was chaired by the main researchers (experienced university professor  
17 in corporate sustainability and public and private sector interactions). Minutes were  
18 set up of the total session. These were exchanged with all the experts present, leading  
19 to a complete version of minutes.

## 20 **10 A framework to understand the influence of sustainable** 21 **procurement on the development of more sustainable** 22 **business models**

23 The research in this paper embraces an exploratory approach contributing to the  
24 emerging body of knowledge of sustainable procurement, more sustainable business  
25 models, as well as the field combining these two. The framework developed enables  
26 to focus on the contribution of the sustainable procurement process on the integration  
27 of CS into business models of related organisations. According to the process of  
28 grounded theory the integration between these fields shows concepts with related  
29 categories as described in section 3 through 6. After having taken into account the  
30 outputs of the expert validation, the following framework was developed.

1 **10.1 The framework process**

2 The framework takes the procurement process as the main object of analysis (see  
3 Figure 4). During this procurement process the development of the collaboration  
4 between the different stakeholders involved, mainly the procurer and supplier, fuels  
5 the development from the first ideas of a product (from the preparatory stage) towards  
6 the specifications included in the requirements document (in the specification stage)  
7 and finally to a real-life product life cycle (in the utilisation stage). The product can be  
8 combined or accompanied by a service which makes the collaboration between  
9 specific stakeholders extend to more than just the procurement process (e.g. a  
10 maintenance service during the use of the product or a take-back procedure to close  
11 the cycle). In both cases the collaboration entails a development process during which  
12 all parties optimize the life cycle of the product at stake. The end quality of the  
13 product is determined by the percentage of recovery can be: 1. created from the used  
14 product, and 2. used to produce the product. The higher this recovery percentage the  
15 lower the percentage of raw materials as input for the provided product and the  
16 percentage of waste generated after the product is used.

17 In the more sustainable situation (i.e. the framework) the functional unit permits both  
18 related parties to negotiate about a service including providing and using products.  
19 The conversion from a product to a more sustainable situation therefore also This  
20 includes a time dimensionsDue to the broader and more complex scope of a service  
21 compared

22  
23 During the collaboration process the technical (e.g. size, weight and color) and non-  
24 technical (e.g. take back procedures, xxx) specifications of the service and the life  
25 cycles of the related products are developed resulting in a list of shared responsibilities  
26 enabling the service and products over time. The compliance of each stakeholder in  
27 this process with the assigned requirements and responsibilities is an important input  
28 for the development of more sustainable business models.

29

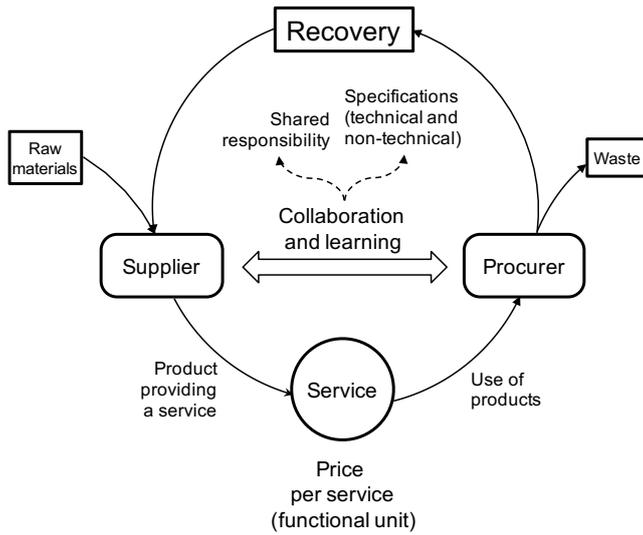


Figure 4 The framework process

In the traditional situation the product unit was the main object of negotiation between the supplier and procurer (see Figure 1) leading to the moment of the selection of the supplier and the signature of the contract. Before and after this moment of this selection and signature the proximity between the supplier and procurer is bigger than at the moment of signature (see Figure 5).

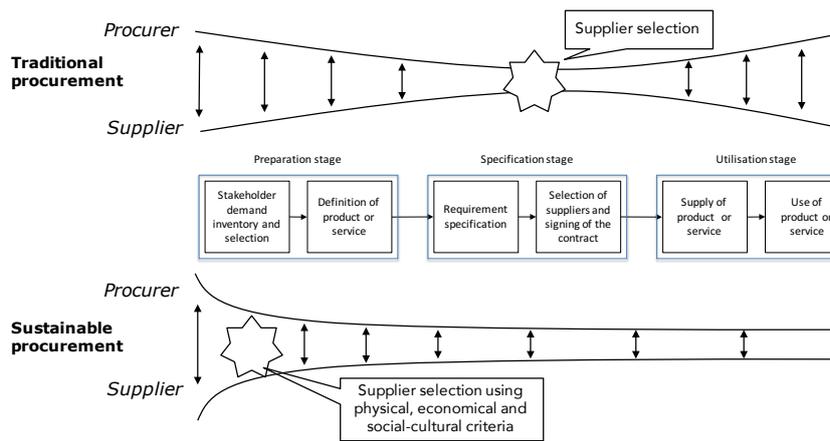


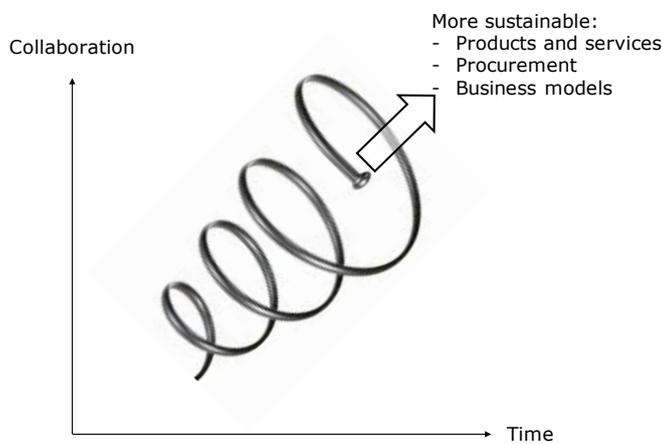
Figure 5 Procurer/supplier proximity and supplier selection during traditional and sustainable procurement

1 Due to the importance of collaboration during the sustainable procurement process,  
2 the selection criteria are both physical, economical and socio-cultural. Furthermore,  
3 procurer and supplier also meet sooner in the procurement process. Because of the  
4 necessary collaboration the proximity maintains in time.

## 5 **10.2 Collaborative learning for more sustainability**

6 During the collaboration all stakeholders involved obtain experience and knowledge  
7 with the process of closing cycles resulting in specifications and shared responsibilities  
8 enabling this closure. It is this learning process that results in more and more  
9 experience and knowledge with the contribution to the circular economy. Besides, it  
10 results in experience and knowledge of collaborating with the specific stakeholders  
11 related to a specific procurement process. In both cases it can be stated that the more  
12 experience and knowledge a company has with the collaboration during a sustainable  
13 procurement process more

14  
15



16  
17

Figure 6 Collaborative learning for more sustainability

18

## 19 **11 Discussion and Conclusions**

20 The concept of circular economy has been motivating the public and private sector to  
21 rethink their propositions. Within the collaboration between the public and private

1 sector SP has been a trigger for some companies to develop more SBMs. This paper  
2 describes a holistic framework developed to contribute to the understanding of how  
3 the process of SP influences the adjustments of business propositions, leading to more  
4 sustainable business models.

**Comment [SW8]:** Do we have to include a more theoretical discussion of the proposed framework?

5  
6 Finally, it can be concluded that the holistic character of the framework increased the  
7 understanding of the influence of SP on the development of more SBM. The balance  
8 between physical and social

9 The validation process including several characteristics taking into account needs and  
10 requirements of future users, and experts from different perspectives of the field of  
11 research resulted in successful input for the improvement of the framework.

12 This research emphasizes the necessity for further development of holistic  
13 frameworks to improve the understanding of the influence of the SP process on the  
14 development of more SBMs. From that perspective, the developed framework  
15 embodies a considerable achievement to summarize key characteristics and elements  
16 of the SP process influencing the development of more SBMs. The next essential step  
17 should be to bring reflections about CSR practices to a relevant and constructive  
18 operational level.

19  
20 As is the case for most research, our study has several limitations that affect our  
21 interpretations. ....

22  
23 Additional research should carry out case studies that might challenge our findings  
24 though generalizing across industry sectors can be difficult. These limitations should  
25 be considered when interpreting our results; however, even despite them, we believe  
26 our study offers several important contributions.

27

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44  
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46

# 1 **Appendices**

## 2 **A. Main remarks from the Expert meeting**

3 The main recommendations from the 4-hours expert validation session were:

4

### 5 **1. A simple framework**

6 The experts repeatedly stressed the complexity of a holistic framework. Particularly, it  
7 was proposed to reduce the framework to the three elements of many backcasting  
8 approaches: what is the resource efficiency situation now, what should it be and  
9 which steps have to be taken to get there.

### 10 **2. Capabilities of the people**

11 At several moments in the discussion, the experts mentioned the capabilities of the  
12 people collaborating in the procurement process as key. These capabilities range from  
13 knowledge from training and/or education, via experience with similar processes to  
14 skills.

### 15 **3. Product development process**

16 Some experts recommended to include (the role in) the product development process  
17 of both organizations (governmental and production) in the framework. They  
18 emphasized the fact that the ideas and concepts from the collaborative, co-designing  
19 process between procurer and supplier will have to be detailed by other people in both  
20 organizations. In businesses, this linking process is the product development process.

### 21 **4. Indicators**

22 The discussion among the experts focused on two topics within the indicator field:  
23 first the importance not to end up with too many indicators, second, consistent with  
24 the point mentioned under “simplifying the framework”, focus on product data (e.g.  
25 LCA).

26

