

# Copernicus Institute of Sustainable Development

## Collaboration for Circular Economy: Linking sustainable public procurement and business models

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# 1 Introduction

Contributing to sustainable development has been a strategic goal of business and government thinking for decades; however, one of the major challenges for this has been integrating this goal into an economic model that also delivers environmental and social benefits. To meet this challenge, governments have been increasingly introducing policies and initiatives aimed at transitioning societies to becoming more sustainable by better managing resources and closing loops in the production, consumption, and disposal stages of products. This, in turn, leads to reductions of environmental impacts, builds economic resilience, and creates jobs.

In 2013, the 7th Environment Action Programme (7th EAP) of the European Union (EU) set out a long-term vision promoting 'living well, within the limits of our planet'. The EAP emphasises innovative and radical new ways of doing business to achieve the necessary transition to a more sustainable European society, and the systems which underpin Europe's economy and human well-being will have to change fundamentally.

Recently, the Circular Economy (CE) concept has gained increased importance by focussing on transforming waste into resources while bridging production and consumption activities. This is achieved by closing loops of different types and levels of recovery of valuable resources between parties in society (as indicated by Yong, 2007; Yuan et al., 2006).

Integrating CE principles in public procurement (PP) is one of the options to create fundamental change and contributing to making societies more sustainable. In the EU, PP on goods and services accounts from between 16% and 40% of GDP (Walker & Brammer, 2012), which represents a huge opportunity to transition the European economy to a more sustainability orientated society. **Given the purchasing power of public organisations, considerable demand for sustainable products and services can, therefore, be promoted.**

When public organisations demand more sustainable products and services, their suppliers are encouraged to develop new sustainable business models. This requires companies to challenge traditional ways of thinking and to better engage with stakeholders, while creating competitive advantages to public and private sector customers, companies and societies.

The European Resource Efficient Business Models (REBus) project was developed to analyse and promote innovations in business models and engagement with stakeholders. REBus was funded in 2013 by EU Life+, with partners in the United Kingdom and the Netherlands. The REBus project's main goal is to accelerate the development and introduction of resource efficient business models (REBMs) for companies using the project's expertise.

This report presents a framework that was developed to link sustainable public procurement with the delivery of CE in the Netherlands. The framework emphasises the promotion of REBMs through SPP by defining technical, non-technical specifications for improved recovery rates, and socio-cultural specifications for improved collaboration during the procurement process.

The report is structured in the following way: Chapter 2 presents the REBus project; Chapter 3 discusses sustainable public procurement, more sustainable business models, and collaboration as main elements of the framework; Chapter 4 discusses two case studies used for the application the framework; and Chapter 5 presents the conclusions.

## 2 The REBus Project

The European REBus project was developed to analyse and promote more sustainable, resource efficient business models (REBMs) that incorporate CE principles. Funded by EU Life+, the project was developed in mid-2013 with partners in the United Kingdom and the Netherlands. The main goal of the project was to enable businesses to accelerate the development and implementation of REBMs using the project's technical expertise and collaboration.

The REBus project aims at providing support to businesses on how to implement resource efficient business models by establishing collaboration between government and businesses in identifying the scope and establishing the financial case for a transition from a traditional to a more circular business model. REBus focusses on four sectors, i.e. electrical and electronic products textiles, furniture, and construction products. REBus aims to deliver 30 REBMs in total (10 in the Netherlands and 20 in the UK). These are to deliver resource savings of an average of 15% compared to the business as usual base cases. This report focusses on two case studies in the Netherlands.

### 2.1 The project set up

As part of the Life+ REBUS project in the Netherlands, a collaboration between organisations and consultants working on pilot evaluations was established in the green deal on circular procurement to have access to knowledge and experience on sustainable procurement and find the case study companies.

The project activities were divided into two phases:

1. Development of an integrated framework, based on a literature review on sustainable business models and sustainable public procurement, to assess practical sustainable business model and public procurement case studies; and
2. Applying the framework on two case studies within the Life+ REBUS project.

#### 2.1.1 Development of an assessment framework

The collaboration between procurement and business models for CE (ProBiz4CE) framework was developed through a literature review on SPP, SBM and CE. The ProBiz4CE framework was designed to be holistic, dynamic, and practice oriented, and be applicable to different cases in the Netherlands and the EU.

The ProBiz4CE framework addresses the following elements:

1. The company system (including operations and processes, strategy and management, organisational systems, procurement and marketing, and assessment and communication);
2. Sustainability dimensions (economic, environmental, social, and time, as well as their context);
3. The role of (public/government) procurement;
4. The relations with and between stakeholders (internal and external); and
5. An indication of the socio-cultural dimension of the drivers for change: are there specific country or regional aspects that could influence the success or failure for the realisation of a sustainable business model.

### 2.1.2 Case study analysis

The objective of this phase was to refine the framework by analysing two Dutch case studies. In this process the following issues were investigated:

1. The drivers of the company and procurement decision-makers for choosing a particular business-model;
2. The major obstacles/challenges/barriers companies (and the public procurement decision-makers) have faced when adopting and implementing the business model(s);
3. The strategies to overcome such challenges/barriers
4. The more successful business models;
5. The promotion of 'better available' business models; and
6. The interaction between public procurement experiences and sustainable business model development.

## 3 Contributing to a more circular economy through collaboration between public procurement and businesses

Companies have been implementing CE, based on closing physical resource loops whilst addressing economic growth. CE is aimed at recognising different types and levels of material recovery by transforming materials into useful goods and services, increasing resource efficiency, and eliminating waste throughout the value chain. Some of the ways to achieve this include light-weighting, durability, efficiency, substitution, eco-design, industrial symbiosis, and leasing/renting. Such transformations are based on technical, social, and organisational innovations throughout the value chain, while bridging production and consumption activities.

These transformations can be achieved through: (1) Skills and knowledge, including entrepreneurship and capacity-building and multi-disciplinarity; (2) Organisational innovation, including integrated solutions and systems, logistics, business models, and policy supporting tools; (3) Social innovation, including new production and consumption models addressing citizens' involvement, product service models, and design services; (4) Technological innovation, including design of materials and processes, product design, and resource management (waste, water, energy and raw materials); (5) Financial instruments; (6) Awareness, dissemination and internationalisation; and (7) multi stakeholder involvement (UNEP, 2014).

### 3.1 Sustainable Public Procurement

Public procurement (PP) is the acquisition of goods and services by governments or public sector organisations through a public contract. It includes inter alia education, construction, administration, transport, leisure, and social services. In the EU, PP accounts for 16 per cent of GDP (Walker & Brammer, 2012), which represents a considerable opportunity to transition the European economy to becoming more sustainable. Given the purchasing power of public organisations, incorporating sustainability criteria into public procurement decision-making criteria can generate considerable demand for sustainable products and services.

According to the EU Public Procurement Directive (European Union, 2014), the procurer awards a contract to the tender winner (i.e. selected a supplier) that is economically the most advantageous. This may be depending on: (1) **the lowest price**; (2) **the lowest overall cost**; or (3) **the most value for money**, based on its price-quality criteria ratio. In the latter, the quality criteria could also include other

non-financial criteria, which allows for the incorporation of sustainability criteria into the product specification.

The purchasing power of public organisations influences the demand for sustainable products, which can set a trend to other organisations and result in an market increase for sustainable products or services. For example, if all public authorities in the European Union switched to green electricity, they would save more than 60 billion tonnes of carbon dioxide (CO<sub>2</sub>), and if they used energy-efficient desktop computers, another 830,000 tonnes of CO<sub>2</sub>.

The procurement process traditionally consists of four stages (UNEP, 2014):

- (1) Preparatory stage: the problem is defined and an inventory is made of the demands of related internal and external stakeholders resulting in a first set of specifications. This set is integrated in the first concepts of a product or service that will be procured;
- (2) Specification stage: the first concepts are further analysed and developed leading to the definite specifications of the product or service;
- (3) Sourcing stage, also called the tender process: the product or service specifications are made public to potential suppliers, where the selection of the supplier and the signature of the contract finishes the tender; and
- (4) Utilisation stage: after signing the contract the product or service is supplied. Figure 1 shows the PP process including these four stages.

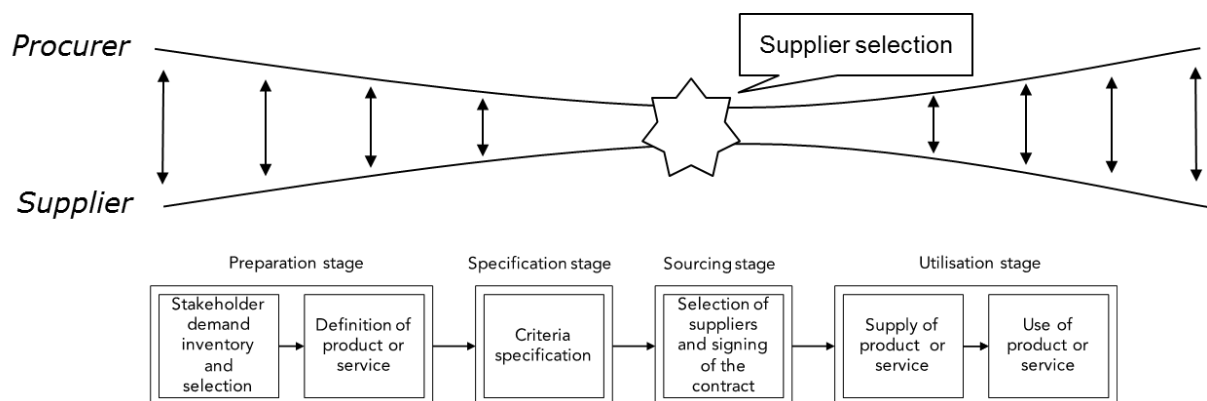


Figure 1 The changing contact between the procurer and supplier during the PP process showing the different stages from preparation to utilisation (Witjes & Lozano, 2016)

In the PP process, the tender plays a central role in linking governmental specifications to potential suppliers. Contact between suppliers and the procurer is not permitted before the publication of the tender in order to ensure fair competition. The supplier develops a particular business model according to the tender specifications, such as operational excellence, product leadership or customer intimacy. The procurer selects the most suitable supplier. After the use period, the product or parts of it become waste, and the procurer is responsible to dispose of it. The influence of PP on business models of private sector companies is usually linear (see Figure 3), where raw materials are an input for production of the product, while waste generation is an output of the use of the product, as shown in Figure 4.

EU Public Procurement directives have been actively including environmental criteria along with several initiatives designed to encourage the growth in market share of green products. For example, through a guideline for including environmental criteria in the PP process (i.e. Green Public Procurement (GPP)), ecolabeling, and a guide on Socially Responsible Public Procurement, which proposes how to integrate social considerations into the PP process (UNEP, 2014).

### 3.2 Sustainable Business Models

In order to implement SPP, new sustainable business models that include sustainability into the company's processes and subsequent value position are required. These require companies to rethink and redesign their business models to better engage with stakeholders, while creating competitive advantages to customers, the company, and society (Hienerth et al., 2011). This redesign of business models transforms the supplier and procurer relationship from a product focus to a more service focus one (Lay et al., 2009).

A business model is a comprehensive understanding of how a company does business (Beattie and Smith, 2013; Teece, 2010), and how value is created (Afuah, 2004). It articulates the logic, the data, and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the company delivering that value (Teece, 2010). Since a company may have different value propositions, it may have more business models at different organisational levels and, consequently, hierarchical relationships between these business models (Burkhart et al., 2012).

The inclusion of sustainability specifications in the procurement process requires a continuous adjustment of the company's internal activities and, therefore, comply with an established vision on Corporate Sustainability (CS). CS covers the entire life cycle of a product or service, from downstream (i.e. extraction), to upstream (i.e. disposal), and its use. CS has to be addressed holistically, in ways that the stakeholder sustainability specifications throughout the entire life cycle now and in the future are addressed systemically (Vermeulen & Witjes, 2016).

The integration of CS into business activities has challenged traditional business models. This has pushed companies to better engage with stakeholders, while creating competitive advantages to customers, the company, and society.

The redesign of business models changes the relationship between the supplier and procurer of goods and moves away from fully product-focused to also include service-focused operations (Lay et al. 2009). This change results in a shift from selling products to providing service solutions offering a multi-issue (i.e. economic, environmental, and social) value for the customer needs including the time dimension (i.e. now and in the future). This process also includes other stakeholders in the life cycle of the product.

One of the alternative to become more circular is moving from a product economy to a more product/system combination, where products are recovered. 'Product-service systems' (PSS), directed at reducing the total environmental burden of consumption could contribute to the more efficient use of resources.

Whilst in the traditional PP process the product unit is the main object of negotiation between suppliers and procurers (see Figure 2), in the SPP process the main object of negotiation becomes broader when switching to a PSS (according to Mont (2002)).



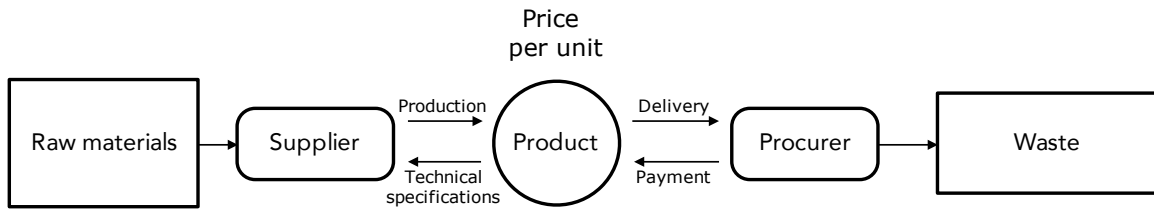


Figure 2 A linear model of the PP process showing the influence on business models (Witjes & Lozano, 2016)

The shift to PSS can be achieved when businesses develop more sustainable business models and integrate CS into business activities. By doing so, company creates a basis for its contribution to CE. The development of more sustainable business models requires changes throughout value chains, where producers, consumers, investors, distributors, and recyclers are better connected to ensure a fair distribution of costs and benefits. In SPP, these changes are the result of a collaborative process between suppliers and procurers, as well as the combination of their business models.

### 3.3 Collaboration

Collaboration is quintessential in promoting and combining the goals of a CE, sustainable business models, and sustainable public procurement. Long term collaboration during the SPP process requires a shift from specifications set up only by the procurer to a collaboration (see Hienert et al., 2011) between supplier and procurer to jointly define these specifications. Such interactions entail the exchange of information and the coordination of activities across interdependent organisational units, such as research and development, procurement, and sales.

In general, collaborative relations increase the level of cohesion in groups and their members (Luukkonen & Nedeva, 2010) and depends on the physical and socio-cultural proximity (i.e. similarity of beliefs and attitudes, amount of interaction and affective ties of the individuals in a group) between the members (Bansal, 2002; Borgatti, 2003). The proximity between members, such as a procurer and a supplier, is a prerequisite for a successful collaboration (Dietrich, Eskerod, Dalcher, & Sandhawalia, 2010; Hannon, 2012; Walker & Brammer, 2012).

Eight antecedents have been identified for a successful collaboration (Dietrich et al., 2010): 1. Roles and process for collaboration; 2. Trust between the actors; physical and cultural proximity; 3. Alignment of incentives; 4. Commitment to the project; 5. Goal congruence and collaborative goals; 6. Conflict resolution; 7. Expectations fulfilment. Including these antecedents as specifications for the procurement process will positively influence the collaboration and, therefore, the contribution to CE.

Socio-cultural skills, capacity building, and multi-disciplinarity of the people involved in the procurement process are components enabling the transformation towards more resource efficiency (as recommended by the European Commission (2014)). As part of the eight antecedents for a successful collaboration, the socio-cultural specifications include the beliefs and attitudes of the actors contributing to the procurement process (as proposed by Borgatti, 2003). While the technical and non-technical specifications motivate the supplier and procurer to develop products or services aiming for more resource efficiency, the socio-cultural specifications will ensure to acquire and capacitate personnel specifically for the co-development procurement process.

Collaboration has been associated with negative consequences, such as less efficient decision making and conflicts over resources and technical issues (Troy et al., 2008), which result in budget overruns (Olson et al., 2001) and project failures (Mishra and Shah, 2009; Swink and Song, 2007).

Some of the benefits of collaboration include the ability to optimise both financial and human capital, including better access to markets and knowledge, enriched creativity, avoidance of confrontation, a decrease in the time needed to accomplish objectives, increased trans disciplinary learning, and making processes more efficient (Fadeeva, 2005). However, collaboration has inherent difficulties (Lozano, 2007) and costs (Cuijpers, Guenter, & Hussinger, 2011), such as: (1) Coordination costs, referring to operational dependence between the activities of the different actors; (2) Vulnerability costs, referring to the safeguarding of important and unique resources; (3) Information, referring to who gets the benefits and the real, or hidden, agenda; (4) Bargaining, how to split the gains; and (5) Free riding, where those who choose not to participate still get the benefits (see Chilosi, 2003; Genefke, 2000; Lozano, 2008).

### 3.4 The Procurement and business model collaboration (ProBiz4CE) framework

Figure 3 presents the ProBiz4CE framework, which includes technical, non-technical and socio-cultural specifications and sharing responsibility of the product/service combination. It should be noted that the raw material and waste are lower than the ones in traditional lineal models (see Figure 2) due to closing loops through recovery, and changing price per unit for value provided per service.

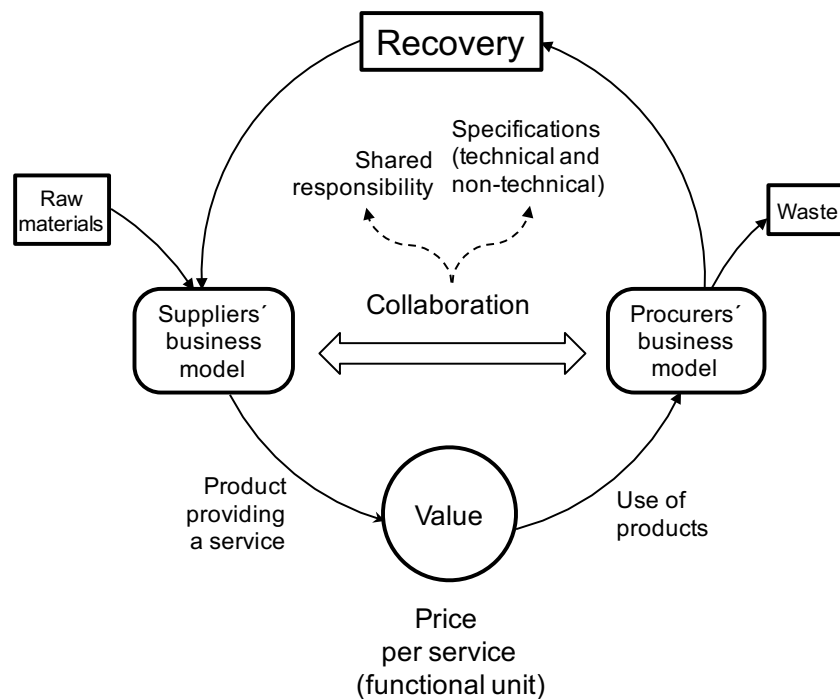


Figure 3 The collaboration between procurement and business models for CE (ProBiz4CE) framework (Witjes & Lozano, 2016)

In the collaboration process between procurement and business models for CE, a company gains experience with defining product or service specifications for closing cycles and optimizing the efficient use of resources at product or service level with multiple stakeholders (as proposed by Mont, 2002).

The SPP process enables a shift from prescriptive to performance specifications through market dialogue and entails the co-development of the technical and non-technical specifications (see Figure 5): from the first ideas of the value of a product or service (from the preparation stage) towards the specifications included in the tender document (in the specification stage), the adjustments with the definite suppliers (in the sourcing stage) and, finally, to a product or service life cycle (in the utilisation stage).

Co-developed performance specifications are focussed on the closing of cycles (i.e. contribution the CE) and, therefore, the efficient use of resources (as discussed by Klettner et al. (2013) and Webster (2013)). The aim of CE is to transform materials into useful goods and services through resource efficiency (as discussed by Klettner et al. (2013) and Webster (2013)) between parties related to the procurement process. Different types and levels of recovery enable closing loops between different parties in society (as indicated by Yong, 2007; Yuan et al., 2006). This recovery can be used to produce the product or service to be procured or generated after the procured product or service has been used. Higher recovery rates result in lower percentage of raw materials used as input for the provided product or service and lower waste generated after the product or service has been used (as discussed by She and Zhang (2010)). Linking both types of recovery closes the overall cycle and reduce the impact of the products or services (Linnenluecke and Griffiths, 2010).

The shift from price per product unit in the traditional PP process to price per delivered service in the circular process allows the parties to discuss and negotiate their responsibilities and risks. This leads to an improved specification of the service-oriented functional unit and results in, e.g. lower total cost of ownership. The unit to be procured changes from a product (i.e. the PP process) towards a life cycle of products or services delivered (as discussed by Guide and Van Wassenhove (2001)).

A closer proximity between the parties involved in the procurement process (as discussed by Meehan and Bryde, 2011), leads to early-stage supplier-procurer dialogue and supplier pre-selection. The SPP process requires a supplier pre-selection in the beginning of the procurement process (i.e. preparation stage; see Figure 4) as the basis for a long-term collaboration (as proposed by Fadeeva (2004)). This makes the relationship between traditional PP process parties stronger over time.

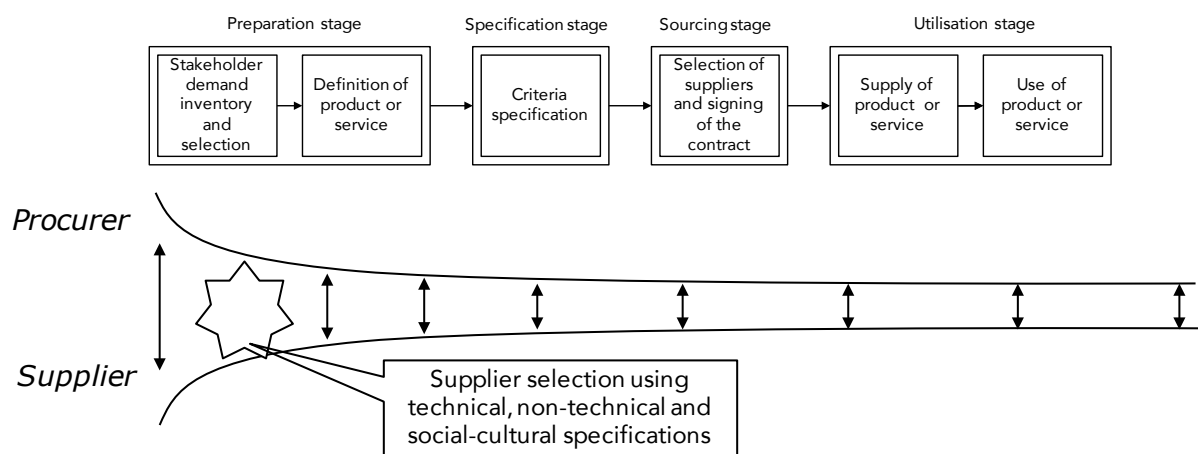


Figure 4 The procurer/supplier proximity and supplier selection during the SPP process (Witjes & Lozano, 2016)

The redesign of the company's business models will influence the company as a whole, its value proposition of products or services, its value creation processes, as and its value capture. The experience with technical indicators, for revealing the level of resource efficiency, and socio-cultural indicators,

for revealing the level of collaboration during SPP collaboration, will also generate future definitions of value capture towards more resource efficiency.

## 4 Case studies

This section presents the application of the ProBiz4CE framework to two case studies. Each case study contained one procurer organisation and one supplier organisation, all being part of the Dutch Green Deal on Circular Procurement:

1. Case study 1 - Office furniture
  - a. Procurer — Alliander: An energy network company providing a reliable, affordable and accessible energy transport and distribution to a large part of the Netherlands;
  - b. Supplier – Gispen: A designer, manufacturer and supplier of office furniture based in the Netherlands. Due to the cooperation with national and international partners, Gispen innovates and creates solutions for living, working, learning and residing.
2. Case study 2 – Professional clothing
  - a. Rijkswaterstaat (RWS): the executive agency of the Dutch ministry of Infrastructure and the Environment, is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands. This includes the main road network, the main waterway network and water systems; and
  - b. Dutch Awearness: A small company that serves as a linking pin in the textile value chain. To ensure circular textiles for their customers Dutch Awearness coordinates the processes between the different partners in the value chain and supports them with to integrate circular principles into processes, business models and strategic visions.

Five interviews were carried out with people related to the procurement process in each case study:

1. An operational person from the procurement side;
2. A strategic person from the procurement side;
3. A CSR specialist related to the procurement process;
4. An operational person from the supplier side; and
5. A strategic person from the supplier side.

The interviews were conducted in a semi-structured way using a question list (see Appendix). The outcomes were analysed using the ProBiz4CE framework. The conclusions of the case studies were presented in: a workshop with experts in the field (see Section 3.1.); in two international conferences (ISDRS 2015, Circular Procurement congress 2016); and in the Green Deal “Sustainable Procurement” (see also figure 5); and published in an open-access peer-reviewed scientific article<sup>1</sup>,

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<sup>1</sup> Witjes, S., Lozano, R., 2016. Towards a more Circular Economy: Proposing a framework linking sustainable public procurement and sustainable business models. *Resour. Conserv. Recycl.* 112, 37–44. doi:10.1016/j.resconrec.2016.04.015

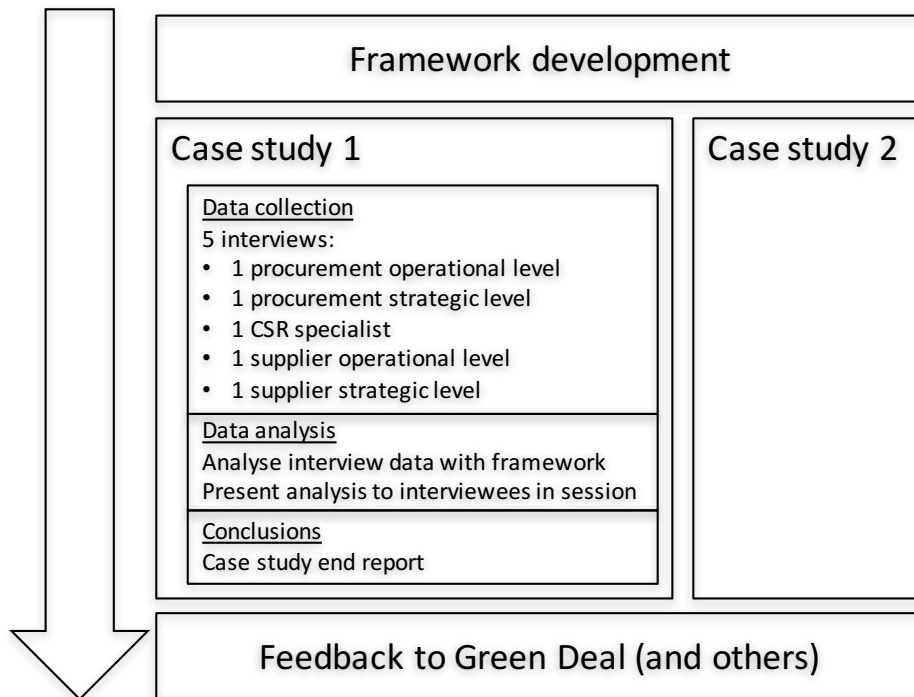


Figure 5 Structure of the research

#### 4.1 Expert validation

Seven experts from the fields of purchasing, sales, business models, change management and corporate sustainability integration from the academy, government and companies were invited for a workshop to discuss the ProBiz4CE framework and provide recommendations. The seven experts were:

1. A professor in PP;
2. A professor in environmental impact assessment;
3. A professor in sustainability reporting;
4. Two consultants on CS;
5. A governmental agent on PP, and;
6. A consultant on business models.

The experts were invited for a four-hour meeting consisting of a plenary presentation of the project and the first version of the framework, a group discussion focussed on the main structure of the framework and its elements, and, finally, a plenary discussion synthesizing the outcomes of the group discussions. This discussion was chaired by the main researchers. This discussion resulted in a final version of the framework. This framework was evaluated by its application in two case studies, the Alliander-Gispen and the RWS-Dutch Awareness case.

#### 4.2 The Alliander-Gispen case

Alliander engages with CE in its different corporate processes. The company decided to start refurbishing their offices in Duiven, the Netherlands, which included office furniture procurement. After having tried to define circular office furniture, Alliander raised the challenges of developing a sustainable office building to the market. Since the market partners did not have a straightforward solution, they decided to form a consortium. The consortium formalisation to generate ideas for the

circular economy oriented office building in Duiven was proposed to the Alliander board of directors. Instead of signing the contract, the board provided feedback to the proposal, including the message that a circular situation would also imply not having a contract on the collaboration of market partners that all want to contribute to a common vision. Technical and non-technical specifications of the office building furniture in Duiven were developed in a similar manner: the challenges were posed to the market, and several potential suppliers were invited to present their proposals (1 traditional tender and 1 according to their vision on circularity). Gispen and Alliander started a co-developmental process to specify the details of the circular furniture supported by several partners from the overall consortium. Each organisation had key responsible person for a circular economy vision, and maintain the team members informed and motivated. Alliander created a role for a “culture broker” to address more balance within the organisation between the ‘grey mice’ (people working hard for the core business processes) and the ‘coloured mice’ (creative people focused on the innovation of Alliander). The culture broker also kept a balance between the hard (physical dynamics) and soft (socio-cultural dynamics) side of the organisation (see Figure 6).

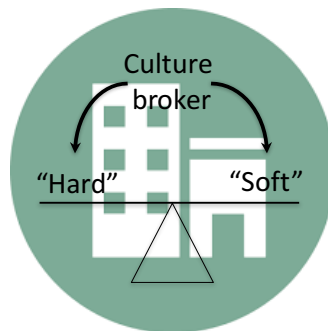


Figure 6 The culture broker role creates and maintains the balance between the "hard" and "soft" side of an organisation

Based on their experience in this role in this and related projects, Alliander developed a vacancy for a similar role at the organisational level, i.e. someone to share Alliander’s vision on circularity with all and guide cross-functional teams in their contribution to this vision.

A crisis during the development of the procurement criteria resulted initially in a non-circular set of specifications. After the interference of Alliander’s CEO, the specifications were adjusted to increase the level of circularity. Uncertainty about the level of degradation and depreciation of the furniture in time due to its use and the technological developments to refurbish this furniture in the years to come made it complicated to agree upon technical and non-technical specification. During the specifications co-development, several tools were developed and used to guide this collaboration. For example, a measurement tool was developed to indicate the level of circularity of the proposed product (“de meetlat”). In the final contract a clause was included obliging both parties to motivate other procurers and suppliers to demand or offer circular solutions. Subsequently, Gispen started conversations with their suppliers and other network partners to re-negotiate the contracts towards more circular ones. In these negotiations the measurement tool has been used and further developed. Banks were seen as the biggest hurdle of all network partners. The collaboration process resulted in product specifications that were calculated to be cheaper than a non-circular alternative, and in a buy back agreement of the furniture. 750 working spaces (desk, chairs, lighting) were revitalised and technically updated. Gispen will maintain, revitalise, exchanged or receive these spaces in the years to come to assure a high level of circularity.

### 4.3 The Rijkswaterstaat-Dutch Awareness case

Rijkswaterstaat (RWS) used the need for new clothing for 50 lock stewards to make a next step with their vision on circularity. The development of this vision relates to the Dutch governmental initiative to set up and apply additional procurement specifications on sustainability led by the Dutch executive governmental agency for entrepreneurs (RVO) (see Melissen & Reinders, 2012). The procurement department of RWS was supported by a former RVO group with expertise on sustainable procurement (i.e. the WVL group) to develop a first set of specifications on circular clothing for the stewards. Although there is a clear dependency of the regular RWS procurement people on the knowledge and experience of the WVL group, several WVL group members had to leave the RWS organisation without a proper agreement on passing on this knowledge and experience. This unclear vision on the integration of the RWS' vision on sustainability was also accompanied by a narrow explanation of the RWS' sustainability vision from the RWS board focussing on merely energy efficiency. After several trials with several market partners, Dutch Awareness (DA) was chosen as the partner to develop the detailed specifications. DA's CEO had invested considerable time in developing a physical process to make clothing as circular as possible. For this high level of circularity, DA transformed itself into the 4 FTE (i.e. full time equivalent) network company that serves as a spider in a network of many different companies. DA constantly builds and maintains alliances by aligning processes for the independent network partners on 4 levels: 1. their products or services; 2. the processes leading to these products/services; 3. the business models enabling these processes sand product/services; and 4. the strategy and vision of each company (see Figure 7).

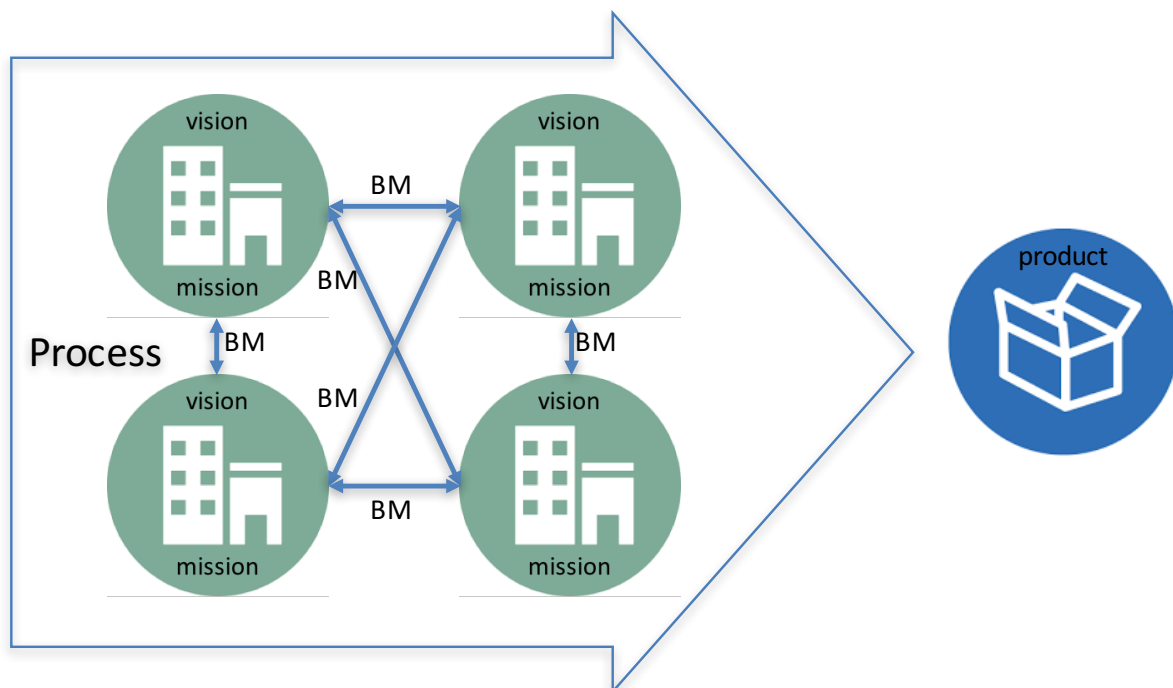


Figure 7 The mission/vision of the companies, its business models, the process and the product interconnected as a contribution to the Circular Economy (BM: Business Model)

At the time of the interview, DA started a separate business unit that formally offers companies support with the development of these 4 levels towards an increased contribution to the circular economy.

One of the main challenges in the co-developmental process in setting the specifications for the clothing was the distribution of the clothing (pick up and hand in) including the culture change of the users.

While the stewards' work is done during specific, and short periods of the year, the stewards use their clothing also for other purposes other than being a highway steward. The distribution of the clothing of the 50 stewards was a challenge with the stewards located throughout the country. The organisational culture of the RWS procurement department did not enable the procurer to do more than what was stipulated in the procurement order coming from his superiors. The support of the WVL group was key in the development of specifications for more circular clothing. RWS, WVL, and DA specified clothing packages for the stewards that will be returned at the end of each season. The used clothing is recycled to generate new clothing for the next season. Because no new materials will be included in the recycling process, no waste is generated. Longer use of the clothing could have contributed to the sustainability performance, but the frequent recycling of the clothing, as it was specified in the project, enables circularity and maintains the quality level of the clothing. The outcomes of this pilot project will be used within RWS to create awareness for recycling in other procurement processes.

## 5 Conclusions and recommendations

This report presents a framework that link sustainable public procurement and businesses with the delivery of circular economy in the Netherlands. The framework was validated by experts in the field and applied in two case studies.

The framework, its validation, and application on the case studies show that technical and non-technical specifications can motivate suppliers and procurers to develop products or services starting from the definition of customer required value, through the development of a possible PSS aiming for more resource efficiency. Integrating sustainability into the procurement process specifications and the organisational system of companies will have to be adjusted on four levels: 1) their products or services; 2) the processes leading to these products/services; and 3) the business models enabling these processes and product/services, and, 4) the strategy and vision of each company (see also Figure 7). Private and public companies addressing sustainability need support with addressing sustainability issues in collaboration with internal and external stakeholders at all 4 levels.

Although organisations can make plans at all four levels (i.e. product, process, business model, and strategy), in general, they do not include feedback points or sharing knowledge and experience with the rest of the organisation. Therefore, the experiences and knowledge coming from a sustainable procurement project are not communicated efficiently throughout the organisation. More focus on these learning processes can help companies realise greater financial and organisational benefits from their involvement in circular procurement processes.

Collaboration with other companies, leading to alliances in the value chain, network or the wider society, is an important first step towards contributing to CE. Alliances determine business models and can lead to a formal business transaction. The informal alliances between actors serves for, for example, network building and knowledge exchange, as a preparation for formal alliances in the future. Consequently, big companies tend to look for smaller companies in their network with greater potential to innovate. Informal alliances of companies in sectors, supply chains, and networks are a prerequisite for the development of more resource efficiency/closing material and product loops.

Collaborative relations increase the level of cohesion in groups and their members and emphasise the trust between value chain actors as well as transparency of the information between different actors as a prerequisite for sustainable public procurement. Public and private organisations do not have the knowledge and experience to develop circular ideas, processes or products internally without input from



other value chain actors. The eight collaboration antecedents support building informal and formal alliances with different types of companies (e.g. big companies with SMEs and start-ups, or manufacturing, service and knowledge businesses). The current focus on the “hard” (physical dynamics) side of collaborative agreements has to be balanced with an emphasize on the “soft” (social dynamics) side (see also Figure 3).

Uncertainty about the future makes it complicated to know with certainty possible levels of resource efficiency of products or services during the requirement development phase of the procurement process. Despite the current focus on indicators for circular products and service, non-technical specifications on depreciation of the products and shared risk for residual value should be included emphasising the need for an indicator based on scenario planning on both environmental and economic issues.

Creativity, flexibility, and cooperation of legal advisors and lawyers are key to challenge current procurement legislation. To enable a focus on the division of the responsibility of the value chain actors for the life cycle of the product or service now and in the future, lawyers have to change their focus from a contract that will be signed to ensure future risks from happening towards an agreement for long term collaboration between different actors. With an unpredictable future ahead, the definition of these collaboration responsibilities have to include depreciation of products and shared risks for residual value.

## 5.1 Recommendations

To further contribute to linking sustainable public procurement and businesses and promote a circular economy in the Netherlands, this reports proposes transformations on SPP based on technical, social, and organisational innovations throughout the value chain, while connecting production and consumption proposed by UNEP (2014): (1) Skills and knowledge, including entrepreneurship and capacity-building and multi-disciplinarity; (2) Organisational innovation, including integrated solutions and systems, logistics, business models, and policy supporting tools; (3) Social innovation, including new production and consumption models addressing citizens’ involvement, product service models, and design services; (4) Technological innovation, including design of materials and processes, product design, and resource management (waste, water, energy and raw materials); (5) Financial instruments; (6) Awareness, dissemination and internationalisation; and (7) multi stakeholder involvement.

This report provides the following recommendations to public procurement departments and to businesses:

- Develop and implement training programs for public and private organisations at the strategic and operational (i.e. procurers) levels to support the integration of sustainability in their daily processes;
- Set up, maintain, and motivate working groups of public and private organisations, such as the green deal on Circular Procurement, to have more organisations benefit from outcomes of example case studies;
- Create support of informal collaboration between companies in the value chain and wider society aiming for motivating companies in certain sectors to look for strategically important alliances;
- Develop and implement training programmes for procurement departments of public organisation in addressing technical, non-technical, as well as socio-cultural requirements during the different phases of the procurement process;

- Establish economies of scale to create a critical mass with experiences and knowledge on the contribution of sustainable procurement to CE; and
- Encourage training of legislators and lawyers on the consequences of the integration of CE and sustainability into the public procurement process.

## 6 Acknowledgements

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## 8 Appendix – Semi-structured interview sustainable procurement for more sustainable business models

The objective of this interview is to gather your opinions and experiences regarding the sustainable procurement process and business models. As one of the experts in the matter your opinion is of invaluable importance. Any confidential answers will be treated and respected as such, asking you to indicate that they are confidential.

The gathered information will be used to for the ReBus project of the European Union for which Rijkswaterstaat and the Copernicus Institute for Sustainable Development of Utrecht University collaborate to understand the influence of the resource efficiency focus of the procurement process in developing more sustainable business models.

Any question, suggestion or comment please direct them to: Sjors Witjes, [s.witjes@uu.nl](mailto:s.witjes@uu.nl)

Place: \_\_\_\_\_ Date and time: \_\_\_\_\_

Name of corporation: \_\_\_\_\_

Name: \_\_\_\_\_

Position held at your company: \_\_\_\_\_

Since when have you been in that position \_\_\_\_\_

Since when have you been in your company \_\_\_\_\_

Name of the procurement project: \_\_\_\_\_

- 1) What have been your company's/organisation's efforts towards making more efficient use of resources?
- 2) Could you tell me what is your organisation's vision on the efficient use of resources?
  - a) Could you explain how this vision is being put into practice?
    - i) To what extent has this vision been integrated in the strategic/tactical/operational level and/or departments of your organisation? Please explain.
    - ii) Has this practice been translated into continuous improved actions?
    - iii) Could you indicate if this practice has resulted in formal actions and/or informal intentions or behaviour? Please explain with examples.
  - b) What is your role in carrying out the actions related to this vision?
- 3) Could you mention anything about the procurement project's goal on the efficient use of resources?
  - a) Is this goal aligned with the vision/strategy of your organisation?
  - b) How was achieving this goal being managed during the procurement project?
- 4) Could you describe the contribution of the project to the efficient use of resources according the project steps?
  - a) What kind of business model approach has been taken to reach resource efficiency? Please, explain why:
    - i) To maximise material and energy efficiency
    - ii) To create value from 'waste'
    - iii) To substitute with renewables and natural processes
    - iv) To deliver functionality, rather than ownership
    - v) To adopt a stewardship role

- vi) To encourage sufficiency
- vii) To re-purpose the business for society/environment
- viii) To develop scale-up solutions
- b) Was efficient use of resources integrated in the project steps?
- c) Who were the main persons contributing to managing this goal?
  - a) What were their roles?
  - b) How did this contribution and these roles evolve during the project?
- 5) Could you tell me what has been your role during the procurement project?
  - a) What have been your responsibilities in relation to the procurement project? And in relation to the efficient use of resources?
  - b) Have you collaborated directly during the project in activities related to the efficient use of resources? If so, could you mention them?
- 6) What, in your opinion, have been the drivers to achieve a more efficient use of resources in the project?
  - a) What was done to facilitate these drivers in achieving the project's goal?
  - b) In your opinion what could be drivers to make this goal influence other processes in your organisation? And other organisations within, but also outside of the project scope?
  - c) Do these drivers depend on the procurement project steps, persons' contributions or roles? If yes, how?
  - d) Could you provide some examples?
- 7) What barriers to achieve the goal of efficient use of resources were encountered during the project?
  - a) How were these barriers been overcome within the project?
  - b) In your opinion what could be barriers to make this goal influence other processes in your organisation? And other organisations within, but also outside of the project scope?
  - c) Do these barriers depend on the procurement project steps, persons' contributions or roles? If yes, how?
  - d) Could you provide some examples of these barriers?
- 8) Could you mention how was defined and/or measured if the project was reaching the goal of the efficient use of resources?
- 9) How do you think the process of reaching this goal could be accelerated?
  - a) How did the focus on the efficient use of resources of the procurement project influence others/other organisations?
  - b) If yes, please state who or what organisations?
  - c) If no, could you please explain why not?
- 10) If the government were to take a more prominent role in motivating companies to include efficient use of resources as a high priority in their procurement: what would be advantages and disadvantages?
- 11) If the companies were to take a more prominent role in motivating companies to include efficient use of resources as a high priority in their procurement: what would be advantages and disadvantages?
- 12) What do you think is necessary in increasing the efficient use of resources by means of the procurement process?
- 13) How do you see the future of procurement and sustainable business models?

I would like to thank you for your collaboration and time.

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