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Green Public Procurement and the EU Action Plan for the Circular Economy

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Green Public Procurement and the EU Action Plan for the Circular Economy

STUDY

Abstract

Public procurement and the purchasing of services, works and supplies cover about 14% of European gross domestic product (GDP). Procurement initiatives, tools and guidance therefore have tremendous power and make products and services greener and more sustainable. The assessment carried out in this study provides results on the applicability of ongoing initiatives and shows how they contribute to the European Commission´s Action Plan on the Circular Economy. With the proposed recommendations the involved parties are offered possibilities and options for a better approach in the future.

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CONTENT

GENERAL INFORMATION

In European countries the public sector accounts for more than 25 % of total employment. Every year, over 250,000 public authorities in the EU spend around 14 % of GDP on the purchase of services, works and supplies. Therefore, Green Public Procurement (GPP) has a key role in delivering a Circular Economy (CE) in Europe. Through their procurement policies public authorities can significantly contribute to the CE, by procuring more environmentally friendly products and energy; improving functional use and reuse; and encouraging high value recycling in line with the Waste Framework Directive waste hierarchy.

Moving towards a more CE will deliver opportunities to reduce pressures on the environment, enhance security of supply of raw materials, and increase competitiveness, innovation, growth and jobs. However, the shift away from the traditional linear 'make-use-dispose' economy also poses challenges with respect to financing, key economic enablers, skills, consumer behaviour, business models and multi-level governance.

The current CE package of the European Commission (EC) contains an Action Plan for the Circular Economy (COM (2015) 0614 final). It maps a series of actions planned for the coming years and aims to 'close the loop' by complementing the measures contained in the legislative proposals. The Plan highlights several broad areas for action and presents several types of measures in priority sectors.

It also includes comprehensive commitments, among others, on public procurement. The European Commission wishes to encourage this role through its actions on Green Public Procurement (GPP), where criteria are developed at EU level and then used by public authorities on a voluntary basis.

GPP could be used more widely across the EU, particularly in encouraging demand for products and services that have high relevance for the Circular Economy. Finally, the European Commission will lead by example, by making sure that GPP is used as widely as possible in its own procurement, and by reinforcing the use of GPP in EU funding. Therefore special emphasis needs to be placed on aspects relevant to GPP and the potential synergies with the CE.

To analyse those issues, the European Parliament commissioned the Environment Agency Austria (EAA) to study current uses and opportunities of GPP as a driver for a more Circular Economy in the EU, with respect to the Commission's Action Plan for the CE. The study provides an overview of the current status of GPP in the EU and explores the capabilities of interaction and cross-impacts between GPP and the CE, with a focus on the particular challenges in implementing GPP in the context of the CE.

The study is based on existing available data, relevant documents/studies, input from interviews with national experts and members of relevant working groups. To strengthen the expertise with case studies from the Member States, the EAA subcontracted part of the work to the Inter-University Research Centre for Technology, Work and Culture (IFZ) and Sustainable Global Resources Ltd (SGR).

In detail, the study takes a look at the following main topics:

- Fitness of current EU GPP criteria and tools according to the CE Action Plan and possibilities for enhancement and harmonisation in order to make them more interoperable (see chapter 3)
- Challenges that current procurement and budgetary cycles present as well as new perspectives on the financing and delivery of public services, including the revision of business processes and the unlocking of potential to exploit GPP opportunities in the context of the CE Action Plan (see chapter 4)

- Current status of EU financed research and innovation and how it supports GPP and its integration with the CE, including further possibilities (see chapter 5)
- The level of development and implementation of National Action Plans on GPP in the EU member states and cooperation between member states and/or international bodies is investigated (see chapter 6)

Chapter 7 includes the main recommendations for the implementation of effective GPP measures that can contribute substantially towards the implementation of the Circular Economy. It allocates the measures to the responsible body and gives a time frame for reasonable implementation.

In addition, an overview of the current GPP and CE framework and existing EU legislation is given in chapter 1, and the literature on GPP and CE is reviewed in chapter 2.

Gathering up to date information via a questionnaire

To have a clearer picture of the most recent developments in the introduction and implementation of GPP and CE measures within the European Union, a written questionnaire survey of EU Member State (MS) experts was produced as part of the project. The structure and key questions of the questionnaire can be found in the template provided in chapter 9.2. The questionnaire was sent to selected national GPP experts and those authorities in the Member States that are in charge of GPP and CE issues.

28 questionnaires were returned with information on 24 Member States. In some cases, the Member States experts completed the questionnaire by telephone interview. One Member State did not provide a written answer (Luxembourg). In the Member States Cyprus, Estonia and Greece the identified experts provided no answer to our request. Chapter 9.4 gives more information on the experts involved.

The expertise gathered with the help of the Member States´ involvement was the basis for the evaluation of the current European situation. Special emphasis was placed on an evaluation of the applicability and suitability of the EU GPP criteria (chapter 3) and the development and implementation of the national GPP Action Plans (chapter 6).

1. CONCEPTUAL FRAMEWORK AND MAIN EU LEGISLATION ON PUBLIC PROCUREMENT (PP) AND THE CIRCULAR ECONOMY (CE)

In the following, the most relevant EU legislative documents on Green Public Procurement (GPP) and the Circular Economy (CE) are described. At international level, the framework for public procurement has been set through the WTO agreement, the European Strategy on public procurement, and national legislative instruments.

European initiatives for Green Public Procurement and Sustainable Public Procurement (SPP) are as a rule voluntary (rather than mandatory instruments). Depending on their level of application in the different areas (products, works, and services), they have the potential to contribute significantly to a more Circular Economy and to the implementation of the Action Plan of the EU CE package, which is highlighted in this study.

1.1. Public procurement at international level

The WTO Agreement on Government Procurement (GPA) is an international agreement to mutually open the public procurement markets among its parties. The agreement stipulates general rules and obligations for entities of each party whose procurement is subject to the agreement. It also indicates which market access opportunities must be open to international tendering. Up to now 19 parties are part of the agreement including the EU (WTO web 2017). Aspects of GPP and SPP are not covered in detail by this agreement.

In 2015 the OECD published an update of the recommendations on public procurement (OECD 2015) to support countries in establishing public procurement practices that enable efficiency, foster growth and support the accomplishment of strategic goals. These recommendations were developed in response to the fact that GPP is increasingly used by countries to achieve policy objectives in the area of environmental protection.

In addition, GPP and SPP are implemented on the international scale on a voluntary basis through initiatives such as:

- UNEP SPP implementation guidelines – developed under the United Nations Environment Programme (UNEP 2012): This document aims at providing guidance for all governments and organisations interested in the implementation of SPP.
- ICLEI global platform (ICLEI Local Governments for Sustainability - ICLEI web 2017): A number of tools have been established to help local governments introduce sustainable procurement practices into their day-to-day activities. Examples are:
  - o Public Procurement of Innovation Guidance (easy-to-understand information for all public authorities on how to go about procurement of innovation)
  - o Procura+ Network (including a manual with practical advice on how to integrate sustainability into procurement)
  - o Buying green! Handbook (comprehensive guidance on the implementation of GPP under the EU Procurement Directives, written by ICLEI on behalf of the European Commission)
  - o Procurement of Innovation (PPI) Platform
  - o Sustainable Procurement Platform

1.2. Procurement in the EU

The European framework for public procurement has been established in accordance with the provisions of the Treaty on the Functioning of the European Union. Furthermore, the EU Procurement Directives stipulate the main obligations and provide the basis for the European Commission's public procurement strategy.

1.2.1. The European Commission's public procurement strategy

The main rules on the procedures for procurement by contracting authorities/entities are laid down in the following EC Directives[1]:

- Directive 2014/23/EU on the award of concession contracts
- Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC
- Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on procurement by entities operating in the water, energy, transport and postal services sectors and repealing Directive 2004/17/EC

These three Directives had to be transposed into national law by the EU Member States by 18 April 2016, introducing new EU public procurement rules and stipulating the following principles:

- wider use of electronic procurement (e-procurement),
- participation of small and medium-sized enterprises (SMEs) in public tenders,
- simplified procurement rules for public authorities,
- innovation partnerships to keep public services up to date,
- more competition with new rules on concessions,
- facilitating procurement cooperation among public authorities,
- lighter rules for the utilities sector,
- preventing corruption,
- supporting social responsibilities,
- enhancing eco-innovation,
- more flexibility for service contracts on health and social issues.

The Directives stipulate threshold amounts for procurement above which the Directives are applicable. Public Procurement within the meaning of Directive 2014/24/EU *is the acquisition by means of a public contract of works, supplies or services by one or more contracting authorities from economic operators chosen by those contracting authorities, whether or not the works, supplies or services are intended for a public purpose.* Contracting authorities comprises *the State, regional or local authorities, bodies governed by public law or associations formed by one or more such authorities or one or more such bodies governed by public law.*

Table 20 in chapter 9.1 shows an estimation of total general government expenditures on works, goods and services (excluding utilities and defence) as % of GDP for the years 2011 to 2015 for the European countries. In Estonia, Spain, Cyprus, Latvia, Lithuania, Luxembourg, Portugal and Romania the decreasing trend of the last three years has come to a halt (or gone into reverse). There are a number of countries showing a steady decrease (Netherlands and UK) whereas in the Netherlands, public expenditures on works, goods and services still made up the highest share of the GDP (within the EU) in 2015. Bulgaria, Greece, Germany, Hungary and Slovakia show an increasing trend for the last 4 years (EC 2016b). On average, public procurement accounted for 13.1 % of the GDP in 2015 in the EU.

1.2.2. Establishment of Green Public Procurement (GPP) and Sustainable Public Procurement (SPP) in the EU

The basic concept of EU GPP relies on having clear and ambitious environmental criteria for products and services. In the European Commission's Communication "Public procurement for a better environment" (COM (2008) 0400 final) Green Public Procurement (GPP) is defined

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[1] In addition, Directive 2009/81/EU stipulates procedures for the award of certain works, contracts, supply contracts and service contracts by contracting authorities or entities in the fields of defence and security.

as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured." In addition, the Commission recommends the development of a process for setting common GPP criteria at European level to be used by the Member States. Therefore, two types of criteria for each sector are proposed:

- *The core criteria are those suitable for use by any contracting authority across the Member States and address the key environmental impacts. They are designed to be used with minimum additional verification effort or cost increases.*
- *The comprehensive criteria are for those who wish to purchase the best environmental products available on the market. These may require an additional verification effort or a slight increase in cost compared to other products with the same functionality.*

Up to now EU GPP criteria of 21 product/service groups (EC GPP web 2017) have been published under the criteria development process which is led by the Commission's Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) in Seville/Spain. The process is conducted by the EU GPP Advisory Group which acts as a consultative body to the European Commission for general GPP policy issues and for the development of EU GPP criteria. The process for setting up EU GPP criteria is described in Figure 1.

Figure 1: **Process for the development and revision of GPP criteria (adopted according to EC GPP web 2017)**

The EU Green Public Procurement policies encourage Member States to take further steps to reach the target of applying green procurement criteria to at least 50% of public tenders (EC 2017). Throughout the evaluation of the applicability of the EU GPP criteria (see also chapter 3), the results of this study should contribute to

- a better uptake of the EU GPP criteria at national level and the provision of justified recommendations for better future approaches and
- a more systematic approach in using GPP criteria which is necessary if GPP is to further support the CE.

Sustainable Public Procurement (SPP) can be understood as procurement based on a broader approach than GPP, covering additional aspects including society impacts/benefits and social responsibility. Within the EU GPP Advisory Group, a group of GPP frontrunner Member States

was established to address the specific SPP issues. Some of the frontrunners have already taken important steps in terms of implementing SPP.

1.2.3. Transposition and implementation in European Member States

With the Commission's Communication on Integrated Product Policy (COM (2003) 0302 final), GPP became part of the European legislative framework. Member States were advised to adopt National Action Plans (NAPs) for GPP by the end of 2006. Up to now, the majority of EU Member States have set up a National Action Plan on GPP (see also: evaluation of the National Action Plans of the Member States in chapter 6). However, the level of transposition of the EU GPP criteria differs between the European Member States (see also: assessment of the applicability of the EU GPP criteria in chapter 3). Strategies, platforms and guidance documents have been established to a varying extent at national level (see also: results of the questionnaires sent to the Member States´ national GPP experts in chapter 6).

1.3. Circular Economy Package of the EC

On 2 December 2015, the Commission adopted the Circular Economy Package with the aim to support the transition towards a more Circular Economy in the EU. The Circular Economy Package proposes actions to keep resources within the economy at their highest utility and value at all times while preserving the environment, and to protect the EU's economy against the scarcity of resources, resource price volatility and dependency on non-EU countries for raw material supply. The Circular Economy Package comprises an Action Plan and a legislative proposal.

The Circular Economy Action Plan addresses production, consumption and the re-circulation of materials from the end-of-life stage of products into the economy by proposing design requirements such as the reparability, upgradability, durability and recyclability of products, parts and materials (also addressed in other EU Directives such as the EU Eco-design Directive (2009/125/EC)), and promotes more efficient consumption and production patterns in general.

The Circular Economy Action Plan contains legislative proposals for amending the Waste Framework Directive (2008/98/EC), the Landfill Directive (99/31/EC), the Packaging and Packaging Waste Directive (2015/720/EC), as well as the Directives on end-of-life vehicles (2000/53/EC), batteries and accumulators (2006/66/EC) and waste electrical and electronic equipment (2012/19/EC). The proposals comprise long term targets for reducing the landfilling of waste and promoting the reuse and recycling of key waste streams, as well as a broad and ambitious set of actions, to be carried out before 2020.

The European Commission is supporting the transition towards a Circular Economy with a variety of policy instruments, e.g. major investments in research and innovation under the umbrella of the EU's Horizon 2020 research programme.

On an international scale, the CE package can contribute to the achievement of the Sustainable Development Goals (SDGs) on Sustainable Consumption and Production by 2030, especially SDG No 12 "responsible consumption and production", but also others such as SDG No 6 "clean water and sanitation", SDG No 11 "sustainable cities and communities" and SDG No 9 "industry, innovation and infrastructure".

The implementation of the UN 2030 Agenda for Sustainable Development and the G7 Alliance on Resource Efficiency, as well as the achievement of the 2050 vision of 'living well within the limits of the planet' as set out in the European Union (EU)'s 7th Environment Action Programme are supported by the CE package as well.

1.3.1. More ambitious waste targets

The revised legislative proposals on waste set more ambitious targets for reducing the landfilling of waste and enhancing the recycling and re-use of waste. The key elements which may have a direct or indirect link to GPP and SPP are:

- Recycling 65% of municipal waste by 2030;
- Recycling 75% of packaging waste by 2030;
- Reducing the landfilling of waste to a maximum of 10% of municipal waste by 2030;
- Banning the landfilling of separately collected waste;
- Promotion of economic instruments to discourage landfilling;
- Simplified and improved definitions and harmonised calculation methods for recycling rates throughout the EU;
- Concrete measures to promote re-use and stimulate industrial symbiosis - turning one industry's by-product into another industry's raw material;
- Economic incentives for producers to put greener products on the market and support recovery and recycling schemes.

1.3.2. Measures defined in the Action Plan

Measures are taken during the specific phases within the life cycle of products, in defined priority areas and also in innovation, investment and other horizontal areas (see chapter 9.2). In addition, the Circular Economy Package identifies plastics, food waste, critical raw materials, construction and demolition materials/waste and biomass/bio-based materials as priority material/waste streams. Specific measures have been devised to address these priority areas in addition to the life-cycle targeting measures.

1.3.3. Status of implementation of the CE Action Plan

In January 2017, the Commission published a first Report on the implementation of its CE Action Plan (COM (2017) 0033 final). The report highlights actions taken, starting in 2016. Several legislative proposals have been drafted such as the proposal on online sales of goods and fertilisers, and initiatives have been launched e.g. by adopting work plans for the Eco-design Directive or 'innovation deals'.

In January 2017, a platform was launched to support the financing of the Circular Economy, bringing together the Commission, the European Investment Bank (EIB), and financial market participants and businesses.

Concerning Green Public Procurement, the Commission published new Green Public Procurement criteria for office buildings, roads, and computers and monitors in 2016. In the implementation report it is mentioned that GPP will play a key role in the transition towards a Circular Economy, although it is not specified how, or which of the measures will contribute the most to this transition.

1.4. Main sectoral EU legislation/instruments covered by the CE (and influencing GPP)

The legislative instruments described in the following play a key role in implementing the CE package and it´s Action Plan. They will also have big influence on single instruments of GPP procedures if designed in appropriately. The main aim of this study is to assess to what extent CE and GPP can strengthen each other. Therefore, their interaction needs to be assessed in both directions (see also: recommendations in chapter 7). Many factors such as the enforcement of mandatory participation, the establishment of technical specifications and the application of suitability and award criteria are reflected in European Strategies, and are crucial to building a link between GPP and the CE.

1.4.1. EC Eco-design Directive 2009/125/EC

The Eco-design Directive establishes rules for improving the environmental performance of products such as household appliances, as well as information and communication technologies or engineering. The Directive is the core instrument of European environment-related product policy for defining generally binding minimum requirements for the design of products and it sets out minimum mandatory requirements for the energy efficiency of products during their use stage. Both EU-manufactured and imported products are equally covered.

Once a product group has been selected and listed in the working plan, the main steps to establish energy efficiency requirements under the EC Eco-design Directive are the following: 1) Compiling background data in a preparatory study, 2) Drafting a working document (by the European Commission) and discussing it in the Consultation Forum, 3) Drafting an implementing measure (voted on by the Regulatory Committee), 4) Sending a draft regulation to the EU Parliament for scrutiny, 5) Publishing a mandatory regulation in the Official Journal of the European Union.

An assessment carried out in 2012 (ÖKOPOL 2012) shows *that also resource-related objectives in different regulatory areas could be well implemented under and/or supported by the Eco-design Directive. For example, design requirements aimed at a prolonged technical durability of product components which are sensitive to failure could contribute to the realisation of the Waste Framework Directive's objective of waste prevention. Furthermore, Member States would be enabled to implement waste-preventing public procurement strategies based on information of the technical durability of products, which could be part of national waste prevention programmes. In addition, requirements for recycling could be designed by specifically taking into account the corresponding requirements for waste treatment in product-related waste legislation. This could significantly support the circular flow of substances and materials by preventing the carry-over of disturbing or polluting substances in the material flow.*

Introducing these elements into the Eco-design Directive is part of the CE Action Plan.

1.4.2. Environmental Footprint Initiative of the EC

As there are many heterogeneous and bottom-up approaches to environmental information on products, services and organisations in the EU, the EU Commission has set up a harmonisation process for the development of a scientific and consensus based method. The intention is to support consumer choices with clear and comparable environmental information. Therefore, guidance on the Environmental Footprint for Products and Organisations has to give clear advice on carrying out a footprint assessment to users and LCA practitioners where existing international standards are not clear enough.

The Commissions Strategy for establishing the Environmental Footprint for Products and Organisations is based on the Communication Roadmap to a Resource Efficient Europe (COM (2011) 0571 final) and Communication on Building the Single Market for Green Products (COM (2013) 0196 final). From 2013 to 2017 the Environmental Footprint (EF) pilot phase is underway. It comprises three main objectives: *1) testing the process for developing product- and sector-specific rules; 2) testing different approaches to verification; 3) testing communication vehicles for communicating life cycle environmental performance to business partners, consumers and other company stakeholders.*

Rules on how to measure the life cycle environmental performance of different products and sectors have already been established or are under development. Introducing those elements to the GPP criteria development process will have significant effects on circularity.

1.5.   GPP initiatives supporting the Action Plan for the CE

Public procurement accounts for a large share of European consumption. Public procurement for innovation (PPI) plays a key role in finding new and better ways of improving productivity and comfort while reducing environmental impact. The inclusion of key requirements which are related to circularity in public authorities' purchasing initiatives will contribute to the transition towards a Circular Economy.

Several measures and instruments defined in the CE Action Plan have already been transposed, to a varying degree, in ongoing initiatives at European and national level. In the following sub-chapters some of the initiatives, also related to PPI, are presented.

1.5.1.   SPP Regions – Regional network for sustainable procurement

Within SPP Regions, seven European regional municipality networks work together on Sustainable Public Procurement (SPP) and public procurement of innovation (PPI). The regional networks transfer skills and knowledge through their SPP and PPI activities with a focus on SPP tendering in the field of energy use in public buildings, vehicles/transport and in the food and catering services (SPP Regions web 2017).

1.5.2.   European sustainable procurement network (Procura+)

Procura+ is a network of European public authorities and regions for connecting public procurers, as well as exchanging best practices and acting on sustainable and innovation procurement. The network develops policy/criteria in specific areas related to sustainable procurement in thematic Interest Groups and operates the Procura+ Helpdesk for individual advice and support (PROCURA+ web 2017).

1.5.3.   GPP 2020 – Procurement for a low-carbon community

This GPP 2020 initiative aims to support procurement across Europe to achieve the EU's goals of a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020. The initiative was co-funded through the Intelligent Energy Europe programme of the European Commission and more than 100 low-carbon tendering processes focusing on capacity building, training and best practice exchange were funded which directly resulted in substantial CO_2 savings (GPP2020 web 2017).

1.5.4.   PPI platform – Public procurement for innovations

The Procurement of Innovation Platform has its legal basis in the revision of the European Procurement Directives which took place in 2014. It is supported by the European Commission and works as a hub for information regarding innovation procurement. The aim is to steer scientific and technological breakthroughs in areas such as health and well-being, food security, sustainable agriculture or clean & efficient energy. The process will be co-funded through the Horizon 2020 fund and support selected groups of procurers in undertaking joint PPI procurement (PPI web 2017).

2. REVIEW OF LITERATURE ON GPP AND THE CE

2.1. Introduction and sources

A considerable amount of literature exists on both GPP and CE topics. There is more literature on GPP than on the CE, due to the fact that GPP has been on the European political agenda longer than the CE. For the purposes of this review, publications which were more recent were screened in order to review the most significant manuscripts on GPP and CE. The scientific database "Science Direct" operated by Elsevier was screened for scientific literature on GPP and CE topics.

The literature reviewed was mostly found at the EU level and was assessed in terms of: 1) the main concepts behind the definitions of "Circular Economy" and "GPP"; 2) the EU approach and the status of implementation regarding the CE and GPP; 3) CE and GPP barriers and innovative capacity; 4) product groups and activities; 5) environmental benefits; 6) best practices; 7) models for contracts and tenders in the CE and GPP.

The available scientific and non-scientific literature was screened and relevant information selected. The results are summarised in the following paragraphs.

The aim of the literature review was to identify potential synergies for the implementation of GPP within a CE. Based on the literature review, a conceptual framework was proposed, which served as a basis for this study, and for the formulation of suitable recommendations.

2.2. Literature screening

Many non-scientific reports were published in the past three years. The most promising and relevant reports on GPP as well as on the CE were published by the European Commission (EC), the European Environment Agency (EEA), by ICLEI – Local Governments for Sustainability, and by a variety of research institutes and think-tanks dealing with environmental and policy issues, such as the Ellen MacArthur Foundation, the Wuppertal Institute, the Fraunhofer Institute, the Eco-Innovation Observatory etc. The manuscripts provide a substantial overview of the main issues about (and the state of) the implementation of GPP and the CE in Europe.

In addition, several other national institutions have contributed further work and information on the status of GPP implementation within the EU by providing concrete examples, publications on best practices etc. These are: the Federal Procurement Agency (FPA, AT), the National Procurement Office (BeschA, DE) and the Competence Centre for Sustainable Procurement (DE), the Rijkswaterstaat and Netherlands Enterprise Agency (NL), the Swedish Environmental Management Council (SE) etc.

When it comes to the CE, it is worth noting that scientific literature did not appear at the European level until 2014. The papers published prior to this date were all from China. This is not surprising, since the CE did not appear officially on the EC political agenda until 2014 - as a new "umbrella term" - whereas in China, the concept of a CE has been known since 2008. As a matter of fact, from 2014 onwards, the interest in a CE has risen tremendously in the EU, with the number of CE papers published rising 7-fold from 2015 to 2017.

The scientific literature on GPP is broader in terms of themes and scope, and papers dealing with a variety of issues relevant to Green Public Procurement can be found for the past decade. Notably, GPP is not the only expression used to indicate the greening of public purchases of products and services. Other types of procurement with clear overlaps with GPP are Sustainable Public Procurement (SPP) and Circular Procurement and Public Procurement of Innovation (PPI). However, a comprehensive review of the available scientific literature on GPP is beyond the scope of this study, whose aim is, after all, to show how GPP can contribute to the CE. Therefore, for the purpose of this study, the literature review was mostly concerned

with the reports and scientific publications on the Circular Economy, as well as the most recent reports on the state of GPP implementation within the EU, and on the literature which combined Green Public Procurement and the CE.

Manuscripts that were considered most relevant in terms of scope and novelty were carefully studied to identify and summarise key findings. The most relevant information was first critically analysed and then recorded, with the aim to provide a conceptual framework on the CE and GPP and their integration into the respective policies.

2.3.   Framing GPP

Green Public Procurement (GPP) can be defined as: "The approach by which Public Authorities integrate environmental criteria into all stages of their procurement process, thus encouraging the spread of environmental technologies and the development of environmentally sound products, by seeking and choosing outcomes and solutions that have the least possible impact on the environment throughout their whole life-cycle" (VIRAGE 2006). In addition, other forms of environmentally friendly and socially responsible public procurement can be identified, such as Sustainable Public Procurement (SPP), Public Procurement of Innovation (PPI) and Circular Procurement. Of particular interest is Public Procurement of Innovation, which gives special attention to innovation and offers an early 'reality check', helping suppliers to better anticipate demand for new solutions and shorten the time to bring them to market (ICLEI 2014). PPI does not always necessarily have a link to environmental issues.

Since public procurement accounts for approximately 14 % of the EU Gross Domestic Product (GDP), encouraging the use of "green" criteria in public procurement is a very important way to stimulate markets to produce and sell greener products. Accordingly, the Europe 2020 strategy mentions the need to encourage "a wider use of Green Public Procurement" within the context of the flagship initiative on a "resource-efficient Europe", especially to encourage the development of environmental and climate-friendly technologies.

GPP has been on the EU political agenda for more than a decade now, and visible progress has been made in Europe during the past few years. Since the publication of Directives 2004/17/EC and 2004/18/EC on the EU procurement procedures (see chapter 1), the European Commission has made several efforts to define GPP criteria, tools, and to mobilise funding mechanisms for GPP capacity building, research and innovation (see chapters 3, 4 and 5). For instance, back in 2006, "a lack of information" and "a lack of tools" were named as the main barriers to GPP, and communication dissemination and practical training were recommended, preferably in the form of websites and platforms (VIRAGE 2005). GPP was already an issue in several MS such as the Netherlands, Sweden and Germany before the implementation of the EU Directives. In Austria, for instance, first projects on GPP were implemented in the late 1980s, and the project "ÖkoKauf Wien" (Eco-Procurement Vienna) was implemented at the end of the 1990s. Later on in 2010, a majority of EU countries had already transposed the EU Directives into national legislation and National Action Plans (NAPs) on GPP or SPP (see also chapter 6), and GPP targets for specific products groups had been established, as well as criteria for construction, office IT equipment, cleaning products and services, and copying and graphic paper. In the meantime, the EC has developed guidance documents for Member States with a full set of GPP criteria and environmental specifications (EC GPP web 2017); it has also promoted the development of web platforms for the exchange of best practices, knowledge sharing among stakeholders, networking, the creation of tools to bring public purchasers and sellers together such as the Procurement Platform, and it has provided guidelines to support public procurers with the tendering process (EC 2016a) and collections of best practices (EC 2012).

EU core Green Public Procurement (GPP) criteria in the EU27 are currently experiencing considerable uptake. At least 26% of the contracts signed by public authorities in the EU27 in 2010 included all EU core GPP criteria. In addition, 55% of these contracts included at least one EU core GPP criterion. The uptake of EU core GPP criteria is increasing, in terms of "green contracts" but also in terms of procurement value: in 2009-2010, for a value of 117.5 billion Euros, 38% of the total value procured included GPP criteria (BRAMMER 2011; MELISSEN 2012). Nevertheless, the uptake of EU GPP criteria varies considerably across the EU27. Beyond the top performing countries, where EU core GPP criteria were applied in 40%-60% of the last contracts signed by public authorities, there are as many as twelve countries where EU core GPP criteria were applied in less than 20% of the last contracts (CEPS 2012). In addition, the uptake of EU core GPP criteria does not only vary across countries, but also across product groups, with four product groups still lagging significantly behind with an uptake level below 20%. A few individual EU core GPP criteria are very frequently used. Regarding the tools, Life Cycle Costing (LCC) and Total Cost of Ownership (TCO) methods are less frequently used by public authorities, who still prefer the purchasing cost (64%). A mix of purchasing costs, LCC and TCO was preferred in 30% of the cases. Also, many authorities face difficulties in including GPP criteria in public procurement (CEPS 2012).

Given its economic significance, public procurement has the potential to influence the market, as well as production and consumption trends, in favour of environmentally friendly, socially responsible and innovative products and services on a large scale (ADELPHI 2010). Unfortunately, current data on budget volumes are scarce and difficult to compare. Additionally, only a few countries (including none of the frontrunners on GPP) can currently provide government estimates for GPP markets. A further challenge is the lack of harmonised international or national procedures and of specific requirements. In general, the development of significantly different tender procedures and criteria on a national, regional or even local level increases the administrative burden, which in turn might lead to market entry barriers, especially for large enterprises (ADELPHI 2010).

Techniques such as life-cycle costing, the specification of sustainable production processes, and the use of environmental award criteria are available to help contracting authorities identify environmentally preferable bids. In 2016, the EC published a handbook on green tendering processes for public procurers (EC 2016a), which looks specifically at the environmental aspects of tendering. The handbook follows the logic and structure of a procurement procedure, gives examples of green purchasing by public authorities across the EU, and should also help suppliers and service providers – particularly smaller companies (SMEs) – to better understand the environmental requirements increasingly encountered in public tenders. In addition, the initiative GPP 2020 gives specific examples of setting up low-carbon tenders to achieve massive CO_2 emission reductions via low carbon service contracts. Tender models have also been published and described in detail to enhance GPP at national level. Examples are: energy efficient building reconstruction (HR), reconstruction motorway (NL), purchase of low emission buses for municipal public transport (SI), acquisition of low energy consumption personal computers (IT) etc.

A collection of best practices was also published in 2014 by the EC. Best GPP practices on paper, IT products, food & catering, cleaning and waste and building maintenance are described. Relevant environmental and economic gains are also presented (EC 2012).

2.4. Framing the Circular Economy

2.4.1. Introduction

The Circular Economy is a fairly old concept which has recently been included in international political agendas in response to the global growing waste burdens and natural resource shortages. Different definitions exist for the Circular Economy. The Ellen MacArthur

Foundation (EMF) defined the CE in its famous study "Growth within" (EMF 2015a) as an economy which is "restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times".

Modern economies are surprisingly wasteful in their models of value creation and mostly operate a take-make-dispose system, using a linear economic model. In Europe alone, 60% of the discarded materials were either landfilled or incinerated in 2012, while only 40% were recycled or reused with a total loss of the energy and material value (95%). This economic model costs Europe € 7.2 trillion every year just in the sectors mobility, food, and built environment (EMF 2015a). Major negative environmental impacts due to intense resource extraction and releases of waste, chemicals and pollutants are associated with the current linear economic model (MCDONOUGH 2010), which severely threatens the resilience of our planet and its planetary boundaries (ROCKSTRÖM 2009). In response to that, many advocate CE as the "new" sustainability paradigm for modern society to increase prosperity while reducing dependence on primary materials, energy, and pressure on the environment. If correctly implemented, the CE has the potential to improve resource use, design out waste, provide added value for businesses, and proceed along a secure route to society-wide prosperity and environmental sustainability for future generations while increasing the number of jobs (EMF 2015a). Even so, current policies in several sectors, particularly in the field of waste and new business practices, are moving only tentatively towards circularity rather than in a systematic or coordinated way, and more information is needed to inform decision-making and include environmental, social and economic impacts (EEA 2016a).

It can be argued that the discussion about what a Circular Economy would look like in a modern context is ongoing. The problem consists in framing the Circular Economy in the context of a highly-globalised planet characterised by an increasing demand for prosperity, fast technological development, but at the same time disrupted by serious environmental and socio-economic issues. The problem obviously requires a systemic approach, to be able to take into account externalities and avoid rebound effects.

2.4.2. Key features of the Circular Economy

Several studies have been conducted to identify the key features of the CE. For the purpose of this study, two studies have been considered in particular.

The report prepared by the EEA (2016) "Circular economy in Europe - developing the knowledge database" provides a summary of the key characteristics and enabling factors for the transition towards a Circular Economy. The report says that less input and use of natural resources, an increased share of renewable energy and materials, reduced emissions including hazardous chemicals, fewer material losses and waste generation, are the key enabling factors of a CE. Approaches such as eco-design and sharing, reusing, repairing, refurbishing and recycling will now play a key role in maintaining the utility of products, components and materials and retaining their value in the economy for a longer time (EEA 2016a).

The EMF "Growth Within" study (EMF 2015a) provides another framework, which is also in line with the previous one. The report identifies three principles of the Circular Economy:

1. **Preserve** and enhance natural capital by controlling finite stocks and balancing renewable resource flows
2. **Optimise** resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles.
3. **Foster** system effectiveness by revealing and designing out negative externalities.

These can translate into six business actions: Regenerate, Share, Optimise, Loop, Virtualise, and Exchange – together, the ReSOLVE framework (EMF 2015a):

- **REgenerate**. Shift to renewable energy and materials; reclaim, retain, and regenerate the health of ecosystems; and return recovered biological resources to the biosphere.
- **Share**. Keep product loop speed low and maximise the utilisation of products by sharing them among users (peer-to-peer sharing of privately owned products or public sharing of a pool of products), reusing them throughout their technical lifetime (second-hand), and prolonging their life through maintenance, repair, and design for durability.
- **Optimise**. Increase the performance/efficiency of a product; remove waste in production and the supply chain (from sourcing and logistics to production, use, and end-of-use collection); leverage big data, automation, remote sensing, and steering.
- **Loop**. Keep components and materials in closed loops and prioritise inner loops. For finite materials, this means remanufacturing products or components and, as a last resort, recycling materials,
- **Virtualise**. Deliver utility virtually – books or music, online shopping, fleets of autonomous vehicles, and virtual offices.
- **Exchange.** Replace old materials with advanced non-renewable materials; apply new technologies (e.g. 3D printing and electric engines); choose new products and services (e.g. multi-modal transport).

The report captures the essence of a Circular Economy in a modern context. It highlights in particular how these actions can be implemented into successful business cases, and insists that the current pace of technological progress, for instance the digitalisation of services, generates countless possibilities to develop innovations for a Circular Economy. Examples such as Willhaben.at (second-hand e-market in Austria) or iTunes (virtual platform, music provider) are good examples of how digitalisation and the sharing/Circular Economy can come together to create successful business models.

But the potential to address the Circular Economy is much broader. First of all, recycling, waste prevention measures and eco-design are important pillars of the Circular Economy. Some of these are already part of many production, consumption and disposal processes, although further efforts are absolutely needed, for instance to increase the recycling rates for many waste streams, or to design non-toxic, long lasting, repairable and recyclable products.

As highlighted by the EEA (EEA 2016b), most of the Member States in Europe associate the Circular Economy with waste prevention and recycling. In the first case, most of the actions implemented at the national level consist of awareness-raising campaigns for a variety of items, from food to white goods and electronics, and of an increasing use of web platforms and smart-phone applications. The impact of such actions has, in many cases, not yet been assessed. The impetus for such changes comes certainly partly from the implementation of legislation, which underlines the importance of implementing directives such as the Eco-design Directive (2009/125/EC) or the European Commission´s Directives stipulating recycling targets.

But legislation is just an instrument that creates the right framework conditions for business and individuals to operate: hence, the transition towards a Circular Economy requires the involvement of society at all levels. While part of the impetus for change needs to come from research, innovation and technology development (Chapter 6 of this study offers a review of current research projects on GPP and the CE), another part needs to come from large and small enterprises, especially in the development of innovative circular approaches that can be translated into successful business models. Many enterprises show a raising interest in circular approaches for a variety of reasons ranging from financial resource savings to greening the company image. The role of businesses will be further examined in the course

of this study. Finally, part of the impetus for change needs to come from groups of individuals. Grey literature already offers a variety of examples of local circular approaches initiated by individuals or local communities. These approaches tackle local problems, boost local markets, involve local SMEs, deliver a positive impact to the environment, connect the community, and often create jobs. For example, the Ellen MacArthur Foundation constantly updates a library collecting CE best practices for a variety of products and services[2]. Examples of innovative business models range from libraries for sharing working tools, breweries producing beer from bread leftovers, repair networks and network cafés, circular restaurants using edible food that would be thrown away because it does not look so appealing, clothing industry models dealing with fast fashion trends and circularity at the same time etc.

Clearly, these examples are positive signs, indicating that the transition is already taking place; nevertheless, huge efforts will be needed to successfully unlock the full potential of the Circular Economy. Hence, this transition will require a further mobilisation of skills and resources in order to develop solutions with positive environmental, economic and societal impacts in the long term. As indicated by the European Commission, the components that achieve these transformations include: (a) Skills and knowledge, including entrepreneurship and capacity-building and multi-disciplinarity; (b) Organisational innovation, including integrated solutions and systems, logistics, business models, and policy supporting tools; (c) Social innovation, including new production and consumption models, citizens' involvement, product service models, and design services; (d) Technological innovation, including the design of materials and processes, product design and resource management (waste, water, energy and raw materials); (e) Financial instruments; (f) Awareness, dissemination and internationalisation; and (g) Multi stakeholder involvement (EC 2014b).

2.4.3. CE in practice

The worldwide resource use agenda is gradually evolving from a largely environmental concern into an integrated, sustainable economic development model (EEA 2016b). In the EU, the CE concept was taken up by the European Commission in December 2015 with the adoption of the Circular Economy Package (COM (2015) 0614 final).

The EC Circular Economy Package consists of a revised legislative proposal on waste (see chapter 1) and of an Action Plan. The Action Plan establishes a concrete and ambitious programme of actions with measures covering the whole cycle from production and consumption to waste management and the secondary raw materials market. The proposed actions will contribute to "closing the loop" of product life cycles through greater recycling and re-use, and bring benefits for both the environment and the economy (COM (2015) 0614 final). The main measures foreseen by the European Commission in its CE Action Plan are summarised in Table 22 of chapter 9.5.

Table 22 shows the measures indicated in the CE Action Plan at a glance. It has been used as a basis for analysis in chapters 3, 4 and 5. The measures foreseen by the EC are targeted at a variety of products and sectors. Particular emphasis is put on food waste, plastic, reuse recycling and repair, water nutrients and marine littering, eco-design etc.

Since the publication of the CE Package, some progress has been made and first measures have already been implemented. As stated by the EU Commission in its report on the implementation of the Circular Economy Action Plan (COM (2017) 0033 final), key actions were undertaken over the course of 2016 in areas such as food waste, eco-design, organic fertilisers, guarantees for consumer goods, and innovation and investment. Circular economy principles are now being gradually integrated into industrial best practices, Green Public

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2   https://www.ellenmacarthurfoundation.org/case-studies

Procurement, the use of cohesion policy funds, and (through new initiatives) into the construction and water sectors. Still, the Circular Economy still means merely better waste management for most countries, and climate change and resource efficiency policies appear to be largely disconnected in practice, while integration with a bio-economy strategy also requires further efforts (EEA 2016b).

Barriers can hamper the implementation of the CE (TECNOPOLIS 2016). There are different types of barriers: legislative and regulatory barriers when it comes to the quality of secondary raw materials or possibilities for donating food; market barriers such as technological "lock-in" preventing the dissemination of innovations; consumer behaviour such as consumers´ resistance to giving up the ownership of a product and accepting services instead, or to buying second-hand goods. A report published recently by (TECNOPOLIS 2016) identified and analysed key regulatory obstacles within these three themes: a) Lack of legislation on the collection of waste streams which end up as mixed waste where high-quality recycling costs are higher than the income from the recycled materials (e.g. in the field of plastic packaging); b) Legislation hindering the use of recycled materials in production processes for health and consumer protection combined with a lack of harmonised EU legislation setting specific quality requirements; c) Lack of concrete and enforceable product requirements, e.g. product design for reuse, repair or recycling. Inconsistencies between existing regulations are also a barrier. These factors often create legal uncertainties for the industry, with the result that it makes it more sense to continue with primary raw material input (TECNOPOLIS 2016). Concerning the business sector, a paper from (RIZOS 2016) provides an overview of potential barriers preventing SMEs from adopting Circular Economy business. The study identifies company environmental culture, lack of capital, lack of government support/effective legislation, lack of information, administrative burdens, lack of technical and technological know-how and lack of support from the supply and demand network as the main barriers (RIZOS 2016). In addition, SMEs do not often have the financial capacity to manage the often disruptive transition to a circular business model.

2.5. GPP and CE

2.5.1. Integrating GPP and the CE

As the CE is a relatively new concept on the EU's political agenda, the integration of GPP and CE concepts within a common working framework is still at an early stage.

In general, public procurement could be a role-model of how a the transition towards a more Circular Economy could work, while helping circular products and services to achieve sufficient scale: incorporating social, environmental and economic (i.e. sustainability) specifications into the public procurement process can have indirect effects on product development and on consumer demand for more sustainable products, resulting in the promotion of improvement in the impact products or services have on society.

Although there is not yet an agreed definition of circular procurement, the idea is to ensure that the products procured are produced in accordance with the principles of the Circular Economy. It is therefore crucial that product design takes into account aspects of durability, reparability and recyclability. A report on circular procurement, produced for the EU-funded project SPP Regions (DK EPA 2016) in 2016, suggests that the following three elements have the biggest potential to promote circular procurement:

1. more focus on service instead of products
2. more focus on a product's design, use phase and end of life
3. more focus on market dialogue.

In general, GPP should play an important role in addressing the principal sources of emissions. GPP should therefore consider electric, shared, and autonomous vehicles, food

waste reduction, regenerative and healthy food chains, passive houses, urban planning, and renewable energy for addressing the Circular Economy (COM (2017) 0033 final).

Several measures are particularly promising for GPP to contribute to a CE. Particular emphasis should be put on the so-called servicising of products. Since the 1990s, Product Service Systems (PSS) have been heralded as one of the most effective instruments for society to move towards a resource-efficient, Circular Economy and to create a much-needed 'resource revolution'. Innovative business models and increased consumers awareness will facilitate the acceptance of services instead of products. Servicising of products plays a very important role in GPP. It will be a challenge to develop and implement successful financial schemes for the purchase of services (instead of products) which can be maintained over the years and under different administrations (TUKKER 2015). Some of this is discussed in chapter 5. TUKKER 2015 suggests that the new framework for including GPP into the CE involves changing from a product focus to a PSS where loops are closed through recovery. In this process value generation switches from price per unit to price per service (of a functional unit). The successful outcome of the process depends on the procurer and the supplier collaborating to establish the technical and non-technical specification, and a shared ownership of the PSS. To make circular procurement possible, market dialogue and cooperation between public and private partners throughout the product chain become essential. New terms and contracts are necessary in circular procurement just as greater transparency between partners in order to learn and benefit from each other. Collaboration starts with the preparation stage of the tender rather than at the sourcing stage: (WITJES 2016) hence, a key element for a successful integration is the long term collaboration between procurers and suppliers and the incorporation of sustainability criteria into suppliers' business models (DK EPA 2016).

The European Commission has also reflected on how to use public procurement tools more strategically, especially in view of the clear links to circularity. This is currently under discussion inside the European Commission and with the Member States, and is aimed at changes in policy and guidance for procurement (EEA 2016c). The EU Circular Economy Action Plan also emphasises the importance of GPP in the transition towards a Circular Economy: in particular, it stipulates the promotion of GPP through the involvement of GPP and CE stakeholders, the promotion of circular procurement for public buildings, and reinforcing the use of GPP in EU funding.

2.5.2. Circular Procurement models for GPP

As already evidenced in this chapter, not many circular procurement models are as yet available. However, those that are available are typically centred on either buy & sell; on buy & take-back; or on servicisation models. A useful framework is proposed by the EU-funded project SPP Regions as it is helpful to define the boundaries and operative fields for Circular Procurement (see Table 23 in chapter 9.6).

The above mentioned procurement models encompass in different ways the circular procurement principles mentioned earlier – more focus on services instead of products, more focus on a product's design, use phase and end-of-life and more focus on market dialogue.

Examples of practical application are for instance: quality and durability standards or a minimum guarantee and availability of spare parts in order to increase the durability pf products; demanding the use of low or no harmful materials and products to improve the recyclability of the products themselves and their packaging; demanding that products can be dismantled for recycling; "buy recycled" by purchasing textiles with recycled fibres, recycled paper etc.

2.6.   Important aspects for integrating GPP into CE

The transition towards a more Circular Economy, which is partly already underway, will need an accelerated mobilisation of resources and skills, in order to realise the full environmental and financial gains. The integration of the CE with other relevant policy areas such as GPP is therefore crucial to ensuring policy coherence, optimised efforts, and to an efficient transition towards a Circular Economy. GPP and PPI have the potential to boost innovation, new business models and contribute to change the way public authorities conceive, use and deliver products and services.

In order to provide a conceptual framework, the main elements of GPP and CE can be summarizsed in:

- A range of product groups, and criteria for GPP
- A number of priority actions for CE stated in the CE Action Plan
- A number of circular procurement models, as suggested in chapter 2.5.2

The idea is that with a conceptual framework, it is possible to use its elements to assess GPP items such as product groups, criteria, research projects, rather than concrete examples of GPP, according to the CE Action Plan (to verify, for instance, which GPP item contributes to which priority area of the CE Action Plan). For the assessment, the main elements can be put in a matrix and then assessed one element at a time.

3. ANALYSE THE FITNESS OF CURRENT EU GPP CRITERIA AND TOOLS ACCORDING TO THE CE ACTION PLAN

KEY FINDINGS

A considerable number of EU GPP criteria (216 criteria in total) have links with the CE Action Plan. In 19 of the 21 product groups for which EU GPP criteria are currently available, there are GPP criteria with links to the CE.

At least 21 Member States have used the EU GPP criteria sets, either as a source for the development of national criteria or by promoting them directly.

The main problem of EU GPP criteria is practicability. First of all, there is a large number of criteria (with and without links to the CE) for most of the product groups. For example, 11 core criteria for „Furniture" are a large number already but 47 core criteria for „Road construction, Design and Maintenance" seem to be out of proportion. Secondly, some of the EU GPP criteria with a link to the CE ask for solutions that markets across the EU have yet to develop. There is for example a criterion for „Textiles" that requires fabric with at least 20 % of recycled polyester. In fact, there are only a small number of companies offering the proposed share of recycled polyester. More importantly, the necessary basis such as a standardisation and certification scheme to introduce this type of criteria is missing. This hampers the applicability of the related criteria.

Furthermore, it is unknown and needs to be assessed whether the main environmental impact of public procurement (for example resource depletion) is due to the 21 product groups for which GPP criteria are currently available.

For a successful implementation of GPP in the CE, four tasks have to be accomplished:

- The enhancement and development of further GPP criteria and tools should focus on those product groups which have a significant environmental impact to derive the greatest benefit.
- GPP criteria with a link to the CE are only efficient if they ask for products, services and works for which the markets have already developed solutions that can easily be verified. There should be only EU GPP criteria with requirements that products, services and works established on the (national) markets are demonstrably able to fulfil. All other EU GPP criteria should be removed from the existing criteria sets in order to enhance practicability and therefore the level of implementation.
- In the future development of EU GPP criteria, all issues from categories of the CE Action Plan (promoting sharing, reuse, refurbishment etc) should be taken into account. Criteria should be developed for those categories that offer a higher impact and an easy verification process.
- For GPP with a link to CE that asks for products, services and works for which the markets have not yet developed solutions that can be easily verified, other tools have to be developed. One does not have to start from scratch. A number of Member States offer tools to support Public Procurement of Innovation. Three of these tools – the Austrian online-platform where public procurers can post their challenges and companies their solutions, the Dutch DuboCalc that calculates the environmental impact of the material used in civil engineering designs and the exchange of public innovation procurers in the Netherlands, for example in peer groups or in the Circular Procurement Academy, are presented briefly.

The implementation of the CE Action Plan offers the possibility to revise the EU GPP criteria to increase its uptake and to deliver standards and schemes that are needed for the procurement of products, services and works with a higher circularity.

3.1. Introduction

In 2008, the European Commission published the first EU GPP toolkit with a set of environmental criteria for 10 product groups. These criteria were mainly taken from existing Eco-labels, results from EU-funded projects (e.g. the RELIEF project) and national GPP criteria. In the same year, the Commission recommended in its Communication „Public procurement for a better environment" (COM (2008) 400, final) the creation of a process for setting common GPP criteria. The process was adopted in 2010. The Joint Research Centres Institute for Prospective Technological Studies (JRC/IPTS) was entrusted with the management of the process and the development and revision of reports and criteria. The whole process takes place under the auspices of DG Environment and with the expert group GPP AG as a kind of sounding board. The duration of the process usually varies between 2-3 years. The process is presented roughly below.

Figure 2: **Process for the development and revision of GPP criteria (adopted according to EC GPP web 2017)**

With IPTS leading the process, the criteria are developed based on the results of life cycle assessments.

The European Commission currently offers sets of GPP criteria for 21 product groups. They are listed below in alphabetical order together with the date of their publication:

1 Cleaning Products and Services, 2012 (currently under revision)
2 Combined Heat and Power, 2010
3 Computers and Monitors, 2016
4 Copying and Graphic Paper, 2008
5 Electrical and Electronic Equipment used in the Health Care Sector, 2014
6 Electricity, 2012
7 Food and Catering Services, 2008 (currently under revision)
8 Furniture, 2008 (currently under revision)
9 Gardening Products and Services, 2012
10 Imaging Equipment, 2014
11 Indoor Lighting, 2012
12 Office Building Design, Construction and Management, 2016

13 Road Construction, Design and Maintenance, 2016
14 Sanitary Tapware, 2013
15 Street Lighting and Traffic Signals, 2012
16 Textiles, 2012 (currently under revision)
17 Toilets and urinals, 2013
18 Transport, 2012 (currently under revision)
19 Wall Panels, 2010
20 Waste Water Infrastructure, 2013
21 Water-based Heaters, 2014

For each of the product groups, there are two levels of criteria – core and comprehensive criteria. According to the European Commission (EC 2016a, page 15):

- *"Core criteria are those that are suitable for use by any contracting authority across the Member States and address the key environmental impacts. (…)*

- *Comprehensive criteria are for those who wish to purchase the best environmental products available on the market."*

The EU GPP criteria are designed to be directly included in the tender documents. For each criterion, the set of EU GPP criteria specifies if it should be used as a selection criterion, a technical specification, an award criterion or a contract performance clause:

- Selection Criteria (SC): These criteria address the potential supplier. They may relate to (a) suitability for pursuing the professional activity; (b) economic and financial standing; (c) technical and professional ability (Directive 2014/24/EU).

- Technical Specifications (TS): The Technical Specifications shall lay down the characteristics required of a work, service or supply (Directive 2014/24/EU).

- Award Criteria (AC): Contracting authorities shall base the award of public contracts on the most economically advantageous tender. The most economically advantageous tender (…) may include the best price-quality ratio, which shall be assessed on the basis of criteria (including qualitative, environmental and/or social aspects) related to the subject matter of the public contract in question (Directive 2014/24/EU).

- Contract Performance Clauses (CPC): These clauses are used to specify how a contract must be carried out (EC 2016a, page 62).

Since 2008, the European Commission's DG Environment has invested a tremendous effort in the development of environmental criteria for products, services and works. The work already undertaken and the established process show that the development of environmental criteria is at the centre of the Commission's GPP efforts. The identification of relevant product groups, the development or revision of criteria, the monitoring of the uptake of the criteria – these are currently the main issues of the European Commission in the field of GPP. By addressing the task 'Emphasising Circular Economy aspects in new or revised criteria' in the CE Action Plan, the European Commission clearly indicates that it intends to introduce circularity into the GPP process.

This chapter aims at answering questions about the fitness of the current EU GPP criteria and tools established according to the CE Action Plan.

3.2. Methodology approach

For an analysis of the fitness of the EU GPP criteria, the following steps have been taken:

- Information about the sets of criteria for each of the 21 product groups was gathered and summarised: the number of sub-product groups for which criteria are provided,

along with the structure of the criteria, the number of core and comprehensive criteria, the application of a life cycle approach and information on costs.

- The EU GPP criteria with a link to the CE Action Plan were identified. A considerable number of GPP criteria address the issue "content of hazardous and other chemical substances". Thresholds for chemicals might increase the recyclability of products and therefore they have a link to the CE. However, the criteria on chemical substances do not exclude chemical substances for reasons of recyclability or biodegradability but because of concerns for human health and biodiversity. Nevertheless, the criterion was included in this study, as the implications for recyclability related to the negative impact of specific substances are gaining relevance.

- The GPP criteria that address the general issue water consumption were not identified as GPP criteria having a link to the CE Action Plan. Only criteria that address the issue of water reuse/grey water were identified as being linked to CE.

- Among the criteria excluded from the assessment are for example criteria on energy efficiency, GHG and other emissions, on noise and on the sustainability of timber.

- As there is a considerable number of EU criteria with a link to the CE Action Plan, they were categorised. Two systems of categorisation were developed for this purpose. The first system was structured according to the main issues addressed in the CE Action Plan (also highlighted in chapter 2.4.3). This system is mainly based on the perspective of producers, policy makers and public authorities as managing institutions. The second system of categorisation was structured from the procurer's perspective. Each EU GPP criterion was assigned to one or more categories of each of the two systems.

- The practicability of each criterion was assessed through expert judgement. The practicability of the criteria depends mainly on the verification process. If the verification process is simple and quick and can be accomplished even without a deep knowledge of technical and regulatory details, the practicability of the criterion has been rated as good. If the verification process is regarded as difficult, time consuming, if it costs money or if the contracting authority has to rely on the disclosure statement of the bidder, the practicability of the criterion has been rated as medium or poor. There are five levels: "good", "good-medium", "medium", "medium-poor" and "poor".

- For an assessment of the practicability of the criteria as a whole, the results of the questionnaire survey were included.

The other EU GPP tools underwent a rough evaluation process.

Based on the results of the evaluation of the GPP criteria and other GPP tools, suggestions for enhancement and harmonisation were developed to make GPP tools and the CE more interoperable. The results of the questionnaire survey were used to develop these suggestions.

3.3.   Fitness of EU GPP criteria

3.3.1.   Categorisation of CE GPP criteria and link to the categories of the CE Action Plan

As described in chapter 2.4.3, the issues, approaches and requirements within the CE Action Plan of the EU Commission that relate to circularity can be differentiated and assigned to certain CE Categories such as "Production", "Consumption" and "Waste Management" as well as "From waste to recycled material". These categories are mainly based on the perspective of producers, policy makers and public authorities as managing institutions.

The EU GPP criteria have been developed for public procurers. Therefore a second categorisation system was chosen that represents the perspective of procurers. The categorisation system has four main categories: The criteria either address the potential contractor, the product (including packaging; service or works) to be procured, the use stage of the product or the end-of-life stage. Furthermore, each of the categories is divided into several sub-categories. For example, the category with criteria addressing the product is divided into several sub-categories, for example "recycled content", "low weight", or "longevity".

The authors of this study conducted a cross-check of CE action derived from the CE Action Plan, as summarised in chapter 2.4.3, linked with the GPP criteria, in order to evaluate the potential of each GPP criterion to contribute towards the achievement of a Circular Economy.

Table 1 lists the requirements for EU GPP criteria under the relevant sub-divisions and their direct links to several CE related categories (incl. sub-categories) from the CE Action Plan.

While screening all currently existing EU GPP criteria sets, the authors of this study also examined which GPP criteria supported which CE category in a direct manner. One example is an EU GPP criteria set on "Computers and Monitors" published in 2016. Within this criteria set many specific criteria can be found whose requirements can be seen as relevant for the Circular Economy. The matrix below shows that requirements regarding the reparability of products during their use stage (such as "Computers and Monitors": repairable with commonly available tools, availability and cost-effectiveness of spare-parts (e.g. batteries)) directly support the following CE categories:

- Promoting product Eco-design
- Increasing repair services
- Promoting waste prevention
- Promoting sharing / reuse / refurbishment

The evaluation shows that some CE categories are already very well supported by current GPP criteria sets (e.g. "Promoting Product Eco-design", "Extended Producer Responsibility", "Waste Prevention" and "Sharing/Collaborative economy/Reuse/Refurbishment") while others such as "Promoting BAT waste management (and Resource Efficiency) in industrial sector" and "Promoting the achievement of long-term recycling targets" still are lagging behind and have minor interaction with GPP criteria.

3.3.2. General findings

a. Life cycle approach and integration of all costs

As described also in chapter 3.1, the life cycle approach has had a stronger influence on the development of EU GPP criteria since JRC/IPTS took the lead in 2010. Until that process was set up, the criteria sets included – among others – criteria from the EU Ecolabel (where such criteria had been in place).

Table 1:   Matrix on interaction between EU GPP criteria and CE categories

CE CATEGORIES	GPP CRITERIA	Knowledge in LCA, longevity, etc.	Capacity waste manage-ment	Report on waste manage-ment	Low weight	Chemical content	Reuse	Refur-bish-ment/ Remanu-facturing	Recycled content	Designed for Recycling	Designed for longevity	Info on End of Life available	Reparabi-lity	Spare-parts availability/ costs	Low maintenance	Extended producer responsi-bility	Acceptance of returned goods	Waste Manage-ment
		Requirements for Contractors			**Requirements for Products (incl. Packaging)**								**Requirements for Use Stage**			**Requirements for Reuse and End-of-Life Stage**		
Production	Promoting Product Eco-design	x			x	x	x	x	x	x	x		x	x	x			
	Promoting BAT waste management in industrial sector		x	x														
	Promoting Extended Producers Responsibility	x	x			x	x	x	x	x	x					x	x	x
Consumption	Increasing repair services						x	x			x		x	x				
	Tackling planned obsolescence	x					x	x			x		x	x		x		
	Promoting waste prevention		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Promoting Sharing/ Reuse/ Refurbishment	x					x	x			x		x	x	x			
Waste Management	Contributing to long-term recycling targets		x	x		x			x	x		x				x	x	x
	Monitoring of waste quantities		x	x												x	x	x
	Improving/ Investing in waste management infrastructure		x	x								x				x	x	x
From Waste to resources/ recycled material	Improving Quality of Standards for secondary raw material	x	x	x		x			x	x		x				x	x	x
	Information flow on secondary materials		x			x			x			x						x
	Reducing the presence of hazardous substances in purchased products and services	x				x				x		x				x	x	x

With Life Cycle Thinking gaining publicity and its strengths being utilised in several policy strategies and initiatives (e.g. Carbon Reporting, EMAS, and Product Environmental Footprint Initiative), its inclusion into the development of EU GPP criteria sets was accomplished.

Currently 12 of the 21 existing EU GPP criteria sets include criteria based on the life cycle approach. Nevertheless, it seems that the selection of those product groups for which EU GPP criteria are developed is as yet not based on a life cycle approach. This would require further research on the amount of products, services and works procured by public authorities and their environmental impact.

Regarding the integration of costs, information about the approach to cost assessment within the EU GPP criteria sets was gathered. All GPP criteria sets contain at least a short note or a short chapter on "cost considerations". The instrument for evaluating the Total Costs of Ownership (TCO) is mentioned in most cases. Only a few documents give more detailed information on the approach of Life Cycle Costing (e.g. GPP criteria sets on "Waste Water Infrastructure", "Computers and Monitors", "Electrical and electronic equipment used in the Health Sector" and "Office Building Design, Construction and Management").

b. Criteria as a whole

EU GPP criteria sets are currently available for for 21 product groups. These product groups can be assigned to one of the following three categories:

- Product groups that consist of a number of sub-product groups: For example, the product group "Cleaning Products and Services" consists of 7 sub-product groups: "Purpose Cleaners", "Laundry Detergents", "Cleaning Services" etc. The product groups "Copying and Graphic Paper", "Food and Catering Services", "Gardening Products and Services", "Textiles", "Toilets and Urinals", "Transport" and "Wall Panels" belong to this category.

- Product groups showing only one sub-product group of simple complexity: The product groups "Combined Heat and Power", "Electricity", "Furniture", "Water-based Heaters" and "Imaging Equipment" belong to this category.

- Product groups with only one sub-product group of higher complexity: The product groups "Road Construction, Design and Maintenance", "Indoor Lighting", "Street Lighting", "Office Building Design, Construction and Management" belong to this category. Their criteria are usually structured according to the individual products, services and works that are primarily tendered for. For example in the product group "Road Construction, Design and Maintenance" criteria are listed for six sub-groups: 1) Selection of the design team and contractors; 2) Detailed design and performance requirements; 3) Construction or major extensions; 4) Use of the road; 5) Maintenance and operation; 6) End-of-life.

The product group "Computers and Monitors" is a mix between the first two groups. On the one hand, it offers identical criteria for computers and monitors; on the other hand it offers specific criteria for notebooks and tablet computers.

This categorisation is important to find out how many core and comprehensive EU GPP criteria have a clear link to the CE: These links have to be assessed at the sub-product level and not only at the product level. For example, 21 criteria in the product group "Gardening Products and Services" with an identified link to the CE seem to be a considerable number, but because the product group consists of 7 sub-product groups, the number of core criteria is actually only 1-8 per sub-product group.

The number of GPP criteria for each of the sub-product groups differs. There is a small number of sub-product groups that have only a few criteria – for example there are 2 core

and 5 comprehensive criteria in the sub-product group "Combined Heat and Power". The majority of the sub-product groups include a large number of criteria. For example, the criteria set for the product group "Computers and Monitors" includes 13 core and 24 comprehensive criteria and the product group "Road Constructions" includes as many as 47 core criteria and 49 comprehensive criteria.

For public procurers, environmental considerations are only one of many other aspects that have to be considered. Large numbers of criteria seem to not only reduce their practicability but also their acceptance altogether – and thus the application of the EU GPP criteria. EU GPP criteria are not meant to be a collection of green criteria from which each public procurer can choose at liberty one or two criteria that fit his/her purpose best. They should be included as much as possible in tender documents.

The practicability of the criteria is hampered by complicated, expensive and/or time con-suming verification process needs. This was also confirmed by feedback gathered with the questionnaires. 11 persons stated that the practicability of the criteria should be increased. Only three persons answered that the practicability of EU GPP criteria was "good".

Some of the criteria that have no direct link with the CE Action Plan can nevertheless have implications for the CE. For example, in the product group "Road Construction, Design and Maintenance" the criterion "Low temperature asphalt" limits the temperature for the laying of bituminous mixtures to 120°C. However, the consequences that this energy efficiency criterion might have on circularity are not further described within the GPP criteria set.

There are considerable differences in the environmental impact of criteria. The impact of the criterion "minimum lifetime" for example is much higher than the impact of the criterion "availability of spare parts".

139 of the 216 criteria linked to the CE are destined for technical specifications, whereas 40 are intended to be used as award criteria, 26 as contract performance clauses and 11 as selection criteria (see Table 27 in chapter 9.10). In some of the Member States the use of green criteria as selection criteria is a controversial topic because a bid is excluded if the tenderer is not able to fulfil the selection criteria. Therefore there is a risk that the use of green criteria as selection criteria reduces the number of bids and thus increases the price. Furthermore, in some Member States, public procurers tend to use only a small number of award criteria, for example only one green award criteria.

Furthermore, around two thirds of the criteria linked to the CE are intended to be used as core and as comprehensive criteria, and only around one third is intended to be used only as comprehensive criteria (see Table 27 in chapter 9.10).

c. Uptake of the EU GPP Criteria

The EU GPP criteria address three main target groups:

- Procurers of the European Commission

- Experts in the Member States responsible for the development and implementation of the National Action Plan on GPP

- Public procurers in those Member States that refer in their National Action Plan directly to EU GPP criteria

No information about the uptake of the EU GPP criteria in tenders or contracts of the EU Commission is available so far. Information about the uptake of EU GPP criteria in the National Action Plans can be found in a document "National GPP Action Plans (policies and guidelines)" that is available on the Green Public Procurement Website of DG Environment. The document was updated in November 2016 but it still lacks completeness. Further information about the

uptake of EU GPP criteria in the National Action Plans was collected via a questionnaire sent out in the course of the study. Information from the report "Assessment and Comparison of National Green and Sustainable Public Procurement Criteria and Underlying Schemes" (2010) – which describes the status quo in 10 Member States – was not taken into account because it seems outdated. Based on the information from the document mentioned above and the questionnaire, the situation regarding direct uptake of EU GPP Criteria in National Action Plans seems to be as follows:

- Five Member States (CZ, HR, LT, SI, SK) seem to use the EU GPP criteria in their National Action Plans without many changes.

- The national GPP criteria of 13 Member States (AT, BE, BG, DE, ES, FI, IT, IE, LV, MT, NL, PT, RO) seem to be based in part on the EU GPP criteria. These Member States modify the EU GPP criteria to a greater extent.

- Three Member States (FR, HU, PL) that either have no criteria in their National Action Plan or have no National Action Plan promote the use of EU GPP criteria.

- Four Member States (DE, LU, SE, UK/Scotland) have their own national criteria or tools and do not refer to the EU GPP criteria (or at least not to a large extent).

- For three Member States (CY, EE, EL) there is no information available.

That means that 21 of the currently 28 Member States use the EU GPP criteria sets either for direct promotion or for the development of national criteria. This is encouraging – and shows that EU GPP criteria have a considerable influence on the national GPP criteria.

Hence, it would be interesting to know more about the uptake of the (modified) EU GPP criteria by public procurers in the Member States and about the uptake in tendering documents and contracts. There are monitoring studies – the latest from 2012 – trying to analyse the use of EU GPP criteria in tenders. These studies do not provide an analysis of the tender documents and contracts. They use interviews with national experts, often policy experts, to arrive at the number of tenders or contracts where EU GPP criteria have been applied.

3.3.3. Main findings for individual criteria

a. Overview of the results of the analysis

For each of the 21 product groups, the GPP criteria that have a direct link to the CE Action Plan were identified and allocated to the four categories of the GPP criteria, requirements for contractors[3], requirements for products (also including services and works)[4], requirements for the use stage and requirements for the Reuse and the End-of-life stage (see 3.3.1 above). The category "Requirements for Products" was further divided into six sub-categories (chemical content, recycled content, designed for recycling, designed for longevity, other criteria, packaging). The result of this allocation is presented in Table 2.

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[3] This category covers criteria adressing the capacity and knowledge of contractors as well as tracebility schemes or management schemes implemented by the contractor for the production and the use stage. Management schemes implemented for the end-of-life-stage were included in the category „end-of-life-stage".

[4] Criteria for products used during service delivery (like cutlery for catering) were included among the requirements for products.

Table 2:   Overview of the (number of) GPP criteria with a link to CE

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

The product groups are arranged according to the year in which the respective criteria were adopted. The number of sub-product groups per product group is given in brackets in the first column (if there is more than one sub-product group). Product groups with criteria adopted in the same year are listed alphabetically. Cells are marked blue where there are corresponding criteria. The numbers in the cells represent the number of the criteria that were identified. For two product groups, Combined Heat and Power (CHP) and Electricity, no criteria could be linked to the CE Action Plan.

The following results can be derived from the assessment in Table 2:

- A considerable number of GPP criteria are linked to the CE Action Plan: 216 criteria were identified in the different product groups.

- A comparison between Table 2 (Overview of the (number of) GPP criteria with a link to CE) and Table 1 (Matrix on interaction between EU GPP criteria and CE categories) shows that some of the possible sub-categories for GPP criteria mentioned in the matrix are missing in the overview of the current criteria. For example, GPP criteria requiring refurbished or remanufactured products are hardly to be found among the criteria for the 21 product groups.

- The criteria usually address a product, service or work (160 criteria). A smaller number of criteria address the contractor (13 criteria), the use stage (15 criteria) or the end-of-life stage (28 criteria). Most of the product groups offer criteria for different CE strategies, for example "longevity" as well as "recycled content". Nevertheless, there is no information in the criteria documents on why there are criteria for some CE strategies and no criteria for others.

- The most common criteria for products are criteria asking for thresholds for chemical substances and criteria asking for a recycled content in products.

- Criteria for packaging can be found only in the criteria of the product groups developed up to 2012. It seems that this is due to the way criteria have been developed by JRC/IPTS. Packaging was deleted from criteria sets that were developed later. The newer criteria sets now have a distinct focus on the life cycle approach. This can be interpreted as packaging being considered to have a smaller environmental impact than other issues within the whole Life Cycle of a product.

The categories and sub-categories used in the table above (as well as the GPP criteria of these sub-categories) are discussed below.

b. Criteria for contractors

Criteria for contractors are currently included in eight product groups: in each of the three construction product groups (Office Building Design, Construction and Management, Road Construction, Design and Maintenance, Waste Water Infrastructure), as well as for the installation of Water-based Heaters, for Gardening services, for Equipment used in the Health Sector, for Computers and Monitors and for Textiles. In some cases, the criteria are related to the competencies of the contractors e.g. in using recycled materials with a high recycled content. In other cases they are related to the existence of management systems implemented in the supply chain or in the use stage, for example a restricted substances control scheme in the supply chain or a traceability system for the source of textile fibres.

The criteria for contractors are to be included in the tender documents as Selection Criteria. It should be noted that at least in some Member States public procurers do not welcome the inclusion of GPP criteria as Selection Criteria.

c. Criteria for products

Chemical content

Setting thresholds for hazardous and other chemical substances in the product to be procured is the most frequently used criterion for products. There are criteria in 11 product groups asking for a limitation of chemical substances.

The practicability of these criteria was rated mostly as medium or poor. Usually, safety data sheets are available with information about hazardous substances contained in products, but

safety data sheets are not always easy to understand for procurers without specific background knowledge in chemistry. Furthermore, for products like furniture, several different safety data sheets are necessary, for example one for the glue and another one for the coat. On some of the chemicals information cannot be provided directly by the manufacturer of furniture but has to be delivered upstream in the supply chain by the producer of wooden intermediate products. Another example showing the difficulty of verifying the criteria for chemical content is computers. A procurer will not be able to verify the threshold for hazardous substances accumulated in computers within a meaningful timeframe or without an unrealistic amount of work and expenditure.

Recycled content

Criteria that require a certain "Recycled content" in the product to be procured is the second most frequently used criterion for products. There are criteria in 10 product groups asking for a recycled content.

The main problem with the criterion "Recycled content" is the sometimes challenging verification process. In those product groups where standards, declarations and certification schemes are widely used, verification is usually easy. For example, for copying paper, the paper industry has developed a paper profile declaration scheme for presenting environmental product information. The declaration scheme offers information about the content of recycled fibres in the paper product. Due to this declaration scheme and its dissemination across the EU, the practicability of the criteria "Recycled content" is "good" for the product group "paper". For some of the other product groups, there are no widely used standards or declaration or certification schemes. Therefore, the practicability of the criterion "Recycled content" has mostly been rated "poor".

If the implementation of the CE Action Plan leads to the development of standards and declaration and certification schemes, or at least to the dissemination of already existing standards and schemes, the practicability of the criterion "Recycled content" would be increased for most of the product groups.

Designed for recycling

The sub-category "Designed for recycling" covers criteria such as "Marking of plastic parts" and "Dismantling potential". Criteria of this sub-category were only found in four product groups ("Computers and Monitors", "Furniture", "Gardening Products and Services" (Machinery) and "Water-based Heaters"). These criteria should be supplemented with criteria asking for the take-back of products to facilitate recycling. Otherwise, recycling might not take place even if a product is designed for recycling. The criteria in the product groups "Furniture" and "Water-based Heaters" only state "Designed for recycling" and do not ask for "Take-back". To increase the acceptance of "Designed for recycling", this criterion should always be accompanied by an efficient "Take-back" requirement that guarantees recycling.

The practicability of the "Designed for recycling" criterion depends on the complexity of the product. It is usually "good" for less complex products (furniture) and "medium-poor" for more complex products (computers and gardening machinery). For more complex products, an additional test report is usually necessary. If a verification of a criterion needs an additional written report, the practicability of the criterion decreases.

Designed for longevity

Criteria in the sub-category "Designed for longevity" ask for compliance with durability standards or minimum values for the nominal lifetime. Criteria from this sub-category can already be found in eight product groups (Furniture, Indoor lighting, Street lighting, Textiles, Sanitary tapware, Electrical and Electronic Equipment used in the Health Care Sector, Road

construction, Design and Maintenance, Computers and Monitors). The practicability of the "Designed for longevity" criteria was mostly rated as "good".

Criteria belonging to the sub-category "Designed for longevity" differ with regard to the level of impact. For example, the criterion "Information about which spare parts can be replaced" does not guarantee that the product can be used for a minimal nominal time before a repair is necessary. The criterion "Minimal nominal lifetime" applied for indoor and street lighting has a comparatively higher impact.

The legal obligation to offer information about the nominal lifetime of products, for example the products addressed by the Eco-design Directive and its regulations, supports the use of "Designed for longevity" criteria with a higher level of impact.

Other criteria for products and services

Additional criteria were identified for products and services which could not be allocated to the four sub-categories (chemical content, recycling content, designed for recycling, designed for longevity) described above. These are criteria asking for example for:

- information on the end-of-life stage
- information on the use stage
- low consumption of consumables
- environmental management plan including information about resource consumption
- LCA results for building material

Criteria that ask for information about the end-of-life stage and sometimes also the use stage of the product were found in six product groups. The requested information ranges from information on disassembly (Indoor lighting and Street lighting) to information on recycling and recovery (Wall Panels) and appropriate disposal (Equipment used in the Health Sector, Water-based Heaters, Toilets and urinals). The practicability of the criteria is "good" but the level of impact seems to be low.

Criteria for Packaging

Criteria for packaging (recycled content, reused packaging, low weight, designed for recycling) are offered for six product groups. These are "Cleaning Products and Services" (2012), "Gardening Products and Services" (2012), "Street lighting" (2012), "Indoor lighting" (2012), "Food and Catering Services" (2008) and "Furniture" (2008). Criteria for packaging, last mentioned in 2012, seem to be no longer included in the GPP criteria. That might be a direct result of the life cycle approach adopted by JRC/IPTS for criteria development, starting with the year 2010.

d. Criteria for the Use Stage

The criteria "minimum warranty" and "availability of spare parts" were seen as criteria that become applicable in the use stage of the product. These criteria can be found in the set of criteria of the seven product groups "Imaging Equipment", "Computers and Monitors", "Electrical and Electronic Equipment used in the Health Care Sector", "Sanitary Tapware", "Toilets and Urinals", "Textiles" and "Water-based Heaters". The practicability of the verification of these criteria was rated as "good".

e. Criteria for Reuse and the End-of-Life Stage

The criteria in this category affect the actual reuse and the end-of-life stage of the product and not just the product's design (see above, for example "Design for recycling"). Currently

criteria for reuse and the end-of-life stage can be found in the criteria sets of 10 product groups. Two of these product groups relate to construction ("Office Building Design, Construction and Management", "Road construction, Design and Management"), three include installations ("Indoor lighting", "Street lighting", "Wall Panels"), another three services ("Gardening Products and Services", "Food and Catering Services", "Transport (Services)") and two include products ("Textiles", "Computers and monitors"). The criteria used in these product groups can be divided into the following groups:

- Criteria for waste management (including in some cases the indication of the final destination of waste) during the service or the occupation of the building ("Office Building Design", "Construction and Management", "Gardening Products and Services", "Food and Catering Services", "Transport (Services)")

- Criteria for waste management on the construction site and during installation ("Indoor lighting", "Street lighting", "Wall Panels", "Office Building Design", "Construction and Management", "Road Construction", "Design and Maintenance").

- Criteria for the reduction of demolition waste ("Office Building Design", "Construction and Management", "Road Construction", "Design and Maintenance").

- Criteria for the operation of a take-back system including information on the status of the equipment and the operation of facilities ("Textiles", "Computers and Monitors").

The practicability of the criteria for reuse and the end-of-life stage was rated as "medium", sometimes also as "medium-poor". The practicability of the criteria of the first two groups mentioned above (criteria for waste management during the service and the occupation of the building and criteria for waste management on the construction site and during installation) was rated as "medium" - because the bidder or supplier has to provide more detailed documents for the relevant procedures or reports that the procurer has to read and assess and secondly, because detailed suggestions on what these documents and reports should look like are missing.

The practicability of the criteria of the third group was rated as "medium to poor". These criteria ask for (pre-)demolition waste audits, the implementation of a monitoring system and tracking of information. It seems that the criterion "Demolition waste audit" has been taken from a guideline for "The Waste and Resources Action Programme"(WRAP) in the UK. The markets in the UK might be more familiar with this kind of audit, but for all the other markets in the EU, the practicability of the criteria was still "poor" due to missing details about what this audit should look like (information that has to be included in the call for tenders). Meanwhile, at the end of 2016, the European Commission proposed a "EU Construction and Demolition Waste Protocol" as non-binding guidelines to the industry. The aim of this Protocol and supporting material developed by the Member States is to make EU markets familiar with demolition waste audits. That will increase the practicability of the criteria in the near future.

The practicability of the fourth group was rated as "medium-poor". Apart from missing details on the information to be provided by the bidders for take-back schemes or inventory tracking systems, practicability was also rated as "low" because information is missing on what a respective contract should look like as it should not only tackle the procurement of computers and monitors but also waste management. Should that be included in one contract or should there be one contract for procurement and another one for reuse and the end-of-life stage?

3.3.4. Synopsis – compatibility of EU GPP criteria with the CE

EU GPP criteria linked to the CE Action Plan try to offer solutions for two different require-ments: On the one hand the requirement for green criteria for defined products, services

and/or works already established in the market and on the other hand the requirement for green criteria for innovative solutions that are designed to drive the market in a certain direction. EU GPP criteria should focus on the first requirement – to increase the procurement of products, services and works for which the market already offers CE solutions. For the second requirement – environmental aspects for innovative solutions – tools that are more appropriate for innovation than constructive criteria should be used. For example, a GPP criterion "recycled content" can be applied to polyester textiles in those Member States where polyester textiles with recycled polyester are already established in the market. In Member States where this is not the case, standards and schemes have to be developed and introduced in the market prior to any inclusion of corresponding criteria in the tendering process. If criteria are developed that ask for products that are not established on the markets yet, one could argue that they can be used as award criteria. Award criteria can send a signal to the market rather than discriminating against bids which are not able to comply. However, it has to be kept in mind that an inclusion of criteria for products not yet established on the markets might lead to bids that refer to unfamiliar documents or schemes which increase the effort to verify the documents offered by the tenderer and decreases the practicability of the criteria.

If EU GPP criteria focus on circular criteria for products, services and works already established on the market, their practicability and application can be increased. Practicability and application should be further increased by offering more detailed information and tools for the verification process.

3.4. Fitness of other EU GPP tools

Apart from criteria, DG Environment offers the following tools for public procurers (operational level):

- **Technical reports** for each of the product groups for which EU GPP criteria are available. The technical reports include the results of a market analysis, key environmental impacts and proposed criteria together with a rationale for proposing them. Even if the reports offer a considerable amount of background information, the results of the market analysis are of a very general nature. The results of the market analysis offered for the product group office buildings are based on aggregated market data from EU Statistics. For example, the report does not offer detailed information on the share of products (like e.g. construction products) in the different regional and national markets that comply with the green criteria.
  The technical reports are most interesting for environmental experts working in the field of Green Public Procurement. Nevertheless, they are too voluminous to be considered as a practical tool for public procurers.

- **The handbook** "Buying Green! A handbook on Green Public Procurement" offers information about implementing GPP, about including green criteria in the tender and about good practice examples. The information that the handbook provides could be of interest to public procurers but it is of a very general nature.

- **A collection of good practice examples of GPP**. There is one EU GPP tool available, an online collection of good practice examples together with documentation in the "GPP brochure on good practice examples" (EC GPP web 2017). For each good practice example, information about the procurement objectives, the green criteria used, results and lessons learned are presented. This tool seems to be helpful even there is a considerable level of detail - for example about the verification process for green criteria and about the costs.

These three main tools offered by DG Environment (in addition to the EU GPP criteria) are tools that provide information. Currently the CE does not play a significant role in any of these three tools. Because most of the public procurers do not read the technical reports in detail and because the handbook offers only very general information, the collection of good practice examples is the most appropriate tool wherever the topic CE is to be included. CE issues could be included with corresponding good practice examples, in-depth information about the procurement process and about the environmental impact (to achieve this, a tool that calculates the environmental impact of CE strategies would be necessary).

In addition, in April 2017 there has been launched an inter-institutional GPP helpdesk as a result of a project under participation of the European Parliament and eight European Institutions and Bodies. As this tool has been launched recently no assessment or further information on its acceptance was available for this study.

3.5. Possibilities for enhancement and harmonisation to make GPP tools and the CE more interoperable

Two main tasks have to be performed to make EU GPP tools and the CE more interoperable: on the one hand, EU GPP criteria have to be restricted to solutions well established on the market and on the other hand, new EU GPP tools have to be developed to support the procurement of innovative circular solutions:

- Firstly, EU GPP criteria have to be restricted to criteria for which the European markets already offer well established solutions (see chapter 3.3.4). The use of GPP criteria broadens the procurement of already well established green solutions and increases the impact. EU GPP criteria should not be used as a tool for public procurement of innovations. EU GPP criteria usually define the frame of outcomes. For the procurement of innovations, the frame of the outcome should not be defined and fixed beforehand as this might hamper the innovation approach.
  The removal of all EU GPP criteria that ask for some kind of innovation would increase the practicability of the remaining EU GPP criteria. On the one hand, criteria which ask for innovation are usually accompanied by an impractical verification process. On the other hand, large numbers of criteria decrease the practicability of the criteria themselves.

- With the removal of EU GPP criteria that ask for some kind of innovation, the link between GPP and innovation would not be lost. In the majority of the product groups, procurement of circular products is innovation procurement. For example, in most Member States the procurement of refurbished furniture is far from established on the market. Therefore, EU GPP tools that support public procurement of innovative circular solutions should be developed, for example tools that focus on the procurement process. Several Member States have developed and tested tools that support public procurement of innovations. These tools should be identified and analysed. The most appropriate tools have to be identified in further studies and could then be modified and used as EU Circular Public Procurement (CPP) tools. Below, three interesting tools from the Member States are presented.

3.5.1. Possibilities for the enhancement of EU GPP criteria

Apart from the most significant task described above (see chapter 3.5) – i.e. the removal of EU GPP criteria for innovation - there are a number of possibilities to enhance EU GPP criteria and make them more interoperable with the CE.

- JRC/IPTS should develop a structured approach to decide which category and sub-category of CPP criteria should be included in the criteria for the different product groups. One example where a more structured process would be meaningful is the

identification of sub-categories ("Recycled content", "Designed for recycling" or "Longevity") where CPP criteria should be developed. The decision should be based on the practicability of the criteria, the level of environmental impact offered by the criteria and the overall objective to keep the number of criteria as low as possible.

- Along with the removal of EU GPP criteria for innovation, the number of the remaining EU GPP criteria should be reduced as far as possible. This is also reflected in some of the answers in the questionnaire. The decision as to whether to delete a criterion or not should also be based on the practicability of the criterion and the environmental impact it offers.

- Each GPP criterion should be cross-checked for conflicting targets with the CE. The criterion "low temperature asphalt" should only be included if the recyclability or longevity of low temperature asphalt is as good as the recyclability or longevity of conventional asphalt.

The CE Action Plan could be supported in the following ways:

- Research should be assigned to the identification of product groups for which EU CPP criteria should be developed. These are product groups on which public authorities spend most of their money, product groups which require high amounts of resources and product groups with the highest environmental impact (for example the highest amount of resource depletion).

- For those product groups that are of the main interest for Circular Public Procurement (CPP), standards should be developed - for example standards that define a method to measure the longevity of products or the quality of recycled materials. Apart from standards, the uptake of declaration and certification schemes (for example the label "cradle-to-cradle") should be supported.

- Two criteria (one for "Textiles" and one for "Computers and Monitors") require take-back solutions for used products. Taking back products usually takes place long after the procurement contract has expired. A study should be undertaken by legal experts to examine how the requirements for the end-of-life stage of products could be included in contracts with the companies that supply the products.

- The remaining EU GPP criteria should include simple, cheap and quick verification processes. For those criteria where the verification process does not meet this require-ment, tools that support public procurers during the verification process should be developed.

3.5.2. Possibilities for the enhancement of EU GPP tools

Besides criteria, there is one EU GPP tool aimed at public procurers that should be enhanced and harmonised - the collection of good practice examples. On the one hand, specific CE information such as the impact on resource depletion should be included in each of the examples. For this purpose, a tool should be developed that calculates the impact. On the other hand, good practice examples that focus on the CE should be included. The examples should be described in as much detail as possible. A description of the procurement process together with an overview of the problems encountered and relevant experiences should be included. The readiness of public procurers to offer detailed information about their procurement process could be increased by introducing a kind of reward.

To support the public procurement of innovations that increase circularity, new EU GPP tools should be developed. These tools could help public procurers "to implement necessary changes in the procurement process", "to implement new internal management practices and procedures", inform them about "new business models by the bidders" and help them "to

calculate the environmental, the economical and/or social impact of the innovative circular solution".

Several Member States have developed and tested tools that support public procurement of innovations. These tools should be identified and analysed. The most appropriate tools could be modified and used as EU-CPP tools. Three tools used in the Member States are presented below.

- In Austria, the Federal Procurement Agency (FPA) functions as an Austrian Service Point for Public Procurement of Innovation (PPI). The FPA identified one hurdle for PPI – i.e. that companies are usually not aware of the problems or challenges of the public procurers who are looking for innovative solutions while public procurers are often not aware of the innovative solutions that companies are able to offer. Therefore, FPA developed an internet platform "Partnership for Innovation" (Innovationspartnerschaft) where public procurers can provide information about their challenges and companies about their solutions (IÖB web 2017).

- One tool to support PPI is direct exchange between public procurers that procure innovations. Direct exchange offers public procurers the possibility to share information, obtain answers to questions, discuss problems and share experiences. This exchange exists in Finland in the form of peer working. The Netherlands currently offers a "Circular Procurement Academy". Public procurers can only participate if they are in the process of tendering for an innovative solution and if they are willing to meet regularly with other participants. During the meetings, problems, questions and experiences are discussed.

- "DuboCalc" is an LCA based tool used for civil engineering projects in the Netherlands (DOBOCALC web 2017, see also http://www.youtube.com/watch?v=cAaL4FfBQNc). It calculates the sustainability value (ECI value) of a specific design based on the materials that are used. The ECI value indicates the environmental impact of a particular design for civil engineering works. A lower ECI value indicates a lower environmental impact. DuboCalc enables designers to calculate ECI values for alternative designs to achieve an optimal sustainable design. The Dubocalc score (ECI value) of the preferred design is submitted with the tender price. Unfortunately DuboCalc is not an open source software.

4. PERSPECTIVES ON THE FINANCING OF PUBLIC PROCUREMENT AND DELIVERY OF PUBLIC SERVICES

KEY FINDINGS

Green public procurement criteria are already contributing to the delivery of a more circular European economy. Their contributions to closing product and material loops need to be applied in a more systematic way in order to realise the full economic, social and environmental benefits that circular economies can potentially deliver.

Whilst many pilot and demonstration projects show a potential for closing product and material loops across all high impact procurement spending categories, significant barriers still remain around scaling up delivery. Many of these barriers are process related and concern the embedding of sustainability within public procurement systems and practice; and the integration of procurement policy with the delivery of wider policy objectives. One gap sustainable procurement could address is using the potential of the use and disposal of goods in a systematic way when considering sourcing.

In order to ensure the delivery of goods and services to an increasingly resource dependent population, procurement policies need to be aligned with key resource security and efficiency goals. Procurement processes and budgeting also need to be adapted in such a way that they increase resource resilience and security rather than eroding it.

Procurement (and by extension the process and finance systems) need to focus on the commissioning of 'outcomes' so as to use demand-pull from the public sector to accelerate the transition to a more Circular Economy. This means strategically addressing the long-term changes that goods and services should achieve rather than just servicing the immediate 'need' or 'want'.

Case studies of public sector procurement have shown that goods and services can be made more resource efficient when using resources in more circular ways; e.g. through inclusion of recycled content; by working in partnership with the suppliers (and users) of goods and services; and by integrating waste and disposal into procurement from the start.

In terms of scaling up best practice from pilots and case studies, the procurement process as well as financial and budgeting barriers will need to be addressed. Current processes and systems are optimised in such a way that they deliver a linear model of procurement rather than a circular model.

In order to create sustained demand-pull in the supply chain and to achieve critical mass, circular procurement should focus initially on areas where the public sector is a major client or end user (workwear, construction and infrastructure) to incentivise a more circular approach. This will help - directly and indirectly – to address the significant perception of barrier that exists in terms of supply chain risk and in a lack of confidence in innovating and supplying circular products and services.

4.1. Introduction and objectives

Every year, over 250,000 public authorities in the EU spend around 14% of GDP on the purchase of services, works and supplies (EC GPP web 2017). Therefore, in terms of delivering an action plan for the Circular Economy (COM (2015) 0614 final), public procurement, and how it is financed, plays an important role. Understanding the positive and negative impacts of the procurement and budgetary cycles on the overall potential of GPP is integral to the overall objective of the study in order to accelerate the transition to a more circular EU economy. So is the relationship between the public sector as a client for circular goods and services, and the private sector that supplies them.

This chapter aims to:

- summarise the current public procurement landscape within EU Member States;
- identify the challenges and opportunities that current procurement and budgetary cycles present in moving away from business as usual;
- highlight any differences within different areas and categories of procurement for delivering more circular products and services through public sector leadership; and
- illustrate the potential for GPP to contribute to delivering a more circular EU economy through selected examples of new circular procurement practice.

4.2. Methodology approach

Building on the methodological approach for the overall report, this chapter adopts the following approach in developing the conclusions and recommendations. It uses a combination of primary data from the project team and desk-based research for secondary data sources. The main sources include:

- The Austrian Umweltbundesamt and information exchange throughout the EPA network.
- Input from the project questionnaire to member state GPP experts (see also template in chapter 9.2).
- Input from the literature review in chapter 2 supplemented by targeting procurement finance open-source literature search.
- Evidence from the Dutch Green Deal programme (over 140 live circular procurement projects) presented through the Green Deal partners Rijkswaterstaat and PIANOo.
- EU LIFE and IEE projects: REBus (Resource Efficient Business Models), European Clothing Action Plan (ECAP), SPP Regions, GPP2020 and Innovation in Catering (Innocat).
- UK case studies on GPP (circa 160 reports through UK resource efficiency delivery bodies WRAP and Zero waste Scotland).
- ICLEI (European and international member-based platform for local authorities) knowledge base and case studies on sustainable procurement.
- 10YFP Sustainable Public Procurement Programme (SPPP) Working Group 4c on Circular Economy & Resource Efficient Business Models.

A meta-synthesis approach is used to analyse the broad ranging scope, quantitative and qualitative evidence available. The meta-synthesis approach is a typical non-statistical technique to integrate, evaluate and interpret the findings of multiple qualitative sources. Data quality is dependent on sources and accounted for as part of the synthesis. Drivers and barriers are examined based on evidence and from the lessons of case studies and pilots.

Recommendations have been generated based on this evidence and tested through peer review within the project team and externally with the EU LIFE Rebus project team and Dutch Rijkswaterstaat (partners in the Green Deal scheme).

4.3.   Current Landscape

Government activities are driven by policy outcomes that require operational activities, including procurement, to deliver them. Procurement contributes to these policies and outcomes directly and indirectly. The direct link between policy and procurement is clearer with, for example, infrastructure, educational and health facilities. In other cases, office supplies, facilities management, catering etc contribute indirectly. Underpinning these activities are public sector finances and procurement budgets. The continuing pressure on public sector finances in many EU Member States, together with the ever growing pressures of demand for public services will continue to increase the need to make better use of the resources available.

Governments purchase everything from routine, low value items to highly complex policy solutions and procurement processes, techniques and issues differ greatly across this spectrum. These processes also differ significantly across Member States, not least because of different policy objectives, priorities and budgets. A variety of factors drive the different approaches, and it is important to consider the context of each procurement requirement.

The start of the procurement process is seen as identifying a need to purchase something and contract award and /or management are commonly viewed end points. This is a typical operational-led view based on purchasing. However, strategically, organisations need to think in terms of procurement cycles. The approach taken for high volume goods (e.g. cleaning materials) varies significantly to that for low volume, high value procurements such as buildings and infrastructure. Inefficiencies will arise in both extremes if the internal stakeholders do not include a strategic view, e.g. at category level within the planning process. Key factors that influence the approach include:

- Repeatability: is there an ongoing requirement, e.g. paper or is it a 'one-off', such as a bespoke development project.
- Complexity: either in terms of a technical specification or the range of services required.
- Value and risk: the value of the procurement or the risk to the authority – procurement may be low in value but may still carry significant reputational risk.
- Commonality: does only a single authority require the item, e.g. a bridge, or is it something many authorities require, such as furniture or computers.

Procurement also faces potential conflicts between supporting the delivery of different policy objectives. For example, ensuring due diligence and governance (reducing risk, robust economic case and ensuring competition etc) can potentially conflict with the procurement of innovation, where risk and uncertainty are high. A purchasing authority may be faced with a situation where the market is limited or even non-existent, for example where we are looking to reduce dependency on linear business models by encouraging alternative, more resource efficient business models. The real and perceived risks as well as the degree of circular ambition by Governments will vary significantly across EU Member States.

Procurement approaches to improving circularity of product and materials loops will need to address a variety of perceived, process-related and financial barriers in order to use procurement as a mechanism for transitioning to more circular economies.

EU revenues per capita varied between € 11,300-18,800 for EU Member States in 2014 according to OECD National Accounts Statistics 2015 (OECD web 2017). EU countries finance their public expenditures in different ways. For example, Denmark is relatively more dependent on taxes (over 80% of total revenues). In contrast, Germany relied relatively more on net social contributions (above 37%) while in Norway grants and other revenues exceeded 25% of total revenues, mostly associated with earnings derived from oil resources.

Governments in EU countries spent on average close to one third (32.4%) of government spending on social protection. This is particularly high in Nordic countries, Luxembourg, France, Germany, Austria and Italy with more than 40% of total government expenditures. Governments' spending on health care, general public services (which includes the debt servicing) and in education also represents important shares of government spending, each above 10% on average in 2013. Spending on economic affairs is also significant (9.5%) and varies from more than 25% in Greece to less than 7% in Denmark, Portugal and the United Kingdom (OECD 2015).

Spending on Environmental protection is highest in the Netherlands (3.2%) due to specific geographical factors, but also high in Luxembourg and the Czech Republic. Environmental protection as a proportion of structural funding is lowest in countries like Denmark, Finland and Sweden.

Governments use a mix of their own employees, capital and outside contractors to produce goods and deliver services. Outsourcing can take place in two ways. Governments can either purchase goods and services to be used directly by the administration, or they can pay a non-profit or private entity to provide the goods and services directly to the end user.

The production costs of goods and services employed by governments vary significantly across EU countries, ranging from 32.2% in Finland to just under 20% for Luxembourg and Ireland. In 2013, government outsourcing represented on average 9% of GDP. This share varied greatly across EU countries. The Netherlands (17%) and Germany dedicated the largest shares (over 60%) of their resources to outsourcing goods and services through direct third party provision. In contrast, Denmark and Switzerland spent the majority of outsourcing on intermediate consumption[5].

In 2016 a European Investment Bank (EIB) study (EIB 2015) looked at the role of finance in the transition to a CE at the EU and national level – the latter based on the pilot initiative, implemented by the Luxembourg Government to promote circularity in its economy. The report concluded that:

1. **The transition towards a Circular Economy is complex and only a 'systemic approach' will be effective.**

The Circular Economy is complex and different factors need to be taken into account and aligned in order to successfully make this transition. Some types of CE projects are marked by higher financial risks, for example in operating costs, length of contracts, residual values etc, and therefore an increased cost of capital. New financing solutions for supply chains appear necessary for others, e.g. industrial symbioses. These solutions require demonstration projects in order to build a track record, understand which risks are associated with CE projects and how these can be mitigated.

CE projects can span the entire risk spectrum, meaning that different forms of capital, involving not only bank finance, but also grants, equity, crowd funding etc will be needed.

Significantly more progress must be made with respect to intelligence building and gathering, information sharing and awareness rising to encourage circular-friendly demand, i.e. procurement. Last but not least, regulation and public policy could further help create a new 'mind-set' in order to screen for and appraise circularity in all economic processes. Hence, an integrated and systemic approach is needed, which can be partly built through the development of a multilateral platform, such as the one suggested in the full report.

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[5]   Total monetary value of goods and services consumed or used up as inputs in production by enterprises, including raw materials, services and various other operating expenses.

2. Market forces alone could create a Circular Economy but with the risk of a slow transition and high opportunity costs.

A cost-benefit analysis always lies at the core of a company's decision to make an investment towards a Circular Economy. Cost of capital and raw materials' and commodities' price fluctuations play an essential role. In view of the uncertainty, however, with respect to the timing and the severity of such price increases, public sector intervention and support is essential. This extends to accelerating the change towards a more Circular Economy by encouraging demand for more circular goods and services and ensuring resource security and resilience by closing material and product loops.

Since Circular Economy projects do not always entail innovation as defined by existing criteria (e.g. EU funding for research take-up, SME support and EIB investment tools), structural barriers need to be addressed. The EIB noted that it has limited capacity to support non-technological (organisational or business model) innovation within the existing financial instruments available to it.

4.4. Procurement mechanisms

Most Member States employ a range of mechanisms in the procurement of their goods and services. The mechanisms noted below are highlighted as case study and plot evidence shows them to be significant drivers and barriers in the transition to more circular procurement practices. The opportunities and challenges are illustrated below.

4.4.1. Category management

Goods and services bought regularly, with significant aggregate value, are often appropriate for collaborative Category Management. This is the process that brings together procurement professionals, buying organisations, suppliers, industry bodies, and users (the stakeholders) who are engaged in the procurement of a particular category of commodity expenditure. Category management means applying a structured approach to analyse and review the spend in that category, and to identify and implement the most appropriate and effective approach to sourcing, supplier selection and contracting, and contract management. The resulting strategy is likely to include the development of strong market and supplier knowledge, a deep understanding of specification and demand, a strong focus on competition, and a drive for continuous improvement – all of which lead to improving VFM. The Dutch approach to category management over the last 4 years has seen the development of over 30 sectoral strategies which focus on cost savings through the development and delivery of more circular procurement.

Circular economy opportunity:

- Utilising category management as a means to steer market to more circular products and materials, e.g. by market engagement.

- Addressing information barriers to innovation – clarifying size of public sector spend and so reducing risk.

- Encouraging innovation – procuring circular goods and services.

- Setting sectoral targets and collaboration, e.g. voluntary agreements.

4.4.2. Framework Agreements

At a different level of scale, framework arrangements have become more popular across public sector purchasing bodies in many EU countries including the Netherlands and UK. A framework agreement is an 'umbrella agreement' that is often divided into lots (sub-categories) and sets out the terms, e.g. relating to price, quality and quantity, under which individual contracts (call-offs) can be made throughout the period of the agreement.

Agreements vary in length, typically up to 4 years. They are perceived to be a more effective way of purchasing than placing 'one-off' orders for recurrent contracts for works or supplies, e.g. by optimising volume purchasing discounts and minimising repetitive purchasing tasks. Nearly half (47%) of Sweden's purchasing authorities handle their own procurements and have their own framework agreements (SE EPA 2013). In the UK well over 80% of public sector orders are put through framework arrangements (CIPS web 2017).

Frameworks have significant potential to improve the circularity of products if set up and managed properly. The ability of the customer to ask for, and the supplier to deliver, innovative circular solutions using more resource efficient business models needs to be actively included in the Framework scope; otherwise they can act as a barrier.

4.4.3. Central Purchasing Bodies (CPB)

The picture for collaborative purchasing is mixed across Europe with purchasing that is both centralised and decentralised. For example in Sweden, municipalities and county councils handle their own procurements and use framework agreements to a greater extent than government agencies and companies. Government agencies do call-offs under coordinated framework agreements to a greater extent than government companies, municipalities and county councils.

The OECD (OECD 2011) notes that a central purchasing body is a contracting authority that either:

- acquires goods or services intended for one or more contracting authorities;

- awards public contracts for works, goods or services intended for one or more contracting authorities; and/or

- concludes framework agreements for works, goods or services intended for one or more contracting authorities.

The motivations to establish CPBs in EU countries include better prices of goods and services, lower transaction costs, improved capacity and expertise, increased legal, technical, economic and contractual certainty, and greater simplicity and usability. Large procurement volumes can reduce prices through economies of scale as well as increased competition. They also reduce duplication, transaction costs, and increase certainty, simplicity and uniformity for repeat purchases.

In countries like Spain, Ireland, Switzerland and the UK, CPBs are also responsible for establishing policies for contracting authorities. Additionally, CPBs are increasingly playing an important role in the implementation of secondary policy objectives. Over 50% of the CPBs in EU countries now include environmental considerations. CPBs provide significant targets for cascading circular procurement principles through their frameworks and lots. CPBs typically operate in accordance with very different mandates and regulatory instruments. In some countries, the operations of the CPBs are regulated in detail by law or government decrees, while in other countries, in particular the Nordic countries, CPBs are given more freedom to plan and manage their operations.

CPBs are embedded in the system of public administration of each country and reflect the specific structures for the provision of public services. Almost all EU countries have a CPB(s) at the central level while half of them also have a CPB(s) at the regional level. CPBs undertake the role of acting as a contracting authority aggregating demand and purchasing and as manager of the system for awarding framework agreements or other consolidated instruments, from which contracting authorities then order. In some countries CPBs co-ordinate training for public officials in charge of public procurement and establish policies for contracting authorities, for example in Greece, Ireland, Switzerland and the United Kingdom.

In contrast, other countries have a single role as a contracting authority, e.g. in Estonia, Luxembourg and Poland.

4.5. Barriers & drivers

Public sector procurement has a pivotal role to play if the transition to a Circular Economy (CE) is to be accelerated and the potential benefits fully realised.

The benefits of a Circular Economy in Europe are well documented and reported, e.g. by the Ellen MacArthur Foundation (EMF 2015a) and the Club of Rome (COR 2015). Benefits include carbon reduction, improved resource efficiency, increased supply chain resilience, employment opportunities and increased growth. More recently the EU LIFE REBus (Resource Efficient Business) project (REBUS web 2017) has demonstrated real-time procurement benefits in the Netherlands and United Kingdom (UK). If replicated across Europe, these would realise around € 324 billion of CE benefits, a figure consistent with the EMF projections.

As noted by the European investment Banks, among others, the transition to a CE requires a mix of complementary instruments and approaches in order to address barriers and realise the benefits that accrue to a variety of stakeholders. These are summarised in Table 24 in chapter 9.7. Measures include regulation, economic incentives, targeted spending, collaboration along the value chain and raising awareness of the benefits of the CE and available solutions (EC 2014a).

4.5.1. Financial barriers

In 2015, the EIB noted that, by nature, the private sector as a whole is geared towards short term gains. Many businesses are therefore likely to wait until high commodity prices create the business case for Circular Economy transitions.

From a supplier perspective, the Circular Economy is a matter of cost-benefit analysis. If the total investment cost of a CE transition is higher than the overall price of a resource saved over a certain defined time interval, businesses have no financial incentive to undertake the CE investment required other than to increase their certainty of a stable resources supply and increase their resilience to fluctuating resource prices.

- **CE TRANSITION cost > Price SAVED RESOURCE:** However, a CE transition would make business sense if the relevant commodity price increases to such an extent that the relationship depicted above is reversed, i.e.:
- **CE TRANSITION cost < Price SAVED RESOURCE:** The 2013 EMF report (EMF 2013) highlighted the increasing pressure on commodity prices necessitating a rethink of market (Figure 3). Together, high and volatile commodity prices dampen the growth of global businesses and therefore economic growth. These effects manifest themselves in two main ways: input cost spikes and increasing hedging costs.

Figure 3:   Commodity price increases 1900-2010

Sharp price increases in commodities since 2000 have erased all the real price declines of the 20th century

McKinsey Commodity Price Index (years 1999-2001 = 100)[1]

1 Based on arithmetic average of 4 commodity sub-indices: food, non-food agricultural items, metals, and energy; 2011 prices based on average of first eight months of 2011.

SOURCE: Grilli and Yang; Pfaffenzeller; World Bank; International Monetary Fund; Organisation for Economic Co-operation and Development statistics; UN Food and Agriculture Organization; UN Comtrade; Ellen MacArthur Foundation circular economy team

Source: Ellen MacArthur Foundation, 2013

The cost of financing is a key determinant of investment decisions. It will also be a factor in reducing CE transition costs. Assessing the expected benefits of an investment and its riskiness can be difficult for external financiers, particularly for certain types of businesses, e.g. SMEs, and certain types of investment, e.g. in innovation. As a result, businesses can face high costs of external finance, or have limited access to any external finance at all. The risk of internal and inward investment can be affected by a number of factors, including the stability of the financial system and the predictability of public policy. For investments that involve the participation of both the public and private sectors, the availability of financial instruments, mechanisms and policies that allocate appropriately risks to each of the parties is key to making private participation viable (EIB 2016).

The public sector can help accelerate the transition by utilising procurement to address price volatility by encouraging resource savings through innovation up to the point where the cost of the CE transition becomes lower than the price of the total saved resource. This underlines the strong relationship between a Circular Economy and demand-led innovation. Relying exclusively on market forces to prompt a generalised CE transition means waiting for such increases, with the risk of exposing economies to potential shocks. The EIB report also concluded that public support is therefore necessary to encourage a long term view of commodity pricing within a Circular Economy.

4.5.2.   Procurement drivers

Extending the scope of existing Sustainable Public Procurement principles (SPP) to consider use and disposal alongside sourcing will help to close material and product loops. This is sometimes referred to as circular procurement. The new EU procurement directives can potentially facilitate this shift through the adoption of relevant economic and / or environmental life cycle approaches and Best Price Quality Ratio (BPQR) as part of Most Economically Advantageous Tendering (MEAT). These approaches take account of use and of disposal.

Analysis of OJEU (Official Journal of the European Union) tenders in the Official Journal of the European Community (OJEC) from 2015 (Table 3) shows the key types of procurement within key categories with high environmental impact. Least cost tendering is still prevalent. This is more so in some categories like ICT compared with others like textiles. However, MEAT provides the best opportunity, either through life cycle costing (LCC) or BPQR, to enable circular procurement options to be offered.

Table 3:   OJEU tendering by procurement type for key categories 2015

Category	MEAT	Least Cost	Unspecified	Total
Catering	€ 4,549,469,369	€ 1,764,887,802	€ 277,699,487	€ 6,592,056,657
Construction	€ 49,851,555,430	€ 26,476,026,241	€ 2,496,208,586	€ 78,823,790,257
Furniture	€ 1,287,077,566	€ 346,939,994	€ 818,581,328	€ 2,452,598,889
ICT	€ 80,787,142	€ 107,744,074	€ 11,122,897	€ 199,654,113
Textiles	€ 8,169,848,430	€ 123,809,808	€ 331,193,518	€ 8,625,479,111

Source: TED (Tenders Electronically Daily) database

Typical least cost procurement approaches are either driven by, or encourage, the continued reliance on the traditional make-use-dispose business model. Resource efficient business models (REBMs) offer value-driven alternatives to the linear model. However, alternative business models require both client and supply chain to collaborate as the benefits are typically whole-life and shared throughout the chain.

One option is more performance based procurement methods, such as functional specifications in place of prescriptive specifications. Examples include the procurement of mobility rather than fleet vehicles and the procurement of light rather than the lighting equipment. In the Netherlands, the Dutch Green Deal programme has initiated a number of pilots and guidance for functional specifications (NL MoE 2013).

A further option is the procurement of services instead of products. This enables manufacturers to retain greater control over the items they produce and the embodied energy and materials, thus enabling better maintenance, reconditioning and recovery. Procurers benefit too, as they pay only for the service used (reducing capital budget expenditure), and often receive a better service as the manufacturer has a greater interest in providing a product that lasts. The initial collaboration between Philips lighting and Thomas Rau Architects produced a bespoke 'pay-per-lux' intelligent lighting system to fit the office requirements at a manageable price. Philips retains control over the items they produce, enabling better maintenance, reconditioning, cost effective technology shifts and end-of-life recovery. This has led to Philips utilising the model with other customers including Schiphol Airport in the Netherlands.

The SPP Regions project found that the key elements to consider when addressing barriers to shifting from linear procurement models were:

- service instead of products;
- product design, use phase and end-of-life; and
- market dialogue.

4.5.3.   Survey responses

The survey questionnaire included a section on current awareness and practices relating to procurement and the Circular Economy (Part E Questions E1-E3). Using the feedback from the questionnaire, Table 4 summarises the responses from different Member States.

Survey responses suggest that currently there are only a small number of EU Member States (and regions) actively trying to link procurement to the delivery of the Circular Economy. Responses suggest that most countries are aware of the potential benefits of the circular ecnomy but have as yet not actively used prcourement to encourage alternative solutions to

the linear make-use-dispose model for goods and services. These findings are consistent with those of the OECD in their 2014 survey which looked at embedding GPP policy within governments (OECD 2015).

Different challenges exist at each level. Awareness of procurement and its potential to contribute to a more Circular Economy is the key challenge for many Member States (yellow). Capacity building, evidence and practical guidance on how to implement more circular procurement are the main challenges for countries already familiar with Circular Economy principles (turquoise). The biggest challenge for those few countries (lavender) that have initated pilots to implement circular procurement is how to scale-up the successes in mainstream practice.

Table 4:   **Summary of respondents' views on Member States and circular procurement**

	Lavender	**Turquoise**	**Yellow**
Definition	*Actively embedding (circular) procurement practice in policies for delivering the Circular Economy*	*Aware of possible alternatives, some evidence of individual examples but no systematic approach to linking procurement and the Circular Economy*	*Not aware beyond the barriers to the Circular Economy*
Countries	Finland, Netherlands, Belgium (Flanders specifically), France, UK (Scotland specifically)	Sweden, Denmark, Italy, Spain, Germany, Austria; UK (England); Belgium; Latvia; Malta	Romania, Lithuania, Slovak Republic, Poland, Bulgaria, Czech Republic, Portugal, Hungary
Major challenges	Legal; financial; inertia	Linking procurement to CE; lack of training in alternative approaches; verification (e.g. of LCC)	Lack of awareness/ evidence; low recognition of BPQR; active legal challenges to BPQR

4.6.   Procurement categories & spend areas

The key link between procurement and the Circular Economy is the procurement cycle and its potential to consider the whole life impacts across the production, consumption and disposal chain of products and materials. This is consistent with the traditional stages of the procurement cycle but broadens the focus on purchasing from sourcing to the consideration of use/utilisation and disposal/recovery (Figure 4).

Repeat supply is typically organised into categories, particularly when organised through central purchasing bodies. In the Netherlands they have taken this further by organising national category plans (since 2014) for major spend areas. Additionally, the Dutch have used these category plans as a mechanism to drive increased circularity in line with their Circular Economy ambitions[6]. Over 30 category plans have been developed covering major

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[6]   A „*Circular Economy in the Netherlands by 2050*" programme sets a target of a 50% reduction in raw materials use by 2030 and builds on the Waste to Resource programme announced in 2014.

spend areas like construction, food and drink, textiles, electricals and computing (ICT), furniture, paper and transport.

Figure 4: Embedding circular thinking within the material and procurement cycles

Using Denmark as an example, the 2015 EMF Policy Makers report (EMF 2015b) also highlighted their specific prioritisation of spend areas in terms of Circular Economy potential. Figure 4 identifies the Danish priorities in the top right hand corner.

The key sectors linking circularity potential and its role in the national economy include construction, health, food & drink and manufacturing. These sectors encompass delivery of goods and services to businesses and citizens as well as to public sector authorities. However, these sectors also typically account for the highest expenditure and environmental impact (e.g. carbon) within the public sector as well as the wider national economy. In practice many countries have similar priorities although there is variation with national policy goals and spending priorities. These correlate well with areas identified as high environmental (and carbon) impact and high potential for improved resource efficiency. In the UK and the Netherlands similar prioritisation exercises have included furniture in this group.

The sections below provide examples from the most common categories found within the wider European knowledge base of case studies and pilot evidence.

Figure 5: **Danish sector prioritisation 2015**

NOTE: Only producing sectors (24% of national GVA) and hospitals (3.5% of national GVA) considered
SOURCE: Statistics Denmark (2011 data); Danish Business Authority; Danish Environmental Protection Agency;
Ellen MacArthur Foundation

4.6.1. Construction

The European construction sector accounts for approximately 25% - 30% of all waste generated in the EU and consists of numerous materials, including concrete, bricks, gypsum, wood, glass, metals, plastic, solvents, asbestos and excavated soil, many of which can be recycled (EC WASTE web 2017). The key circular considerations relating to procurement are the ability to address:

- Waste prevention – designing out waste and reducing wastage within the construction process.
- Design for reuse and recyclability at end-of-life
- Construction – reducing wastage and creating demand for recyclate through the specification of recycled content to close materials loops
- In-use - for example:
  - o effective commissioning.
  - o facilities management including pay-per-use models such as for lighting (e.g. Schiphol Airport, the Netherlands).
  - o increasing utilisation rates, e.g. through adoption of sharing economy principles, shared space etc.

- End-of-life – recycling demolition materials into new build projects e.g. the Helsinki dock regeneration project; ensuring quality recycling to maximise both recovery rates and economic value.

The linear nature of construction creates a barrier to circular thinking within the procurement of construction projects. It highlights the role that clients (e.g. the public sector) can play in creating demand for circular solutions. In Brummen, the Netherlands, the municipality worked closely with the architect to design and optimise the lifetime (20 years) of the Town Hall extension. Financing options for ownership and leasing (including leasing of building materials) were all considered as part of the design brief. The design itself ensured that all materials used could either be reused (e.g. beams) or recycled at end-of-(first) life.

The complexity of construction projects also highlights the importance of internal collaboration alongside market engagement exercises as both Den Haag and Amsterdam City municipalities in the Netherlands have found as part of the recent Dutch Green and EU LIFE REBus pilot projects.

Large scale infrastructure projects, however, also provide significant scope to address life cycle thinking through procurement and adopt alternatives to ownership, e.g. through service-based models like Design, Build, Maintain (Operate) models. Private Finance Initiatives (PFI) such as those adopted in the UK in past have, however, had mixed success. However, Public Private Partnerships, for instance in France, are more suited to public sector financing arrangements and have therefore demonstrated better value.

For the 18 year DBFM refurbishment project of a section of road on the A12 in the Netherlands, The Dutch Rijkswaterstaat embedded sustainability within the MEAT process by monetising CO_2 savings and utilising an 'environmental costs indicator value' (ECI) which favours low environmental impacts through life cycle assessment (LCA) of all the materials that are used in the construction and maintenance operations. This Total Cost of Ownership (TCO) approach monetises environmental benefits like carbon reduction and reduces the ceiling value price of € 83.7 million down to a final bid price of € 61.9 million, saving € 21.8 million. The latest Dutch circular exemplar is the new Innova 58 tender for a section of highway and two junctions based on a fully circular design.

In the Netherlands, the municipality of Enschede has initiated a circular approach to Framework contracts through a new method called Rapid Circular Contracting under the Dutch Green Deal. A characteristic of RCC is that the parties involved work from a Programme of Ambitions (PoA) rather than the traditional Programme of Requirements (PoR). This creates what is, in effect, a public-private partnership with the common objective of delivering the Circular Economy through the public procurement of circular goods and services within a given category like construction.

4.6.2. Furniture

Closely associated with construction is facilities management and in particular the procurement and maintenance of office equipment and furniture. This is typically sourced and purchased rather than leased.

The newly published (2016) Dutch circular category plan for furniture identifies 6 key cycles for circular office furniture:

- maintain – using preventative maintenance to maximise product lifetime, e.g. a chair remains a chair;
- repair – corrective maintenance , e.g. a chair remains a chair;
- reuse – redistributing products through a change in ownership, e.g. a chair remains a chair;

- refurbish – remanufacturing the product to optimise lifetime, e.g. by changing appearance of a chair through re-upholstering to extend 'psychological' service life, or resizing desks;
- re-purpose – change functionality of the product, e.g. a desk becomes a table; and,
- recycle – recovering the value of components and materials for feedstock as secondary materials in new products.

The national Rail services (ProRail) furniture procurement provides a good example of developing an internal circular vision for furniture and flooring tiles and encouraging market development of resource efficient business models (REBMs) as part of the new operations centre in Utrecht. Although the agreed service solution for floor tiles (provision, cleaning, maintenance, replacement and disposal) was more expensive than the baseline ownership model, it was felt the on-cost was justified in stimulating market development of more circular business models. These will generate savings over time as demand increases. The furniture element identified that nearly a third of the requirement for desks could be met through reuse. Reuse can save substantially on overall costs if simple purchasing is used, as Perth & Kinross Council demonstrated in Scotland (UNEP 2015). The Dutch Rijkswaterstaat have extended the reuse principle and estimated that across the whole Government Estate, internal redistribution of office furniture would save € 7 million per year over the reduction of workplaces through to 2020.

The Belgian company PMC Holding is an example of how supply can be driven by demand. Originally starting as an office furniture remover, it began to develop an increasingly wider range of services in response to market demand. This led to facilitating the logistics of large interior design projects. Subsequently, storage and internal logistics have been further expanded at the request of clients along with the formation of NNOF (Nearly New Office Furniture), which responds to the need to re-purpose (to give a new purpose or use to) written-off furniture as new office furniture. Suppliers like Decorum in the Netherlands are now able to offer a variety of resource efficient business models depending on customer needs.

In terms of office fit-out and facilities management, service options have good potential to increase circularity of products and materials if included in the specification and tendering. Public Health Wales in the UK have applied a circular approach to an office move in Cardiff. Market engagement set out their ambition for reuse and enabled a consortium including Welsh SMEs to repurpose and remanufacture existing desks and chairs for the entire contract of 550 workstations. This was achieved using conventional financing arrangements.

4.6.3. Workwear and textiles

Although textile and clothing supply chains are global, European production and consumption of workwear provides good opportunities for the procurement process to influence the design and close the fibre circular through more closed loop recycling.

Branding, garment design and material choices within public sector workwear mean that lifetime optimisation, in particular, is often low. Re-branding and design choices can account for around 50% of all replacement needs. Although a lack of R&D budgets can inhibit innovation, extending contracts from the typical 4 years to 6 years can provide sufficient incentive to encourage innovation in design and material choice. Opportunities also exist to specify levels of recycled content in new garments, helping to create a demand for recycled fibres. The Dutch Textiles Covenant and EU LIFE REBus pilots are trialling requirements for between 20-25% recycled fibres in certain product categories.

The Rawicz Hospital, in collaboration with eight other health units in Poland, procured an alternative cellulose yarn produced from the pulp of eucalyptus tree for uniforms – which is

a good example of the role procurement can play in encouraging new and greener products and materials (EC IP web 2017).

The 2015 Public Procurement Act in Denmark simplified procedures to facilitate negotiations between the contracting entity and bidders in order to encourage more innovative solutions and also encourage alternate business models based on life cycle costing that can be applied to categories like workwear (textiles). This supports a more holistic Circular Economy approach where environmental concerns rank equal to other concerns and are implemented where standard products can meet the criteria. The City of Herning in Denmark adopted a circular approach to uniforms procurement through renting, washing and repairing of work clothes for the city's technical operations department. This extended to the development of objective criteria for purchasing new branded fire service work clothes to address discard, regardless of the quality and lack of recycling. Reuse of work clothes and transfer of work clothes, from the current contract to the next, will save €6,700 and 1,011 tonnes of CO_2 between 2014 and 2018 in the technical operations department alone.

A significant portion of discarded textile and clothing is sent to landfill or to energy recovery from waste (EfW) despite workwear often being of a higher quality specification than consumer equivalents. At best, general clothing collection for reuse is circa 50% so the potential for greater reuse collection is high. Introducing track and trace requirements or adopting take-back and serviced contracts can provide more circular options to the linear procurement model of purchase-own-dispose.

4.6.4. ICT and electricals

With global supply chains, there is less scope to influence design options for electrical equipment, although collective purchasing, e.g. through Central Purchasing Bodies (CPBs) can provide some opportunities. It is therefore even more important within this category to target SPP on lifetime optimisation (alongside energy efficiency of products) and disposal options.

The initial opportunity within the procurement cycle is to challenge the need for new ICT products as the REBus Province of Utrecht pilot project identified. An internal poll within the municipality found that 37% of employees would accept a refurbished unit. Refurbished second-user systems can offer savings of 60% to 90% from list prices and there has been a growing interest in refurbished equipment, due to the effects of the economic recession and the waste electrical and electronic equipment (WEEE) directive.

Take-back models or buy-sell-on models are potential options where ownership is preferred. This early, strategic approach to sustainable procurement also provides the opportunity to look at the risks and benefits of alternative financing models. ICT equipment lends itself favourably to servicisation models especially given the frequency of software and hardware updates. Finance systems can, however, cause issues with leasing arrangements. For example, where capital expenditure (capex) and operational expenditure (opex) are budgeted separately, many systems discourage recurring costs as these introduce risk across financial years.

In the UK, a study showed that almost 50% of electrical equipment collected for recycling could have been reused with little or no repair (WRAP 2011). The key barrier is the collection system adopted. If not specified this will typically be low level and reduces the ability for items to be reused. The Dutch Ministry of Finance Personal Estate Office (DRZ) are responsible for disposal of around 30,000 redundant, data supporting ICT items of the national government. Their research into alternatives to destruction of the equipment found that around 25% of items collected can be data-wiped and then reused. The sale of the cleaned equipment is sufficient to cover the residual costs of recycling and destruction.

A key element in actively specifying recycling options is data security. Linking resource security to this through the recovery of critical raw materials not only helps close materials loops but also helps introduce greater resilience through a more Circular Economy.

4.6.5. Food

Waste prevention forms the most significant action that public sector procurement activities have addressed in existing food-related case studies and pilots. It is estimated that about 30% of food is wasted along the value chain. In September 2015, as part of the 2030 Sustainable Development Goals (SDGs), the UN adopted a target of halving per capita food waste at the retail and consumer level and reducing food losses along the production and supply chains. However, unavoidable food waste is inevitable and linking local authority household and commercial collections and public sector food waste disposal to anaerobic digestion, as in the UK, can help close nutrient loops.

Public procurement of catering services has also linked the closing of nutrient loops through food waste composting with encouraging healthier and more nutritious diets. The EU REFRESH project (REFRESH web 2017) focuses on the reduction of avoidable waste and improved valorisation of food resources. It combines EU sustainable consumption and production with global supply chains across 26 partners from 12 European countries and China.

The recent EU INNOCAT project (INNOCAT web 2017) brought together public and private buyers to provide evidence-based tender guidance for eco-innovative catering products, services and solutions. Partners included ICLEI and representatives from Sweden, Finland, France and Italy. Building on market engagement case studies from catering and other sectors, the sustainable procurement opportunities in schools catering can combine healthy diets with more circular procurement practices (INNOCAT 2015).

5. VIEW ON HOW EU FINANCED RESEARCH AND INNOVATION MIGHT SUPPORT GPP AND ITS BETTER INTEGRATION WITHIN THE CE

KEY FINDINGS

Substantial research has been conducted on GPP at the EU level in the last few years. From 2012 onwards alone, 54 projects have been funded in the area of Green Public Procurement, Sustainable Public Procurement, Public Procurement of Innovation or Circular Procurement, with a total EU contribution of about € 91.7 million. The main EU funding programmes focusing on GPP have been Horizon 2020 (ongoing) and the FP7 and the Intelligent Energy Europe Programme (IEE) within the Competitiveness and Innovation Framework Programme (all now closed).

About 88 % of GPP-related projects were funded within just three sectors, namely the Electrical & ICT Equipment sector, the Construction sector, and the Transport sector. As regards content, the majority of the projects focused on improving energy efficiency in public buildings, IT infrastructures and transports, e.g. by incorporating energy savings, renewable energy or alternative low-carbon vehicles. The remaining projects focus on a variety of topics such as Waste, Water, Food, Paper etc. The primary goal of most of the projects is to build GPP capacity within public authorities.

The analysis of projects has shown that in general, the Circular Economy provides only partially a focus for EC funded projects. On average, 1 in every 3 of the analysed projects has some kind of relation to the Circular Economy. For some product categories the link is more evident (e.g. food and catering), while for other product categories such as construction, transport and energy the link is less evident or altogether absent.

5.1. Introduction

Research and innovation play a key role in advancing the knowledge and improving the state of the art of technologies and processes.

The aim of this chapter is to provide an overview on the different research projects funded through EU research programmes with a clear link to Green Public Procurement. On the other hand, this chapter builds on the outcomes of the analysis and examines how EU financed research and innovation might support GPP and its better integration within the Circular Economy.

Hence, the chapter provides an overview of research on GPP based on qualitative (e.g. on types of funded projects and foci of investigation), and quantitative (duration of projects, budgets etc) analysis of EU research funded projects.

More specifically, the chapter aims at answering the following questions:

a) Which EU financing schemes support research on GPP and CE; which areas of investigation, sectors, products and services are covered by EU financed research and innovation programmes? Which of these offer opportunities for the implementation of the Circular Economy?

b) What should be included in the next calls for EU research programmes (e.g. Horizon 2020) in order to foster funding of GPP-related topics?

Based on these findings, recommendations were formulated.

5.2. Methodology approach

The analysis was conducted by taking the following steps.

The European Commission makes direct financial contributions in the form of grants in support of projects or organisations which further the interests of the EU, or contribute to the implementation of an EU programme or policy.

Hence, the first step concerned the identification and screening of the main EU research funding schemes. The European Commission provides different sources of information on its web pages. The main sources of information for this study were:

- The CORDIS database, collecting FP1 to FP7, the EU Horizon 2020 projects, and other projects and additional funding.
- Different web pages of the EC Directorates (DG ENVIRONMENT, DG GROW etc).
- The web page of the EC on GPP, presenting a list of related projects financed by the EU.

5.2.1. Scoping and projects screening

Different key terms can be used to refer to Green Public Procurement. These are as follows:

- Green Public Procurement
- Sustainable Public Procurement
- Circular Procurement
- Public Procurement of Innovation

These terms were used in the screening phase in order to identify relevant projects. It was then decided to include only projects financed from January 2012 onwards, to be able to capture the advancements in the field in the last 5 years. Screened projects were collected in an Excel database.

The database was refined based on the results of a project abstracts analysis (text analysis and coding). The assumption for this analysis was that whenever green / sustainable / innovation public procurement was at the core of the project, then that would be explicitly mentioned in the project abstract through one of the key search terms. This step is necessary in order to exclude projects addressing forms of procurement that are not sustainable or green: for instance, procurement of innovations often focuses on sensitive groups (aging population, visually impaired people etc) these groups do not fall within the scope of this analysis. In summary, the projects within the scope of this study are:

Table 5:   Scope of the analysis

Projects within the scope of the study	Projects not within the scope of the study
- Projects funded within one of the EC funding schemes (referred to as "Framework Programme") - Projects addressing "Green Public Procurement" including "Circular Procurement", "Public Procurement of Innovation" and "Sustainable Public Procurement" - Projects funded from 2012 onwards	- Projects funded before 2012 - Projects dealing with Public Procurement in fields other than green procurement (e.g. in the healthcare sector for the care of patients, public procurement for the aging population, earth observation, security etc) - Projects dealing with the greening of certain sectors, but without a clear link to public procurement

Projects within the scope of the study	Projects not within the scope of the study
• Project indicated on the GPP - EC webpage with a clear link to "Green Public Procurement"	

5.2.2. Qualitative and quantitative analysis: the logic behind

Qualitative and quantitative analyses have been carried out to answer the questions raised in the introduction to this report. The table below explains the logic behind.

Table 6: Logic behind the analysis

Question	Approach to answering the question
a) Which EU financing schemes support GPP and the CE?	• Desk research and analysis of EU funding programmes and projects
b) Which areas of investigation, sectors, products and services are covered by EU financed research and innovation programmes? c) Which of these offer opportunities for the implementation of the Circular Economy?	Based on project abstract (text) analysis: • Creation of categories to categorise the projects into different sub-clusters and common constructs • Analysis and interpretation of the different sub-clusters
d) What should be included in the next calls for EU research programmes (e.g. Horizon 2020) to foster funding for GPP-related themes?	• Combined analysis of results from chapter 5, as well as chapters 2, 3, 4 and 6

5.2.3. Categories

For each project, the following data were collected: Project Acronym, Project Title, ID, Start Date, End Date, EU Contribution, Total Budget, Abstract, Coordinator Country, Consortium Countries.

Different categories were then proposed to classify the projects. These aim at evidencing which areas of investigation, sectors, products and services are covered by EU financed research and innovation programmes

Each project's area of investigation was identified through the following categories, which build on those already proposed by the EC on the GPP web page where EC funded tenders are collected:

- Production of tools and tender models
- Establishment of groups of buyers and suppliers
- Development of eco-innovation solutions through pre-procurement and joint procurement
- Organisation of knowledge sharing and awareness raising activities (forum, knowledge-sharing platforms, networks); capacity building
- Production of guidance documents
- Others

The sectors and products were investigated in their relevant categories, which build on the projects addressed by the EC on the GPP web page (as mentioned above):

Table 7:   Proposed categories to identify the sectors and products

Category	Sub-categories	GPP Criteria
Food	Agricultural, farming, fishing, forestry and related products Food, beverages, dairy and related products.	Food and Catering services
Furniture	Furniture (incl. office furniture, desks chairs, storage and fittings) excl. Lighting, domestic appliances, kitchen equipment and catering supplies)	Furniture
Electrical & ICT equipment	Including data centre equipment, ICT, telecommunications, large and small electrical equipment (Excl. detection equipment)	Computer and monitors
		Electrical and Electronic Equipment used in the Health Care Sector; Imaging Equipment
Construction	Construction materials, construction works including demolition, groundworks and landscaping (excl. Services & management) , indoor lightning, street lightning	Road Design, Construction and Maintenance; Combined Heat and Power (CHP);
		Office Building Design, Construction & Management
		Waste Water Infrastructure
Transport	Transport equipment and auxiliary products to transportation	Transport
Textiles	Occupational and industrial workwear and uniforms (Excl. Footwear and accessories)	Textiles

In order to find out which of these projects offer opportunities for the implementation of the Circular Economy, the Circular Economy Action Plan was screened, and the proposed actions are summarised in Table 22 presented in chapter 9.5. With qualitative analysis it was established if projects address none, one or more of the sectors and priority areas mentioned in the EU Circular Economy Action Plan.

5.3.   Results

The European Commission provides funding for GPP related research through a variety of funding programmes. In total, about 100 projects were found within the screening phase, whereas only 54 projects fit the scope of this analysis, as described in Table 8.

Table 8:   Descriptive analysis of GPP- related projects

Total number of screened projects	99
Total number of projects fitting the scope	54
Project duration - Average (years)	3
Average project budget (Euro)	1.840.539,40
Total estimated EU contribution (Euro)	91.669.377,00
Total estimated project budget (Euro)	109.586.145,00

The graphs in Figure 6 below summarise the distribution of projects within the different European funding schemes. The majority of projects were funded within the Horizon 2020 or its predecessor programme FP7, followed by the Competitiveness and Innovation Programme (CIP).

Figure 6:   Distribution of GPP-related research among the different EU funding programmes

Figure 7:   Distribution of project budget across the different funding programmes

For 9 projects no budget was available, and was therefore calculated based on the average funding per project within the same funding programme. Figure 7 intends to provide an overview of the main funding schemes for research on GPP in Europe, which can be taken into account when designing future funding schemes.

Most of the projects were funded through Horizon 2020 and FP7, followed by the Intelligent Energy Europe Programme (IEE) which was closed in 2014. The main funding scheme at the moment is Horizon 2020. The average duration of the projects is 3 years. Half of the financed projects are still running until 2018/2019, with few exceptions running until 2021. The average project budget ranged from 1.5 million euros for the CIP programme to 2.5 million euros for Horizon 2020 and FP7 funded projects. The EC contribution represents on average more than 80 % of the total project budget.

5.3.1. GPP and CE entry points in research

Of the topics mentioned in the methodology chapter, GPP funding opportunities focused on three main topics, namely the Electrical & ICT Equipment sector, the Construction sector, and the Transport sector. Relatively few projects were funded in the area of food and catering, furniture, textile and cleaning, gardening products and services. The following sub-chapters offer an overview of project characteristics within each category, and their contribution – referred to as "entry points", to a Circular Economy.

Figure 8:   Distribution of projects according to sectors

Construction, Electrical & ICT equipment and Transport cover 88% of the GPP-funded projects analysed for this study.

- GPP research in the Construction-related sector

With a total of more than 46.26 million euros of total investment in 20 projects and an average project budget of 2.3 million euros, the construction sector received the largest amount of funding.

In terms of content, the majority of projects focused on improving energy efficiency in public buildings by incorporating energy savings and renewable energy, e.g. to meet the Nearly Zero Energy Building (NZEB) standards, or for the sustainable refurbishment of buildings and

sustainable retrofitting. Indoor lighting as well as street lighting also provided an important focus, with projects aiming especially at exploring efficient solutions for energy supply. Hence, for almost all projects the primary objective was to achieve a certain degree of energy efficiency in public buildings. Only three projects were different, taking into account construction materials and water management for buildings.

Construction-related projects are concerned with three areas of investigation. At first, projects focus on capacity building, in particular when funded within the CIP programme. These projects do not aim at generating new evidence, but at implementing existing knowledge on public procurement (such as know-how, tenders, criteria, tools, education of workers) for public building construction and management, and in particular in cities or regions where Green Public Procurement is not yet fully implemented, such as Barcelona or Birmingham, or in the mountain regions of Europe. Another type of projects is focused on innovation procurement, e.g. projects exploring and developing innovative, cost effective and sustainable solutions for indoor and outdoor lighting, or developing standards for the retrofitting and refurbishment of existing buildings. Hence, although the choice of materials can have a considerable impact on the energy efficiency of buildings, the focus of the Construction-related sector is on the energy aspect.

When it comes to contributions to the Circular Economy, the majority of projects are not expected to have any impact. A couple of energy-related projects will facilitate assessments of the environmental performance of buildings, e.g. through the development of Building Information Modelling (BIM) systems, although they tend to be focused on Safety and Health rather than the energy performance of the building. Among the non-energy driven projects (three in total) focusing on construction material, one explicitly mentioned a contribution to the recovery of valuable resources and adequate waste management in the construction and demolition sector, while another one focused, at least partially, on wood as a construction material and the efficient use of bio-based resources and wood. Another project was focused on public procurement for the decontamination of brownfields. In addition, although it could be expected that projects in this area would contribute to the CE objective of facilitating assessments of the environmental performance of buildings, no project mentioned this aspect directly. Hence, the projects in the Construction-related sector had a strong focus on energy efficiency, and rarely offered entry points for the Circular Economy.

- GPP research in the Electrical & ICT equipment-related sector

With a total of about 17.9 million euros of total investment in 13 projects and an average project budget of 1.4 million euros, the Electrical & ICT equipment-related sector received the 2nd largest amount of funding.

GPP in the Electrical & ICT equipment–related sector focused on electric and electronic appliances (excluding lightning), data centre equipment, ICT, telecommunications, large and small electrical equipment (excl. detection equipment). The projects analysed within this category focused mostly on energy efficiency. The projects aimed mostly at promoting the procurement of energy efficient electric and electronic appliances, as for instance in the sector of professional cold products, or for data centres. Half of the projects had as primary goal GPP capacity building in public authorities, such as for instance the establishment of "supporting permanent structures", called G.PP.S. – Green Public Procurement Supporters (Supporting Units) within the participating Energy Agencies, to provide long-term support and technical assistance on GPP to the public authorities. The non-capacity building projects had a variety of foci: from the implementation of effective policies on energy efficiency of electrical products to the motivation of product manufacturers and suppliers in delivering more efficient models to the market and to fostering investments to launch green procurement and mainstream low-carbon procurement across Europe.

The entry point for CE was to improve energy labelling, mentioned in some of the projects. The use of the European energy label as well as other voluntary labels commonly used in the EU (Ecolabel, TCO, Energy Star) was promoted by some of the projects. One project included the improvement of data centres with applications in the waste management system of public buildings. If properly implemented, such data centres may be of relevance in monitoring exact quantities of waste produced in public buildings, and therefore contribute to the corresponding action described within the CE Action Plan.

Beyond the objectives concerning energy labelling and data centres for waste management, the projects had hardly any other entry point for the CE. Important objectives that might be pursued could be tackling planned obsolescence and fostering extended producer responsibility for electronic appliances, for instance by promoting stakeholder dialogue and establishing groups of producers and buyers. This could lead to improvements in the recovery of critical raw materials such as WEEE. Similarly, it would be important to monitor food waste quantities from public activities, for instance through the development of innovative data centres and digital solutions.

- GPP research in the Transport-related sector

With a total of about 17.4 million euros of total investment in 9 projects and an average project budget of 1.9 million euros, the Transport-related sector received the 3rd largest amount of funding.

Projects in the Transport-related sector had a variety of foci. These ranged from the efficient implementation of traditional public transport to the implementation of alternative low-carbon transportation systems including clean and energy efficient vehicles and the logistics for efficient shipping of goods and service delivery systems for public procurers. The majority of projects had a substantial focus on capacity building, enhancing for instance the transferability of best practices between different European cities, or aiming at developing a procurement plan for the implementation of efficient transport systems. Other projects focused on creating networks of individuals and organisations who were experienced in procurement of cooperative innovative technologies (ITS); enhancing collaboration between enterprises and public procurers through dialogues, technology co-operation and public tendering; or on implementing framework conditions that are favourable for cycle-logistics applications. Similar to the Construction-related sector, energy efficiency and emission reduction were the drivers for the implementation of these projects.

Notably, none of the projects in this category has a consistent impact on the CE, which is partly to be expected since the CE Action Plan is focused neither on energy nor on transport. One underrated aspect and possible entry point is the promotion of a sharing and collaborative economy in the public transport sector, e.g. fostering shared mobility or E-mobility. A number of projects already exist in this area, but with no particular emphasis on the public procurement aspect. Hence, more in-depth analysis of the procurement cycle for shared public mobility is needed, as well as an exchange of best practices and an examination of transfer mechanisms.

- GPP research in the other sectors

In total, there were 8 projects focused on different product categories: food and catering services, paper, waste, eco-innovation, water services and GPP. There were no projects focused on textiles.

- Food and Catering Services

Three projects were funded in the food and catering sector. The projects fostered innovation in the catering sector; aimed at bringing procurers and suppliers such as local farmers or fishers together; and finally at publishing a series of tenders for eco-innovative catering

products, services and solutions. Innovative food packaging, more environmentally friendly menus in canteens and schools, and regional food labelling and local markets were the targets.

Concerning the entry points for the CE, one project explicitly targeted eco-design for food packaging, while another one promoted the efficient use of bio-based resources. Nevertheless, there is big potential for GPP in the food sector, especially in tackling food waste. The topic seems not to be of relevance in the projects analysed, although there would be room for innovation in food waste prevention, food donation, or in the promotion of "best before date" good practice fields.

- Paper

Only one project focused on paper, with the goal to provide an innovative and common knowledge platform to enable future cooperation for raw material supply and collection, and finally to ensure high level quality recycled paper. With regard to the CE, such projects can impact on the achievement of long-term recycling targets, as well as contributing to improving the quality and standards of secondary raw materials.

- Waste

Two projects were found in the area of waste, with the objective of achieving sustainable waste management and sustainable consumption throughout Europe. The first project focused on capacity building and dissemination for waste management practices, while the second project focused on the development of a market for reused products. Hence, an important contribution to the CE is to increase repair services and to tackle planned obsolescence, while promoting waste prevention as well as a sharing / collaborative economy. The possibility to foster these goals through public procurement should be further explored in future programmes.

- Eco-innovation

Two projects focused on eco-innovation. Both projects aimed at promoting technological and non-technological eco-innovation, eco-innovative policies as well as networks in a holistic one-stop shop for eco-innovation. In both cases, the projects were aimed at stimulating and promoting eco-design at all stages of production.

- GPP

Three projects focused on capacity building and knowledge sharing for GPP. In particular, they aimed at improving capacity on implementing resource efficiency policies that promote eco-innovation and green growth through GPP.

- Water services

Just one project focused on water services, and in particular on putting in place an information platform for water procurement to facilitate planning of irrigation water resources, and therefore to contribute to combating water scarcity.

5.4.   Discussion and recommendations

5.4.1.   GPP-related projects and the CE

The analysis of the projects showed that in general, the focus of EC funded projects is only partially on the Circular Economy. On average, 1 in every 3 of the analysed projects had some link to the Circular Economy. For some product categories the link was more evident (e.g. food and catering), while for other product categories such as transport the link was absent.

So-called circular procurement offers several entry points for GPP although the question is more if research can offer relevant support. Since GPP normally makes use of products and services which are produced for private consumption, the relevant question for public procurers is not so much how to develop such products and services (e.g. through eco-design etc), but rather how to integrate them into public procurement. In other words, while eco-innovation projects thrive in EU funding programmes like Horizon 2020, and will certainly contribute to the achievement of a more Circular Economy (see for example the H2020 working programme on "Industry in the Circular economy"), the uptake of such innovative solutions might happen also without the need for additional research on GPP (e.g. an energy efficient light bulb will work in the same way in a public and in a private building).

The question is how research can help bring about a rethinking of common public procurement practices in order to integrate those aspects which enhance a Circular Economy, while at the same time enabling economies of scale. Public procurement of innovation can help to bridge the gap between the development of an innovative product and its dissemination in the market, because public consumers are usually big consumers. In addition, there are products that are only to be found in public consumption (for example some defense articles, road construction, traffic signals), hence the question would be how these particular purchases can address the Circular Economy.

Taking into account the priority areas of the Circular Economy, possible further areas of investigation might be:

- Further promotion of extended producer responsibility schemes.
- Promotion of waste prevention, e.g. through procurer platforms for an exchange of best practices. The promotion of waste prevention could be also supported by capacity building among workers, although here the question is always how research could contribute to this.
- Promoting a sharing / collaborative economy, for instance through the promotion of e-mobility sharing, or through the implementation of reuse / sharing schemes among employees (e.g. for private goods), or with charity organisations.
- Increasing the promotion of plastic recycling, e.g. through further in-house separation, or the implementation of data centres to monitor plastic waste generation and its quality.
- Tackling planned obsolescence, e.g. by requiring contracting companies to guarantee a minimum durability of a wide range of products such as electronic appliances or textiles.
- Preventing food waste through education and promotion of good in-house practices among workers and employees such as surplus food sharing.
- Improving the recovery of critical materials such as WEEE, establishment of collection centres, collection points, or agreements with education centres (e.g. technical education institutes) for the handing over of end-of-life appliances.

In some cases some degree of innovation will be required, although in many cases the key point would be a better organisation of public institutions, education of employees, the implementation of platforms or networks for the exchange of best practices, the implementation of cascade systems for the reutilisation of products or the implementation of action plans and roadmaps, e.g. for food donations or waste prevention.

Table 9 below provides a summary of entry points for the CE in GPP, based on the outcomes of this task, as well as proposed entry points for the CE which might be included in upcoming research programmes. As for the entry point for the CE in GPP, a distinction can be made between "widely investigated in research" (***), "partially investigated in research, e.g. just one or two projects" (**) and "not investigated in research" (*).

Table 9:   Entry points for CE in GPP-related research

GPP product category	GPP-related research
Construction	Contributing to recovery of valuable resources and adequate waste management in the construction and demolition sector (**) Promoting efficient use of bio-based resources and wood (**) Facilitating the assessment of the environmental performance of buildings (*)
Transport	Promoting sharing / collaborative economy in the transport sector (*)
Electrical & ICT equipment including data centres	Improving energy labelling (***) Creation of information systems for waste management (**) Tackling planned obsolescence (*) Fostering extended producer responsibility (*)
Waste	Promoting waste prevention (*)
Food and catering	Eco-design for packaging (**) Preventing food waste (*) Measuring food waste (*) Facilitating food donations (*)
Furniture	Achievement of long-term recycling targets for paper (**) Contributing to improving the quality and standards of secondary raw material (**) Increasing repair/reuse/exchange services for end–of-life goods among workers, promoting a sharing / collaborative economy (**)
Water services	Combat water scarcity (**)
Textile	Promoting Eco-design for textile products (*) Promoting Extended Producer Responsibility (*)
Eco-Innovation	Promoting Eco-design for generic products (***)

Entry points for the CE in GPP: widely investigated in research (***), partially investigated in research, e.g. just one or two projects (**), not investigated in research (*)

6. THE STATUS OF NATIONAL ACTION PLANS (NAP) ON GPP IN THE EU MS AND HOW THE CE ACTION PLAN COULD CONTRIBUTE TO THEIR DEVELOPMENT

KEY FINDINGS

An overview of the level of development and implementation of GPP NAPs with a focus on the 23 Member States (MS) which have already adopted GPP-NAPs indicates that most of the NAPs are in line with the requirements defined in the Communication from the European Commission on the Integrated Product Policy - Building on Environmental Life-Cycle Thinking (COM (2003) 0302 final). In this respect the most complete results are the GPP-NAPs of Belgium, Ireland, Italy, Latvia, and Portugal.

In most Member States the practical implementation of green aspects in public procurement according to their GPP-NAP is already at a sufficiently high level. Indicators for this evaluation were training and information, cooperation, product group databases, tender models and monitoring activities. In this evaluation the frontrunners are Austria, Belgium, Denmark, France, Italy, Netherland, Portugal, Spain, Sweden and UK. This list of Member States includes countries with a long experience in GPP, with the first GPP-NAPs adopted in 2008 or before (except Austria 2010).

A comparison of these two evaluations shows that there is not necessarily a connection between them. A NAP which is in line with the provisions of COM (2003) 302 is not necessarily a precondition for an exemplary implementation of GPP and vice versa.

The main reasons for lagging behind in the implementation of the GPP-NAPs are delays in development, gaps of information exchange, control, monitoring and reporting as well as financial burdens. In addition, GPP regulations are not always mandatory; if they were, they would bring a significant boost to implementation.

Even though many GPP-NAPs were published before the Circular Economy Action Plan, they already contain elements contributing to circularity. The evaluation shows that most of the links between GPP-NAPs and the Circular Economy Action Plan can be found in the categories "Production" and "Consumption" of the Circular Economy Action Plan.

6.1.   Aim of this chapter

The aim of this chapter is to show the status of National Action Plans (NAP) on GPP in the European Member States and to identify how the Circular Economy Action Plan could contribute to their development.

6.2.   Methodology approach

In 2016 the European Commission published its latest review (EC GPP web 2017) on the GPP NAPs. The document "National GPP Action Plans (policies and guidelines)" contains a comprehensive overview of the state of affairs in the 28 EU Member States (last updated in November 2016). Based on this review, the existing National GPP Action Plans (GPP-NAPs) were screened as a starting point. Most of the GPP-NAPs are written in the national language which hampers an in-depth assessment without contacting the authors of the NAPs. For the

GPP-NAPs of the Netherlands, Latvia, and Sweden and to some extent of Slovenia, English translations were available. Altogether, in-depth assessment was possible for 13 NAPs through multilingual translation. The following table shows an overview of the national GPP-NAPs and their available translations.

Where NAPs were available online at national level, the relevant website was screened and the information gathered.

Table 10:   Overview of the GPP-NAP of EU-28

Overview of the GPP-NAP	Member States
GPP-NAPs in English	Ireland, Latvia, Netherlands, Sweden, United Kingdom, Malta
GPP-NAPs in the national language spoken by project team members	Austria, Belgium, France, Germany, Italy, Portugal, Spain
GPP-NAPs available in the national language (no English translation)	Bulgaria, Czech Republic, Denmark, Finland, Lithuania, Poland, Slovakia, Slovenia, Croatia
GPP-NAPs not available online	Cyprus
No GPP-NAPs adopted	Estonia, Greece, Hungary, Luxembourg, Romania*

* Romania is currently working on a GPP-NAP which has not been adopted yet

To update the status of the NAPs, experts in the Member States were contacted. The relevant contact persons were members of the GPP Advisory Group[7] and the EIONET group. The experts were asked for an update of the current status of implementation of their NAP. The questions addressed to the Member State experts are listed in the questionnaire template as shown in chapter 9.2. They relate to the following main issues:

- Determination of the extent to which the NAP has been **developed** to identify areas with a need for improvement and gaps in the development;

- Determination of the extent to which the NAP has been **implemented** to have an idea of the progress made with putting GPP into practice;

- Identification of the elements of the GPP NAPs that most contribute to the implementation of the **CE Action Plan** and vice versa, and how the CE Action Plan could contribute to the development of GPP NAPs;

- Identification of **reasons for lagging behind** in the implementation of GPP NAP and how the CE aspects could be helpful in removing the obstacles;

- Information about **plans to revise the GPP NAP** at Member State level in the near future according to the needs of the recently published Circular Economy Package and about those elements that are crucial;

- Information about **cooperation** with other Member State and/or international bodies and if experience is available on the exchange of expertise and practices.

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[7] The GPP Advisory Group is an expert group which meets twice a year and is composed of representatives of the EU Member States (and some stakeholders).

To conduct an exchange with the stakeholders, a combination of emails and standardised telephone interviews was seen as the most appropriate method to update and gain new information.

Based on the outcome of the questionnaires, the regional/national activities of each Member State were classified either as "best comprehensive practices", "good practice" or as "lagging behind" and then further analysed, in order to identify enablers of – and barriers to - the implementation of GPP at the national level.

6.3. National Action Plans on GPP

6.3.1. General aspects concerning the National Action Plans on GPP

A National Action Plan or equivalent document on GPP has been adopted in 23 Member States, while 5 Member States do not have a National Action Plan (see Table 13).

The National Action Plans were usually drafted based on the specific framework conditions of each Member State. Therefore, they differ with regard to:

- Level of development - assessment of the existing situation, targets for a three-year period, measures to achieve these targets, the topics they tackle (environment, financial, social aspects etc), revisions etc.

- Level of implementation - adoption of handbooks, workshops, conferences, helpdesks, publications, etc.; forms of cooperation such as platforms, forums, networks etc.

- Integration of Circular Economy aspects[8] - elements contributing to the Circular Economy Action Plan, plans to revise the GPP-NAPs according to Circularity; tackling areas to be improved and gaps in implementation etc.

6.3.2. Level of development concerning the National Action Plans on GPP

According to the Communication from the European Commission on the Integrated Product Policy - Building on Environmental Life-Cycle Thinking (COM (2003) 0302 final) the publicly available National Action Plans for greening the public procurement should contain an assessment of the existing situation and ambitious targets for the situation in three years' time. The action plans should also state clearly what measures will be taken to achieve this. The GPP-NAP should be drawn up for the first time by the end of 2006 and then revised every three years. The NAPs are not necessarily legally binding but provide political impetus to the process of implementing and raising awareness of greener public procurement. They allow Member States to choose the options that best suit their political framework and the level they have reached.

In screening the GPP-NAPs, an assessment was conducted to determine if the GPP-NAPs meet the provisions drafted in the Communication mentioned above. A summary of this evaluation can be found at the end of this chapter.

a. Assessment of the existing situation

Assessments of the existing situation can be found in the GPP-NAPs for instance of **Austria, Belgium, France, Ireland, Italy, Latvia, Malta, Portugal, Slovenia** and **Spain**. The GPP-NAPs which were already thoroughly revised do no longer contain an assessment of the existing situation (for example **Denmark, the Netherlands, Sweden**). As the previous versions of those GPP-NAPs are not available anymore, a further examination of this issue was not possible. It seems that the assessment of the existing situation is especially important for the first GPP-NAP. Therefore a clarification regarding this issue is

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[8] Many GPP-NAPs were published before the Circular Economy Action Plan.

recommended. It should be clear if the existing situation should be assessed only in the first GPP-NAP adopted by a Member State or in following one as well. **Denmark, the Netherlands** and **Sweden** have obviously come to the conclusion that an assessment of the existing situation is not important for further GPP-NAPs.

The following examples show the way in which the Member States have assessed the existing situation:

The description of the status quo of Sustainable Public Procurement in **Austria** is based on the results of a status quo survey carried out in 2008. Selected initiatives promoting sustainable procurement in Austria are presented. The survey provides information on the following questions:

- How often do public authorities make ecological demands in Austria? What is the level of these ecological demands and how is their compliance verified?

- Are social requirements taken into account? Which social requirements have been considered so far?

- How often is TCO (Total-Cost-of-Ownership) taken into account?

- How common is it to use functional specifications in tenders? How often are alternative offers allowed?

- How pronounced is the interest of the procurement managers in an exchange of experiences with other procurement managers on the topic of sustainable procurement?

The survey highlighted that in about 36% of the cases procurers required minimum environmental standards for the purchased products, whereas in 64% of cases no environmental requirement was indicated.

The **Irish** GPP-NAP includes a description of the national policy referring to GPP, e.g. the legal context and the existing mandatory requirements concerning GPP.

In **Latvia** the GPP-NAP contains a description of the current situation including a description of the legal basis for Green Public Procurement, of the GPP-criteria, of the inclusion of GPP requirements in EU-funded projects, of Life-Cycle Costing, of eco-labels and their importance and of the benefits of GPP. The assessment refers not only to the situation in Latvia but also in the European Union.

In **Spain** the assessment was done by means of questionnaires sent to public authorities, inquiring on the level of implementation of GPP measures for eight product categories.

In the Sustainable Procurement National Action Plan of the **UK** the assessment of the current situation is addressed in the chapter "Where are we now?" which also provides a comparison with other EU countries. It is stated that the UK is currently in the top group but not the top EU performer on green (i.e. environmental) procurement. On Green Public Procurement the EU leaders are: Sweden, Austria, Denmark, Netherlands, UK, Germany, and Finland. The Task Force believes that a more systematic approach to sustainable procurement will allow the UK to move to a leadership position.

b. Targets for the situation in three years' time

In the Commission's Communication on Public Procurement for a Better Environment, the Commission proposes a 50% target of GPP in the procurement procedures for each Member State to be reached by 2010. In September 2008, the European Council welcomed this political indicative target of 50% GPP tendering per Member State leaving the Member State

the flexibility "to define its own targets in every sector to contribute to the overall 50% target" and "to apply more ambitious GPP modalities" (IE GO 2012).

The study by ADELPHI 2010 reports that the modes in which political targets are set vary and can be differentiated as follows:

- Aiming for a general level of GPP
- Obliging particular levels of government or authorities
- Stipulating targets for specific product groups

Table 11:   Focus of Member States' target setting (source: ADELPHI 2010)

	AT	BE	CZ	DE	DK	EE	ES	FI	FR	HU	IE	IS	IT	LT	LV	MT	NL	PL	PT	SI	SK	RO	UK
General	x				x							x	x	x	x			x	x				
Gov. level		x						x									x				x		
Product group			x	x	x	x	x	x	x	x	x					x	(x)			x		x	x

Among those countries with general GPP targets, three (**Latvia, Denmark** and **Portugal**) have aligned their target setting with the recommended European target level of 50% GPP (for 10 product groups) by 2010; **Iceland** is the only country that sets a more ambitious target. The **Netherlands** and **Finland** have set ambitious specific government level targets and apply them not only to the central government, but also to regional and local levels; both countries have also targets which increase progressively over time and aim to achieve 100% GPP at the central level. As shown in Table 11, targets for specific product groups are by far the most common targets among the Member States; 13 out of the 28 countries that have established GPP priority product groups and criteria also establish corresponding targets. **Romania, Slovenia** and **Estonia** make target specifications for seven, eight and nine priority product groups, respectively, while **France** specifies quantitative targets for most of its priority product groups (11 GPP-related) and the **Netherlands'** targets apply to all priority product groups. The product groups for which targets are set typically overlap with the EC GPP priority product groups.

The evaluation of the GPP-NAPs and the questionnaires shows that targets for a three years time period are defined in almost every GPP-NAP, with only a few exceptions (for instance **Sweden**). However, in many cases (for details see chapter 6.3.2.g) the GPP-NAPs were not revised every three years. Some Member States (for example **Austria** and **Bulgaria**) stated that although there was no revision of the targets, the objectives were still relevant and valid. Therefore it should be considered leaving the Member State the flexibility to define targets for a longer period.

The targets are set in a both quantitative and/or qualitative manner. The percentages rely on the application of GPP in the procurement procedures. For example the target "95% for IT products" means that 95% of the purchased IT products should be procured in line with the GPP provisions. In many cases the targets are related to priority product groups such as construction and buildings, vehicles, paper, food, cleaning products and services etc. (for example in the **Czech Republic, Finland, France, Germany, Ireland, Malta, Slovenia, Spain, Sweden**). Some Member States have target percentages concerning the total volume of public procurement (for example **Netherlands, Latvia, Denmark, Lithuania, Slovak Republic**). **Austria, Bulgaria** and **the Netherlands** have qualitative but no quantitative targets.

Compared to the latest review (EC GPP web 2017) on the GPP NAPs of the European Commission the following new or more concrete aspects have been detected:

Austria has four qualititative targets; the most important one is that sustainable procurement must be considered by all public procurers.

Bulgarian specific annual targets are set for 2012, 2013 and 2014, as the share of green procurement of the total number of contracts awarded. The target values are increased over the years. The goals are mandatory for central administration and recommended for the local administration. The selection of product groups is consistent with the limitations of the national market, the opportunities for businesses to offer environmental goods and services and the capacity of procurers.

Denmark has adapted the indicative political target of 50 % of GPP as referred to in the Communication on EU GPP. The Partnership on Green Public Procurement is a partnership between front runner municipalities, regions and other public organisations. Joining the partnership is voluntary, but the partners signing up commit the organisation to follow specific green procurement criteria within 11 different product groups (for example food, transport, cleaning products, lightning). For each product group the partnership has formulated some targets/criteria for the procurement.

Finland aims at near-zero energy building after 2017 in the new construction of public buildings, a reduction in energy consumption of public sector transportation and personal transportation by 10% in the period 2012-2015 by means of smart logistics solutions, employer-provided commuter tickets and remote and teleconferencing technologies. The percentage of new motive power solutions used (e.g. electric, ethanol, natural gas or hybrid) shall account for at least 30% of all vehicles in use. In addition, 10% of the food served in public institutions shall be organic by 2015 and 20% by 2020.

The Federal Administrations in **Germany** have amongst others the targets that 50% of textiles procured are sustainable, an increase of the share of recycled paper with the Blue Angel (95% by 2020), the reduction of the CO_2 emissions of the fleet (by 2018 average emission value of 110 g CO_2 / km, by 2020 95 g CO_2 / km), the procurement of vehicles with the highest exhaust emissions standards and low noise emissions. The procurement of electronic equipment with the highest energy efficiency is a mandatory application for all federal authorities, minimised lifecycle costs has to be considered, sustainability features in ICT framework contracts, e.g. energy efficiency have to be identified.

Ireland has a 50% target for eight priority product groups (Construction, Energy, Transport, Food and catering services, Cleaning products and services, Paper, Uniforms and other textiles, ICT).

In the **Netherlands** there are qualitative but no quantitative targets in the 5-year action plan. SPP is seen as an instrument contributing to realising policy objectives with sustainability as a regular part of the procurement process.

In **Romania** the NAP will include quantitative targets and the percentages that have been taken into consideration by now are up to 5% of GPP by 2020. As mentioned before Romania is currently working on a GPP-NAP, but it is not adopted up to now.

The NAP GPP for the **Slovak Republic** is set up for the period 2016-2020. The general target of GPP NAP for 2016-2020 is to reach 50% of GPP in all tendering procedures for the Central Government.

The **Slovenian** targets are: Construction and buildings 30 %, Cleaning 60 %, Electronic office equipment 95 %, Vehicles 40 %, Electricity 100 %, Furniture 50 %, Paper 70 %, Food 40 %.

c. Measures to achieve the defined targets

According to the Communication from the European Commission on the Integrated Product Policy - Building on Environmental Life-Cycle Thinking (COM (2003) 0302 final) the action plans should also state clearly what measures will be taken to achieve the ambitious targets for the situation in three years' time. At least 18 Member States (for details see chapter 6.3.2.g) have defined measures to reach the aimed objectives. In most of the countries the measures are aimed assisting the procurers. In this respect for instance a helpdesk is installed, handbooks are published. In addition, networking of the procurement managers and exchanges of ideas are facilitated by installing for example platforms. Publication and dissemination of information are conducted to raise the awareness among stakeholders.

The following information concerning the measures in the Member States has been obtained by analysing the GPP-NAPs and the answers in the questionnaires.

In order to achieve the objectives, several measures have been implemented in **Austria**. On the one hand, these are operational measures designed to assist procurement managers in the implementation of sustainable procurement, such as a helpdesk. These operational measures are presented in the second part of the action plan, which deals with a handbook of guidance specifically for procurement managers. On the other hand, eight measures aiming at the process of implementing the action plan are described: Networking of the procurement managers; Expert group for budgetary questions; Expert group for the development of social criteria; Increasing the knowledge base on cost effects of sustainable procurement; The federal authority strengthens its pioneering role and uses the results of the pilot phase; Monitoring of the implementation of the action plan; Evaluation of the action plan; Information for suppliers and contracting authorities.

In **Belgium** there are several measures defined such as updating of labels, product tests, Corporate Social Responsibility, application of life cycle costing, study on bioplastics etc.

The **Bulgarian** GPP-NAP contains green criteria for procurement procedures which are mandatory for a given period for the procurement of the Ministry of Environment and Water. The measures are: building the necessary administrative capacity for the implementation of mandatory and recommended targets for the identified product groups - providing methodological guidance, training of contracting authorities, dissemination of information and best practices; raising awareness among stakeholders about the nature, implementation and benefits of Green Public Procurement - publication of information; creating an information environment for the exchange of ideas, knowledge, experiences and best practices on green procurement - electronic exchange of information; creating a system to monitor the National Plan for Green Public Procurement - analysis and reporting on the performance of mandatory and recommended goals.

In **Denmark** it is up to each member of the partnership to ensure that the targets are met.

The **Irish** GPP-NAP contains a list of key actions which is a summary of actions proposed for green procurement in each of the eight sectors (Construction, Energy, Transport, Food and Catering Services, Cleaning Products and Services, Paper, Uniforms and Other Textiles, ICT).

In **Latvia** three action lines are proposed for the achievement of GPP targets, such as improvement of the institutional system and regulatory framework; methodological management and monitoring, and promotion of GP and GPP.

In **Lithuania** there are certain measures and terms for the achievement of the defined targets, e.g. revision and renewal of GPP teaching programme in 2017, seminars for contracting authorities dedicated to GPP, educational material, recommendations, consultations on GPP for the period of 2016-2020, publication of information on environment

friendly products, environmental criteria and information on internet sites (2016-2020), gathering of GPP statistical data (2016-2020) and others.

d. Revision every three years

The chronology of the first NAP drawn up in each Member State is shown in Figure 9.

Figure 9:   NAP chronology (source: ADELPHI 2010)

A majority of countries have developed NAPs since 2006 (with the exceptions of the Netherlands and Denmark, which started earlier).

In some Member States (for example the **Netherlands**), the National Action Plan was fundamentally revised, while others (for example **Austria, Bulgaria, Czech Republic, Finland, France, Malta, Poland, Slovenia, Spain** and **UK**) are still working with their first National Action Plan, therefore in these countries the GPP-NAPs are in need of a revision (for details see chapter 6.3.2.g). In **Austria, the Czech Republic** and **Malta** the GPP-NAPs are currently under revision. As mentioned in chapter 6.3.2.b it should be considered giving the Member State the flexibility to draw up NAPs for a longer period of time.

Nevertheless, even though the GPP-NAPs have not been revised, in many countries additional extensions are published online. Therefore taking a look not only at the GPP-NAPs but also at the websites in which the GPP-NAPs are embedded is highly recommended to assess the initiatives established in addition to the GPP-NAPs.

e. GPP-NAP documents embedded in websites

Whereas some Member States adopted the NAPs in the form of published reports (for example **Austria, France, Ireland, Latvia, Malta, Portugal, Spain, Slovenia, UK** etc.), others do not have printed documents and use only web pages to publish information about GPP (for example **Germany, the Netherlands, Sweden** etc).

f. Topics tackled in the GPP-NAP

Regarding the topics tackled in the GPP-NAPs, in many countries there are not only provisions for greening public procurement, but also financial and social aspects in addition to environmental aspects (for example in **Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden, UK**). In these cases "Green Public Procurement" is extended to "Sustainable Public Procurement" (for definitions see chapter 1.2.2 and EC GPP web 2017).

The answers in the questionnaire show that Member States still place the focus especially on resource efficiency:

The first **Bulgarian** GPP-NAP tackles mainly environmental considerations whereas first considerations show that the next GPP-NAP will also aim to reduce environmental impacts and increase resource efficiency.

The **Czech** GPP-NAP mainly tackles the reduction of environmental impacts and increasing resource efficiency.

Denmark place the focus on sustainability as an instrument to create a more resource-efficient society with a more efficient and effective use of resources and green transition in businesses. Focus areas are environmental and energy requirements, the development of green solutions and taking corporate social responsibility and social concerns into account, including clauses on social and labour issues.

Increasing resource efficiency (including energy efficiency) is also a main topic in the **Finnish** GPP-NAP e.g. minimising CO_2 emissions or reducing harmful environmental impacts.

In **Lithuania** the strategy covers four priority areas of environmental protection policy: sustainable usage of natural resources and waste management, preservation of ecosystem stability, improvement of environmental quality, climate change mitigation and adaptation to the environmental changes caused by climate change.

g. Evaluation of development of GPP-NAPs: In-depth analysis of each Member State

Table 25 in chapter 9.8 in combination with Table 12 sum up the assessment described in the chapters above concerning the development of the GPP-NAPs.

Table 12:   Level of development of the national GPP-NAPs of EU-28

	Lavender	**Turquoise**	**Yellow**
Definition	*In line with COM (2003) 302*	*Partially in line with COM (2003) 302*	*Insufficient Compliance with COM(2003) 302*
Countries[9]	Belgium, Ireland, Italy, Latvia, Portugal	Austria, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Netherland, Poland, Lithuania, Malta, Slovakia, Slovenia, Spain, Sweden, UK	Estonia, Greece, Hungary, Luxembourg, Romania
Development		Revision of NAP (update of targets, assessment of the existing situation etc)	Adoption of NAP

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[9] Cyprus: not assessed

Comparing the GPP-NAPs with the provisions defined in the Communication from the European Commission on the Integrated Product Policy - Building on Environmental Life-Cycle Thinking - COM (2003) 302, **Belgium, Ireland, Italy Latvia** and **Portugal** show the most complete results. The GPP-NAPs of these countries are in line with COM (2003) 302. They contain an assessment of the existing situation, targets for a three-year period, measures to achieve these targets and they are revised every three years.

The so-called frontrunners which have a greater amount of experience in GPP like the **Netherlands** (first NAP in 2003) and **Denmark** (first NAP in 1994) are not in the top group. As mentioned in chapter 6.3.2.a it is recommended that the requirements regarding COM (2003) 302 should be revised or replaced. For example, it should be considered giving the Member State the flexibility to define targets for a longer period, to revise the GPP-NAPs at longer intervals and to no longer assess the existing situation in each revised GPP-NAP.

6.3.3. Level of implementation

In order to obtain an overview of the level of implementation of GPP, the application of certain measures has been assessed. These measures are:

- Training and information such as workshops, conferences, handbooks, helpdesks, publications etc;
- Types of cooperation (platforms, forums, networks etc);
- Product group databases;
- Tender models; and
- Monitoring activities.

a. Training and information

The study by ADELPHI 2010 shows that complementing national policies, disseminative approaches by means of providing information, networking, training or incentives are most widespread for promoting the implementation of environmental policy objectives in procurement. Activities addressing GPP are present in every country, even in cases where the national policy is still under development. Almost half of the Member States with strategic approaches to GPP also oblige federal or central government bodies in some way to integrate environmental and individual social policy objectives in procurement.

The evaluation of the answers in the questionnaires confirms that every Member State engaging in Green Public Procurement has some kind of training / information on Green Public Procurement. No country indicated that it had nothing in place. Training / information activities are dedicated for example to procurers, contracting authorities, decision-makers, representatives of business and suppliers. Conferences, seminars, workshops and discussions in working groups on the topic of GPP are organised periodically. The topics of these activities are for instance general information about GPP, the implementation of GPP criteria and practical guidance on public procurement with examples on how to use GPP criteria. One of the main objectives of these activities is to raise the awareness of GPP.

In some countries (**Austria, Cyprus, Germany, Sweden**) special awards on GPP are granted for good practices, for example in Sweden for the greenest contracting authority and the greenest supplier.

Information material - for example handbooks and publications - are published and helpdesks have been set up for e-mail and telephone correspondence and with websites on GPP (for example with "Frequently Asked Questions"), and guidelines and manual are provided to give support and assistance for practical issues in almost every Member State.

In **France** a certain number of hours of training in sustainable development are mandatory, Italy publishes monthly newsletters on GPP and Sweden has free online GPP training.

b. Cooperation

Only with a few exceptions (for details see chapter 6.3.3.f) cooperation activities are established in most of the countries. Above all, cooperation with procurement organisations in other Member States (EU GPP Advisory Group) is mentioned in the questionnaires. Especially in the Nordic countries (**Finland, Sweden, Denmark**) collaboration on green procurement is established in the Nordic Council of Ministers and in a working group on sustainable consumption and production.

Cooperation at the national level comprises for example the installation of networks for procurers to exchange experiences in GPP at the federal, regional and local level. The websites mentioned above are also used for means of cooperation - for instance as a forum for sustainable procurement such as a knowledge sharing network involving both public and private sector organisations. The installation of networks on GPP can be found in **Austria, Belgium, Denmark, Germany, France, Portugal** and **Spain**. For example, **Dutch** authorities are obliged to publish their national and European tenders on a Tenderned's announcement platform, so businesses can access all public publications from a single webpage.

c. Product group database

The evaluation of the questionnaires shows that product group databases are established in several Member States (for example in **Austria, Belgium, Croatia, Denmark, Finland, France, Italy, Lithuania, Netherlands, Portugal, Slovenia, Spain, Sweden, UK**). In these product group databases, information about product data concerning GPP can be found. In Sweden registration is required for the use of the product group database.

d. Tender models

The availability of tender models is one further indicator to assess the level of implementation of GPP in Member States. According to the questionnaires, approximately half of the Member States have tender models in use (for details see chapter 6.3.3.f). Bulgaria intends to develop tender models which will be part of a practical handbook.

e. Monitoring

The study by ADELPHI 2010 reports that monitoring and evaluating policy implementation is of further importance when assigning public procurement the role of fostering certain additional public policy objectives. In proposing that GPP levels reach 50% by 2010 in each Member State, the Commission Communication of 2008 also requires verification (European Commission 2008). The monitoring of such public procurement and related expenditures remains in general weakly developed and comparatively inconsistent throughout Europe. Generally, where GPP NAPs or equivalently targeted policies are in place, the importance of evaluation and monitoring is underlined and most frequently addressed. Although targets (found in 25 Member States) are more common than established monitoring systems (found in approximately one third of the Member States), the extent of monitoring typically corresponds to a country's degree of target setting; mandatory GPP targets are commonly accompanied by monitoring systems to measure and ensure compliance. Countries with GPP targets going beyond the common European target of 50% by 2010 – including **Austria, the Czech Republic, France, Germany, the Netherlands, Spain** and **Sweden** – thus also have more extensive monitoring systems in place. Some countries with general or less ambitious targets (such as **Belgium, Estonia, Lithuania, Romania** (draft), **Portugal,**

Slovakia and **Slovenia**) also have limited systems in place to monitor the corresponding shares of GPP.

The evaluation of the answers in the questionnaires shows that monitoring instruments to evaluate the implementation of GPP can now be found in almost every Member States (for details see chapter 6.3.3.f). Monitoring systems have been established to measure progress on GPP ; in many cases the monitoring systems of the Member States are accompanied by reports on the progress of implementation (for example in **Austria, Denmark, Latvia, Lithuania, Poland, Spain**). Monitoring systems differ considerably in terms of continuity (continuous, annual, and occasional) and in terms of the data they are based on (statistical data, questionnaires, and benchmarks).

Compared to the latest review (EC GPP web 2017) on the GPP NAPs of the European Commission the following new or more concrete aspects have been detected:

In **Bulgaria** monitoring is carried out on the basis of statistical data of the national procurement register (PPR). The electronic register for public procurement of the Public Procurement Agency allows for making inquiries concerning GPP for specific product groups. The **Danish** Secretariat of the Partnership conducts an annual survey (questionnaire) among all the members to find out how well they follow the targets/recommendations. In **Finland** occasional monitoring based on calls for tenders within a given timeframe is carried out. In the **Netherlands** a benchmark is being developed and parallel research on impact monitoring is conducted.

f. Evaluation of the implementation of GPP-NAPs: In-depth analysis for each Member State

Table 26 of chapter 9.9 and Table 13 sum up the assessment described in the chapters above concerning the implementation of the GPP-NAPs.

Table 13: **Level of implementation of the national GPP-NAPs of EU-28**

	Lavender	Turquoise	Yellow
Definition	*Handbooks, work-shops, conferences, helpdesks, publications, platforms, forums, networks, monitoring, product group database, tender models*	*Partial implementation of handbooks, work-shops, conferences, helpdesks, publications, platforms, forums, networks, monitoring, product group database, tender models*	*Insufficient implementation of GPP*
Countries[10]	Austria, Belgium, Denmark, France, Italy, Netherland, Portugal, Spain, Sweden, UK	Bulgaria, Croatia, Czech Republic, Germany, Finland, Ireland, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia	Estonia, Greece, Hungary, Luxembourg, Romania

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[10] Cyprus: not assessed

	Lavender	Turquoise	Yellow
Implementation		Implementation of the missing aspects	Adoption of NAP

The evaluation of the indicators used (training and information, cooperation, installation of product group databases, tender models and monitoring) shows that **Austria, Belgium, Denmark, France, Italy, Netherland, Portugal, Spain, Sweden** and **UK** achieved the best results.

This list of Member States includes especially countries with a long experience in GPP. In these countries the first GPP-NAPs were adopted in 2008 or before (except **Austria** 2010). A comparison of this evaluation with the one in chapter 6.3.2.g shows that there is not necessarily a connection between the two evaluations. A NAP which is in line with the provisions in COM (2003) 0302 final is not necessarily a precondition for an exemplary implementation of GPP and vice versa.

This list of countries corresponds to some extent to the front runners (**Austria, Belgium, Denmark, France, Finland, Germany, the Netherlands, Norway, Sweden** and **the United Kingdom**) identified by DG ENV in 2011 (EC 2011), when the status of GPP in each state in Europe was evaluated.

6.3.4. Reasons for lagging behind

The aim of this analysis is to identify barriers which hamper the implementation of GPP activities at national level. According to COM (2017) 0063 final in some countries, a lack of financial and human resources poses an obstacle to implementation, as this prevents the authorities from preparing and implementing investment projects. Even when financing is available, local authorities sometimes lack the human resources and/or the know-how for organising public procurement and monitoring the quality of the service provided. For example, in the area of nature protection, a lack of capacity has resulted in the inability to carry out and monitor necessary management and conservation measures.

The answers in the questionnaires indicate that the main obstacles are gaps in development and implementation, financial burdens and the fact that GPP regulations are not mandatory.

In **Estonia, Greece, Hungary, Luxembourg** and **Romania** there are no GPP-NAPs, whereas in **Romania** it has been prepared but not adopted. There is no significant information about the reason for lagging behind in these countries. The administrative capacity in these Member States may be insufficient in the area of GPP. Nevertheless, in **Luxembourg** there are some GPP activities (the adoption of a draft law on public procurement law by Parliament is foreseen for June 2017).

The following information about the reasons for lagging behind in the implementation of GPP in the Member States has been extracted from the answers of the national experts on GPP in the questionnaires. It cannot be verified how extensive or common they are.

a. Gap in development

Gaps can be found in the developments towards achieving the targets. In **Bulgaria** for example quantitative targets for a share of GPP has not been implemented and in **Spain** the plan focuses more on general targets rather than on specific measures. In **Slovenia** only one out of 14 proposed measures has been implemented and in **Spain** the plan does not include all the specific groups of products and services which have been established by the European Commission.

b. Gap in implementation

i. Gaps in information, promotion and dialogue

Room for improvement was detected in the following fields:

- Information of all public buyers concerning the strategic guidelines regarding sustainable purchases

- The development of a common culture and common practices should be improved

- Sufficient knowledge, skills and understanding to set up relevant green requirements
- Time to conduct a market dialogue
- Practices and information on the social dimension in procurement
- Practical advice on how to include green criteria in the procurement process
- Technical and communications support at regional and local levels (help desks) during the implementation phase

ii. Gap in control, monitoring and reporting

The following gaps have been identified:

- Insufficiencies or gaps in the control of the implementation of public contracts

- Difficulties in monitoring even in one and the same public body

- Reporting is lagging behind e.g. because the reporting system is not user-friendly

iii. Gap in training

Gaps in training can be found as follows:

- employees/contracting authorities in charge of tendering process are not qualified enough to introduce environmental technical specifications

- Consulting functions should be given more attention (recommendations and teaching material for contracting authorities, more seminars dedicated to GPP etc)

c. Gap in commitment in some bodies

A need for improvements was detected in:

- Gap in the commitment to introduce GPP policy in some bodies

- GPP refers only to the central level, not to regional levels, because autonomous communities and local entities have their own competences in public procurement

- Gaps in political support in public management layers for the implementation of innovative tenders. This may be related to gaps in good case examples that illustrate the benefits and support the public purchaser in calculating the economic and environmental benefits or consequences of green procurement
- Gaps in the interest of institutions to cooperate on GPP

d. Non-mandatory regulation

The **Netherlands** stated that the reasons for lagging behind in implementing GPP could be found in cases where green and Sustainable Public Procurement is built only on a voluntary approach. Procurement is not an instrument in its own right but part of organisational management systems, including schemes for setting ambitions, facility management and asset management. Procurement has an integrated and strategic role which requires more attention.

e. Financial burdens

Financial burdens were identified as an obstacle in implementing GPP.

6.4.   Link to Circular Economy

a. Which elements of the NAPs contribute most to the Circular Economy Action Plan?

Even though many GPP-NAPS were published before the Circular Economy Action Plan, there are already a few elements in the GPP-NAPs which contribute to the Circular Economy Action Plan. The Member States were asked in the questionnaires in which areas they would recognise the main contributions of the GPP-NAPs to the CE Action Plan.

The evaluation shows that most of the links between GPP-NAPs and the Circular Economy Action Plan can be found in the category "Production". Concerning product eco-design, the "reusability of products" and the "life-cycle cost" approach was mentioned. "Resource efficiency" was quoted by some Member States (see Table 14) - which would also be a contribution to the "Production" category of the Circular Economy Action Plan.

In the category "consumption" of the CE Action Plan "reuse" and "waste prevention" was mainly cited.

Some inputs can also be found in the category "Construction and demolition", where **Germany, Finland** and **Spain** identified some links to the Circular Economy Action Plan.

The **Netherlands** (see point 9 below) mentioned a mechanisms that implement a specific strategy for a Circular Economy. As this is an integrated Circular Economy strategy it is not possible to assign it to a special category of the Circular Economy Action Plan.

A model or guidance document could be developed that enables and encourages Member States to include the Circular Economy package more directly in future NAP revisions. This would focus on presenting an integrated and systemic approach to the Circular Economy rather than the approaches that this research has found.

When updating NAPs, they should more accurately reference and reflect other areas of national policy that already exist. For example, in the UK public procurement has a construction strategy, food waste strategy and a CRM Action plan that are not mentioned in the NAP. Similarly, the Dutch NAP does not mention their 30 circular category action plans.

In detail the following links between the GPP-NAPs and the CE Action Plan were detected:

Table 14:   Links between GPP-NAPs and the Circular Economy Action Plan

Area	Measure from CE Action Plan	GPP-NAPs[11]
Production	Promoting Product Eco-design	1) 3) 7) 10) 11)
	Promoting BAT waste management and RE in the industrial sector	1) 2) 3) 6) 11)
	Promoting Extended Producer Responsibility	
Consumption	Improving labelling for energy	
	Increasing repair services	1) 8)
	Tackling planned obsolescence	
	Promoting waste prevention	4) 6)
	Promoting sharing/a collaborative economy	
Waste Management	Contributing to achieving long-term recycling targets (MSW and Packaging)	
	Monitoring of waste quantities	

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[11]   The numbers refer to the text below the table.

Area	Measure from CE Action Plan	GPP-NAPs[11]
	Improving/ Investing in waste management infrastructure	4)
From Waste to resources: bosting the market for secondary raw material and water reuse	Contributing to Improving the Quality of Standards of secondary raw material	
	Contributing to the recycling of nutrients	
	Contributing to combating water scarcity	
	Reducing the presence of hazardous substances in purchased products and services	
Plastic	Increasing plastic recycling	
	Reducing marine litter	
Food	Preventing food waste	
	Measuring food waste	
	Facilitating food donations	
	Promoting "Best before date" good practices	
Critical Raw Materials	Improving the recovery of critical material such as WEEE	
Construction and demolition	Contributing to the recovery of valuable resources and adequate waste management in the construction and demolition sector	3) 4) 11)
	Facilitating the assessment of the environmental performance of buildings	
Biomass and Biobased Products	Promoting efficient use of bio-based resources and wood	
Other horizontal measures	Mobilising the involvement of stakeholders for GPP and CE	
	Supporting SMEs and Social Enterprises active in the fields of recycling, repair and innovation	5)
Monitoring progress towards a Circular Economy	Contributing to the development of indicators to measures progress towards a CE	

1) In **Bulgaria** there is no special reference to the Circular Economy Action Plan, but the NAP includes elements on the reusability of products and on recycling and stressing the importance of the life-cycle cost approach.

2) All future efforts of the **Danish** EPAs in promoting green procurement are linked to the overall effort of a Circular Economy. One of the larger municipalities has contributed to a project under the Interreg Baltic Sea Regions Programme. The project aims to address the societal challenge of resource efficiency by considering innovation from a multidimensional perspective involving products, processes and new business models and by exploiting the synergies between public authorities, research institutions, SMEs and non-profit organisations in this field. A change of paradigms in the current way of using resources will be given by introducing the principles of Circular Economy thinking to the market and in the public procurement strategies and practices of partner cities.

3) **Germany** stated that in the GPP-NAP there is no explicit reference to the Circular Economy or Circular Procurement. But indirectly, targets such as the reduction of consumption of resources, water and energy or waste management (reduction of waste and recycling) have a relation to CE, for example: sustainable construction (use of recycling materials, recycling of construction and demolition waste, heat supply etc), sustainable organisation of events (recycling of food waste etc)

4) The **Finnish** "Decision-in-principle" has the following elements regarding the Circular Economy: in renovation projects, special attention shall be given to preventing the generation of waste and recycling demolition waste. Waste management procurements shall be aimed at the implementation of cleantech solutions, with an emphasis on the creation and implementation of first references in the prevention, sorting, and collection, transport, recycling and processing of waste.

5) The **French** GPP-NAP encourages buyers to develop procurements with actors in the social and solidarity-based economy involved in Circular Economy activities.

6) The **French** GPP-NAP also encourages buyers to implement the goals of the law on energy transition for a green growth (LTECV): waste prevention, life cost cycle, reduction of natural resources consumption, using of recycled, recyclable and renewable materials.

7) **Italy** intends to push promoting purchases of products made with recycled materials.

8) **Italy** also intends to push improving reuse

9) In the **Netherlands** circularity is an important topic, which is addressed separately in the implementation of the NAP. Practically this implies: training of local governments in starting Circular Procurement (using practical tenders); a Green Deal Circular Procurement for front runners, sharing experiences on tenders in a Community of Practice); developing and sharing tools and examples on how to insert circularity in practise (tools, criteria, factsheets, ambition web)

10) In **Slovakia** the elements that contribute most to the Circular Economy Action Plan are all forms of promoting GPP targeted at public procurers and focused on increasing awareness. Raising GPP awareness means more public procurers who apply GPP which leads to a higher contribution to the CE, including an effort to stipulate binding criteria for specific product groups based on market analysis

11) In the **Spanish** Action Plan especially the measures which focus on a more effective and efficient use of resources (e.g. energy, paper, buildings, transport etc) are important in terms of "Circular Economy".

12) The **Swedish** strategy document stresses the life cycle perspective on sustainable procurement.

b. Plans to revise the GPP NAP according to the Circular Economy

According to the answers in the questionnaires several Member States have plans to revise their GPP NAPs. It does not seem that the main motivation for these plans comes from the EC Circular Economy Action Plan, but nevertheless, in revising the GPP NAPs an additional aspect of the CE will be taken into account:

Table 15:   Evaluation of plans to revise the GPP-NAP of EU-28

Plan to revise the GPP NAP according to Circular Economy	Plan to revise the GPP NAP for other reasons	No plan to revise the GPP NAP	Not assessed
Croatia (1), France (2), Italy (3), Malta (4), Slovakia (5)	Austria, Czech Republic, Spain	Belgium, Bulgaria, Denmark, Finland, Germany, Lithuania, Netherland, Portugal	Estonia, Greece, Hungary, Ireland, Latvia, Luxembourg, Poland, Romania, Slovenia, Sweden, UK

In the following, details are listed for those Member States which plan to revise the GPP NAP in line with a Circular Economy:

(1) In **Croatia** the second GPP-NAP is planned by the end of 2017 and a Circular Economy Action Plan will certainly be considered.

(2) In **France** the State purchasing directorate is already involved in national working groups dedicated to the Circular Economy, life cycle costs and biomaterials. The results of these studies will be integrated as additional actions in the GPP-NAP.

(3) The **Italian** GPP NAP is currently under revision especially to underline its links with the Circular Economy Action Plan and to state that the national GPP criteria will be more targeted to promote Circular Economy production models. This will include for instance the revision of textile products, the inclusion of chemicals criteria, an award criterion for repair and reuse, and an award criterion for textile products remanufactured or with a recycled fibre content.

(4) In **Malta** GPP is increasingly being seen as encapsulating the principles of sustainable consumption and a contribution towards achieving a more resource efficient economy. In this regard, the second NAP is set to include more criteria addressing Circular Economy namely the criteria for indoor lighting and office building design, construction and management.

(5) **Slovakia** plans to revise the existing NAP-GPP in the near future, especially in the light of the Circular Economy. A market analysis of which products entering the GPP competition are the most relevant and what their share is on the market is going to be conducted in the course of 2017. Then, binding criteria for the most relevant product groups will be stipulated.

7. CONCLUSIONS AND POLICY RECOMMENDATIONS BASED ON THE RESEARCH AND ANALYSIS CONDUCTED AND DESCRIBED ABOVE

Based on the assessments carried out in chapters 3, 4, 5 and 6 and the key findings, recommendations for a better approach in the future were developed. The recommendations and measures take into account identified barriers and drivers for a better integration of CE into GPP procedures and provide decision makers with a pool of options for taking circularity to a higher level. In the following, the main outcomes and relevant recommendations are presented.

Basis for deriving the recommendations…

- …on the fitness of current EU GPP criteria and tools according to the CE Action Plan (see also chapter 3):

A considerable number of EU GPP criteria already havs links with the CE Action Plan. The main challenge is whether the EU GPP criteria are practicable for the procurers. Lack of practicability may hinder the implementation of certain criteria within the procurement process.

First of all, there is a large number of criteria sets (with and without links to the CE) for most of the product groups. For those criteria which have a link to the CE the market has not yet developed easily verifiable solutions, by that additional other tools have to be developed. For example, some Member States offer tools to support Public Procurement of Innovation.

As it is unknown whether the main environmental impact of public procurement comes from the 21 product groups for which GPP criteria are currently available, an assessment is needed as well as an enhancement and the development of further GPP criteria and tools. To gain the greatest benefit, the focus should be placed on those product groups which have a significant environmental impact.

To strengthen GPP further with a view to support the Circular Economy, all issues from the categories of the CE Action Plan (the promotion of sharing, reuse, refurbishment etc) should be taken into account in the future development of EU GPP criteria. Criteria should be developed for those categories that have a higher impact and offer an easy verification process.

- …on the financing of public procurement and delivery of public services (see also chapter 4):

Evidence from pilot and demonstration projects on circular procurement and business models shows that although there is potential for closing product and material loops, significant barriers still remain around scaling up delivery. Financing the procurement of goods and services is both a challenge and an opportunity.

There is some evidence of a shift from the traditional business model of procuring and owning products to service-based and more circular outcomes. This PSS (Product Service System) trend reflects a number of product-service combinations along with a variety of financing options. In the circular procurement approach, the product-service system can facilitate a variety of cycles, both in resource use and in the ownership and utilisation of assets.

However, the circular economic contracts which are currently most commonly used are the simpler buy/buy-back model and pay-per-use model. Evidence from existing studies and

pilots (e.g. UMC Utrecht, the Netherlands; Cambridge NHS Trust, UK) show that these models can be more economical than a standard linear contracting approach.

Nevertheless, the fact remains that mainstream financing in public sector procurement does not currently encourage a shift from the traditional procurement approach let alone more Circular Public Procurement. A significant shift in financing and contracting will be required if the benefits demonstrated by the circular procurement pilots are to be scaled up across EU Member States.

- …on how EU financed research and innovation might support GPP in its better integration within the CE (see also chapter 5):

EU-funded research on GPP has so far mainly focused on energy-related topics. Although energy efficiency is a crucial environmental aspect, addressing the Circular Economy would require greater focus to be placed on material efficiency. This study has found that some important aspects of the CE have been only marginally addressed in research. These include waste prevention and food waste prevention, product design with particular reference to longer product life and actions against planned obsolescence, and the promotion of reuse and repair and of the sharing/collaborative economy in general. Future EU research framework programmes should include dedicated calls for including the CE in GPP, as highlighted above. Moreover, programmes with regional focus such as the European Regional Development Fund (ERDF) and the INTERREG might be the appropriate instruments to launch GPP-CE related calls since they aim mostly at helping regional and local governments all over Europe to develop better policy, as well as at sharing knowledge and transferring experience to improve regional development. Aspects such as local cooperation and partnerships for GPP and the CE might be enhanced under such programmes. Similarly, if future EU funding schemes on innovation and entrepreneurship (such as the EIP) are released, further working programmes on PPI and the CE can be included here.

- … on the status of the NAPs on GPP and how the CE Action Plan could contribute to their development (see also chapter 6):

This study shows that most of the NAPs are in line with the requirements defined in the Communication from the European Commission on Integrated Product Policy - Building on Environmental Life-Cycle Thinking (COM (2003) 302 final). In those Member States which have not established a NAP or an equivalent document on GPP established up to now, such plans should be adopted as soon as possible. In addition, making the development and application of GPP-NAPs or equivalent documents mandatory would foster the introduction of GPP in all European Member States. In cases where green and Sustainable Public Procurement is adopted only on a voluntary basis, a stricter approach (e.g. making it mandatory) should be considered.

Learning from so-called frontrunners with experience in GPP at a higher level, it is recommended that the requirements under < COM (2003) 302 final > should be revised or replaced. For example, more flexibility should be given to the Member States in defining targets for longer periods of time or extending the intervals between GPP-NAP revisions. Furthermore, the importance of the quantification of targets should be stressed. Where the NAP is in the process of being revised or developed for the first time a direct link between GPP and the CE should be established.

Even before the Circular Economy Action Plan many GPP-NAPs were published, which already contained elements contributing to circularity. A model (or guidance document) could be developed that enables and encourages Member States to include the Circular Economy package more directly in future NAPs. Such a model would focus an integrated and systematic approach to the Circular Economy.

Recommendations:

The recommendations are addressed to specific stakeholders, covering a wide range including national procurement agencies and Member States authorities dealing with GPP and the CE as well as standardisation institutes, both at European and national level, and the European Commission´s officials in charge of GPP and the CE.

For the implementation of the measures and recommendations the time scales short term (<4 years), medium term (4-8 years) and long term (>8 years) have been used to indicate time spans within which the proposed activities can be expected to be fully implemented and first effects may be visible.

In the following, the main recommendations for a better integration of CE aspects into the GPP framework are listed for regulatory, operative, market based and voluntary instruments:

Table 16:   Recommendations on regulatory instruments

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
1	Support the development of a fundament for the CE with a link to Circular Public Procurement	3, 4	Enhancement of Eco-design regulations: Inclusion of mandatory information about "recycled content", "designed for recycling" and "lifetime" regarding different product groups.	*European Commission and Member States*	Medium
2	Enhancement of existing standards and development of standards for testing procedures	3, 4	Enhancement of existing standards and development of standards for testing procedures to determine the lifetime of products, the recycled content and the design for recycling.	*ISO, CEN, Member States and Industry representatives*	Medium
3	To make GPP-NAPs or equivalent documents on GPP mandatory within the Member States	6	Making the development and application of GPP-NAPs or equivalent documents mandatory will foster the introduction of GPP in European Member States.	*European Commission and Member States*	Medium

Table 17:   Recommendations on operative instruments

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
1	Prioritisation of the most resource dependent products, services and works procured by public authorities in the EU ("Which are the products, services, works with the highest impact from a CE-perspective?") and development of tools to support Circular Public Procurement of the first priorities	3	Research: Which of the products, services and works procured by public authorities are most important from a CE perspective? For this question, relevant information on the amount of products, services and works procured by public authorities, their monetary value, their environmental impact (resource depletion etc) and the potential for reduction has to be collected. Management: Development of tools to support Circular Public Procurement of those product groups identified as resource-dependent hot spots.	*European Commission (DG ENV, JRC, GPP Advisory Group) and Member States*	Short
2	Produce guidance on how to use criteria to proactively create circular outcomes	3, 4	Build procurement knowledge with a view to using criteria in a more proactive way, addressing sourcing, as well as the use and disposal of products and materials.	*European Commission (DG ENV), Member States, Purchasing Bodies*	Short
3	Provision of training to improve knowledge and capacity for more strategic	3	Improve consistency in the use of GPP and increase the strategic link between procurement and	*European Commission (DG ENV) and Member States*	Short

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
	procurement approaches and outcomes		delivering policy needs (e.g. CE) rather than focusing on least cost approaches.		
4	Inclusion of specific GPP-CE-related working programmes in upcoming EU-funded research	5	EU programmes such as INTERREG, the European Regional development Fund (ERDF) and future programmes on innovation and entrepreneurship should include calls for research on GPP and the CE, especially in the context of local and regional cooperation.	*European Commission*	Short
5	Inclusion of specific GPP-CE-related topics in upcoming EU-funded research	5	Inclusion of research working programmes related in particular to: waste prevention, waste food prevention, collaborative and sharing economy, reuse, product design to tackle planned obsolescence.	*European Commission*	Short
6	Cooperation with DG ENV to develop GPP criteria that are linked to the CE using a structured approach	3	Definition of proper categories (designed for recycling, longevity, end-of-life etc) and evaluation of these categories with regard to their practicability.	*European Commission (DG ENV, JRC, GPP Advisory Group) and Member States*	Short and Medium
7	Incentivise and further develop monitoring of the application of EC GPP criteria	3	The monitoring process for evaluating the practicability, impact potential and actual implementation of EC GPP criteria on Member State level should be further developed.	*European Commission (DG ENV, GPP Advisory Group) and Member States*	Short and Medium

Table 18: Recommendations on market based instruments

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
1	Support the market to develop its own voluntary schemes for the transmission of CE information.	3	Schemes similar to the voluntary scheme "Paper profile" (developed by the paper industry) could be developed by the market that inform about the recycled content, the design for longevity or provide other CE related information.	*Industry representatives*	Short and medium
2	Encouraging a sectoral approach to the categories to improve product circularity	4	Introduction of measures such as the development of Category Plans (Netherlands) which are linked directly to the NAPs.	*Member States*	Short and medium
3	Measures to address financial barriers to improvement of the circularity of products and materials through procurement	4	Market engagement to overcome budgetary and financing barriers to take-up of non-linear business models in public sector procurement and supply chains.	*Purchasing bodies, Industry representatives, Financiers and Investors*	medium

Table 19: Recommendations on voluntary instruments

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
1	Develop information material or improve already existing documents and tools for public procurers specifically on how to include CE criteria in the tenders	3	This material should provide information on how to focus on the life cycle approach and circularity, e.g. how to include criteria for "take-back" systems, recycled content, designed for recycling etc.	*European Commission (DG ENV) and Member States*	Short

	Recommendation	Link to chapter	Sub-Measure (more detailed description)	Main Responsibility	Time scale (short, medium, long term)
2	Adoption of GPP-NAP in all Member States	6	Where the NAP is in the process of being revised or developed for the first time, a direct link between GPP and the CE should be established. A National Action Plan or an equivalent document on GPP should be adopted in those Member States where NAPs do not exist as yet.	*Member States*	Short
3	Encouraging a sectoral approach to the categories to improve product circularity	4	Introduction of measures such as the voluntary Sectoral Green Deals (Netherlands) which are linked directly to the NAPs	*Member States*	Short and medium
4	Revision of NAP requirements under COM (2003) 0302 final	6	NAP requirements under COM (2003) 0302 final should be revised or replaced. The following changes should be considered: • giving Member States more flexibility in defining targets for longer periods of time, • extending the intervals between GPP-NAPs revision. Furthermore, the importance of the quantification of targets should be stressed. In cases where green and Sustainable Public Procurement is adapted only on a voluntary basis a stricter approach (e.g. making it mandatory) should be considered.	*European Commission and Member States*	Medium
5	Development of models or guidance	6	A model (or guidance document) could be developed that enables and encourages Member States to include the Circular Economy package more directly in future NAP revisions. Such a model would focus on a CE approach that is more integrated and systematic than the approaches found in this research. In addition, there could be guidance to assist the Member States in the implementation of the GPP-NAP in an exemplary manner, for instance on handbooks, work-shops, conferences, helpdesks, publications, platforms, forums, networks, monitoring, a product group database and tender models.	*European Commission*	Medium

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9. ANNEXES

9.1. Annex A – Public procurement expenditure as % of GDP

Table 20:   Total expenditure on works, goods and services as % of GDP

Country / Region	2012	2013	2014	2015	Mean
Belgium	14.7	14.5	14.6	14.5	14.6
Bulgaria	10.6	11.7	12.9	13.7	12.2
Czech Republic	13.8	13.6	13.7	14.5	13.9
Denmark	14.9	14.6	14.7	14.5	14.7
Germany	14.8	15.1	15.1	15.2	15.1
Estonia	14.6	13.9	13.6	14.1	14.1
Ireland	9.7	9.2	9.3	7.2	8.8
Greece	10.5	10.5	10.6	10.8	10.6
Spain	10.9	10.3	10.1	10.4	10.4
France	15.0	15.1	14.8	14.5	14.9
Croatia	13.0	13.8	13.9	13.1	13.5
Italy	10.6	10.7	10.4	10.4	10.5
Cyprus	6.8	6.1	5.5	5.5	6.0
Latvia	12.1	11.8	11.6	12.0	11.9
Lithuania	10.7	10.2	10.0	10.6	10.4
Luxembourg	12.7	12.3	11.9	12.3	12.3
Hungary	13.3	14.1	15.4	15.8	14.7
Malta	10.4	9.5	10.7	11.9	10.6
Netherlands	20.9	20.5	20.3	20.0	20.4
Austria	13.0	13.2	13.1	13.3	13.2
Poland	12.4	12.0	12.5	12.2	12.3
Portugal	10.2	9.7	9.8	9.9	9.9
Romania	11.7	11.2	10.9	11.6	11.3
Slovenia	13.1	13.4	13.7	13.6	13.5
Slovakia	13.6	13.6	14.4	17.0	14.7
Finland	17.9	18.4	18.4	18.2	18.2
Sweden	16.4	16.5	16.4	16.1	16.3
United Kingdom	14.1	13.9	13.8	13.6	13.9
EU country average	**12.9**	**12.8**	**12.9**	**13.1**	**13.0**
EU total	**13.9**	**13.9**	**13.8**	**13.7**	**13.8**

Source: EC 2016b.

9.2. Annex B – Measures of the EC CE Action Plan

a. Measures taken in the production phase

- Emphasis on Circular Economy aspects in future product requirements under the Eco-design Directive,
- Eco-design work plan 2015-2017 and a request made to European standardisation organisations to develop standards on material efficiency for setting future Eco-design requirements on the durability, reparability and recyclability of products,
- Proposal for an implementing regulation on televisions and displays,
- Examine options and actions for a more coherent policy framework for the different strands of work of EU product policy and their contribution to the Circular Economy,
- Include guidance on the Circular Economy in Best Available Techniques reference documents (BREFs) for several industrial sectors,
- Guidance and promotion of best practices in the mining waste management plans,
- Establishing an open, pan-European network of technological infrastructures for SMEs to integrate advanced manufacturing technologies into their production processes,
- Examine how to improve the efficiency and uptake of the EU Eco-Management and Audit Scheme (EMAS) and the pilot programme on environmental technology verification (ETV),
- Develop an improved knowledge base and provide support to SMEs in the substitution of hazardous substances of very high concern.

b. Measures taken in the consumption phase

- Better enforcement of existing guarantees for tangible products, accompanied by a reflection on improvements,
- Action on false green claims, including updated guidance on unfair commercial practices,
- Analysis of the possibility to propose horizontal requirements on repair information provision in the context of Eco-design,
- Refit of Ecolabel, to be followed by actions to enhance its effectiveness,
- Assessment of the possibility of an independent testing programme on planned obsolescence,
- Subject to evaluation of current ongoing pilots projects, explore the possible uses of the Product Environmental Footprint to measure and communicate environmental information,
- Action on Green Public Procurement: enhanced integration of Circular Economy requirements, support for higher uptake through training schemes, strenghening GPP in Commission procurement and EU funds.

c. Measures taken in the end-of-life and waste management stage

- Revised legislative proposal on waste,
- Improved cooperation with Member States for better implementation of EU waste legislation, combatting illicit shipment of end of life vehicles,
- Stepping up the enforcement of the revised Waste Shipment Regulation,
- Promotion of industry-led voluntary certification of treatment facilities for key waste/recyclate streams,
- Initiative on waste to energy in the framework of the Energy Union,
- Identification and dissemination of good practices in waste collection systems.

d. Measures taken in the secondary raw materials market

- Development of quality standards for secondary raw materials (in particular for plastics),

- Proposal for a revised fertilisers regulation,
- Proposed legislation setting minimum requirements for reused water for irrigation and groundwater recharge,
- Promotion of safe and cost-effective water reuse, including guidance on the integration of water reuse in water planning and management, inclusion of best practices in relevant BREFs, and support to innovation (through the European Innovation Partnership and Horizon 2020) and investments,
- Analysis and policy options to address the interface between chemicals, products and waste legislation, including how to reduce the presence and improve the tracking of chemicals of concern in products,
- Measures to facilitate waste shipment across the EU, including electronic data exchange (and possibly other measures),
- Further development of the EU raw materials information system.

e. Measures taken on innovation, investment, and other horizontal areas

- Initiative "Industry 2020 and the Circular Economy" under Horizon 2020,
- Pilot project for "innovation deals" to address possible regulatory obstacles for innovators,
- Targeted outreach to encourage applications for funding under the European Fund for Strategic Investments (EFSI), and support the development of projects and investment platforms relevant to the Circular Economy,
- Targeted outreach and communication activities to assist Member States and regions for the uptake of Cohesion Policy funds for the Circular Economy,
- Support to Member States and regions to strengthen innovation for the Circular Economy through smart specialisation,
- Assessment of the possibility of launching a platform together with the EIB and national banks to support the financing of the Circular Economy,
- Engagement with stakeholders in the implementation of this action plan through existing fora in key sectors,
- Support for a range of stakeholders through actions on public-private partnerships, cooperation platforms, support to voluntary business approaches, and exchanges of best practices,
- Development of a monitoring framework for the Circular Economy.

9.3. Annex C – Questionnaire template

Member State´s expert Questionnaire

to examine the current use and opportunities of GPP (Green Public Procurement) as a driver for a more Circular Economy in the EU, with respect to the Commission's Action Plan for the CE (Circular Economy)

(The whole questionnaire should take between 30-45 minutes to complete)

Info on MS expert	
Name / Position	
Organisation / Department	
EU Member State	
Contact details (mail and phone number)	
Active in following Working Group(s) on GPP and CE	

Part A	Fitness of EU GPP criteria: transposition into national strategies	
A.1	Which of the EU-GPP-criteria[12] are **transposed** into your national strategy? Could you list them and explain briefly how they are transposed (mandatory or advisory)?	
A.2	Could you provide details on the level of **transposition** of the EU-GPP-criteria into the national strategy: Do you foresee the criteria for all product groups or just for some specific ones? Do you consider the "core criteria", or the "comprehensive criteria"?	

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[12] Please refer to the EC list at: http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm

A.3	Are you aware of reasons for exclusion of EU - GPP criteria in the **transposition** into national strategy?	
Part B	**Fitness of EU- GPP criteria: uptake in tendering process**	
B.1	Do you monitor the **uptake** of EU GPP criteria in the tendering processes at the national level? (e.g. are you aware if, and to which extent, national public procurers apply the EC criteria in the tendering process?	
B.2	What is your opinion on the **practicability** of the EU-GPP-criteria? What is your view on the practicability in applying the core and the comprehensive critieria?	
B.3	What would be needed to increase the **uptake** of the EU GPP-criteria within the tendering processes?	
Part C	**Fitness of GPP tools**	
C.1	Please list key tools for GPP or public procurement of innovation (PPI) that you find particularly useful	
C.2	Please list 2 to 3 characteristics of these tools which make them useful	
C.3	Please list the barriers for the uptake of these tools in the tendering process	
C.4	Please specify which tools are applied in your country	
Part D	**Financing and delivery of public services**	
D.1	What level of take up is there for Best Price-Quality Ratio (BPQR) within major (TED notified) procurements?	
D.2	Are you aware of any alternative (to linear make-use-dispose) business models specifically being used to improve the sustainability or the circularity of products & services? If yes, please describe them.	
D.3	Within current public procurement and financing, what do you see as the greatest barriers to more Circular Public Procurement? In which categories are they most prominent?	
Part E	**GPP-related research and innovation at the EU and national level**	
E.1	What should be included in the next calls of EU research programmes (such as Horizon 2020 or the EC tender programmes), in order to promote research and innovation of GPP-related themes?	
E.2	Are you aware of any national programmes to finance GPP-related research in your country? Which area of investigation do they cover?	
Part F	**GPP and the EC Circular Economy Package**	
F.1	Are you aware of any initiatives/pilots within your country to link public procurement (GPP) with the delivery of a Circular Economy? If yes, please shortly describe them.	
F.2	Are there any other thoughts you want to share with us regarding the links between GPP and the Circular Economy?	

Part G	Intruducing the National Action Plan on GPP	
G.1	Which elements of your GPP-NAP do most contribute to the implementation of Circular Economy Action Plan?	
G.2	Are there plans to revise the GPP NAP at MS Level in near future according to the needs of the recently published Circular Economy Package? Which elements are crucial therefore?	

9.4. Annex D – Experts involved in the Questionnaire

Table 21: Member States´s experts

Member State	Expert	Organisation
Austria	Karin Hiller	Ministry of Environment
Austria	Angelika Tisch	National contact-point for sustainable procurement
Belgium	Frederik Claerbout	Government of Flanders
Bulgaria	Hristo Stoev	Ministry of Environment and Water
Bulgaria	Valeriya Natseva-Metodieva	Public Procurement Agency
Croatia	Branka Pivčevič Novak	Ministry of Environmental and Nature Protection
Czech	Marta Ortova	Ministry of the Environment
Denmark	Anne-Mette Lysemose Bensen	Environmental Protection Agency
Finland	Taina Nikula	Ministry of the Environment
France	Michel Grevoul	Ministry for Finances
France	Sylvain Chevassus	Ministry of Environment
Germany	Grit Körber	Environmental Agency
Ireland	Bernadette Kiely	Department of the Environment, Community and Local Government
Hungary	Gabriella Havas-Kovács	Public Procurement Authority
Italy	Alessandra Mascioli	Ministry of Environment
Italy	Lidia Capparelli	Consip
Latvia	Ugis Zanders	Ministry of Environmental Protection and Regional Development
Lithuania	Laura Kuoraitė	Public Procurement Office
Netherlands	Cuno van Geet	Ministry of Infrastructure and the Environment
Malta	Branica Xuereb	Ministry of the Environment
Poland	Marcin Skowron	Public Procurement Office
Portugal	Paula Trinidada	National Laboratory of Energy and Geology
Portugal	Ana Lucia Cruz	Ministry of Environment / Environment Protection Agency
Romania	Ana Paladus	Ecosistemi
Slovakia	Adriána Mančušková	Environment Agency
Slovenia	Alenka Burja	Umantera
Spain	Bettina Schäfer	Ecoinstitut Barcelona
Spain	Cesar Mantecon	Ministry of Agriculture, Food and Environment
Sweden	Joakim Thornéus	National Agency for Public Procurement
UK	Mervyn Jones	Sustainable Global Resources

9.5. Annex E – Key areas and measures of the EC CE Action Plan

Table 22: Key areas and measures of the EC CE Action Plan

Area	Measure from CE Action Plan
Production	Promoting Product Eco-design
	Promoting BAT waste management and RE in industrial sector
	Promoting Extended Producer Responsibility
Consumption	Improving labelling for energy
	Increasing repair services
	Tackling planned obsolescence
	Promoting waste prevention
	Promoting Sharing/ Collaborative economy
Waste Management	Contributing to achieve long-term recycling targets (MSW and Packaging)
	Monitoring of waste quantities
	Improving/ Investing in waste management infrastructure
From Waste to resources: boosting the market for secondary raw material and water reuse	Contributing to Improve Quality of Standards of secondary raw material
	Contributing to recycling of nutrients
	Contributing to combat water scarcity
	Reducing the presence of hazardous substances in purchased products and services
Plastic	Increasing plastic recycling
	Reducing marine litter
Food	Preventing food waste
	Measuring food waste
	Facilitating food donations
	Promoting "Best before date" good practices
Critical Raw Materials	Improving recovery of critical material such as rare earth and Platinum Group metals from WEEE
Construction and demolition	Contributing to recovery of valuable resources and adequate waste management in the construction and demolition sector
	Facilitating the assessment of the environmental performance of buildings
Biomass and Bio based Products	Promoting efficient use of bio-based resources and wood
Other horizontal measures	Mobilizing the involvement of stakeholders for GPP and CE
	Supporting SMEs and Social Enterprises active in the field s of recycling, repair and innovation
Monitoring progress towards a Circular Economy	Contributing to develop indicators to measures progress towards a CE

9.6. Annex F – Circular procurement models

Table 23: Circular procurement models (source SPP Regions report, 2016)

System Level	Product Service System
	Public Private Partnership
	Cooperation with other organisations on sharing and reuse
	Rent / Lease
	Supplier take- back- systems incl. reuse/ recycling/ refurbishment/ remanufacturing
Supplier Level	Supplier take-back system
	Design to disassembly
	Reparability of standard products
	External reuse / sale of products – buy – resell
	Internal Reuse of products
Product Level	Materials in the product can be identified
	Products can be disassembled after use
	Recyclable materials
	Resource efficiency and Total Cost of Ownership
	Recycled materials

9.7. Annex G – Drivers and barriers to a Circular Economy transition

Table 24: Common drivers and barriers to a Circular Economy transition

	Drivers	**Barriers**
Regulatory	Transparency, Incentivisation Resource security, Carbon reduction Reduced environmental impact	Fragmentation, Unintended consequences, Poor targeting of existing instruments for CE
Economic	Resource Efficient Business Models Cost savings Profitability	Linear model, Perceived and real on-costs Access to finance Scale-up costs
Market	GPP demand pull Clear criteria Encourages innovation Market engagement	Too big to deal with Benefits spread too wide Market entry Barriers to competition Technology
Organisation	Multiple policy delivery Resilience Leadership Delivering more with less	Inertia - Business as Usual Risk Time & resourcing change Lack of incentives to initiate change Lack of business case
Social	Green jobs Social well-being Improved efficiency and utilisation	Short termism Cultural Lack of social inclusion

9.8. Annex H – Development of the national GPP-NAPs of EU-28

Table 25: Level of development of the national GPP-NAPs of EU-28

	Assessment of existing situation	Targets	Measures	Revision every three years
Austria	✓	✓	✓	-
Belgium	✓	✓	✓	✓
Bulgaria	n.a.	✓	✓	-
Croatia	n.a.	✓	✓	✓
Cyprus	n.a.	n.a.	n.a.	n.a.
Czech Republic	n.a.	✓	-	-
Denmark	-	✓	-	✓
Estonia	-	-	-	-
Finland	n.a.	✓	-	n.a.
France	✓	✓	✓	-
Germany	-	✓	✓	✓
Greece	-	-	-	-
Hungary	-	-	-	-
Ireland	✓	✓	✓	✓
Italy	✓	✓	✓	✓
Latvia	✓	✓	✓	✓
Lithuania	n.a.	✓	✓	✓
Luxembourg	-	-	-	-
Malta	✓	✓	✓	-
Netherlands	-	✓	✓	✓
Poland	n.a.	✓	✓	-
Portugal	✓	✓	✓	✓
Romania	-	-	-	-
Slovakia	n.a.	✓	✓	✓
Slovenia	✓	✓	✓	-
Spain	✓	✓	✓	-
Sweden	-	-	-	✓
United Kingdom	✓	✓	✓	-

✓… in line with COM(2003) 302

-… lagging behind

n.a… not assessed

9.9.   Annex I – Implementation of the national GPP-NAPs of EU-28

Table 26:   Level of implementation of the national GPP-NAPs of EU-28

	Training	Cooperation	Product group database	Tender models	Monitoring of progress
Austria	✓	✓	✓	✓	✓
Belgium	✓	✓	✓	✓	✓
Bulgaria	✓	✓	-	-	✓
Croatia	✓	✓	✓	-	✓
Cyprus	n.a.	n.a.	n.a.	n.a.	n.a.
Czech Republic	✓	✓	-	✓	✓
Denmark	✓	✓	✓	✓	✓
Estonia	-	-	-	-	-
Finland	✓	✓	✓	-	✓
France	✓	✓	✓	✓	✓
Germany	✓	✓	-	-	✓
Greece	-	-	-	-	-
Hungary	-	-	-	-	-
Ireland	✓	✓	-	✓	✓
Italy	✓	✓	✓	✓	✓
Latvia	✓	✓	-	-	✓
Lithuania	✓	-	✓	✓	✓
Luxembourg	-	-	-	-	-
Malta	✓	✓	-	-	✓
Netherlands	✓	✓	✓	✓	✓
Poland	✓	✓	-	-	✓
Portugal	✓	✓	✓	✓	✓
Romania	-	-	-	-	-
Slovakia	✓	✓	-	-	✓
Slovenia	✓	✓	✓	-	✓
Spain	✓	✓	✓	✓	✓
Sweden	✓	✓	✓	✓	✓
United Kingdom	✓	✓	✓	✓	✓

✓…   in line

-…   lagging behind

n.a…   not assessed

9.10. Annex J – Individual GPP-criteria linked to CE and assessment of the practicbility

Table 27: Individual GPP-criteria linked to CE and assessment of the practicbility

Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
Cleaning Products and services	2012	under rev.	Purpose cleaners: 4; Sanitary cleaners: 4; window cleaners: 3; hand dishwasher detergents: 2; laundry detergents: 5; dishwasher detergents: 4; cleaning services: 3	Purpose cleaners: 8; Sanitary cleaners: 8; window cleaners: 7; hand dishwasher detergents: 6; laundry detergents: 8; dishwasher detergents: 7; cleaning services: 7	a) Purpose cleaners; b) Sanitary cleaners; c) window cleaners; d) hand dishwasher detergents; e) laundry detergents; f) dishwasher detergents; g) cleaning services	Purpose cleaner, Sanitary cleaner; Window cleaner; Hand dishwasher detergents; Dishwasher detergents	Weight utility ratio for the primary packaging must not exceed specific values	TS	Comp	Requirements for products: Low weight	Type I ecolabel; technical dossier of the manufacturer or a test report from a recognised body.	Medium
						Purpose cleaner; Sanitary cleaner; Services	Products packaged as trigger sprays must be sold as part of a refillable system.	TS	Core and comp	Requirements for packaging: Reuse	Written declaration together with details on how to obtain refills.	Good
						Purpose cleaner; Sanitary cleaner; Window cleaner; Hand dishwasher detergents; Laundry detergents; Dishwasher detergents; Services	No ingredients that are identified as substances of very high concern.	TS	Comp	Requirements for products: Chemical content	All substances contained above 0.01 % by weight of the final product must be listed together with their CAS-Number and a declaration that none of the substances are on the candidate list.	Medium-Poor
						Purpose cleaner; Sanitary cleaner; Window cleaner; Hand dishwasher detergents;	No ingredients with specific hazardous statements	TS	Comp	Requirements for products: Chemical content	All substances contained above 0,01 % by weight of the final product must be listed together with their CAS-Number and any hazardous statement.	Medium-Poor

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						Laundry detergents; Dishwasher detergents; Services						
						Purpose cleaner; Sanitary cleaner; Window cleaner; Hand dishwasher detergents; Laundry detergents; Dishwasher detergents; Services	Phosphorus and specific biocides must not be included.	TS	Comp	Requirements for products: Chemical content	A list with the name and the function of all biocides. For all biocides classified as H410 or H411, the log Pow or BCF must be given. The total quantity of elementary phosphorous must be given (per functional unit).	Poor
						Purpose cleaner; Sanitary cleaner; Window cleaner; Hand dishwasher detergents; Laundry detergents; Dishwasher detergents; Services	Critical dilution volume shall not exceed specific limits.	TS	Comp	Requirements for products: Chemical content	Type I Ecolabel or other appropriate means of proof such as a technical dossier of the manufacturer or a test report form a recognised body.	Good (if an ecolabel exist)- Poor
						Dishwasher detergents; Services	The cardboard packaging shall consist of min. 80 % recycled material.	TS	Core and comp	Requirements for packaging: Recycled content	Type I Ecolabel or other appropriate means of proof such as a technical dossier of the manufacturer or a test report form a recognised body.	Good (if an ecolabel exist)- Poor
						Laundry detergents	Primary packaging shall not exceed 2.0 g per wash.	TS	Comp	Requirements for products: Low weight	Type I ecolabel; technical dossier of the manufacturer or a test report from a recognised body.	Medium

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						Cleaning services	The contractor shall use reusable microfibre cloths were appropriate.	TS	Comp	Requirements for Use Stage: Low maintenance	Within 6 months of the beginning of the contract, the contractor will provide a report to the contracting authority on the practice of using microfibre cloths.	Good
Combined Heat and Power	2010		2	5			All criteria is about energy efficiency; no resource criteria (unless we consider the fuel as resources, too.					
Computers and Monitors	2016		Procurement: Technical specifications: 6; Award criteria: 5; End of life: Technical specifications: 1; Contract performance clauses: 2	Selection criteria: 1; Technical specifications: 8; Award criteria: 10; End of life: Technical specifications: 1; Award criteria: 2; Contract performance clauses: 2	Criteria divided into 4 distinct categories: Energy consumption, Hazardous substances, Product lifetime extensions (use of finite resources and critical raw materials), EoL Management	Computers and Monitors	Provision of a two-year (core) resp. a three-year (comp.) warranty that covers repair or replacement.	TS	Core and comp	Requirements for Use Stage	The tenderer shall provide a written declaration that the products supplied will be warrantied in conformity with the contract specifications and service requirements.	Good
						Computers and Monitors	Declaration of REACH Candidate List substances in the whole product and in the following sub-assemblies: Populated motherboard display unit, casings and bezels, external	TS	Core and comp	Requirements for products: Chemical content	The tenderer shall provide a declaration identifying specific substances that are present	Poor

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					t (hazardous waste); Subdivision of criteria for Procuremen t (PROC) and criteria for End of Life Managemen t (EoLM)		keyboard, mouse and/or trackpad, external AC and DC power cords.					
						Computers and Monitors	Restricted Substance Controls along the supply chain (implemented by the tenderer).	SC	Comp	Requirements for contractors	The tenderer shall provide documentation, which describes the system, its procedures and proof of its implementation.	Medium
						Computers and Monitors	Plasticisers in external cables: Non-presence of hazardous phthalates in power cords and for Medium Chain Chlorinated Paraffins.	TS	Comp	Requirements for products: Chemical content	Test report that is based on specific testing methods	Medium -Poor
						Computers and Monitors	Continued availability of spare parts for at least 3 years (core) resp. 5 years (comp.).	TS	Core and comp	Requirements for Use Stage	The tenderer shall provide a declaration that compatible spare parts, including rechargeable batteries (if applicable), will be made available to the contracting authority or through a service provider. Equipment holding the EU Ecolabel or another relevant Type I Eco-label fulfilling the specified requirements will be deemed to comply.	Good
						Computers and Monitors	Design for reparability - Parts like the memory or the LCD backlight shall be easily	TS	Core and comp	Requirements for products - Designed for longevity	A manual shall be provided by the tenderer, which shall include an exploded diagram of the device illustrating the parts that can be accessed and replaced, and the tools required. It shall also be confirmed which tools are covered by service agreements under the warranty.	Good

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							accessible and replaceable.					
						Portable products	Ease of replacement of rechargeable batteries: They shall not be glued or soldered into portable products.	TS	Core and comp	Requirements for products - Designed for longevity	The tenderer shall illustrate how the battery is installed in the product, the steps required to remove and cover markings.	Good
						Computers and Monitors	Marking of plastic casings, enclosures and bezels with a weight greater than 100 g and a surface greater than 50 cm² shall be marked in accordance with ISO 11469 and ISO 1043-1.	TS	Core and comp	Requirements for products - Designed for recycling	The tenderer shall identify the plastic parts by their weight, their polymer composition, and their ISO 11469 and ISO 1043 markings. The dimension and position of the marking shall be visually illustrated. Equipment holding the EU Ecolabel or another relevant Type I Eco-label fulfilling the specified requirements will be deemed to comply.	Medium
						Computers and Monitors	The tenderer shall provide a price list for specific component parts.	AC	Core and Comp.	Requirement for Use Stage: Cost competitiveness	Existance of price information on components.	Good
						Computers and Monitors	Plastic casings, enclosures and bezels shall not contain moulded-in or glued-on metal inserts unless	TS	Comp	Requirements for products: Designed for recycling	A manual shall be provided by the tenderer which shall include an exploded diagram of the device illustrating the parts that can be accessed and replaced, and the tools required. It shall also be confirmed which parts are covered by service agreements under the warranty.	Good

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							they can be removed with commonly available tools.				Equipment holding the EU Ecolabel or another relevant Type I Eco-label fulfilling the specified requirements will be deemed to comply.	
						Computers and Monitors	The presence of paints and coatings shall not significantly impact upon the resilience of plastic recyclate produces from these components upon recycling and when tested according to ISP 180 or equivalent.	TS	Comp	Requirements for products: Designed for recycling	The tenderer shall provide mechanical/physical test reports carried out according to ISO 180 or equivalent.	Medium
						Computers	The main Printed Circuit Board is halogen free in conformance with IEC 61249-2-21.	AC	Comp	Requirements for products: Chemical content	Test reports.	Medium
						Computers and Monitors	External power cables are halogen free in conformance with IEC 62821.	AC	Comp	Requirements for products: Chemical content	Test reports.	Medium
						Computers and Monitors	Product dismantling potential.	AC	Comp	Requirements for products: Designed for recycling	The tenderer shall upon award provide a 'dismantling test report' according to the protocol in Annex II. The dismantling test shall be carried out by a specialised WEEE recycling firm that is a permitted electrical waste treatment operation in accordance with Article 23 of the Waste Framework	Good-Medium

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											Directive or that are certified under equivalent national or international WEEE regulations or standards. Third party verification of the timing shall be accepted as an alternative to providing a recording. Equipment holding the EU Ecolabel or another relevant Type I Eco-label fulfilling the specified requirements will be deemed to comply.	
						Computers and Monitors	Tenderers shall provide a re-use and recycling service for a specified inventory of equipment that has reached the end of its service life.	TS	Core and comp	Requirements for Reuse and End of life	The tenderer shall provide details of the arrangements for collection, data security, testing, remarketing for re-use and recycling and disposal. This shall include, during the contract, valid certifications of compliance for the WEEE handling facilities to be used.	Medium
						Computers and Monitors	Reporting on equipment status.	CPC	Core and comp	Requirements for Reuse and End of life	The successful tenderer shall provide a report on the status of the equipment in the inventory once all items have been processed for re-use or recycling/disposal. The report shall identify the proportion of items re-used or recycled, whether they remained in the EU or were exported.	Medium
						Computers and Monitors	Operation of re-use and recycling facilities.	CPC	Core and comp	Requirements for Reuse and End of life	The successful tenderer shall provide valid certificates verifying the permitting for the re-use and recycling facilities used to fulfil the contract.	Medium
						Computers and Monitors	Longer warranties and service agreements.	AC	Core and comp	Requirements for Use Stage	A copy of the warranty and service agreement.	Good
						Tablet and All-in-one-Notebooks	Tablet and All-in-one-Notebook:	AC	Core and comp	Requirements for products:	Tenderer shall provide details of the physical design of the memory and or storage capacity.	Good

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							Potential to replace and upgrade the RAM.			Designed for longevity		
						Computers	Rechargeable battery life and endurance.	AC	Core and comp	Requirements for products: Designed for longevity	test report that shows compliance with IEC EN 61960.	Medium
						Notebook	Durability of notebook computer drives.	AC	Comp	Requirements for products: Designed for longevity	Tenderer shall provide a specification for the drive. This shall be supported by a test report according to IEC 62131, IEC 60068 or IEEE 1293.	Medium
						Notebook	Notebook durability testing.	AC	Comp	Requirements for products: Designed for longevity	Test reports.	Medium
						Tablet	Tablet durability testing.	AC	Comp	Requirements for products: Designed for longevity	Test report according to IEC 60068, US MIL 810G.	Medium
						Computers and Monitors	Inventory tracking system (a unique identifier for each item of equipment in the Contracting Authority's equipment inventory. The system shall enable the proportion of items re-used or recycled, and whether they remained in the	AC	Comp	Requirements for Reuse and End of life	The tenderer shall provide details of the tracking system that they operate.	Medium

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							EU or were exported).					
Copying and graphic paper	2008		RP - TS:3, VP - TS:2, AC:1	RP - TS:3, VP - TS:2, AC:2	Different sets of criteria are proposed for: Paper based on recovered paper fibres, recycled paper-> *further differentiation into "normal office use" and "professional purposes"* Paper based on virgin fibre	Recycling option	Content of recovered paper fibres in % in the recycled option.	TS	Core and comp	Requirements for products: Recycled content	All products carrying any type I ecolabel, such as the EU Ecolabel can serve as means of proof if it is specified that the paper is made from 100% recovered paper fibres. Any other appropriate means of proof, such as a technical dossier of the manufacturer or a test report from a recognised body will also be accepted.	Medium
						Recycling and virgin fibre option	Paper must be elementary chlorine free.	TS	Core and comp	Requirements for products: Chemical content	Technical dossier or test report.	Medium
Electrical and electronic equipment used in the	2014		SC:1, TS:4, CPC:1, AC:2	AC:2	Health care electric and electronic equipment includes both high and low		Warranty terms given by the manufacturer.	TS	Core	Requirements for Use Stage	The tenderer has to declare that the above clause will be met.	Good
							Tenderer shall also ensure that spare parts are available, at least for 5 years.	TS	Core	Requirements for Use Stage	The tenderer has to declare that the above clause will be met.	Good

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Health Sector					voltage equipment		The tenderer shall have a chemicals management system in place to ensure that he is aware of the presence of substances in the products purchased under this contract.	SC	Core	Requirements for products: Chemical content	Tenderer shall confirm that they have routines and instructions in place and describe the system.	Good-Medium
							A guide shall be provided with instructions how to maximise the environmental performance of the particular medical equipment including information about recycling and disposal, information about which spare parts can be replaced and information on the content of Candidate list substances.	TS	Core	Requirements for products: Information	Copy of the relevant pages.	Good
							Information on content of Candidate List Substances of	CPC	Core	Requirement for products: Information about Chemicals	Within 5 years following the delivery of the product, the contracting authority shall be notified about revised SVHC Candidate Lists.	Medium

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							Very High Concern.					
Electri-city	201 2						NO CE RELEVANCE					
Food and Catering Services	200 8	under rev.	Food: 3; Catering Services: 6	Food: 7; Catering Services: 18	a) Food; b) Catering services	Food	Packaging: Percentage of products that are supplied in secondary or transport packaging with more than 45 % recycled content. Percentage of products that are supplied in packaging materials based on renewable raw materials. Percentage of products that are not supplied in individual portions.	AC	Core and comp	Requirements for packaging: Recycled content	Signed declaration indicating which of these criteria it is able to meet.	Medium
						Catering Services	Packaging: Percentage of products that are supplied in secondary or transport packaging with more than 45 % recycled	AC	Core and comp	Requirements for packaging: Recycled content	Signed declaration indicating which of these criteria it is able to meet.	Medium

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							content. Percentage of products that are supplied in packaging materials based on renewable raw materials. Percentage of products that are not supplied in individual portions.					
						Catering Services	Cutlery, glassware, rockery and tablecloths have to be renewable or based on renewable raw material.	CPC	Core and comp	Requirements for products: Renewable content	No Verification mentioned.	Medium
						Catering Services	Paper products (kitchen paper or napkins) that are used in carrying out the service must be made from recycled (or sustainably managed virgin fibres).	AC	Comp	Requirements for products: Recycled content	EU Ecolabel or any other national Ecolabel; technical dossier from the manufacturer or test report.	Good
						Catering Services	Service management - within the first 6 months of the contract, the contractor will	CPC	Comp	Requirements for Reuse and End of life	No Verification mentioned.	Good

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							have structured and documented procedures for i. a. waste minimisation and selective collection.					
Furniture	2008	under rev.	11	15			Plastic parts - all plastic parts ≥ 50g shall be marked according to ISO 11469 and must not contain additions or other materials that may hinder their recycling.	TS	Core and comp	Requirements for products: Designed for Recycling	Description of the plastic materials that are present and the quantities used, the way in which they are labelled and how they are attached to one another or to other materials. Ecolabel Type I.	Medium
							Products used for surface coating shall not contain hazardous substances with specific numbers.	TS	Core and comp	Requirements for products: Chemical content	Bidder must present a list with all surface treatment substances used for each material present in the furniture and their Security Data Sheet.	Medium -Poor
							VOC content of adhesive used in the assembly of the furniture shall not exceed 10% by weight.	TS	Core and comp	Requirements for products: Chemical content	Bidder must present a list of adhesives used and their Safety data sheet or equivalent documentation.	Medium
							Wood classified with a durability class 1 or 2 according to EN	TS	Comp	Requirements for products: Chemical content	Bidders must present the durability classification of the timber products together with a list of the preservation substances used for each material present	Medium -Poor

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							350-2 must not have been treated with preservatives, substances classified as carcinogenic, harmful to the reproductive system, mutagenic or allergic when inhaled. Active substances in preservatives must not be based on arsenic, chrome or organic tin compounds.				in the furniture and their Safety Data Sheet.	
							The blowing agents of polyurethane foams must not be HFC or methylene chloride.	TS	Comp	Requirements for products: Chemical content	Bidders must present a declaration by the foam manufacturer of compliance with the criterion.	Medium
							Packaging must consist of readily recycled material and/or materials taken from renewable resources or be a multi-use system.	TS	Core and comp	Requirements for packaging	Description of the product packaging together with a corresponding declaration of compliance.	Good

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							All packaging materials shall be easily separable by hand into recyclable parts consisting of one material (e.g. cardboard, paper plastic, textile).	TS	Core and comp	Requirements for packaging	Description of the product packaging together with a corresponding declaration of compliance.	Good
							Durability, reparability, fitness for use and ergonomics - furniture must meet relevant standards regarding serviceability (abrasion resistance, light fastness etc).	TS	Core and comp	Requirements for products: Designed for longevity	Appropriate documentation to demonstrate compliance with the standards.	Good
							Percentage by weight of recycled content of wood-based materials, plastics and/or metals in the final piece of furniture.	AC	Core and comp	Requirements for products: Recycled content	Appropriate documentation where the recycled content percentage by weight is stated.	Poor
							Proportion of the textile by weight made from recycled fibres.	AC	Comp	Requirements for products: Recycled content	Evidence of the origin of the recycled fibres used.	Poor

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							Percentage by weight of recycled content in the packaging materials (plastics and cardboard).	AC	Comp	Requirements for products: Recycled content	List of the different packaging materials, their weight and a declaration by the packaging producer where it states the % of recycled content in their packaging material.	Poor
Gardening Products and Services	2012		Plants: 1; Soil improvers: 1; Irrigation: 4; Machinery: 4; Oils: 2; Gardening Services: 15	Plants: 4; Soil improvers: 8; Irrigation: 4; Machinery: 9; Oils: 2; Gardening Services: 19	Ornamental Plants; Soil improvers; Irrigation Systems; Gardening machinery; Machinery Lubricant Oil; Gardening Services	Ornamental plants	Plants must be delivered in reusable or biodegradable containers. If they are reusable, the company must take them back after the planting. If they are biodegradable, they must be made of 100 % biodegradable substances, they must not contain synthetic plastic materials, plasticisers or biocide substances.	TS	Comp	Requirements for Packaging	Reusable containers: signed declaration stating that they will be taken back. Biodegradable: List of product ingredients and their respective shares together with a declaration that the specifications are met. Appropriate documentation must be consulted by the contracting authority at its own expense to establish whether containers are biodegradable. Ecotype I containers will be deemed to comply as well as products classified as biodegradable and compostable according to EN 13432:2000 Standard or equivalent.	Medium
						Ornamental plants	Small plants must be supplied in returnable crates or boxes.	TS	Comp	Requirements for Packaging	Signed declaration that this criterion is met.	Good

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						Soil improvers	Organic matter content must be derived from the processing and/or reuse of waste (as defined in 2006/12/EC).	TS	Comp	Requirements for products: Recycled content	Detailed composition of the product, the origin of organic matter and a declaration of compliance with the criteria. Type I Ecolabels are deemed to comply. Other proof: technical dossier of a manufacturer or test report of an independent body.	Medium
						Soil improvers	Max. concentration of heavy metals in the final soil improvers.	TS	Comp	Requirements for products: Chemical content	Test reports.	Good
						Irrigation Systems	Irrigation system can collect and use water from locally recycled sources such as rain water, ground water and filtered grey water.	AC	Core and comp	Requirements for products: Use of recycled water	The contracting authority will provide the guidelines based on the water resources availability characteristics specific to the climate and location of the irrigation system. Tenders must provide appropriate technical documentation demonstrating that the criterion is met.	Good
						Machinery	The machines shall allow the use of biodegradable engine lubricant oils or regenerated lubricant oils.	TS	Comp	Requirements for products: Recycled content	Declaration of compliance.	Medium
						Machinery	Plastic components weighting more than 50 g must be marked according to ISO	TS	Comp	Requirements for products: Designed for recycling	Declaration of compliance. Machines with an ecolabel type 1 are deemed to comply. Other proof: technical dossier of the manufacturer or a test report by an independent body.	Medium

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							11469 or equivalent (that doesn't address electrical cables).					
						Machinery	Plastic materials must not contain pigments or additives based on lead cadmium, chromium, mercury or their compounds.	TS	Comp	Requirements for products: Chemical content	Declaration of compliance. Machines with an ecolabel type 1 are deemed to comply. Other proof: technical dossier of the manufacturer or a test report by an independent body.	Poor
						Machinery	Surface treatment agents must not contain pigments or additives based on lead, cadmium, chromium, mercury or their compounds.	TS	Comp	Requirements for products: Chemical content	Declaration of compliance. Machines with an ecolabel type 1 are deemed to comply. Other proof: technical dossier of the manufacturer or a test report by an independent body.	Poor
						Lubricant Oils	The formulated product shall have a carbon content derived from renewable raw materials (derived from vegetable oil or animal fats).	TS	Core and comp	Requirements for products: Recycled content	Detailed composition of the product, the origin of renewable raw materials and a declaration of compliance with the criteria. Type I Ecolabels are deemed to comply. Other proof: technical dossier of a manufacturer or test report of an independent body.	Medium
						Lubricant Oils	The product shall not include	TS	Core and comp	Requirements for products: Chemical content	Technical dossier of the manufacturer, test report.	Medium

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							any hazardous substances.					
						Gardening services	Evidence or their capacity to perform environmental procedures for at least (…) waste minimisation and selective collection.	SC	Core and comp	Requirements for contractors: Capacity environmental procedures	EMS or written instructions and procedures which demonstrate the professional capacity. Or a list of previous .	Good
						Gardening services	General constituents of soil improvers: Organic matter content of soil improvers must be derived from the processing and/or re-use of waste.	TS	Core and comp	Requirements for products: Recycled content	Detailed composition of the product, the origin of organic matter and a declaration of compliance with the criteria. Type I Ecolabels are deemed to comply. Other proof: technical dossier of a manufacturer or test report of an independent body.	Medium
						Gardening services	Max. concentration of heavy metals in the final soil improvers.	TS	Core and comp	Requirements for products: Chemical content	Provision of test reports according to EN 13650, ISO 16772.	Good-Medium
						Gardening services	Lubricant oils must be biodegradable - carbon content has to derive from renewable raw materials.	TS	Core and comp	Requirements for products: Recycled content	Detailed composition of the product, the origin of renewable raw materials and a declaration of compliance with the criteria. Type I Ecolabels are deemed to comply. Other proof: technical dossier of a manufacturer or test report of an independent body.	Medium
						Gardening services	Waste management like "When a	TS	Core and comp	Requirements for Reuse and End of	Appropriate documentation.	Good

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							gardening machine is irreparably broken, the tenderer will have to indicate the final destination of the machine.			life: Waste management		
						Gardening services	Watering and water use management measures must among others maximise the use of non-potable water like reused water.	TS	Core and comp	Requirements for products: Water efficiency	Appropriate documentation.	Good
						Gardening services	Automatic irrigation systems must be able to use water from locally recycled sources (rain water, ground water and grey water).	TS	Core and comp	Requirements for products: Water efficiency	Appropriate documentation.	Good
						Gardening services	Periodical report with information - among others - about the amount of waste generated by fraction and destination.	TS	Core and comp	Requirements for Reuse and End of life: Waste management	Report.	Medium

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						Gardening services	Use of chemical plant protection products must be reduced by applying alternative techniques.	TS	Core and comp	Requirements for products: Chemical content	Appropriate documentation.	Medium -poor
						Gardening services	Staff training in among others waste minimisation, selective collection.	CPC	Core and comp	Requirements for Reuse and End of life: Waste management	Training plan when the contract is awarded and a certificate at the end of the contract.	Good
							Double side printing for devices with a speed of more than 25 pages/minute.	TS	Core and comp	Requirements for products: Low amount of consumables	Type I Ecolabel; Energy Star 2.0 label; statement from the manufacturer.	Good
Imaging Equipm ent	201 4		8	9			Multiple Images on single sheet of paper.	TS	Core and comp	Requirements for products: Low amount of consumables	Type I Ecolabel; statement from the manufacturer.	Good
							Product longevity and warranty - repair and replacement shall be covered by warranty terms for a minimum of 5 years.	TS	Core and comp	Requirements for Use Stage: Warranty	Type I Ecolabel; statement from the manufacturer.	Good
							Genuine or equivalent spare parts have to	TS	Core and comp	Requirements for Use Stage: Spare parts	Type I Ecolabel; statement from the manufacturer.	Good

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							available for at least 5 years.					
							Resource efficiency for cartridges: Design for reuse of toner and/or ink cartridges - the products must accept remanufactured toner and/or ink cartridges.	TS	Core and comp	Requirements for products: Product must accept recycled products	Type I Ecolabel; statement from the manufacturer.	Good
							Double side printing for devices with a speed of less than 25 pages/minute.	AC	Comp	Requirements for products: Low amount of consumables	Type I Ecolabel; statement from the manufacturer.	Good
Indoor Lighting	2012		Lamps: 8; design: 4; installation: 5	Lamps: 8; design: 4; installation: 5	a) lamps; b) design of indoor lighting; c) installation	Lamps	Lamps shall have a lifetime not less than that given in a table.	TS	Core and comp	Requirements for products: Designed for longevity	Type I ecolabel; result of lamp life testing according to the test procedure 50285 (except for HID lamps and LEDs).	Good
						Lamps	Packaging. No laminates and composite plastics; cardboard or paper or plastic boxes with min. 50 % post-consumer recycled material.	TS	Core and comp	Requirements for packaging	Type I ecolabel; written evidence from the tenderer.	Poor

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Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
						Lamps	Lamp lifetime is at least 120 % of a given minimum.	AC	Core and comp	Requirements for products: Designed for longevity	Result of lamp life testing according to the procedure in EN 50285, together with a calculation showing that the lamp life is at least 120 % of the specified minimum value for that lamp type.	Good
						Lamps	Mercury content below a certain threshold.	AC	Core and comp	Requirements for products: Chemical content	Statement of the manufacturer and a calculation.	Good
						Installation of indoor lighting	The tenderer shall provide i. a. disassembly instructions for luminaires.	TS	Core and comp	Requirements for products: Information of end of life	Confirmation that written instructions will be provided to the contracting authority.	Good
						Installation of indoor lighting	The tenderer shall implement appropriate environmental measures to reduce and recover the waste that is produced during the installation. All waste lamps and luminaires and lighting controls shall be separated and sent for recovery in accordance with the WEEE directive.	TS	Core and comp	Requirements for Reuse and End of life: Acceptance of returned goods	Tenderer shall provide written confirmation setting out how the waste has been separated, recovered or recycled.	Good
Office Building Design, Constru	201 6		A: 5, B: 10 (+set of AC), C: 1, D: 4 (+set	A: 5, B: 10 (+set of AC), C: 1, D: 4 (+set	Criteria sets apply for RENOVATIO N and	Selection of design team and contractors	Competencies of the main construction contractor and	SC	Core and comp	Requirements for contractors	Evidence in the form of information and references related to relevant contracts in the last 5 years in which the above elements have been carried out. This shall	Medium

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ction and Manage ment			of contract performanc e clauses), E: 1, F: 1 (+1 AC, + set of contract performanc e clauses), G: 3 (+set of contract performanc e clauses)	of contract performanc e clauses), E: 1, F: 1 (+1 AC, + set of contract performanc e clauses), G: 3 (+set of contract performanc e clauses)	CONSTRUC TION. Stages for which proposed criteria are in place: A. Selection of the design team and contractors B. Detailed design and performanc e requiremen ts C. Strip- out, demolition and site preparation works D. Constructio n of the building or major renovation works E. Installation of energy systems or the supply of energy services F.		specialist contractor: Among others: The successful implementation of demolition and site waste management plans in order to minimise waste arising. Selection and knowledge of off-site treatment options.				also be supported by CVs for personnel who will work on the project and their relevant project experience.	
						Detailed design and performance requirements	Recyclable waste storage (Dedicated storage space shall be provided within the building, or within the curtilage of the building, to facilitate the segregation of recyclable materials and end-of-life products by occupiers).	TS	Core and comp	Requirements for Reuse and End of life	Design teams or contractors shall provide plans of the building showing the space(s) that have been designated for waste segregation and collection as well as the assumptions made in order to estimate the space provision.	Good
						Detailed design and performance requirements	Performance of the main building elements.	AC	Core and comp	All	The Design team or the Design & Build tenderer or the DBO tenderer shall provide a bill of materials for the proposed design and the LCA results, which shall be reported according to ISO 14044 or EN	Medium -Poor

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Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
					Completion and handover G. Facilities manageme nt						15978. The comparison with the reference building shall be written up in a concise technical report that compares the proposed design option(s) and calculates the improvement potential. The technical report shall describe how the 'technical points to address' (as set out in Annex 1(Core) 2(Comp)) have been covered. Where the results from a building assessment and certification system are used, the tenderer's accredited building assessor shall provide verification according to the methodology used by the system. The technical report shall be subject to a critical review by the contracting authorities appointed LCA technical evaluator. The critical review shall follow the guidelines in Annex 3.	
						Detailed design and performance requirements	Incorporation of recycled or re-used content in concrete and masonry.	AC	Core and comp	Requirements for products: Recycled content	The tenderers for main contractor or the Design & Build contractor or the DBO contractor shall propose the total recycled content quantifying the proportional contribution of the recycled or re-used content to the overall value of the specified building elements, based on the information provided by the producer(s) of the construction product. The tenderers for main contractor, the Design & Build contractor or the DBO contractor shall describe how the overall value will be calculated and verified, including, as a minimum, batch documentation, factory production control documentation and delivery documentation, and how the third party verification will be arranged during the construction phase.	Medium -Poor

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						Strip-out, demolition and site preparation works	Demolition waste audit and management plan (minimum of 55% by weight of the non-hazardous waste generated during demolition and strip-out works, and excluding excavations and backfilling, shall be prepared for re-use, recycling and other forms of material recovery).	TS	Core and comp	Requirements on Reuse and End of life	The lead construction contractor, Design & Build contractor or DBO contractor shall submit a pre-demolition/strip-out audit that contains the specified information. A system shall be used to monitor and account for waste arising. The destination of consignments of waste and end-of-waste materials shall be tracked using consignment notes and invoices. Monitoring data shall be provided to the contracting authority.	Medium
						Construction of the building or major renovation works	Site waste management (A site waste management plan shall be prepared prior to the commencement of work on-site. The plan shall establish systems for the separate collection of materials on-site for re-use, recycling and other forms of recovery).	TS	Core and comp	Requirements on Reuse and End of life	The lead construction contractor, Design & Build contractor or DBO contractor shall submit a site waste management plan consisting of: (i) A bill of materials with estimates for waste arising and the potential for waste prevention based on good practices, (ii) Estimates of the % re-use potential based on separate collection during the construction process, (iii) An estimation of the % recycling and recovery potential based on separate collection, A system shall be used to monitor and account for waste arising and to track the destination of consignments of waste. Monitoring data shall be provided to the contracting authority.	Good

Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
						Construction of the building or major renovation works	Thresholds for TVOC (comp: also for SVOC and special Carcinogens) and Formaldehyde in ceiling tiles, paints and varnishes, textile floor and wall coverings, laminate and flexible floor coverings.	TS	Core and comp	Requirement on products: Chemical content	Test results (CEN/TS 16516)	Medium
						Construction of the building or major renovation works	Incorporation of recycled content (As materials are ordered and brought onto site, recycled content claims shall be verified for each batch of product).	CPC	Core and comp	Requirements for Products: Recycled content	The main construction contractor or the DBO contractor shall verify claims by obtaining information from supplier(s) of the construction products used. This shall include mass balance calculations supported by batch testing results, delivery documentation and/or factory production control documentation. In each the data shall be verified by a third party audit.	Depends (Good-Poor)
						Construction of the building or major renovation works	Site waste management (Operation of the agreed site waste management plan shall be monitored and reported on during progress of construction work on-site. This shall	CPC	Core and comp	Requirements on Reuse and End of life	A system shall be used to monitor and quantify waste arising and materials segregated for recycling and re-use. It shall also track and verify the destination of consignments of waste. The monitoring and tracking data shall be provided to the contracting authority on an agreed periodic basis.	Good

Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
							include data accounting for the weight of materials collected by the separate collection of materials on-site for re-use and recycling according to the scope described in the technical specifications).					
						Completion and handover	Recyclable waste storage (Upon completion it shall be confirmed that dedicated storage space has been provided within the building, or within the curtilage of the building, to facilitate the segregation of recyclable materials and end-of-life products by occupiers).	CPC	Core and comp	Requirements on Reuse and End of life	The construction contractor, the Design & Build contractor or the DBO contractor shall provide final detailed plans of the recycling facilities as-built.	Good
						Facilities management	Waste management system (building manager shall	TS	Core and comp	Requirements on Reuse and End of life	Facilities managers or DBO contractors shall submit a proposal for the systems to be used, including details of the waste	Good

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							implement systems that allow occupiers to segregate paper, cardboard, food and drink packaging (glass, plastic and other materials for which local separate collection systems exist) into separate streams for recycling. Batteries., ink and toner cartridges, IT equipment and furniture shall also be collected and arranged for re-use or recycling where possible)				streams, the segregation systems, working arrangements and contractors to be used.	
						Facilities management	Waste management systems (The building manager shall monitor and quantify on an ongoing agreed basis the overall waste arising	CPC	Core and comp	Requirements on Reuse and End of life	Facilities managers or DBO contractors shall provide the contracting authority with monthly data quantifying waste arising as a proportion of the overall waste arising from the building and in kg per waste fraction.	Good-medium

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							and recycling rate for the building(s)).					
Road Constru ction, Design and Mainten ance	201 6		**47** (A1-A2; B1-B20 (ohne B13); C1-C14 (ohne C2); D1-D3; E1-E9; F1)	**49**	A. Selection of the design team and contractors; B. Detailed design and performanc e requiremen ts; C. Constructio n or major extensions; D. Use of the road; E.Maintena nce and operation; F.End of life	Selection of design team and contractors	Competencies of the project manager ("use of construction material with high recycled and re-used content"; "Increasing the durability of pavement courses" etc).	SC	Core and comp	Requirements for contractors: Knowledge recycled content, longevity	Information, references, CVs of the personal who will work in the project.	Medium
						Selection of design team and contractors	Competencies of the main construction contractor ("evaluation of durability related to construction materials" etc).	SC	Core and comp	Requirements for contractors: Knowledge recycled content, longevity	Information, references, CVs of the personal who will work in the project.	Medium
						Detailed design and performance requirements	Excavated Materials and Soil Management Plan (Waste production during excavation, excl. Construction and demolition waste, shall be recorded).	TS	Core and comp	Requirements for Reuse and End of life: Waste management	Extracted materials and topsoil management plan.	Good

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						Detailed design and performance requirements	Performance requirements for durability of pavement (nominal minimum service lifetimes for the binder course, the base course and the sub-base).	TS	Core and comp	Requirements for products: Designed for longevity	Technical report specifying among others the minimum nominal lifetime of the binder and base courses and the subbase course.	Medium-Poor
						Detailed design and performance requirements	Incorporation of recycled content (Alternative to LCA of main road elements).	AC	gypsum	Requirements for products: Recycled content	Information on the recycled content, reused content etc.	Medium-Poor
						Construction of major extensions	Incorporation of recycled content.	CPC	Core and comp	Requirements for products: Recycled content	The main contractor shall verify: independent 3rd party verification of the traceability and mass balance of the product.	Medium-Poor
						Construction of major extensions	Implementation of a system to monitor and report on actions involving excavated materials and soil.	CPC	Core and comp	Requirements for Reuse and End of life: Waste management	No verification	Good
						Maintenance and operation	Demolition Waste Audit and Management Plan.	TS	Core and comp	Requirements for Reuse and End of life: Waste management	Pre-demolition audit that contains the information. A system shall be implemented to monitor and account for waste production. The destination of waste shall be tracked. Provision of monitoring data.	Medium-Poor
						Maintenance and operation	Incorporation of recycled content.	CPC	Core and comp	Requirements for products: Recycled content	Information on the recycled content, reused content etc.	Medium-Poor

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Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
						End of life	Demolition Waste Audit and Management Plan.	TS	Core and comp	Requirements for Reuse and End of life: Waste management	Pre-demolition audit that contains the information. A system shall be implemented to monitor and account for waste production. The destination of waste shall be tracked. Provision of monitoring data.	Medium-Poor
Sanitary Tapware	2013		Tapware: 8 Technical Specifications; installation: 2 (1 Selection; 1 Contract Clause)	Tapware: 9 Technical Specifications; installation: 2 (1 Selection; 1 Contract Clause)	a) Criteria for the tapware; b) Criteria for the installation.	Sanitary Tapware	Sanitary products with a metallic Ni-Cr-coating shall comply with EN 248.	TS	Core and comp	Requirements for products: Designed for longevity	Type I ecolabel that fulfil the requirements; otherwise, results of sanitary tapware testing according to the test procedure contained in the EN 248 standard or equivalent shall be submitted. The testing shall be performed by laboratories that meet the general requirements of EN ISO 17025 or equivalent. A technical dossier from the manufacturer demonstrating that these requirements have been met will also be accepted.	Medium
						Sanitary Tapware	The product shall be designed in such a way that its exchangeable components can be replaced easily by the end-user or a professional service engineer. Information about which elements can be replaced shall be clearly indicated in the information	TS	Core and comp	Requirements for products: Designed for longevity	Type I ecolabel; other appropriate means of proof are written evidence from the manufacturer that the criteria is met. The tenderer shall provide a description of how to replace components and provide a guarantee for the availability of spare parts.	Good

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							sheet attached to the product. The tenderer shall also provide clear instructions to enable the end-user or trained expert to undertake basic repairs. The tenderer shall ensure that spare parts are available for at least 5 years.					
						Sanitary Tapware	The tenderer shall ensure that spare parts are available for at least 5 years from the date of purchase.	TS	Core and comp	Requirements for Use Stage: Spare parts	Guarantee by the tenderer	Good
						Sanitary Tapware	The tenderer shall give a warranty for repair or replacement of minimum 4 years.	TS	Core and comp	Requirements for Use Stage: Warranty	Type I ecolabel; other appropriate means of proof are written evidence from the manufacturer that the criteria is met.	Good
						Sanitary Tapware	Product shall be supplied with information in printed and/or electronic form: (…) information about which spare parts can	TS	Core and comp	Requirements for products: Designed for longevity	Type I ecolabel; other appropriate means of proof are written evidence from the manufacturer that the criteria is met.	Good

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Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
							be replaced; instructions concerning the replacement.					
Street lighting and traffic signals	2012		Street lighting equipment: 9; Street lighting: 5; installation: 5; traffic signals: 2	Street lighting equipment: 12; Design of street lighting: 7; installation: 5, traffic signals: 2	a) Street lighting equipment; b) design of street lighting; c) installation of street lighting; d) traffic signals.	Street lighting equipment	Requirements concerning packaging for lighting equipment: cardboard boxes shall be made of min. 80 % post-consumer recycled material.	TS	Core and comp	Requirements for packaging	Type I ecolabel; written evidence from the manufacturer.	Medium -Poor
						Street lighting equipment	Lamp survival factors and lamp luminance maintenance factors for the burning hours 2.000, 4.000, 8.000 and 16.000 hours.	TS	Core and comp	Requirements for products: Designed for longevity	Technical specification of the lamp; written declaration.	Good
						Street lighting equipment	Lamp survival factors and lamp luminance maintenance factors for the burning hours 2.000, 4.000, 8.000 and 16.000 hours.	AC	Comp	Requirements for products: Designed for longevity	Product information	Good
						Street lighting equipment	Thresholds for the mercury content.	AC	Core and comp	Requirements for products: Chemical content	Product information	Good

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						Installation of street lighting	Tenderer shall provide i. a. disassembly instructions for luminaires.	TS	Core and comp	Requirements for products: Information on End of life	Confirmation that written instructions will be provided to the contracting authority.	Good
						Installation of street lighting	The tenderer shall implement appropriate environmental measures to reduce and recover the waste that is produced during the installation. All waste lamps and luminaires and lighting controls shall be separated and sent for recovery in accordance with the WEEE directive.	TS	Core and comp	Requirements for Reuse and End of life: Acceptance of returned goods	Tenderer shall provide written confirmation setting out how the waste has been separated, recovered or recycled.	Good
						Traffic signals	Requirements concerning packaging for traffic signal purchases: cardboard boxes shall be made of min. 80 % post-consumer recycled material.	TS	Core and comp	Requirements for packaging	Type I ecolabel; written evidence from the manufacturer.	Medium -Poor

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Textiles	2014	revised, not yet published	textile product: 14; textile services: 8	textile product: 17; textile services: 9	a) textile products; b) textile services	Textile Products	Traceability system for the source of the textile fibre is in order.	SC	Core and comp	Requirements for Contractors	Confirmation and description of the traceability system.	Medium-Poor
						Textile Product	Threshold for chlorine and organically bound chlorine in the finished fibre.	TS	Comp	Requirements for products: Chemical content	Text report for the specific fibre product	Medium
						Textile Product	Thresholds for azo dyes, formaldehydes, APEOs, specific Phenol-Substances, specific phthalates.	TS	Core and comp	Requirements for products: Chemical content	Analysis result (by a laboratory accredited to ISO 17025)	Medium
						Textile Products	Polyester fibre products shall be manufactured using a min. recycled content of 20 % pre-consumer and/or post-consumer waste.	TS	Comp	Requirements for products: Recycled content	Tenderer shall demonstrate that the production lines for the fibre product are dedicated to production using the min. recycled content. Transaction records shall also be provided that verify the proportion of the recyclate feedstock purchased for use in the production lines.; the tenderer shall identify the production lines used for the specific fibre products to be used in fulfilment of the contract; third party certification shall be provided for the production line and the recyclate feedstock according to EN 15343, ISP 9001.	Medium-Poor
						Textile Products	Durability standards - the tenderer shall design and specify the	TS	Core and comp	Requirements for products: Designed for longevity	Test reports	Good

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							textile products in order to meet the relevant durability requirements and text methods specified in the annex.					
						Textile Products	Availability of parts and accessories - the tenderer shall provide an inventory of parts and accessories that form part of the products and make spare parts available for at least 2 (or 3 for comprehensive criteria) years.	TS	Core and comp	Requirements for products: Designed for longevity	Written commitment to fulfil the requirement as part of the product warranty.	Good
						Textile Products	Polyester and polyamide recycled content - points for each additional increment (greater than the minimum content) of 10 %.	AC	Comp	Requirements for products: Recycled content	Tenderer shall demonstrate that the production lines for the fibre product are dedicated to production using the min. recycled content. Transaction records shall also be provided that verify the proportion of the recyclate feedstock purchased for use in the production lines.; the tenderer shall identify the production lines used for the specific fibre products to be used in fulfilment of the contract; third party certification shall be provided for the production line and the recyclate feedstock according to EN 15343, ISP 9001.	Medium -Poor

Product Group	Date of publi-cation	Status	Number of core criteria	Number of comp. criteria	Structure of the criteria	Product group	List of individual CE-Criteria	SC, TS, AC, CPC	Core, comp	Category of CE-criterion (Procurer's perspective)	Verification of the criterion	Pract-icability of the criterion
						Textile Products	Restriction of specific substances at the production site.	TS	Core and comp	Requirements for the production site: Chemical content	Site audit report carried out by a third party	Medium
						Textile Products	Design for re-use - Garments shall be designed so that any logos or distinctive identifications features can be easily removed or overprinted without damaging the item.	AC	Core and comp	Requirements for products: Designed for longevity	Instructions for re-use on how to remove or overprint logos or branding.	Good-Medium
						Textile Services	Tracing and asset management systems which allow for the identification of the causes and frequency of fabric and garment failure. The management of services to repair and maintain garments and fabrics in order to maximise their lifespan.	SC	Core and comp	Requirements for Contractors	Description of the internal management systems.	Good

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						Textile Services	The tenderer shall extent the useful life of work wear and interior textiles by providing ongoing maintenance and repair services.	TS	Core and comp	Requirements for Use Stage	Provision of a detailed specification for the services offered.	Good
						Textile Services	Operation of a take-back scheme for the textiles under this contract.	TS	Comp	Requirements for Reuse and End of life: Acceptance of returned goods	Description of the internal management systems.	Medium
						Textile Services	Tenderer shall report on their take-back system: Surveys; proportion by weight of the collected textiles that have been reused or recycled.	CPC	Comp	Requirements for Reuse and End of life: Acceptance of returned goods	Summary of the staff survey findings. Annual report with a breakdown of the destination of the textiles and the value obtained from each end market.	Medium -Poor
Toilets and urinals	201 3		Flushing toilet: 11; Urinal: 12	Flushing toilet: 11; Urinal: 12	a) Criteria for flushing toilet equipment; b) Criteria for urinal equipment	Toilets and Urinals	Minimum of 4 years warranty for repair or replacement; the warranty terms shall cover the leak tightness and any valve of the product.	TS	Core and comp	Requirements for Use Stage: Warranty	Products holding a relevant type 1 Eco-label fulfilling the listed requirements will be deemed to comply. Other acceptable means of proof like self-declaration from the manufacturer stating that the clauses are met.	Good

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						Toilets and Urinals	Original spare parts or their equivalent are available for at least 10 years from the date of purchase.	TS	Core and comp	Requirements for Use Stage: Spare parts are available	Products holding a relevant type 1 Eco-label fulfilling the listed requirements will be deemed to comply. Other acceptable means of proof like self-declaration from the manufacturer stating that the clauses are met.	Good
						Toilets and Urinals	Equipment shall be supplied with information in print and/or electronic format: Information concerning appropriate disposal at product's end-of-life.	TS	Core and comp	Requirements for products: Information about waste management	Products holding a relevant type 1 Eco-label fulfilling the listed requirements will be deemed to comply. Other acceptable means of proof like self-declaration from the manufacturer stating that the clauses are met.	Good
Transport	2012		**31** - a) passenger cars and light-duty vehicles: 7; b) Public transport Vehicles: 4; c) Public Transport Services: 8; d) Waste collection trucks: 4; e) Waste	**63** - a) passenger cars and light-duty vehicles: 16; b) Public transport Vehicles: 10; c) Public Transport Services: 15; d) Waste	a) passenger cars and light-duty vehicles; b) Public transport Vehicles; c) Public Transport Services; d) Waste collection trucks; e) Waste	Passenger Car	Vehicles must use low viscosity oils or regenerated lubricant oils with a minimum of 25 % regenerated base oils. At least 45 % of the carbon content shall derive from renewable raw material.	TS	Comp	Requirements for consumables: Recycled content	Technical sheet of the lubricants.	Medium -Poor

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			collection services: 8	collection trucks: 8; e) Waste collection services: 14	collection services	Passenger Car	Extra points on the percentage of vehicle that is from recycled or renewable materials.	AC	Comp	Requirements for products: Recycled content	Technical sheet of the vehicle where this information is displayed.	Poor
						Passenger Car	Contractor has provisions in place to collect and dispose of used lubricant oils and tyres.	CPC	Core and Comp	Requirements for Reuse and End of life: Waste management	Proof of provisions	Good
						Public Transport Vehicle	Vehicles must use low viscosity oils or regenerated lubricant oils with a minimum of 25 % regenerated base oils. At least 45 % of the carbon content shall derive from renewable raw material.	TS	Comp	Requirements for consumables: Recycled content	Technical sheet of the lubricants.	Medium -Poor
						Public Transport Vehicle	Extra points on the percentage of vehicle that is from recycled or renewable materials.	AC	Comp	Requirements for products: Recycled content	Technical sheet of the vehicle where this information is displayed.	Poor
						Public Transport Services	Vehicles must use low viscosity oils or regenerated	TS	Comp	Requirements for consumables: Recycled content	Technical sheet of the lubricants.	Medium -Poor

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							lubricant oils with a minimum of 25 % regenerated base oils. At least 45 % of the carbon content shall derive from renewable raw material.					
						Public Transport Services	Extra points on the percentage of vehicle that is from recycled or renewable materials.	AC	Comp	Requirements for products: Recycled content	Technical sheet of the vehicle where this information is displayed.	Poor
						Public Transport Services	Contractor has provisions in place to collect and dispose of used lubricant oils and tyres.	CPC	Core and comp	Requirements for Use Stage	Proof of provisions	Good
						Public Transport Services	Washing during the contract period in wash bay that has at least a sludge and oil separator.	CPC	Comp	Requirements for Use Stage	Certificate of the wash bay	Good
						Waste collection trucks	Vehicles must use low viscosity oils or regenerated lubricant oils with a minimum of 25 %	TS	Comp	Requirements for consumables: Recycled content	Technical sheet of the lubricants.	Medium -Poor

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							regenerated base oils. At least 45 % of the carbon content shall derive from renewable raw material.					
						Waste collection trucks	Extra points on the percentage of vehicle that is from recycled or renewable materials.	AC	Comp	Requirements for products: Recycled content	Technical sheet of the vehicle where this information is displayed.	Poor
						Waste collection services	Vehicles must use low viscosity oils or regenerated lubricant oils with a minimum of 25 % regenerated base oils. At least 45 % of the carbon content shall derive from renewable raw material.	TS	Comp	Requirements for consumables: Recycled content	Technical sheet of the lubricants.	Medium -Poor
						Waste collection services	Extra points on the percentage of vehicles that is from recycled or renewable materials.	AC	Comp	Requirements for products: Recycled content	Technical sheet of the vehicle where this information is displayed.	Poor

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						Waste collection services	Contractor has provisions in place to collect and dispose of used lubricant oils and tyres.	CPC	Core and comp	Requirements for Reuse and End of life: Waste management	Proof of provisions	Good
						Waste collection services	Washing during the contract period in wash bay that has at least a sludge and oil separator.	CPC	Comp	Requirements for Reuse and End of life: Waste management	Certificate of the wash bay	Good
Wall Panels	2010		Criteria for GPB: TS:2, AC:2, CPC: 3; Criteria for WBB: TS:2, AC:2, CPC: 3	Criteria for GPB: TS:5, AC:2, CPC: 3; Criteria for WBB: TS:6, AC:2, CPC: 3	Two types of wall panels have been focused on (together they represent the whole panel market): Gypsum plasterboard (GPB) and Wood-based boards (WBB)	Gypsum plasterboard	Paper used in gypsum panels must be either from 100% recycled wood/paper and/or made from wood, wood fibres or wood particles stemming from legally harvested forests.	TS	Core and comp	Requirements for products: Recycled content	Verification a: Provision of appropriate documentation verifying that the paper or wood used is 100% recycled, i.e. from a national or EU certification scheme. Verification b: The legal origin of timber/wood fibres can be demonstrated with a chain-of-custody tracing system being in place. These voluntary systems may be 3rd-party certified, often as part of ISO 9000 and/or ISO 14000 or EMAS management system.	Poor
						Gypsum plasterboard	Gypsum content must be at least 2% (and 5 % in comp. Criteria) recycled gypsum board (by weight, based on an annual average…).	TS	Core and comp	Requirements for products: Recycled content	Appropriate proof must be provided that this criterion is met. For example, the supply of quality control or production documentation.	Poor

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						Gypsum plasterboard	The gamma index or the activity index is less than 1, when panels contain potentially radioactive material (from slag products, ash from coal fire, phosphogypsum).	TS	Comp	Requirement for products: Chemical content (radioactivity)	Testing report	Medium
						Gypsum plasterboard	Gypsum plasterboard shall not contain any chemical product classified as carcinogenic, mutagenic, harmful or toxic to the reproductive system, toxic.	TS	Comp	Requirement for products: Chemical content	Testing report, safety data sheets	Medium -Poor
						Gypsum plasterboard	GPB must not be treated in a manner which would prevent recycling and/or composting in Europe.	TS	Comp	Requirements for Product: Information on Use stage and End of life	The bidder must provide appropriate proof that this criterion is met. For example, relevant test certificates and information sheets or any other appropriate proof will also be accepted.	Poor
						Gypsum plasterboard	Increased percentage of recycled gypsum	AC	Core and comp	Requirements for products: Recycled content	Appropriate proof must be provided that this criterion is met. For example through the provision of documentation covering proof of recycled input.	Poor

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							in purchased plasterboard.					
						Gypsum plasterboard	Information on wall panel covering that will not hinder the recycling of diversion of GPB at End of Life.	CPC	Core and comp	Requirements for products: Information on Use Stage and End of life	Products holding a relevant Type 1 Ecolabel fulfilling the listed criteria will be deemed to comply. Other appropriate means of proof will also be accepted.	Medium
						Gypsum plasterboard	User information describing the handling through all stages (also info regarding recovery, recycling and diverting from landfill…).	CPC	Core and comp	Requirements for Products: Information on end of life	Compliance with these requirements shall be demonstrated by providing examples of labels, packaging and point of sale information. Other appropriate means of proof will also be accepted.	Good
						Gypsum plasterboard	Effective policies and procedures to ensure that waste arising from the installation is properly dealt with.	CPC	Core and comp	Requirements for Reuse and End of life	EMAS or ISO 14001 certificates or other appropriate means.	Good
						Wood based board	Wood panels that use formaldehyde-containing binding agents shall not exceed the emission limit of the E1 standard following EN 13986.	TS	Core and comp	Requirement for products: Chemical content	Test report	Medium

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						Wood based board	Content of free formaldehyde in glues for plywood panels or laminated wood panels may be up to 0,5 %.	TS	Comp	Requirement for products: Chemical content	Test report	Medium
						Wood based board	Composite wood panels including phenol-containing binding agents must not exceed a phenol concentration of 14 micrograms/m³.	TS	Comp	Requirement for products: Chemical content	Test report	Medium
						Wood based board	Composite wood panels containing PMDI-based binding agents must not emit more than 1 micrograms/m³ of the monomer MDI.	TS	Comp	Requirement for products: Chemical content	Test report	Medium
						Wood based board	The final product shall not contain chemical products classified as carcinogenic, mutagenic, harmful to the	TS	Comp	Requirement for products: Chemical content	Test report	Medium

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							reproductive system, toxic.					
						Wood based board	The proportion of % of timber that is recycled or reused timber.	AC	Core and comp	Requirements for products: Recycled content	Bidders must provide a signed declaration indicating the level of this criterion the products are able to meet.	Medium -Poor
						Wood based board	Information on wall panel covering materials, such as paint types, that will not hinder the recycling or diversion of WBB at end of life must be made available.	CPC	Core and comp	Requirements for products: Information on use phase and End of life	Type 1 ecolabel or other appropriate means.	Medium
						Wood based board	User information describing i. a. recycling or disposal methods.	CPC	Core and comp	Requirements for Products: Information on End of life	Examples of labels, packaging and point of sale information.	Good
						Wood based board	The bidder must demonstrate that the contractor installing the wall panels has in place effective policies and procedures to ensure that installation waste is properly dealt with in a	CPC	Core and comp	Requirement for Reuse and End of life	EMAS or ISO 14001 certificates or other appropriate means.	Good

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							sustainable manner, such as recycling or diverting from landfill where possible.					
Waste Water Infrastructure (sewerage systems and waste water treatment plants)	2013	Difficult to specify (each criteria consists of several criteria)	Difficult to specify (each criteria consists of several criteria)	a) GPP criteria for consultancy services; b) GPP criteria for construction contract; c) Energy performance requirements; d) water consumption; e) waste water treatment efficiency; f) treatment efficiency of flue gas treatment; g) contract performance clauses; h) verification of the GPP data	Consultancy Services	Qualification of the consultant - perform LCAs.	SC		Requirements for contractors: Knowledge LCA	List of comparable projects; certificates and information on the qualifications.	Medium
						Consultancy Services	Description of the specific method to assess the environmental impacts using an LCA approach.	AC		Requirements for contractors: Knowledge LCA	In the proposal, the understanding of the project, the proposed methodology and the management and organisation of the project has to be set out.	Medium
						Construction Contract	Experiences in reducing environmental impacts.	SC		Requirements for contractors: Knowledge LCA	List of comparable projects; certificates.	Medium
						Construction Contract	Approach and methodology related to the environmental aspects of the project. For example a draft environmental management plan for the construction/operation (among others Reduction of waste and recovery/recycling of materials).	AC		Requirements for products: Environmental aspects of the project	The quality and competitiveness of the environmental management plan will be assessed.	Good

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						Construction Contract	Tenderer must provide a proposal on how to maximise the use of rain water and grey water.	AC	Comp	Requirement for products: Use of grey water	Calculation and documentation of the tenderer will be assessed.	Good
						Construction Contract	Demand on maximal chemical consumption (chemicals per treated waste water or per kg phosphorus in the inlet).	TS	Core and comp	Requirement for products: Chemical content (mass of used chemicals)	Calculation and documentation of the tenderer will be assessed.	Good
						Construction Contract	Demand on maximal chemical consumption (chemicals per treated waste water or per kg phosphorus in the inlet).	AC	Core and comp	Requirement for products: Chemical consumption	Calculation and documentation of the tenderer will be assessed.	Good
						Construction Contract	Detailed requirements in the Environmental Management Plan, for example the use of i. a. renewable/reused materials, materials recycled and recovered.	CPC	Core	Requirement for products: Recycled content	Monitoring and reporting routines established in the contract.	Good

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Water-based Heaters	2014		11 (1 Selection criteria, 4 Technical Spec., 6 Award Criteria)	14 (1 Selection criteria, 9 Technical Spec., 4 Award Criteria)		Water based heaters	Ability of the tenderer - only in case of installation works - maintenance and repair of heating systems.	SC	Core and comp	Requirements for contractors: Knowledge longevity	The tenderer shall supply a list of comparable projects recently carried out	Good
						Water based heaters	Warranty for a minimum of 4 years.	TS	Core and comp	Requirements for Use Stage: Warranty	Products with the EU Ecolabel for water-based heaters or other Type I ecolabels are deemed to comply. Other acceptable means of proof: self-declaration from the manufacturer.	Good
						Water based heaters	Tenderer shall ensure that genuine or equivalent spare parts are available for at least 10 years.	TS	Core and comp	Requirements for Use Stage: Spare Parts	Products with the EU Ecolabel for water-based heaters or other Type I ecolabels are deemed to comply. Other acceptable means of proof: self-declaration from the manufacturer.	Good
						Water based heaters	The product shall be supplied with the following user information in printed and electronic format (…) recommendations on appropriate disposal at product's end of life.	TS	Core and comp	Requirements for products: Information on end of life	Products with the EU Ecolabel for water-based heaters or other Type I ecolabels are deemed to comply. Other appropriate means of proof are written evidence of compliance.	Good
						Water based heaters	Points will be awarded if the water-based	AC	Core and comp	Requirements for products:	Products with a Type I ecolabels fulfilling the listed requirements will receive the points. Other appropriate means of proof	Good

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							heater is easy to dismantle by professionally trained personnel using commonly available tools, for the purpose of repairs and replacements of worn-out parts, upgrading older or obsolete parts, and separating parts and materials, ultimately for reuse or recycling.			Designed for recycling	will also be accepted, e. g. a declaration of compliance with this criterion together with a technical report from the manufacturer showing the dismantling of a product with an exploded diagram labelling the main components as well as identifying any hazardous substances in these components. This diagram shall be available in the manufacturer website. Information regarding hazardous substances shall be provided to the procurer in the form of a list of materials identifying material type, quantity used and position in the water-based heater equipment.	

<u>Legend for Annex J:</u>

AC   Award criteria

Comp   Comprehensive criteria

Comp.   Comprehensive criteria

Core   Core criteria

CPC   Contract performance clause

rev.   Revision

SC   Selection criteria

TS   Technical specification

DIRECTORATE-GENERAL FOR INTERNAL POLICIES

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