Public Procurement and Sustainable Development

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Abstract

Public procurement has been evolving from an economic instrument into a mixed one with the inclusion of horizontal policies (both environmental and social ones). The latest Directives regarding public procurement have turned some of the previous "suggested" instruments into binding law, namely the sustainability principle, mandatory procedure dematerialization, ecolabels, life-cycle costing as a factor within the most economically advantageous tender criterion, social protection of persons with disabilities, specific procedure rules concerning certain social contracts, and innovation as an instrument to achieve sustainability. This legal instrument has been recognised as a strong legal mechanism to achieve the 12th SGD goal for promoting sustainable public procurement practices, in line with national policies and priorities (target 12.7). This is why public procurement actors must consider EU determinations such as The New Green Deal, which intends to make EU economy sustainable: "public authorities, including the EU institutions, should lead by example and ensure that their procurement is green"(European Commission, 2019a, §2.1.3). Since public procurement appears to be an interesting instrument for transitioning from a linear economy to a circular (sustainable) one, the EU has also published the Circular Economy Action Plan, the latest dating from March 2020 (European Commission, 2020a) and including a "sustainable products policy" to help public procurers design procurement and economic operators adapt their business models thereto. Both documents focus on "reducing and reusing materials before recycling", particularly in resource-intensive sectors such as textiles, construction, electronics, and plastics. While many Member States have been implementing green public procurement (hereinafter: GPP) in several economic fields, studies have shown that procedures still lack common methodologies, among other difficulties regarding the Life Cycle Costing (hereinafter: LCC) factor implementation. In this paper, we will therefore go through several of these national legal solutions and practices to understand how far GPP has been implemented and which methodologies are being applied (GPP Good Practice), dwelling particularly on the latest Portuguese guides concerning GPP, and analyse how far the present implementation meets the requirements of circular economy (Portuguese National Strategy of Green Public Buy 2020: hereinafter: ENCPE 2020a). This is the first step towards building guidelines for both public procurers and economic operators: as regards the first, in order to help them design adequate sustainable public procurement procedures; as for the latter, to help them adapt their business models accordingly. Sustainable development within public procurement can only be achieved that way.

Keywords: Public Procurement, Sustainability, 12th UN SDG goal, Circular Procurement

1. Introduction

Public Procurement Procedure has evolved from a typical economic tool to a complex one that embodies and pursues several dimensions of sustainable development, a "multiple-objective instrument" nowadays (Lundberg and Marklund, 2018, p. 44). The 12th UN SGD goal, *Ensure sustainable consumption and production patterns*, expressively includes Public Procurement as the 7th Target (Sönnichsen and Clement, 2020). As an instrument that serves both public entities and economic operators in their business of buying and selling goods and services, the topics of consumption and production are key factors in public procurement. Although sustainable development and sustainability should not be confused (Montini, 2020; Montini and Volpe, 2017), the ecological core of the concepts is present in the concept of sustainable public procurement. Besides the hard law of the Directives, Member States (MS) have now several soft law documents to guide them into implementing sustainability in public procurement and help public procurement to become a tool to implement circular economy. Even though circular economy (CE) is not yet a certain concept within the law - not even in economics (Kirchherr, Reike and Hekkert, 2017), although it has "a strong intuitive appeal" (Zink and Geyer, 2017, p. 600), we will try to demonstrate the adequacy of the public procurement process based upon the EU documents on the circular action plan by comparing the GPP experiences with soft law goals and tools foreseen in the two most recent EU Documents: The New Green Deal (European Commission, 2019a), which intends to make EU economy sustainable, and the Circular Economy Action Plan, the latest dating from March 2020 (European Commission, 2020a). For that purpose, we have chosen the four products targeted by those EU documents: textiles, construction, electronics, and plastics. The particular tool that 2014 Directives and the two abovementioned EU documents use is Life-Cycle Costing (LCC). The study on the use, the challenges, and the opportunities related to the use of LCC methodologies has been drawing the attention of researchers (Andhov, Caranta and Wiesbrock 2019; Caranta, 2015; Carvalho, 2019; Dragos and Neamtu, 2016; Estevan and Schaefer, 2017; Schebesta, 2014; Swarr, et al., 2011). The particular purpose is to analyse whether the path already travelled is useful to go further and embody circularity.

2. Methods

We intend to compare the circular economy concept enshrined in the Circular Economy Action Plan (CEAP), the latest dating from March 2020 (European Commission, 2020a) with The New Green Deal, which addresses the economic sustainability linked to environmental dimension as "one of [its] main building blocks" (European Commission, 2019a). For that purpose and bearing in mind that this paper is, essentially, an academic reflection in the law field, we will use, as foundations, the latest literature specifically devoted to CE related to Public Procurement. Finally, we will try to ascertain whether the GPP criteria already applied in some Member States include some of the concerns regarding circularity, using textiles, construction, electronics, and plastics as examples.

3. Results and Discussion

3.1. The construction of the European framework on Circular Economy (CE) and Public Procurement

The traditional economy process is a linear one, and the transition to a circular one is seen as an opportunity to overcome some of the most challenging problems the world and humankind are currently facing, such as climate changes and natural resources scarcity, to name the most serious ones (Popa and Popa, 2021; European Commission, 2017). Even though waste was initially the main concern (European Commission, 2014), by 2015 the EU acknowledged that waste targets were not enough. The Circular Era began (Popa and Popa, 2021) and, by December 2015, a wide range of tools were displayed, such as the European Circular Economy Stakeholder Platform and the European Cluster Collaboration Platform (Witjes and Lozano, 2016).

The first Circular Economy Action Plan – *Closing the loop – An EU action plan for the Circular Economy* – contained the definition of circular economy: an "economy in which the value of products, materials and resources is maintained in the economy as long as possible and the generation of waste is minimised" (European Commission, 2015, p. 2). The EU Communication recognises that public procurement can be helpful in pursuing the transition, namely though GPP. The Commission embraces a set of commitments: "the Commission will make sure that in future, special emphasis is placed on aspects relevant to the circular economy, such as durability and reparability, when setting out or revising criteria. Secondly, it will support a greater uptake of these criteria by public authorities and reflect on how GPP could be used more widely across the EU, in particular for products or markets that have high relevance for the circular economy. Finally, the Commission will lead by example, by making sure that Green Public Procurement is used as widely as possible in its own procurement, and by reinforcing the use of GPP in EU funding" (European Commission, 2015, p. 8). In 2017, the European Commission defined circular procurement as "the process by which public authorities purchase works, goods or services that seek to contribute to closed energy and material loops within supply chains, whilst minimising, and in the best case avoiding, negative environmental impacts and waste creation across their whole life-cycle" (European Commission, 2017b, p. 5). By 2018, the Commission proposed a monitoring system to gather up a set of indicators "covering each stage of the product life cycle". This tool allowed a site construction with "tools for monitoring progress and documents, methodologies for indicators, data sources, definitions and publication standards" particularly related to GPP (Popa and Popa, 2021, p. 25).

To better understand the transition, the Report on the implementation of the 2019 circular action plan (European Commission 2019) defined "circularity process" and related it to an adaptation of industrial processes. Design became a key factor in circularity process' implementation: "Products and services

designed in a circular way can minimise resource use and foster materials' reuse, recovery and recyclability down the road" (European Commission 2019, p. 2).

In 2020, the Commission's Communication *A new circular economy action plan for a cleaner and more competitive economy* went further and into CE implementation (European Commission, 2020a) and, in October 2020, the European Committee of the Regions presented a plan to strengthen the CE concept both locally and regionally.

Through all these EU documents and with ever-increasing visibility, the Commission has shown to be perfectly aware of the need to address the voluntary use of GPP criteria within the goal of transitioning to circularity using the public procurement tool.

Although most of the literature is uncertain about the rigour of the concept of CE and many of the papers address the waste topic, we believe we can establish that, as regards public procurement in particular, the concept must work with (a be related to) some already existing tools such as the LCC factor, which is currently of voluntary use, but will surely become mandatory in a near future (European Commission, 2020) . This tool is particularly useful and adequate to address products' design and lifespan (use, reuse, recovery, remanufacturing, recyclability, secondary raw materials, and so on). These concepts are at the heart of CE and can already be found in some GPP experiences, in soft EU law and in some of the national guidelines, such as Portugal has. Niero et al. criticize "the lack of emphasis on social contexts" (Niero et al., 2021, p. 2) and Michaux and Gruyters also highlight that the LCC is "solely focused on the inclusion of environmental parameters" (Michaux and Gruyters, 2020, p. 65).

3.2. Public Procurement rules, the path already crossed, and the one yet to be crossed

According to the Circular Economy Action Plan, "Global consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double in the next forty years [OECD (2018), Global Material Resources Outlook to 2060], while annual waste generation is projected to increase by 70% by 2050 [World Bank (2018), What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050]" (§1) (European Commission, 2020a, p. 2).

The Circular Economy Action Plan focuses on the products "where the potential for circularity is high": electronics and Information and Communication Technologies (hereinafter: ICT), batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients. It is a tool to implement *The Green Deal.* Therefore, a "sustainable framework" is set out, which includes: (i) the design phase (do note the existence of the Eco-Design Directive); (ii) the empowerment of both consumers and public buyers; and (iii) circularity in production processes (European Commission,

2020a).The design phase is responsible for up to 80% of products' environmental impacts (European Commission, 2014a). Therefore, the Action Plan dedicates some relevant reflection upon this life phase.

It is important to recall that the 2014 Directives (and the 2014/24/EU Directive, in particular) establish life-cycling costing (LCC) as a relevant factor to include in award criteria and as a tool to implement sustainable (ecological) public procurement. Sustainable public procurement can be achieved both by technical specifications (recitals 74 and ff.) and award criteria (recitals 92 and ff.) (Brammer and Walker, 2011; Witjes and Lozano, 2016). Public procurement is recognised as a tool to "support of sustainable growth" (recital 95), precisely through LCC, which includes: "all costs over the life cycle of works, supplies or services"; "internal costs, such as research to be carried out, development, production, transport, use, maintenance and end-of-life disposal costs"; it "can also include costs imputed to environmental externalities, such as pollution caused by extraction of the raw materials used in the product or caused by the product itself or its manufacturing, provided they can be monetised and monitored" (recital 96). Article 2 (20) defines life cycle as "all consecutive and/or interlinked stages, including research and development to be carried out, production, trading and its conditions, transport, use and maintenance, throughout the existence of the product or the works or the provision of the service, from raw material acquisition or generation of resources to disposal, clearance and end of service or utilisation". Article 67, no. 2, refers to LCC as a useful factor to be considered in the award criteria. Article 68 describes several aspects of the LCC factor, including the legal requirements set by EUCJ: costs relating to acquisition, use, consumption of energy and other resources, maintenance costs, and end of life costs, such as collection and recycling costs. All these costs have a straightforward link to the design stage, in the sense that most of them can be anticipated and addressed. Not all of them will have the same costs and the same relevance, but it is certain that the design phase is crucial to the life of products, goods and services.

Within the design factor, the Action Plan for Circular Economy lists a wide range of concepts that can be found in some GPP criteria: "durability, reusability, upgradability and reparability, addressing the presence of hazardous chemicals in products, and increasing their energy and resource efficiency", "remanufacturing and high-quality recycling", "restricting single-use and countering premature obsolescence", "ban on the destruction of unsold durable goods"; "product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle"; "mobilising the potential of digitalisation of product information, including solutions such as digital passports, tagging and watermarks"; "rewarding products based on their different sustainability performance, including by linking high performance levels to incentives" (European Commission, 2020a, p. 4). Design is therefore the key to implement circularity.

As stated before, we will focus particularly on textiles, construction, electronics, and plastics. The timeline for the implementation of the circular economy action plan is very ambitious: the latest date is 2023. The "Mandatory Green Public Procurement criteria and targets in sectoral legislation and

phasing-in mandatory reporting on GPP" is due until the end of 2021 (European Commission, s.d.) and has been supported by some of the most relevant researchers in this field of law (Pouikli, 2021; Andhov, M. et al., 2020; Melón, 2020, p. 1; Pantzar et. al., 2018).

Some examples of good practices regarding GPP criteria implementation:

Textiles: the Barcelona Sports Institute (IBE – Spain) intended to reduce plastic waste to diminish the environmental impacts of sports events, namely the "La Mercè Race". It wanted to "reduce the waste generated when athletes collect their t-shirts". Additionally, it wanted to "buy t-shirts which met the standards of MADE IN GREEN by OEKO TEX, to ensure t-shirts were free from harmful chemicals and made under safe working conditions". A procurement process was built for the 2019-2020-2021 race, implementing sustainable measures regarding transport (vehicles' environmental impact certification, use of eco-vehicles, etc.), waste (packing requirements and calculation of waste reduction), fibres (use of green fibres), design (comfort and breathability), and the reduction of the production period. Such requirements were useful: "the new race t-shirts are certified by MADE IN GREEN OEKO TEX, and are delivered using ECO vehicles, which leads to less CO2 emissions and reduces air pollution in the city. The packaging used to deliver the t-shirts has been reduced by over 75%, through the delivery of the t-shirts in reusable crates that the company takes back, after the t-shirts have been distributed to the runners' packs prepared for the race" (GPP In Practice, issue no. 99, September 2020, pp. 1-3). In 2015, the Municipality of Odense, Denmark, "published a call for tender which sought to include all elements of clothing provision to health professionals within one contract: leasing, collection, washing, and return of clothes to various points in the Odense Municipality. In addition, the supplier was to become responsible for the logistics of the service". Some of the abovementioned features of circularity can be traced here, such as leasing instead of buying, and the outsourcing of the logistics. Sustainability concerns were enshrined in both technical specifications and award criteria. As regards technical specifications, "purchase and use of low-toxicity textile products, preferably products and fibres with limited environmental impact during manufacture and made from fibres grown with minimal use of pesticides, and minimi[zation of] the environmental impact of use, maintenance and disposal of textile products"; environmental management certification was required "in order to support Odense Municipality's compliance with the POGI targets". Within the award criteria, service and sustainability weighted 45%, in line with the implementation of the LCC factor. Tenderers had to describe the production process and the measures taken to reduce environmental impacts: the measures taken to reduce the consumption of water, oil, pesticides, fertilizers, energy and CO2 emissions, and those regarding the recycling of disposals. Circularity features such as sourcing, manufacturing, use and end-of-life are particularly relevant within textile production: "an environmental improvement offered by the successful bidder was related to the recycling of discarded work clothes for new products. Textiles which are no longer suitable for clothing are now being recycled to produce 'OdensePoser' textile shopping bags, made by people employed on social clauses, to

promote sustainability within Odense" (GPP In Practice, issue no. 87, April 2019, pp. 1-3). Another example regarding textiles made from recycled fibres is found in the Netherlands, related to the procurement of towels and overalls, which had to contain "at least 10% recycled post-consumer cellulose fibres, [which] had to come from post-consumer textile material, as opposed to production waste or other alternative sources" (technical specifications)" (GPP In Practice, issue no. 77, December 2017, p. 2). Again, recycling is used as a way to implement circularity in public procurement.

These three examples are illustrative of the possibility to enshrine circular requirements into public procurement. *The EU Green Public Procurement (GPP) Criteria for Textile Products and Services Report* gives a set of examples of how to draw the procurement process and underlines the importance and benefits of the use of LCC as an analytic tool. It recognises the complexity and variation of the process, which depends on the nature, origin, use and end-of-life of the final product.

The European Commission has established five key aspects regarding the impact of textiles during their life, addressing fibre sourcing, chemical restrictions, durability and lifespan extension, energy conservation during use; and design for reuse and recycling:

Table 1

European Commission, 2017a, p. 8

Key environmental aspects	GPP approach
• Hazardous effects on the aquatic environment due to the use of hazardous fertilisers and pesticides during the cultivation of natural fibres. • Hazardous effects on the aquatic environment due to substances used during the processing of intermediate and final textile products. • The use of biotic and abiotic resources from forestry, petroleum and natural gas to manufacture fertilisers and fibres. • Greenhouse gas emissions, acidification and smog resulting from the production and use of electricity and natural gas used to manufacture synthetic fibres and to wash, dry and iron textiles. • Early product failure which can result in the consequent waste of biotic and abiotic resources, and their landfilling or burning with potential for hazardous emissions to air and water.	• Purchase textiles made from fibres which are produced using fewer fertilisers, hazardous pesticides and production chemicals. • Purchase textiles that contain recycled materials and fibres. • Purchase textiles with a reduced use of environmentally harmful and hazardous substances in their production. • Purchase textiles that require less energy for drying and ironing. • Purchase colour-fast fabrics that do not shrink during use, that are constructed to be more durable in use and which have longer-lasting functional coatings. • Contract services that minimise the energy used to wash, dry and iron textiles. • Contract services that maintain textiles in order to extend their lifetime. • Contract services that reuse maximise the potential for reuse and recycling of textiles at the end of their service life.

The document addresses the LCC methodology and underlines its importance of reducing "the life cycle costs associated with their laundering, maintenance and end of life: (…) energy associated with washing, drying and ironing textile products"; lifespan, and disposal (European Commission, 2017a, p. 32). Since December 2020, Portugal has adopted some GPP criteria regarding textiles which are very similar to EU GPP criteria. The main concerns regard fibres' origin; chemical restrictions; durability and prolonged service life; energy conservation during use conservation of water consumption and quality; and design with a view to reuse and recycling. Life-cycle analysis is a key tool in the Portuguese Manual and is centred in cotton, wool, synthetic fibres, man-made fibres, "energy consumed in the

processes and ecotoxicity associated to the production phases", and "release of microfibres in the washing process during use phase". The use of mixed contracts including services regarding maintenance, recovery, and recycled raw materials is one of the possibilities (ENCPE 2020a, pp. 9 and ff).

Road design, construction, and maintenance: The municipality of Frederiksberg, Denmark, has a particular environmental constrain regarding heavy rainfall combined with old sewage network. Therefore, urban flooding is a reality that has the danger of becoming more regular due to climate changes. Thus, the municipality launched "a number of projects to improve rainwater management. By improving the city's 'green' and 'blue' infrastructure (such as vegetation and water features), rainwater can be captured, and its flow can be diverted from sewers or slowed down". An innovative partnership was the chosen tool. The municipality sought for solutions to withhold rainwater from sewages and roadways and allowed both the use of existing road structure and the building of other structures. The award criteria foresaw a 20% deployability rate for the implementation of the solution presented (flexibility and modularity). The solutions proposed used the existing trees for retained rainwater, "saving time, water, and CO2 in terms of the trucks used for these maintenance operations), and reduc[ing] pressure on existing drainage networks by diverting water through transpiration (evaporation from trees)". This example demonstrates the contribution to climate changes fight and water circularity within a road problem (GPP In Practice, issue no. 97, June 2020, p. 2).

In 2016, the European Commission published some GPP criteria regarding road construction and identified the "most significant environmental impacts of roads": rolling resistance; congestion; "resources used and the emissions and ecosystem impacts associated with materials production, including extraction and transportation"; maintenance and rehabilitation; environmental noise emissions; and storm-water drainage. The tools to address the impacts of road construction are life-cycle assessment (hereinafter: LCA) and carbon footprint (hereinafter: CF). Portugal has issued a Manual with criteria that are very similar to those of the EU concerning design, construction and major repair, use, rehabilitation, maintenance, operation, and end of life. The particular features regarding use, for instance, are "rolling resistance associated with the texture of the road surface", traffic jams, extraction, processing and transport of construction materials, traffic flow, environmental noise emissions, and storm water drainage. LCC, carbon footprint, recycled, reused and reusable materials, and CO2 emission reduction are also tools inserted therein (ENCPE 2020, p. 13).

Electronics: computers, monitors, tablets and smartphones: there are several good practices regarding Information Technology (hereinafter: IT). In Sweden, in the Region Stockholm, there is a programme is being applied to reduce greenhouse gas emissions with relevant success. Even though the focus had initially been on transport and energy, IT procurement was also considered in the environmental requirements: "the Region Stockholm has identified ICT as a priority area to be addressed in their procurement, due to the high risk of human rights, labour rights, and child labour violations within the

supply chain". Therefore, the public body intends to procure products that are free of "substances hazardous to the environment and human health, have a low environmental impact from a life cycle perspective, and stimulate sustainable product development, while reinforcing social responsibility in the supply chain for goods and services". Thus, the technical specifications are focused on energy savings, and products to be halogen free, mercury free (documentation to confirm this is required for the last two requirements), and PVC free in the package, while "cellulose in packaging must be of recycled pulp, unbleached pulp, or pulp bleached without chlorine gas". Environmental factors weighed 15%, in the award criteria and environmental impact from a life cycle perspective and durability were among the factors taken into account in the process. Sustainable supply chains were required as contract performance clauses as well. Thus, some of the circularity issues are already addressed therein: energy savings, LCC perspective, durability, and supply chain sustainability (GPP In Practice, issue no. 89, July 2019, p. 2). Just about the same concerns, earlier, in 2016, the United Kingdom and Scotland sought for supply of ITC devices. Technical specifications focused on energy efficiency, product lifecycle, management of delivery fleet ("All deliveries should be managed in order to minimise emissions, including use of efficient logistics, full loads and driver training"), mandatory continuous monitoring duties, innovative packaging (to reduce waste and in line with "a more circular approach, innovative packaging solutions were sought that included take-back pallets or crate systems and alternative packaging materials"; these solutions sought waste minimisation, re-use, package recycling, and sustainable sourced materials), devices' end of life management, and circular economy (WEEE Directive: "emphasis was placed on repair, refurbishment and re-use of devices and the frameworks sought to embed this as a key requirement and encourage the market to go further"). I believe the example speaks for itself regarding the connection of public procurement and circularity within the technical specifications. In what regards the award criteria, these concerns weighed 50% altogether (GPP In Practice, issue no. 69, March 2017, p. 1). Portugal also has an example of IT procurement where energy efficiency was a deep concern. A municipality association (LIPOR) wanted to rent multifunction printers with high energy efficiency and, therefore, defined the technical requirements and "organised informal meetings with potential service providers in order to assess their ability to meet the tender criteria and communicate its benefits". In terms of energy efficiency, it received a "significantly better offer than the minimum required in the tender" (European Commission, 2016a).

This year, the European Commission published the GPP criteria regarding computers, monitors, tablets, and smartphones (European Commission, 2021). The Report addresses (i) product lifetime extension (reparability, reusability and upgradeability; rechargeable battery life and endurance; mobile equipment durability testing; Interoperability and reusability of components); (ii) energy consumption; (iii) hazardous substances; (iv) end-of-life management; and (v) refurbished/remanufactured equipment (supply of refurbished/remanufactured ICT equipment; service agreement associated with the supply of refurbished/remanufactured ICT equipment). The LCC tool is also considered to be suitable to

calculate costs related to acquisition costs, delivery and installation costs, maintenance/service costs, operation costs (energy consumption), fees, taxes and other costs, and externalities (CO2 emissions linked to energy consumption). Portugal has a Manual regarding ITC, but health related. Still, energy efficiency and life span are again the main concerns (ENCPE, 2019, pp. 5, 8 and 17).

Plastics: this issue is normally addressed in waste management or embodied in other issues that involve plastics as packages, as we have seen in previous examples.

Even though there are many examples of voluntary use of GPP criteria, the trend of turning them into mandatory GPP criteria has been growing: "given the size of public procurement in the EU economy" ("Public procurement is worth an estimated 14% of GDP in the EU, according to the CEAP"), GPP "can be an effective instrument in bringing about a wider change in the market by creating demand and acceptability for more circular products, and business models, which, at scale, may contribute to reducing the EU's material consumption" (Pantzar and Suljada, 2020, p. 14); (Testa et al., 2016). The fastest way into mandatory GPP criteria is to take advantage of the existence of guidelines and move "from voluntary guideless to mandatory criteria" (Pantzar and Suljada, 2020, p. 14). This option is not free from challenges, as we have already pointed regarding LCC implementation (Carvalho, 2019) (Testa et al., 2016; Testa et al., 2012): the lack of expertise in contracting authorities, the absence of reliable database, the absence of standardization, citizens' mistrust regarding costs (Lundberg and Marklund, 2018; Brammer and Walker, 2011), and the lack of methodologies capable of demonstrating the economic gain within the green concerns embodied in technical specifications and award criteria. Halonen further highlights that the economic discussion regarding GPP is made in a very outlined perspective, only considering transition costs, and not taking into account the societal effects, that remain unknown (Halonen, 2021, p. 7-8).

Furthermore, it will be necessary to address the differences among the several goods and products, and to reflect upon how this process can be adapted to services. Pantzar and Suljada (2020, p. 14) also underline the need to address the issues concerning prioritisation and include "more than energy use" . In parallel with the adoption of mandatory GPP criteria within the sustainable product framework, we can find in the description of the legislative proposal many of the sub concepts related to circular economy: durability, repairability and recyclability of products; value retention and reuse; digitalisation; energy efficiency; and right to repair (Pantzar and Suljada, 2020). The authors propose a "centralised system for environmental product information in the EU to support industry and regional initiatives in the transition towards circularity" (Pantzar and Suljada, 2020, p. 10); (Pantzar et. al., 2018). One of the tools is the widening the Eco-Design Directive – Directive 2009/125/EC, 21st October (energy-related products). There is also a directly related public procurement Directive regarding energy efficiency – Directive 2012/27/EC, 25th October. However, Pantzar and Suljada recognise the potential issue related to this tool: "it needs to be accompanied by the development of standards and testing methods to support harmonised verification of new requirements" (Pantzar and Suljada, 2020,

p. 11). Another tool is proposed, this time regarding citizens: to legislatively create a procedure of "substantiating green claims", replacing the different procedures already in force that are creating "confusion and possibly eroding consumer confidence in the legitimacy of the claims" (Pantzar and Suljada, 2020, p. 12). Finally, the authors claim the transparency and reliability of the information addressed to both consumers and economic operators. This kind of information may potentiate citizens' awareness to the topic and change behaviours. As for economic operators, this awareness may drive them to apply both the concept and the sub concepts into their business models (Witjes and Lozano, 2016). Both situations will benefit the public procurement procedure by meeting the requirements within the technical specifications, terms and conditions, and award criteria. Pantzar and Suljada are sceptic regarding this societal effect: "there is limited evidence to suggest that improved information about products' environmental impacts, such as eco-labels, result in real-life changes in purchasing behaviour because of various rebound effects, subconscious routines and habits, etc.; let alone at the scale required. Our choices as consumers (be them household, private sector or public) remain largely driven by price and convenience" (Pantzar and Suljada, 2020, p. 13).

Once mandatory GPP criteria are established, and the European Commission "will propose minimum mandatory green criteria or targets for public procurements in sectorial initiatives, EU funding or product-specific legislation" (European Commission, 2020, p. 12), it would be important to monitor their implementation (Cheng, et. al., 2018). So far, voluntary GPP criteria implementation has been a disappointment. For instance, in Portugal, the latest Report assessing green public buy, by the Court of Auditors, precisely expresses no monitoring, whereas environmental criteria/factors are given little relevance (Court of Auditors, 2020). The perception of this implementation may be very useful to endorse and support public policies and try to change citizens' behaviour in this matter, even though Pantzar and Suljada's recommend to "avoid a sole focus on citizens' role in changing consumption behaviour" and focus on public and private operators' responsibility (Pantzar and Suljada, 2020, p. 24). Furthermore, monitorization will also allow to assess whether products, goods, and services are effectively "circular" and "green", as declared. Having the label of circular or environmental conformity should not be enough to "automatically [assume the good or the product] to benefit the environment" (Pantzar and Suljada, 2020, p. 16). Sometimes, remanufactured products are "resulting in environmental impacts of both the primary and secondary production" (Pantzar and Suljada, 2020, p. 16), (Zink and Geyer, 2017).

Circular public procurement is already being implemented whenever technical specifications and/or criteria award embody factors such as reuse, recycled materials, remanufactured materials, repair, services rent, and so on. We have described some examples of effective procedures and Manuals that enshrine those concepts. Although there are several possible concepts of CE, as Kirchherr, Reike and Hekkert (2017, p. 229) refer, CE is "an economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and

consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations". This economic perspective is capable of being "translated" into law requirements.

We believe that one of the most relevant hindrances for the transition to circularity within public procurement is Member States' economic development. Asymmetries in development persist, which will slow down the transition from linear to circular processes, also in what regards public procurement (Sönnichsen and Clement (2020) . These asymmetries are relevant to the existence of the barriers identified by Gasfström and Aasma (2021).This transition to a circular procurement will not be possible without the commitment of procurers, economic operators, and civil society. The law is only a small input (Testa et. al., 2016), and it seems rather settled that, as Sönnichsen and Clement (2020, p. 15) underline, there are three dimensions of circular procurement: "organisational aspects, individual behaviour and operational tools". The barriers rely, as Gasfström and Aasma state, "on very particular contextual conditions, including jurisdictions, consumer preferences and the presence or absence of various other institutional settings". Therefore, the national context analysis must be the starting point to address those barriers (Gasfström and Aasma, 2021, p. 11). Furthermore, from the standpoint of economy, the public policy makers must ensure "that products are good substitutes for benchmark alternatives and [focus] where buyer price sensitivity is low" (Zink and Geyer, 2017, p. 600).

4. Conclusions

The legal (both hard and soft EU Law) framework is clearly converging into linking sustainability to the transition to a circular economy. Joining in the SDG goals – the urgence of climate change –, the public procurement process, initially a fully economic instrument, is perceived as an important instrument to help that transition. Both the aforementioned examples and the existing guidelines regarding IT, textiles and road design, and construction and maintenance, clearly show that the public procurement process can be very relevant in the effort to transit to a circular economy. Several key circularity features are therefore being included in both technical specifications and award criteria, fomenting recycled raw materials, reuse, remanufacturing, refurbishment, repair, etc. The LCC methodology is being increasingly used in these procedures to assess the fulfilment of the requirements. Member States' efforts to implement GPP criteria (not mandatory yet), is a step further for Public Procurement to become an instrument of Circular Economy implementation.

There are still challenges ahead, though. The transition to a full circular public procurement must be holistic, and it must rely not only on the main actors within public procurement, but on the awareness of civil society as well (Niero et al., 2021, p. 8). Nevertheless, some public procurement procedures

already include some circular concepts in technical specifications and award criteria. However, one must remain open to the possibility that public procurement may not be the most appropriate instrument for pursuing the objectives of sustainability, from the perspective of "Law and Economics". Halonen uses the Tinberger rule, "applied in economic research on GPP, to demonstrate the tool's limitation to "drive such green transformation" and the "ambuiguity regarding which environmental targets the use of certain GPP criteria aims for" (Halonen, 2021, p. 17). Nevertheless, as Gasfström and Aasma state, "despite high gains of circular economy implementation, progress on the macro, meso and micro level is sluggish" (Gasfström and Aasma, 2021, p.1). There are some barriers, some of them similar to LCC implementation: technical barriers related to design stage and waste separation; market barriers regarding business models; institutional barriers concerning inconsistent public policies and infrastructures and social barriers related to "lack consumer awareness" (Gasfström and Aasma, 2021, pp. 6-7). On the other hand, Zink and Geyer highlight that, due the overlook of the economy part, "circular activities can lead to rebound by either failing to compete effectively with primary production or by lowering prices and therefore increasing and shifting consumption" (Zink and Geyer, 2017, p. 600).

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