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RESEARCH ARTICLE

ENCOURAGING SUSTAINABILITY OF EUROPEAN SMART CITIES THROUGH GREEN AND SUSTAINABLE PUBLIC PROCUREMENT

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Abstract

Green and Sustainable Public Procurement (SPP and GPP) is a strategic tool to pursue sustainable development and broader environmental, social, and innovation policy goals, achieving real progress to cities and turning them to "smart cities". As public authorities have a significant purchasing power, they can play an important role in the promotion of sustainability, by integrating sustainable and innovative considerations in the development of their procurement strategies. The current European framework for public procurement include environmental and social considerations and innovation-friendly provisions that may be taken into account when governmental contracts are awarded and performed. Smarter approaches to public procurement should be further developed and widely adopted. Public purchasers' risk-averse behavior triggered by their mandate to manage taxpayers' money wisely and their limited experience with sustainability-oriented mechanisms impede public buyers in smart cities to introduce sustainability in their procurements. The good knowledge of the available SPP and GPP provisions will therefore support public buyers in smart cities to benefit from these procurement mechanisms. Outlining the green and sustainability-orientated mechanisms set out in the European procurement framework, this paper holds implications for academics, procurement practitioners, and urban planners.

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Introduction:-

Green Public Procurement (GPP) is a process by which public purchasers procure goods and services that have a reduced environmental impact throughout their life cycle [1] (e.g. lower CO₂ and NO_x emissions, decreasing water consumption). In addition to the GPP scope, the concept of sustainability is composed of three pillars: economic, environmental, and social [2]. Therefore, Sustainable Public Procurement (SPP) is considered as a broader procurement practice that seeks to achieve the appropriate balance between the aforementioned three pillars of sustainable development when procuring. The notion of 'sustainability' emerged in the early 1970s, following the need to reflect upon the environmental and social damage caused by modern development practices [3]. The most frequently quoted definition of sustainability is from the Brundtland Report: "Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [4].

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In order to face the current problems and challenges, the scope of European Environmental Policy [5] has broadened from the direct environmental challenges, such as access to clean water and water scarcity, to climate change and sustainable development, addressing their practical implementation through public policies, such as public procurement [6]. Recently, a growing academic interest has arisen in public procurement as a tool to pursue broader policy goals, such as sustainable development, by introducing social and environmental considerations through the use of public contracts. As from 2014, with the adoption of the European legislative procurement package [7], (in particular, Directive 24/2014/EU), there is a subsequent rise of related policy measures being in sustainable policy agendas.

In the field of smart cities, green and sustainable procurement could foster innovation, promote urban growth, and citizen well-being. In particular, GPP and SPP could help cities to develop electric car-sharing solutions, which would reduce emissions and noise in cities and free up urban space. It could also allow cities to develop smart traffic management and public lighting system to make roads safer and increase energy efficiency. Furthermore, in the midst of the COVID-19 outbreak crisis, sustainable procurement could encourage the adoption of innovative health technologies (such as telemedicine, artificial intelligence for data analysis) that will improve measurability and provide innovative solutions for patient treatment.

Traditionally, procurement decisions by city authorities have been based solely on the criteria of price and quality, with little regard for other objectives than the purely economic ones. The total value of public procurement in the EU is estimated at around 14% of the EU Gross Domestic Product (GDP) (around EUR 1.8 trillion) [8]. Given their significant purchasing power, public authorities can play a crucial role against climate change and promote environmental protection, social inclusion, and competitiveness of the European industry by stimulating innovation in eco-technologies. Public purchasers in cities are therefore encouraged to incorporate sustainability considerations throughout the procurement process and “lead by example” using their power to support the goals of sustainable development [9].

European cities satisfy their needs for infrastructures and services following public procurement rules, while being under public scrutiny related to their mandate to manage taxpayers’ money wisely. Public purchasers usually adopt a risk-averse behaviour and prefer a structured procurement approach, guided mainly by budgetary considerations, where sustainability is not the evident priority. Apart from the risk-averse behavior of public purchasers, another reason that prevents public buyers from capturing sustainability is their lack of expertise and knowledge of sustainable procurement methods.

The Directive contains a number of key provisions that encourage the incorporation of environmental and social considerations into the procurement process. By applying the appropriate procurement mechanisms strategically, public authorities can use their abundant purchasing power to drive innovation, promote urban growth and citizen well-being, and ultimately improve productivity, quality, and affordability of the procured services.

The paper is structured in four sections. Section 1 summarizes the eco-friendly provisions in the EU procurement legislative framework. Section 2 and 3 describe the social and economic considerations as set out in the European procurement rules. Finally, in Section 4, the conclusions are presented.

“Green” considerations in the European procurement rules

The European procurement legislation (in particular, the Directive 2014/24/EU) stimulates public purchasers to behave in an environmentally friendly manner, in order to develop a pro-environmental mentality across the public sector and among its suppliers. Furthermore, it facilitates a better integration of environmental considerations in procurement procedures – from mandatory inclusion to the tender documents to prohibited restrictions. Examples of environmental considerations could be to increase the energy efficiency of buildings, reduce the carbon footprint and wastage of natural resources, or to encourage the development of variants and alternative energy sources.

As a starting point, the EU’s support to green procurement is highlighted with a horizontal clause in the Procurement Directive relating inter alia to environmental requirements. “*Member States shall take appropriate measures to ensure the compliance by economic operators, in the performance of the contract, of applicable obligations in the field of environmental, social or labour law obligations under EU and national rules, collective agreements or international law*” (art.18.2 of the Directive 24/2014/EU). The Procurement Directive takes a firm position in favor of environmental protection by imposing mandatory exclusion to tenderers that are in breach of environmental law

obligations. Interestingly, under Article 57, the tenderers may be excluded “*if the public authority can demonstrate that they are in violation of applicable obligations in the fields of environmental, social and labor law established by Union law, national law, and collective agreements or by the international environmental, social and labor law provisions*”. Mandatory exclusion will also occur in case of an abnormally low tenders, “*if these result from failure to comply with environmental, social or labour law obligations*”(art. 69 of the Directive 24/2014/EU).

Apart from the mandatory provisions in the Procurement Directive, several other environmental requirements and standards can be also introduced in relation to technical specifications, criteria underlying labels, selection criteria, award criteria, and contract performance conditions.

Green considerations can be triggered at the time of defining the subject matter [10] of the contract to be awarded and when drawing up its technical specifications. These specifications are the minimum compliance criteria for the tenderers and provide measurable requirements against which tenders can be evaluated. They can be formulated in terms of performance or functional requirements, meaning that they can lay down the characteristics required of final service or good, or refer to the production process/method (Article 42 of the Directive 24/2014/EU). Therefore, due attention should be given at the technical specification stage, to avoid setting too specific and restrictive technical requirements which focus mainly on price [11]. On the contrary, public buyers are encouraged to develop functional requirements focusing on the desired performance with due respect to environmental and social objectives, instead of describing the product (that is to perform the function) or prescribing a concrete solution. Public authorities can also consider environmental considerations in regard to the production process or trading of the requested product, for example to require that they are produced using energy-efficient machines or do not involve toxic chemicals.

In order to ensure the respect of green objectives, public authorities can also introduce in their tender processes specific international [12], European, or national environmental technical standards or equivalent. In case the tenderers cannot meet the required standards, they will be eliminated, unless they can prove that they meet the performance levels set by the standards, or by following other equivalent methods. These conditions need to be sufficiently precise to allow tenderers to determine the subject matter of the contract and to encourage sufficient competition.

Furthermore, the Procurement Directive provides the possibility to refer to specific environmental labels referring to environmental performance and functional requirements set out in technical specifications. A label can certify that a specific product fulfills established quality conditions, allowing thus public purchasers to identify sustainable products or services. Environmental labels can be used at the definition of the technical characteristics required from the procured product or to check compliance with these requirements, by accepting the label as one means of proof of compliance with the technical specifications. Certain conditions must, however, be met: “*(a) the label requirements are linked to the subject-matter of the contract and are appropriate to define characteristics of the subject-matter of the contract; (b) the label requirements are based on objectively verifiable and non-discriminatory criteria; (c) the labels are established in an open and transparent procedure in which all relevant stakeholders may participate; (d) the labels are accessible to all interested parties; (e) the label requirements are set by a third party over which the economic operator applying for the label cannot exercise a decisive influence*” (Article 43 of the Directive 2014/24/EU).

Moreover, the contract award criteria set out in the contract notice and tender documentation may comprise “*quality, including technical merit, aesthetic and functional characteristics, accessibility, design for all users, social, environmental and innovative characteristics and trading and its conditions*” (Article 67 of the Directive 2014/24/EU).

Public authorities may also include environmental, social, or employment-related considerations in the conditions for performance of contracts (Article 70), which have to be complied with by the successful tenderers. The performance conditions can specify the way the goods are to be supplied and even the method of transport.

A contractor is obliged to respect the agreed performance clauses set out in the contractual documentation when providing the procured services or supplying the procured products. However, even though the contract clauses refer to the implementation phase, instead of the procurement stage, they still need to be foreseen in the call for tenders. Examples of contract performance conditions with green considerations can be: the obligation to deliver the final

product to the site in an eco-friendly way (for example, in concentrated form and then dilution on-site), or to perform the contract in accordance with environmental management measures (Attestation European Union, Eco-management and Audit Scheme - EMAS).

The incorporation of environmental considerations in the contract performance conditions may present deficiencies, in case this obligation is based on a simple declaratory statement, which is not an effective way to ensure that the actual implications are assessed properly. This may lead to violation of these obligations because the “*cost of compliance outweighs the margin of profit achieved by the successful tenderer*” [13]. Therefore, the contract conditions can impose environmental commitments made by tenderers as long as they provide for appropriate remedies in case of violation.

Apart from the procurement legislation, there are several environment related policies that complement the procurement rules. For certain public projects, the Environmental Impact Assessment (EIA) Directive [14] requires the public authority to carry out an EIA before the launch of the tender procedure. Hence, the public authority will have a priori all relevant information allowing it to take any procurement decision with due respect to the environmental impact of this project. Examples of these projects can be oil refineries, power stations, major infrastructure projects and waste disposal installations.

Another relevant legislative initiative supporting the GPP is the Energy Performance of Buildings Directive [15], according to which, States must ensure that new buildings occupied and owned by public authorities are nearly zero-energy buildings. Similarly, the Clean Vehicles Directive [16] requires targeting a certain amount of clean vehicles and setting minimum operational lifetime energy and environmental impacts that shall be considered when purchasing road transport vehicles. The development of a voluntary ‘EU Ecolabel scheme’ [17], which applies to any goods or services that are supplied for distribution, consumption or use on the European Community market is also encouraged. The provisions set out in this Regulation cover the award of the EU Ecolabel, its terms and conditions and the establishment of the European Union Ecolabelling Board (EUEB).

In addition to the EU Procurement Directive, the Energy Labelling Directive [18] sets a “*framework for the harmonization of national measures on end-user information, particularly by means of labelling and standard product information, on the consumption of energy, with a view to allowing end-users to choose more efficient products*”. Furthermore, the Energy Efficiency Directive [19] establishes a framework of measures for the promotion of energy efficiency within the European Union with the aim to remove barriers in the energy market and set indicative national energy efficiency targets for 2020. Based on this Directive, Member States of the European Union should adopt specific energy efficiency obligation schemes (EEOS).

The European Commission has also provided significant assistance to national authorities by recommending several GPP criteria linked to the subject matter of contracts, such as for GPP criteria for road transport that can reduce environmental impacts from road transport [20] and for road lighting and traffic signals [21].

Social considerations in the European procurement rules

Public procurement can be a promising vector for social progress, promoting fair treatment, non-discrimination, equal opportunity, sustainable development benefits, and opportunities for vulnerable groups and combatting child labour and social dumping.

Similar to the green requirements laid down in the EU Procurement Directive, the shift to a more socially responsible behaviour of the public sector is based on the horizontal clause (“*respect applicable environmental, social or labour law obligations*”). The Directive also requires from the public purchasers to exclude any tenderer that violates social/labour law obligations or in case of an abnormally low tenders, “*if these result from failure to comply with environmental, social or labour law obligations*”.

Public authorities are encouraged to integrate into their procurement processes several social-related criteria. Thus, public purchasers may now consider the process by which the goods they intend to purchase are produced. Tenderers are not required to amend their corporate policy adopting a more social perspective, but solely to ensure that these considerations will apply to staff involved in the production of the goods - the subject matter of the procured contract. Therefore, companies that (intend to) employ a set number of disadvantaged people to produce the concerned products (such as the long-term unemployed people), or companies with specific working conditions of

the employees, may have a benefit in the procurement process. Moreover, in order to support the social and professional integration or reintegration of disabled and disadvantaged persons, public purchasers may reserve the right to participate in procurement procedures to “sheltered workshops” or social enterprises working for the inclusion of disadvantaged people, “*provided that at least 30 % of the employees of those workshops, economic operators or programmes are disabled or disadvantaged workers*” (Article 20 of the Directive 2014/24/EU) [22].

Furthermore, considering the crucial role of social protection, health care, education, and urban planning, the Procurement Directive has provided for a simplified procurement system for awarding contracts for such services, with the threshold of EUR 750,000, which is much higher than the threshold that applies to other services (EUR 200,000) under the scope of the Directive. The award of other services is regulated by the Directive, but to a lesser degree (“light regime” - Article 74 and Annex XIV of the Directive 2014/24/EU), as the procuring authorities are given wide discretion in the organization of procurement procedures. However, as a minimum, it does require advertisement in the EU Official Journal (OJEU) and compliance with the Treaty on the Functioning of the EU (TFEU) principles (ie. transparency, equal treatment, and non-discrimination).

At the stage of drafting the technical specifications of the product/service to be procured, public purchasers may insert social requirements, such as accessibility for persons with disabilities or design for all users (Recital 99 of the Directive 2014/24/EU).

The contract award criteria set out in the contract notice and tender documentation may also comprise “*quality, including technical merit, aesthetic and functional characteristics, accessibility, design for all users, social, environmental and innovative characteristics and trading and its conditions*” (Article 67 of the Directive 2014/24/EU).

The procurement rules also provide greater control over subcontracting practices (Article 71). Public purchasers must ensure subcontractors ‘compliance with social or labour law obligations. At the tender submission stage, any tenderer will be required to disclose the expected level of subcontracting in advance and legal information of the subcontractor.

In addition to the above requirements and in order to establish common rules on accessibility, the EU adopted a new directive [23] for accessibility requirements for products and services in 2019 that will also apply to public tenders.

Economic Considerations

Procuring more efficient and sustainable goods and services can also lead to significant economic benefits for cities. In particular, sustainable and green procurement can reduce disposal costs, foster innovation, and market competitiveness and save costs by applying life-cycle costing.

A major step towards sustainable procurement is the introduction of the concept of the most economically advantageous tender (MEAT) award criterion (Article 67 of the Directive 2014/24/EU) in an attempt from the legislator to ensure better value for money and higher quality of the products, works and services procured. To identify the most economically advantageous tender, qualitative criteria should be taken into account. These criteria may comprise “*social, environmental and innovative characteristics, quality, technical merit, accessibility, design for all users, and other factors involved “in the specific process of production”*” (Article 67 and recitals 89-92 of the Directive 2014/24/EU). Environmental criteria may include externalities linked to consumption (e.g. bus pollution), externalities linked to production (e.g. renewable electricity), life-cycle costing (acquisition, use, maintenance, and disposal). These qualitative criteria should be accompanied by a cost criterion that could, at the choice of the contracting authority, “*be either the price or a cost-effectiveness approach such as life-cycle costing and may include the best price-quality ratio*” (Recital 92 of the Directive 2014/24/EU).

The lifecycle cost (LCC) (Article 68 of the Directive 2014/24/EU) is a tool for assessing the total cost performance of a product over time, including the acquisition, maintenance, and disposal costs improving awareness of total costs and helping to evaluate competing options. It encourages public authorities to consider in their purchasing decisions not only the price of the acquisition but also the costs related to the full life-cycle of products. The purchase price alone does not reflect the financial and non-financial gains that are offered by environmentally and socially preferable assets as they accumulate during their operations and use stages [24]. For some products (such as furniture, ICT equipment, indoor and outdoor lighting, vehicles) considering only the price factor might be a correct

approach, but for other products (such as irrigation systems, waste treatment, railways) the purchase price represents only a small part of the total costs that may include cost related to the use and maintenance of the product [25]. The notion of life-cycle costing “*means internal costs, such as research to be carried out, development, production, transport, use, maintenance, and end-of-life disposal costs but 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 monetized and monitored*” (Recital 96 of the Directive 2014/24/EU).

As defined by the United Nations [26], environmental externalities are “*an economic concept of uncompensated environmental effects of production and consumption that affect consumer utility and enterprise cost outside the market mechanism*”. As a consequence of negative externalities, the private costs of production tend to be lower than the costs borne by society at large. It is the aim of the “*polluter/user-pays*” principle to prompt households and enterprises to internalise externalities in their plans and budgets.. Apart from the environmental externalities, the Directive does not refer to societal externalities such as social costs, violations of labour conditions, health care costs that should be taken into account. Despite the absence of a specific reference to societal LCC, public purchasers can determine the life cycle of a product by calculating the labor hours and the income per hour in order to assess whether it is sufficient to fulfill the basic needs of the employees.

In the context of sustainable procurement, the use of LCC is crucial in the effort to shift the paradigm of public procurement beyond the confinement of using solely the purchase price of a good or service [27]. The European Commission provided for a methodology (LCC methodology) that could be applied at different stages of the procurement process. The public purchaser can introduce the LCC element when drafting the technical specifications that can be drawn upon the basis of “*performance criteria linked to the life cycle and the sustainability of the production process of the works, supplies and services*” (Recital 74 of the Directive 2014/24/EU). In addition, the LCC methodology can be considered at the award stage by including quality and life cycle costing requirements as main criteria in the award process, provided that the bidding documents indicate the data to be provided by the bidders and the method which will be used to determine the life cycle cost. In light of the above, it could be concluded that bids with environmentally and socially friendly and innovative elements may be awarded more points in the light of their long-term financial benefits [28]. Given the complexity of the LCC methodology, the effectiveness of using a LCC approach should be given due consideration, by employing a joint appraisal from a legal, economic, and financial perspective. It should provide a concise and precise description of the experimental results, their interpretation as well as the experimental conclusions that can be drawn.

The public sector is often reluctant to adopt the LCC approach, as it remains a complex concept, and procurement professionals may lack the skills and knowledge necessary to successfully implement sustainable procurement [29]. Despite its recognized value, the use of LCC as a decision-making tool by European public authorities is not systematic in contrast with the public sector outside the European Union. In particular, the Netherlands, France and Austria follow “*some form of LCC analyses*” or “*derivatives of it*” in the procurement/commissioning of new energy-efficient buildings [30]. Whereas USA [31], Japan, Switzerland, and Norway [32] often apply LCC methodologies as a part of green and sustainable procurement policies.

The support of SMEs through public contracts is also foreseen in the European procurement rules. SMEs are considered the backbone of the European economy as they produce more than half of the European GDP. Therefore, SMEs’ participation in tender procedures will increase competition will increase and, consequently, governments will be able to achieve better value for money in their contracts [33]. Some of the main reasons that hinder SMEs from public contracting include the administrative burden in the tender procedures [34], the restrictive and rigorous qualification standards that cannot be met by SMEs or startups with own resource constraints, and the public purchaser’s preference for large scale companies [35].

The EU procurement rules have relaxed the administrative and documentation requirements for the bidders by requesting a completed self-declaration template (European Single Procurement Document- ESDP, Article 59 of the Directive 2014/24/EU) at the time of submission of tenders. The full documentation will be requested only from the winning bidder. With the aim to support SMEs’ participation in public contracts, public authorities may also apply more flexible payment schemes such as early, advance or interim payments or even sub-divide public contracts into smaller lots [36].

Conclusions:-

Green and Sustainable Public Procurement is a strategic tool to pursue environmental, social, and innovation objectives, helping cities to follow a “smarter” approach and become eventually “smart cities”. Given the significant purchasing power of European public authorities, public procurement can be a strategic tool for environmental protection, combating climate change, and promoting social inclusion competitiveness of the European industry by stimulating innovation in eco-technologies. The current EU legal framework for public procurement promotes green, social, economic benefits, and innovation-friendly practices through the public procurement process. The risk averse behavior of public bodies and their limited experience with green and sustainable procedures impede public buyers in smart cities to integrate sustainability in their procurements.

The European procurement rules offer several opportunities to promote environmental protection, social inclusion, and innovation through procurement processes. An overview of the green and sustainability-orientated aspects and requirements laid down in the EU procurement framework is provided in this paper.

Apart from the incorporation of the aforementioned provisions in the procurement practices of public purchasers, additional steps should be taken towards this direction. In particular, at the national level, the government’s support can change cities’ averse mindset and encourage them to embrace sustainability. States should be also encouraged to design holistic and dynamic Action Plans to harmonize the national procurement strategies with sustainability and green objective. Methodologies for calculating the life cycle linked to the concrete needs of the procuring authority should be further developed. Moreover, public authorities should invest in improving the professionalism and training of their staff. The set-up of national competence centres with an updated library of sustainable and environmentally friendly technical solutions can be also considered as a crucial step to mainstream innovation procurement.

Smart cities can benefit from sharing experiences and best practices and developing synergies via specific platforms or networks. The dialogue between smart cities and the private sector should be also encouraged with the aim to cultivate a sustainable, green, and innovative ecosystem across the city.

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