

ENVIRONMENTAL ASPECTS IN PUBLIC PROCUREMENT IN POLAND: A CASE STUDY OF SELECTED SUPPLY TENDERS

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Purpose: The aim of the publication is to present the results of a study on the evaluation of the extent to which the environmental aspect is applied in public contracts awarded by public entities in Poland for the supply of goods.

Design/methodology/approach: The aim was achieved by analysing 2145 public procurement notices from public entities in the Łódzkie Voivodeship in Poland, which were published from 1 January to 30 November 2024 in the Public Procurement Bulletin. The theoretical aspects covered in the publication included the issues of sustainability, the circular economy and green public procurement. The material scope of the publication includes the results of a survey of the scale of application of environmental criteria in the public procurement procedures covered by the survey.

Findings: The analysis showed that environmental aspects were included in only 34 procurement notices. Green procurement therefore represented a small proportion of the surveyed population at 1.59%. The environmental aspects in the advertisements surveyed mainly concerned environmental performance.

Research limitations/implications: A limitation of the survey was the scope and presentation of aggregate information published in the Public Procurement Bulletin. Subsequent surveys should be extended to service and works contracts, as well as to other regions of Poland and other EU countries.

Practical implications: The studies conducted should inspire public authorities to use green public procurement more widely. In addition, they indicate that legislative authorities in Poland and the European Union should introduce changes to the law obliging public entities to apply environmental criteria in every tender.

Originality/value: The publication contains original research on the extent to which environmental aspects are used in public supply procurement procedures.

Keywords: green public procurement, sustainability, circular economy, public finances.

Category of the paper: Research paper.

1. Introduction

Global economic development and increasing consumption are resulting in large environmental costs in addition to increased prosperity. To date, global economic growth has been based mainly on energy produced from non-renewable energy sources, which has simultaneously generated numerous negative consequences for the environment. This issue is discernible in numerous studies (Kozar, 2018; Kozar, Sulich, 2023; Sulich, Kozar, 2024; Suproń, Myszczyzyn, 2023). Furthermore, the very intensive unsustainable exploitation of the earth's natural resources and the environment in which we live has led to its reduction or destruction, such as in the case of the forests of the Amazon (Hariram et al., 2023). The progressive degradation of the environment as a result of uncontrolled development, the increased emissions causing an increase in carbon dioxide in the atmosphere and the associated decrease in available natural resources has forced the authorities of individual countries to take necessary action on a global scale (Mensah, 2019). The need to reduce the negative effects of economic development that does not take into account environmental protection in its production and service processes has prompted action at the international level (Hess, 2016; Kozar, Oleksiak, 2022).

As a result of public authorities becoming aware of increasing threats to the environment worldwide, the concept of sustainable development was developed and implemented by the World Commission on Environment and Development United Nations Organization. The objective of sustainable development is to implement social and economic processes in such a way that meeting the current needs of the present generation does not limit the opportunities for life and social and economic development of future generations (United Nations, 1987). Sustainable development encompasses a range of goals to be implemented in all countries of the world. The detailed definition of goals aimed at reducing the negative effects of human activities on the environment is set out in Agenda 2030, adopted in 2015, collectively by 193 United Nations countries. The main goal of Agenda 2030 is global economic development and modernisation leading to 'the eradication of poverty in all its forms, while achieving a range of economic, social and environmental objectives' (United Nations, 2015). The implementation of the 2030 Agenda includes a total of 17 Sustainable Development Goals (SDGs) relating to many areas of human life and functioning. The SDGs cover areas such as education, health care, increased productivity, implementation of zero-carbon energy, environmental protection and restoration, sustainable food production systems, sustainable lifestyles and others. The response of public authorities to the Agenda 2030 goals set and adopted for implementation is the implementation by individual countries and international organisations of their own sustainable development programmes tailored to the specifics of the country or region (Sekula et al., 2022). A very important document in this regard is the Green Deal, developed by the European Union in 2019. It assumes the transformation of the EU into

a just and prosperous society, with a modern, resource-efficient and competitive economy with no net greenhouse gas emissions in 2050 and economic growth decoupled from resource use' (European Commission, 2019). Achieving the European Union's Green Deal targets requires the implementation of sustainable development principles in most areas of social and economic activity. The pursuit of climate neutrality by 2050 requires comprehensive changes of action also by public sector actors. Individual EU states should promote and practically implement sustainability goals through their actions, if only as is being done in the area of public procurement (Pouikli, 2021).

The public sector in each country plays a significant role and is an entity participating in the market game usually on the demand side. The situation is similar in Poland, as public organisations purchase necessary goods and services on the market from economic entities operating on it. In addition, it should be remembered that public expenditure should, as a rule, be targeted, economical, effective and rational. This can be achieved, to a certain extent, using a public procurement system, which makes it possible to fulfil the requirement of rational and transparent spending of public funds. Access of commercial entities to public funds related to the offering of goods and services to public organisations should be transparent and unrestricted (Chrisidu-Budnik, 2022). Public organisations are an important part of the demand side of the market, as they fulfil their needs in the market by purchasing goods, services or works. Businesses that offer their goods and services should be able to compete for public contracts without restriction once the contracting authority meets certain criteria (Koch, 2020). The awarding of contracts by public entities is an important market area in which the principles of sustainability can be promoted. The public sector, by specifying in the legislation governing public procurement, the requirements to meet a given criterion relating to sustainability principles, can set certain rules in the market in this respect. The definition of environmental criteria in the public procurement system makes it possible to influence commercial actors and can encourage their implementation. According to current European Union regulations (European Parliament, 2014), public sector procurement in Poland should include environmental and social, i.e. sustainability, aspects in the bid evaluation criteria. When awarding a public procurement contract, Polish public sector entities may, according to the regulations, include environmental aspects in the evaluation criteria. The drive to improve and restore the state of the natural environment in Poland requires public authorities to make extensive use of environmental criteria in the public procurement system. Taking into account the environmental criterion in individual public procurement procedures is an instrument to encourage commercial entities to implement procedures and technological processes which reduce harmful effects on the environment. Such actions by public authorities can contribute to creating demand and markets for environmentally friendly products and services, thus creating incentives for the production and consumption of ecological products green products (Chiappinelli, 2022), also referred to in the literature as green products (Haba et al., 2023; Khizar et al., 2024; Padászyńska, Kozar, 2024).

The above analysis of the literature around green public procurement points to the need to pose research questions. The first question that needs to be asked is to what extent environmental aspects are practically used in public procurement in Poland? Another question that arises from the analysis of the literature is to what extent is research conducted in the area of green public procurement? Furthermore, the question should also be asked, in which types of public procurement of goods are environmental criteria used? The answer to the above questions will enable the evaluation of green public procurement in Poland in relation to the selected research sample.

2. The essence of green public procurement

The public procurement system in a democratic state is an important area for meeting the needs of public entities on the demand side of the market. Commercial entities can, through public procurement procedures, compete for orders from public entities that are financially reliable and stable recipients of goods and services. In addition, the public procurement system through tendering enables public organisations to spend their budgets more rationally, if only by choosing cheaper goods and services in a given market (Lotti et al., 2023). By implementing appropriate purchasing policies and strategies, public authorities can create a public procurement market, also in terms of promoting sustainable goods and services. By doing so, public authorities can, for example, influence companies to increase their interest in the practical implementation of the circular economy. The circular economy is nothing more than, design thinking and education for sustainability in the activities of all market participants (Arruda et al., 2021). Action on the implementation of circular economy principles is strongly promoted by the European Union institutions. Practical implementation of the circular economy concept can have a positive impact on the environment and the economy of individual Member States. In addition, the concept itself is a different solution to traditional recycling, as it relies on practical policies. This manifests itself in the fact that economic operators are oriented towards the re-use of products, components and materials and their re-manufacturing, refurbishment or repair. Furthermore, and very importantly, the circular economy relies on the extensive use of solar, wind, biomass and waste energy throughout the entire value chain of a product as part of its life cycle. Such activities contribute to better management of available goods with clear positive environmental benefits (Korhonen et al., 2018).

An important area of activity for public organisations embedded in the circular economy is well-developed procurement rules at national or international level. Public procurement that incorporates sustainability and life-cycle considerations into tenders as key criteria for evaluating bids can make a significant contribution to changing the performance of the various actors in a given supply chain in a given country (Chersan et al., 2020). Such actions should be

a strategic task for public authorities in the system of procurement of goods and services and in the incurring of public expenditure from the state budget, local government or other public entities. Increasing the number of public tenders that include environmental aspects in their criteria can be effectively supported by relevant state policies promoting the green economy.

The implementation of the public procurement system in Poland took place in 1995 through the introduction of the first legal regulations in this area. This was a result of social and economic changes in Poland in the 1990s, which made it necessary to regulate issues related to the purchase of goods and services by the public sector. Public procurement is intended to provide all economic entities with transparent and equal access to the public sector's demand for the supply of goods, services and works. Public procurement regulations have defined a catalogue of public entities obliged to purchase goods, services and works by public tender. They have also established specific amount thresholds for the value of a given contract defining a given mode of public procurement (open tender, restricted tender, negotiations with an announcement, competitive dialogue, innovative partnership, negotiations without an announcement and procurement on a sole-source basis), i.e. the resulting tender procedure (Szydłowski, 2022).

Through public procurement, the private sector has access to the state's public expenditure, which, depending on the country concerned, can represent between 12% and 30% of Gross Domestic Product (GDP). It should be emphasised that public entities satisfying their needs through the market play a significant demand-side role in the market. In addition, appropriate public authorities' spending policies on the purchase of goods and services can contribute to sustainable market demand (Mélou, 2020). The procedures for conducting tender procedures in Poland have undergone many changes, especially after accession to the European Union. In addition to the regulation of public procurement itself, steps have also been taken in Poland to introduce several European Union guidelines and recommendations on sustainable public procurement. The first actions in this area were taken because of amendments to the Public Procurement Law in 2004. As a result, elements of sustainable development principles were introduced into the Polish public procurement system for the first time (Kancelaria Sejmu RP, 2004). These changes included the introduction of social and environmental criteria into public procurement.

Poland, like any other EU Member State, is obliged to apply the public procurement rules resulting from Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement (European Parliament, 2014). It should be emphasised that the European Union strongly emphasises the importance of a public procurement system that takes environmental aspects into account in tenders. This approach is confirmed by the content of the Green Deal regulations, which emphasises that 'Public authorities, including the EU institutions, should lead by example and ensure that their procurement is green' (European Commission, 2019). It should be mentioned that the procurement process of public entities of the individual Member States must be identical to the principles of the Treaty on the

Functioning of the European Union. The principles deriving from this treaty have also been included in the Polish procurement system. These include the free movement of goods, freedom of establishment, freedom to provide services, the principle of equal treatment, the principle of non-discrimination, the principle of mutual recognition, the principle of proportionality and the principle of transparency. The European Union promotes the use of environmental considerations in public procurement.

According to a handbook developed by the EU, 'green public procurement is a very important tool for achieving environmental policy goals related to climate change, resource use and sustainable consumption and production, especially given the role of public sector spending from Member States' budgets' (Directorate-General for Environment (European Commission) & ICLEI – Local Governments for Sustainability, 2016). It should be emphasised that the EU's implementation of an effective public procurement system that includes environmental aspects contributes to the real implementation of the circular economy concept in individual economies. Furthermore, public procurement can realistically support those business models that aim to preserve the value of goods, materials and resources through the application of closed-loop circularity within the product life cycle (Lăzăroiu et al., 2020). However, as various studies and surveys indicate, green procurement in the EU is still not properly used in practice despite accounting for about 14% of EU GDP. If there is no overall strategy adopted by public authorities to implement green procurement on a large scale then its scope is limited (Sapir et al., 2022).

The issue of green procurement is addressed in numerous academic studies (Kozar et al., 2023; Kozar, Wodnicka, 2024). Green public procurement is identified by many authors as a strategic enabler for sustainable development, but there is still not enough action in this area. Many barriers to the development of green procurement are perceived, such as the reluctance of the public sector to promote it. A key factor in increasing the use of green procurement is the commitment of public authorities and a vision for green procurement in the future. In addition, there are a variety of barriers limiting the actual implementation of green procurement such as the lack of clear legislation, centralisation of purchasing, resistance from political authorities, or corruption, which is one of the key threats to the smooth and transparent functioning of the public procurement system as a whole (Ortega Carrasco et al., 2024). Practically, green public procurement is implemented by incorporating several environmental criteria into the tendering process, which derive from good practice and are included in the relevant legislation. The criteria for the evaluation of tenders are defined by the public entity awarding the contract in question and must be related to the subject matter of the contract. According to the legislation, the contracting entity may select the most advantageous offer based on quality criteria and price or cost, or price and cost. The contracting entity may use an environmental criterion as a criterion for evaluating the tender, which should be linked to certain benefits. These environmental criteria may include the saving of materials, energy in the process of manufacturing the product or service. In addition, they may include the minimisation of waste

or reduced environmental impact (Chrisidu-Budnik, 2022). An important environmental criterion used in green procurement is the aforementioned energy efficiency resulting from the regulation of the legislation in this area (Kancelaria Sejmu RP, 2016). The energy efficiency of products is covered by Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 establishing a framework for energy labelling and repealing Directive 2010/30/EU (European Parliament, 2017). The Polish legal equivalent of this regulation is the Act of 14 September 2012 on energy labelling of energy-related products (Kancelaria Sejmu RP, 2012). It is worth noting that a public entity awarding a contract may use the information presented in the form of an energy label in the description of the subject matter of the contract, the criteria for evaluation of tenders, or the requirements related to the contractor's performance of a given supply.

In addition to energy labels, there are also eco-labels within the EU, introduced by Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel (European Parliament, 2007). The Regulation allows for the use of voluntary eco-labels by operators. The use of such an eco-label requires the operator to undergo a certification process by the relevant Ecolabel product certification body. The procedure for awarding the label covers the life cycle of the product, so that the recipient of the good is aware that the product has been produced in accordance with the principles of sustainability and respect for the environment (Iraldo et al., 2020). Public entities, as part of the award of a public contract, may specify in the criteria for evaluating the subject matter of the contract the requirement for a potential supplier to use the Ecolabel for selected products (Galarraga Gallastegui, 2002). The detailed scope of application of the Ecolabel is defined by the relevant regulations. It is worth mentioning that Polish regulations have imposed an obligation on the government administration to have, as of 1 January 2022, 10 % share of electric vehicles in the fleet of motor vehicles in use. Similar regulations also apply to the need for local government units to have electric vehicles or those powered by another environmentally friendly energy source (Urząd Zamówień Publicznych, 2022). The fulfilment of the above criterion should therefore be considered when tenders for the supply of energy-efficient vehicles are carried out. However, according to the regulations, the environmental criterion is applicable and not required.

Detailed rules for the scope of use of environmental aspects in public procurement in Poland are set out in the relevant Public Procurement Act 2019. In accordance with the provisions of the Act, several environmental criteria have been implemented that may be used by the public entity announcing the tender when determining the criteria or requirements for the evaluation of bids in each tender. These criteria include:

- the possibility of specifying environmental requirements in the description of the subject matter of the contract in accordance with the regulation of Article 101 of the Act,
- the possibility of specifying a requirement for the applicant to apply environmental management systems or standards in accordance with Article 116(1) of the Act,

- the possibility of specifying in the criteria for evaluation of tenders environmental aspects, including energy efficiency of the subject matter of the contract, as referred to in Article 242(2) of the Act,
- the possibility of specifying in the criteria for the evaluation of tenders the application of the cost criterion using life-cycle costing as referred to in Article 245 (1) of the Act,
- specifying the requirements for the performance of the contract including the environmental aspects referred to in Article 96(1) of the Act,
- the determination of the label relating to environmental aspects in accordance with Section 104 of the Act (Kancelaria Sejmu RP, 2004).

The environmental criteria outlined above, which can be used by public entities during the execution of a public contract, are only an option that can be used in a tender. Unfortunately, environmental criteria are not mandatory for use by public entities. The complexity of public procurement procedures and the existing thresholds for the value of the contract which determine the need for a specific procedure mean that the use of environmental aspects is not very easy to apply.

When discussing the green procurement system in Poland, it is important to mention the scale of the public procurement market as a whole and in relation to environmental procurement. According to the report of the President of the Public Procurement Office on the functioning of the public procurement system in 2023, the approximate value of the entire public procurement market in Poland in 2023 was approximately PLN 579.7 billion in total. It is worth pointing out that, for comparison, in 2022 it was a total of PLN 698.3 billion, so year-on-year the value of the public procurement market in Poland fell by 16.98% (Urząd Zamówień Publicznych, 2024). The report also contains very important data on the scale of environmental public procurement awarded by the public sector in 2023. The report shows that 693 public entities awarded a total of 4052 public contracts incorporating environmental aspects in 2023. The value of these contracts amounted to a total value of - 11925319278.12 PLN (excluding VAT). It is worth noting that, according to the report, there was an increase in green public procurement by 730 tenders in 2023 compared to 2022. However, there was also a decrease in their total value by 5247011109.53 PLN (excluding VAT). There was also an increase in the number of total green public procurement by 84 in 2023 compared to 2022. However, the data in the analysed report shows that the total share of green public procurement in Poland in the total number of public contracts awarded in 2023 was only 3%, while its value accounted for 4% of the total value of public contracts awarded (Urząd Zamówień Publicznych, 2024).

3. Description of the research method

The aim of the research presented in this article was to assess the extent to which public entities use the environmental criterion in public procurement of supplies in Poland. For the purposes of the study, the hypothesis was assumed that the scope of application of environmental criteria in supply contracts awarded by public entities in Poland is small. Verification of the research hypothesis and an assessment of the practical application of the environmental criterion in tenders was possible by verifying the content of public contract award notices, which contain detailed information in this respect. The study concerned only announcements at the stage of commencement of the public procurement procedure and not completed procedures with selection of the contractor. This was due to the aim of the study, which was to examine the scope and scale of the use of environmental criteria in tendering procedures by public entities. The study used a qualitative method and a case study relating to individual tender notices and tender documentation such as the Terms of Reference. The use of these research methods made it possible to assess the actual extent of application of the environmental criterion in public supply contracts. The research was focused exclusively on the analysis and verification of the content of individual public supply contract notices published by public entities. The source of data for the analysis was the general database of public contract award notices published on the website of the Public Procurement Bulletin (*EZamowienia*). The supervision of the public procurement system in Poland is exercised by the President of the Public Procurement Office, who, through its subordinate Public Procurement Office, performs its statutory tasks, including being responsible for the publication of tender notices. The choice of the Public Procurement Bulletin as the source of data for the analysis was based on the fact that it is the only complete and reliable database of all public contract award notices in Poland. According to the regulations, all public entities in Poland which are obliged to award public contracts must publish announcements on tenders and other information on their progress, including the award or conclusion of a contract for the execution of a given contract, in the Public Procurement Bulletin. For the purposes of the study, methodological assumptions were defined, which determined the criteria for the selection of the scope of data, i.e. announcements on the awarding of public contracts. For the study, only notices for supplies from the Łódzkie Voivodeship were selected as the type of contract to be realised for the needs of public entities. It is worth mentioning that according to Polish law, supplies are understood as 'the acquisition of products, which are movables, energy, water and property rights, if they can be the subject of trade, in particular on the basis of a sale, supply, rental, lease and leasing agreement with or without a purchase option, which may additionally include placement or installation' (Kancelaria Sejmu RP, 2004).

Another criterion for the selection of data for the study was the restriction to notices published under the national public procurement procedure. The restriction to the national procedure only is determined by the fact that, in practice, public entities in Poland carry out most supplies under this simplified procedure. This is due to the use in the EU public procurement regulations of separate amount thresholds for supplies, services and works, below which a simplified national procedure may be used in public procurement other than when these thresholds are exceeded. The simplified procedure mode is defined by the relevant provisions of the Act of 11 September 2019. Public Procurement Law (Kancelaria Sejmu RP, 2004). In accordance with the provisions of the 2019 Public Procurement Law, the President of the Public Procurement Office published a notice in 2023, which specified that in 2024 there will be 2 quota thresholds for supplies depending on the type of public entities. The first quota threshold below which simplified tendering procedures for supplies for public entities apply was €143,000, equivalent to PLN 663,105. On the other hand, for other public entities listed in the Act, the amount threshold below which simplified procedures may be applied was 221000 euro, which was the equivalent of 1024799 PLN (Prezes Urzędu Zamówień Publicznych, 2023). The established amount thresholds for public supply contracts are very occasionally exceeded each year by the ordering entities, so it was optimal to set this criterion when selecting public procurement procedures for the purposes of the study. Furthermore, for the purposes of the study, only tender notices for supply contracts of public entities from the Łódzkie Voivodeship were selected. To unify the scope of the analysed data in relation to the applicable legal regulations and the related procedure and the applicable amount thresholds, announcements from 1 January 2024 to 30 November 2024 were selected. The assumptions allowed for the unification of the results of the study and their interpretation with regard to the analysed phenomenon. According to data from the Public Procurement Bulletin, in the period under study, public entities in the Łódzkie Voivodeship published a total of 2145 announcements on the award of public supply contracts in accordance with the national procedure. It should be noted that the national procedure also for supply contracts provides for the possibility of considering sustainability criteria, including the environmental criterion.

The database of public supply contract award notices under the simplified procedure, downloaded for the purpose of the study, contained only general information about the tender along with the website address of the Public Procurement Bulletin where the specific notice was published. The downloaded database therefore did not contain the exact content of the notices but only general information, including the entity awarding the contract and the subject of the contract. In practice, this required a thorough review and analysis of each public procurement notice published on the website of the Public Procurement Bulletin during the research. In the end, the study covered a total of 2145 contract award notices of public entities from the Łódzkie Voivodeship, i.e. all notices published in the period under study (1 January - 30 November 2024). It should be emphasised that each announcement of the award of a public contract must contain a note on the fact that environmental criteria were applied with regard to

the description of the subject of the contract, the qualitative assessment of the offer made by potential suppliers and its inclusion in the projected supply contract. Also, the fact that environmental criteria have not been applied must be included in the notice in question. Thus, this research methodology enabled a precise assessment of the scope of application of the environmental criterion in public supply contract award procedures in Poland on the example of the Łódzkie region. It should be emphasised that the inclusion of a given requirement to apply environmental criteria in a public procurement notice means that at the selected stage of the tender procedure, they must be applied during the evaluation of bids submitted by potential suppliers.

The focus of the research was to establish the extent to which the environmental criterion was applied to the announcement in question separately:

- the use of the environmental criterion in the notice as a separate criterion in the description of the subject of the contract,
- the application of the environmental criterion in the announcement in the qualitative assessment criteria,
- the inclusion of an environmental criterion in the notice in the draft contract for the delivery of the public procurement contract awarded.

A thorough analysis of public procurement notices made it possible to verify the actual extent to which the above-mentioned environmental criteria were applied in the awarded public contracts. The results of the research are presented later in this publication. Furthermore, it should be emphasised that a certain limitation of the research in this case was the fact that some of the public procurement notices analysed may not have resulted in the actual award of a tender consisting in the conclusion of a supply contract. However, the study of announcements made it possible to assess the scale of the use of the environmental criterion by public entities in the Łódzkie Voivodeship in supply tender procedures.

4. The results of green procurement research

The verification of each of the 2145 notices made it possible to determine the overall share of green procurement in the total number of tender notices during the period under review. Figures on the number of public procurement notices verified, together with data on the number of tender notices with environmental aspects and their percentage share, are included in the table (Table 1).

According to the data in the table (Table 1), public entities from the Łódzkie Voivodeship in the examined period of 2024 only applied environmental criteria in 34 public procurement notices for supplies. This represented only a share of 1.59% in the total number of public procurement notices examined. This indicates that the share of green procurement in the total

number of public procurement notices issued by public entities in the Łódzkie Voivodeship in the examined period was low. It is noteworthy that the shown share of 1.59% is lower than the total share of all green public contracts in Poland awarded by public entities in the whole of 2023, when it amounted to 3% (Urząd Zamówień Publicznych, 2024). It should be noted, of course, that the data covered in this study included 11 months of 2024, and only announcements for supply tenders in one region of Poland. Despite this, the results of the analysis indicate a general trend in the share of green public procurement in Poland in total tenders. It should be mentioned that the examined announcements included procurement procedures carried out by various public entities, such as offices, universities, hospitals, scientific and research institutes and other organisational units of the public sector obliged to do so. A thorough verification of the procurement notices also made it possible to check to what extent the public entities in the sample considered particular environmental criteria or aspects in their tender notices. The results of this analysis are summarised in the table (Table 2).

Table 1.

Summary of the total number of public procurement notices examined with notices containing environmental aspects

Item	Numerical and percentage coverage of public procurement notices examined	
	Number of public procurement notices	Share of a given type of public procurement notice in %
Total number of public procurement notices examined	2145	100.00%
Public procurement notices with environmental aspects	34	1.59%

Note: The study covered a total of 2145 public procurement notices published by public procurers (central and local government offices, public universities, healthcare institutions, research institutes, higher education institutions and by other public entities obliged to do so) from Łódzkie Voivodeship in the period from 1 January to 30 November 2024 on the website of the Public Procurement Bulletin (EZamowienia). Table 1 also includes a total of 34 tender notices to be counted as green public procurement.

Source: own study based on empirical research.

According to the data in the table (Table 2), public procurers most often included environmental performance or functionality requirements in their green supply contract announcements, resulting from Article 101(1) of the PPL. In total, in 20 out of 34 notices containing environmental aspects, public entities included environmental criteria. This represented only a share of 0.93% of all notices examined. Among all 34 notices containing environmental aspects, the share of this criterion was at the level of 58.82%. Detailed analysis of the notices showed that most often the environmental aspect resulting from Article 101, paragraph 1 of the PPL was used as a criterion for evaluation of a given offer regarding energy consumption in the purchase of motor vehicles (cars, including electric cars).

In the case of purchase of vehicles, this criterion accounted for, however, only 10% in the overall evaluation criterion in addition to the price offered by the potential supplier (the criterion's ratio was 90% price to 10% energy consumption). In addition to the purchase of

cars (10 tenders), this criterion was included in the purchase of necessary infrastructure for new childcare places (4 tenders), in the purchase of agricultural equipment (3 tenders). The criterion in question was also used in tenders for the purchase of equipment for rescue or fire-fighting operations (1 tender), for the purchase of a mobile stage for the Cultural Centre (1 tender) and for the purchase of renewable energy installations (1 tender). It should be emphasised that in relation to all the 2145 public procurement notices examined for the purchase of similar goods (cars, agricultural equipment, rescue and fire-fighting equipment or photovoltaic panels), this is an almost trace proportion of the use of this environmental criterion in tenders.

Table 2.

Summary of numbers and percentages of public contract award notices containing specific environmental criteria under the provisions of the PPL

Item	Numerical and percentage coverage of the public procurement notices examined regarding the application of specific environmental criteria under the PPL		
	Number of public procurement notices containing specific environmental criteria resulting from the legal provisions of the PPL	Percentage of notices with selected environmental aspects from the PPL in the total number of notices (2145)	Share of notices with a selected environmental aspect from the PHP in the total number of green public procurement notices of public procurement notices (34)
Notices containing environmental aspects (Article 96 of the PPL)	16	0.75%	47.06%
Notices containing performance or functional requirements, including environmental requirements (Article 101(1) of the PPL)	20	0.93%	58.82%
Notices requiring the supplier to provide an environmental label (Article 104 of the PPL)	1	0.05%	2.94%
Notices requiring that the most advantageous tender be selected on the basis of quality criteria - environmental aspects (Article 242(2) of the PPL)	6	0.28%	17.65%

Note: The abbreviation PPL stands for the specific legal regulations contained in the Act of 11 September 2019. Public Procurement Law (Kancelaria Sejmu RP, 2004). The study covered a total of 2145 public procurement notices published by public contracting authorities (government and local government offices, public universities, health care facilities and self-government administration offices, public universities, healthcare institutions, research institutes, higher education institutions and by other public entities obliged to do so) from Łódzkie Voivodeship in the period from 1 January to 30 November 2024 on the website of the Public Procurement Bulletin (*EZamowienia*). The table (Table 2) includes a summary of the number and percentage of announcements that included specific environmental aspects resulting from the legal regulations governing the public procurement system in Poland. A total of 34 notices containing the environmental aspects indicated in detail in the table above were identified in the study population (Table 2). Some of the environmental criteria were collectively used several times by public sector procurers.

Source: own study based on empirical research.

The next criterion in terms of the number of times it was used by public entities in tender announcements was the environmental aspect resulting from Article 96 of the PPL. In total, the fact that this criterion was included was found in 16 green public procurement notices. This represented only a share of 0.75% of all the notices examined and a 47.06% share in all 34 notices containing environmental aspects. The environmental criterion resulting from the regulation of Article 96 of the PPL was included in the draft provisions of the contract for the execution of a given public procurement supply. This regulation was included in the case of announcements for the supply of motor vehicles (7 tenders), for the supply of octagonal reducers on existing acoustic screens (2 tenders), for the supply of number plates (1 tender), for the supply of photovoltaic panels (1 tender), for the supply of fuel oil for a social care facility (1 tender), for the supply of electrical equipment (1 tender), for the supply of a platform for the disabled (1 tender), for the supply of granite aggregate (1 tender) and for the supply of equipment for traffic stops (1 tender). Again, it should be emphasised that an analysis of all the announcements from the surveyed sample shows that in the case of similar announcements for the supply of goods, public entities did not make use of the possibility to apply the environmental criterion. This was the case with the purchase of passenger cars as well as fuel oil or number plates and other similar goods.

Another criterion in terms of the number of its application by public entities in public procurement was the requirement to select the most advantageous offer on the basis of quality criteria, i.e. environmental aspects included in Article 242(2) of the PPL. In total, the fact of including this criterion was found in 6 public procurement notices. This constituted only a 0.28% share among all the notices examined and a 17.65% share among all the 34 notices containing environmental aspects analysed. The criterion of the requirement to select the most advantageous offer on the basis of environmental aspects, mainly concerned the energy efficiency of the subject of the contract. In practice, it was used similarly to the criterion resulting from Article 101, paragraph 1 of the PPL. First of all, it was applied in the scope of offer evaluation concerning energy consumption in the purchase of motor vehicles. Both indicated criteria resulting from Article 101, paragraph 1 and Article 242, paragraph 2 of the PPL was used in total in 5 tenders. All 6 notices containing the criterion of environmental aspects resulting from Article 242, paragraph 2, concerned notices for the award of public procurement contracts for motor vehicles.

Among all the notices examined, only one was found to include a requirement for the supplier to provide an environmental label (Article 104 of the PPL). This announcement therefore accounted for a trace share of 0.05% in the total number of public procurement notices examined. Furthermore, this announcement accounted for a 2.94% share of all 34 announcements containing environmental aspects. The requirement for a supplier to use an environmental label concerned, in the case examined, the supply of lighting retrofits. The symbolic use by public entities of the requirement for a supplier to use an environmental label in the announcement may indicate a very low awareness of the importance of environmental labels and the essence of green procurement among managers of public entities.

The verification of the individual 34 green procurement notices also showed that the public entities launching the tender in question applied several environmental criteria or aspects simultaneously in a single procurement procedure. Generalizing, public entities applied 3 environmental criteria or aspects simultaneously in one announcement in only 2 announcements containing environmental aspects. The simultaneous application of 2 environmental aspects in an announcement was found in 5 announcements, while only one of the environmental criteria indicated above was applied by public entities for a total of 27 announcements.

A detailed study of 2145 public procurement notices shows that the scope for green public procurement is small. Research in this area needs to be broadened, if only to include further areas of public procurement, namely services and public works. Furthermore, it is worth extending the territorial scope of the Green Public Procurement Survey to include the entire country and the member states of the European Union. In addition, the study should focus on evaluating completed public procurement procedures with the conclusion of a contract. This would enable a thorough analysis of the extent of green public procurement. The selection of contract award notices for the study was conditioned by the need to examine the scope of green procurement in 2024, the practice of proceedings indicates that they can take a very long time, so complete data in this area is not easy to obtain in a short period of time. In addition, the selection of announcements was conditioned by the attempt to study in-depth the tenders in the scope selected for the study.

The presented results of a study on the extent to which environmental aspects were applied in public procurement announcements included actual green public procurement. The data presented may be an interesting source of information on this issue or may inspire other researchers interested in the subject. However, when analysing the results of the study, it should be borne in mind that some procurement notices may have been re-posted and their content may always have changed, for example by adding environmental aspects to the new notice. Despite some limitations, the analysed database of announcements made it possible to examine the scope of application of Green Public Procurement in tenders for the supply of goods for public entities in the selected region of Poland (Łódzkie Voivodeship).

5. Discussion

The issue of green public procurement and the extent to which it is applied in practice in European Union countries is an interesting research area for many researchers. One important research area in the field of public procurement is the assessment of the determinants of the adoption of green procurement practices at the local authority level. This issue was the subject of a survey in Sweden, which covered a total of 140 municipalities in 2018. The results of this

research indicate that, for Swedish municipalities, the most important determinant of green procurement was reliance on existing green procurement action strategies. It was also found that the propensity to use environmental criteria in public procurement decreased as the priority given to cost minimisation in the procurement process increased. The publication points out that the use of environmental criteria in public procurement is voluntary and formulated only as a suggestion to public entities. There is therefore, according to the researchers, a significant risk that environmental objectives will be given less importance in public organisations where procurement processes are centralised (Bryngemark et al., 2023). The conclusions of these studies indicate that Sweden lacks an explicit legal obligation to use an environmental criterion in tenders, which contributes to their limited use by public entities in practice. Similar conclusions can be drawn in this respect by analysing the legal regulations for the award of public contracts in Poland, as mentioned earlier in this publication.

Another example of analysing the activities of public entities in this area was a study on Malta, which is a small Member State of the European Union. The analysis of green public procurement in Malta shows that the lack of clear regulations for its use is a barrier to its practical application. As a small country, Malta is heavily dependent on imports. This is why the Circular Economy Malta (*Home - CE Malta*) programme was implemented there. This is because the Maltese public authorities have recognised that if entrepreneurs implement innovative production or service delivery systems based on closed-loop business models that include reuse and recycling in their processes they will be able to succeed. This scheme can fit well into the green public procurement system, as the public sector will be able to source goods produced in accordance with the circular economy concept. It can be considered good practice in this area (Caruana, Vassallo, 2024). So far, no such concepts promoting circular economy have been implemented in Poland within the public procurement system. It is worth mentioning that the use of environmental criteria in public procurement by the public sector can also have a very good impact on the environmental innovation of companies, as is the case in Germany, as demonstrated by research in this area (Krieger, Zipperer, 2022).

An analysis of Spain's green procurement implementation process, covering thousands of public procurement processes awarded between 2012 and 2019, showed that Spain's implementation of Directive 2014/24/EU on public procurement has had a positive effect on increasing its use by local public entities. The most pronounced effect of the increase in green procurement in Spain was found among the more bureaucratic, less flexible public administrations. Overall, based on the results of the study of green public procurement in Spain, it should be concluded that public administrations can effectively use public procurement as a strategic tool to achieve sustainable results (Rosell, 2023). When comparing green procurement data between Poland (Urząd Zamówień Publicznych, 2024) and Spain, it is clear that public entities in Poland make less use of environmental aspects in public procurement (Piotrowska, Przygodzki, 2024). The findings in Spain are significant in that the country is often comparable in its population and economic potential to Poland within the European Union

countries. Interesting findings on green procurement emerge from a publication containing the results of research in Romania. An analysis of the implementation of green procurement by public entities in Romania, shows that the level of application of environmental aspects was as low as in Poland (Urząd Zamówień Publicznych, 2024). A key barrier to increasing the scope of green public procurement in Romania is, as in Poland, the lack of mandatory legal requirements and clear performance targets in this area. In addition, in Romania, a barrier to the development of green procurement has been the lack of training, little awareness of existing tools in this field and insufficient knowledge and skills necessary to properly prepare and conduct tenders that include environmental considerations in the evaluation criteria. The similarities between Romania and Poland (Urząd Zamówień Publicznych, 2024) in the area of public procurement based on this research are very clear (Bilan, 2023).

The results of the research clearly show the benefits of green public procurement. A perceived barrier in this area by many researchers is the lack of legal regulations that would explicitly require the public sector to use environmental criteria in public procurement. It is important to remember, however, that green public procurement can make a significant contribution to reducing carbon emissions and improving the environment. Research carried out in Germany on the impact of green public procurement on decarbonisation policies indicates that it can also play a positive role in this area. Indeed, by selecting environmentally friendly goods and services in areas where public authorities are important buyers, public organisations can have both a direct and indirect impact on the direction of sustainable development in a country (Chiappinelli, Zipperer, 2017).

Summarising the analysis of research on the use of green public procurement in various exemplary European Union countries, it is worth highlighting research on the use of environmental criteria by EU institutions. The results of a study in this area covering tenders for the period 2009-2019 showed that, in fact, the local public sector in EU countries led the way in implementing environmental aspects in public procurement (8.7%), while EU institutions achieved a rate of (3.1%) compared to national governments (5.4%) and regions (6.2%). These studies clearly indicate that there is still a lot of work to be done across the European Union to increase the practical application of environmental criteria in public procurement (Badell, Rosell, 2021).

Conclusions

A study of the extent to which green public procurement is used has revealed very little use of the environmental criterion by Polish public entities. Out of a total of 2145 public supply contract award notices examined, the fact that an environmental criterion was applied was found in 34 tender notices. This represented only a 1.59% share of notices with environmental criteria

in the total population examined (2145 notices). A thorough analysis of all public supply contract notices revealed that public entities in Poland make sporadic use of environmental criteria. The study made it possible to confirm the research hypothesis that the extent of use of environmental aspects in the awarding of public contracts in Poland is low.

Among the advertisements examined, none with an environmental criterion were found to be published by universities, medical care facilities (including hospitals) or scientific and research centres. The advertisements of these entities concerned, among other things, the purchase of very different computer equipment, medical equipment, household appliances, cars and other goods, the manufacture and decommissioning of which affect the environment. The fact that the above-mentioned public entities did not use the criterion of energy consumption or the use of environmental labels in their advertisements shows that issues of sustainable development, including environmental aspects, have so far had little practical application. This is all the more surprising in the case of these entities, as most of the universities that have awarded public supply contracts have conducted extensive research into the nature and principles of sustainable development. This therefore calls for a broader implementation of scientific findings into the practical organisational activities of the university or research institute concerned.

The negligible use of environmental criteria by public entities in public procurement when evaluating bids was probably due to the regulations in force. Tenders carried out under national public supply procurement procedures do not contain an obligatory requirement to apply an environmental criterion. The application of the environmental criteria in question is only a recommendation, the non-implementation of which does not result in any sanctions for the public entity. The application of environmental aspects in a tender may, in practice, cause considerable organisational and formal problems for the awarding entity. This is because the need for a good definition of environmental requirements in the tender documentation requires staff with the relevant qualifications or training in this area. In addition, the inclusion of an environmental criterion in the formal requirements for evaluation of an offer means that the entity ordering the products in question has a limited number of entities that will be able to meet these requirements and deliver a good one. In practical terms, this means a reduction in the potential number of bidders willing to deliver a given supply that complies with environmental aspects. Thus, the lack of explicitly stated mandatory requirements in the legislation for the use of environmental criteria in tenders makes their use sporadic. This is also confirmed by the research results discussed in the publication and data from the report of the President of the Public Procurement Office on the implementation of public procurement in Poland in 2023, where it was indicated that the share of green procurement in all completed tenders was only 3% (Urząd Zamówień Publicznych, 2024).

A possible solution for increasing the scope of application of environmental aspects in public procurement is to change the legal regulations in this regard. Changes in legal regulations should be aimed at a clear determination of the obligation to apply environmental criteria each

time. This obligation, at least at the beginning of changes in legal regulations, could concern the necessity to apply the environmental criterion when making purchases of specific groups of goods, e.g. cars, computer equipment, household appliances, whose production process and operation are very energy-consuming and harmful to the environment. In subsequent stages, the range of mandatory goods or product categories for the purchase of which the public sector must apply environmental criteria in every case could be increased.

It is also worth mentioning that the implementation of such mandatory requirements for the use of environmental criteria in tenders should be regulated at EU-wide level, if only in the relevant EU Directive. This would be a practical implementation across the EU of a number of 'Green Deal' principles for the award of public procurement containing environmental aspects. Currently, the only available possibility of increasing the scope of green public procurement in Poland is to promote and encourage the use of environmental aspects in individual tenders of the management of public entities.

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