

CHARACTERISTICS OF GREEN PUBLIC PROCUREMENT IN HUNGARY

Anita Boros¹, László Kovács²

¹professor, ²doctoral student

¹Hungarian University of Agriculture and Life Sciences, ²University of Public Service, The
Doctoral School of Public Administration Sciences

E-mail: boros.anita@uni-mate.hu, kovacs.laszlo@kt.hu

Introduction/Abstract

Green, sustainable and circular public procurement are concepts that require a completely different approach from the point of view of public procurement as well. An economic approach that goes beyond the economic aspects of occasional procurement needs and is also suitable for achieving wider effects. The legal foundations for these have already been mostly created by the legislator at the EU and national level. However, the application of narrowly or broadly interpreted green aspects requires the conscious behavior of the entire value chain of the given procurement.

In our study, we examined (i) what exactly is covered by some definitions of public procurement classified under the general term of green public procurement (sustainable public procurement, circular public procurement), (ii) what is the ratio of green public procurement in Hungary, and (iii) we tried to formulate proposals for the more effective application of green public procurement.

Keywords: *green public procurement, sustainable public procurement, circular economy, circular public procurement, sustainability*

JEL classification: *H57, K32, O21, O52*

LCC code: *KKF1-4999*

Material and Methodology

In terms of methodology, we used different solutions: in order to clarify the definitions, we conducted a systematic literature search in studies following the introduction of green public procurement in the EU. In addition, we also reviewed the studies on SLR prepared in the topic (especially Quazi, 2022 and Bressanelli, 2019). In addition, we also reviewed those relevant documents belonging to the field of soft law, which have an impact on the development of the EU green public procurement market. We analyzed the proportion of green public procurement in Hungary by studying the databases of the Public Procurement Authority and the Central Statistical Office.

Our basic hypothesis is that although the legal framework is in place for the expansion of green public procurement, their share in Hungary is still very low. At the same time, this is also an obstacle to the spread of circular public procurement suitable for triggering much wider impact mechanisms.

Results

The concept of green, sustainable and circular public procurement

In the European Commission's interpretation, green public procurement (GPP) is "a process in which public authorities wish to procure goods, services and works that have a lower environmental impact during their life cycle than goods, services and works with the same primary function. otherwise procure" (European Commission, 2008, p. 4) that is, when applying it, the authorities give preference to the procurement of those goods, services and works that burden the environment to a lesser extent compared to other goods, services and works of the same purpose". Accordingly, green public procurement has been recognized by European institutions as a means of supporting the transition to a circular economy (CE). The European Commission's Public procurement for a circular economy. Good practice and guidance brochure takes you the GPP definition provided in Commission "Public procurement for a better environment".

The total value of public procurement in the European Union is around 2 trillion euros, which represents 19% of the EU's GDP, and it cannot be disputed that it has a significant impact on the Union's economy. On February 26, 2014, the European Parliament and the Council adopted the currently effective directives on public procurement, in which sustainability also played a significantly greater role. In order to transpose the directive, the Hungarian legislator adopted Act CXLIII of 2015 on Public Procurement (hereinafter: Public Procurement Act), which entered into force on November 1, 2015. The directive regulates the life-cycle cost as a kind of cost-effectiveness method, to which both environmental externalities and social costs can be related. The life cycle cost includes any cost that can be expressed in money and is linked to the life cycle of the object of purchase - from planning, research and development to destruction. In short, the essence of life cycle costing is to take into account the specific cost incurred during the entire life cycle of a given product, service or investment. In contrast to green public procurement, the concept of the life cycle is defined by the EU directive and the Hungarian Public Procurement Act in point 7 of Section 3:

"life cycle: all the successive or interconnected phases of the use of a product, the provision of a service or the existence of a construction investment - including the research and development to be carried out, production, trade and its conditions, delivery, use and maintenance - from the procurement of raw materials and the creation of resources to removal, disposal, the restoration of the original condition of the given areas, and the end of the service or use." The life cycle analysis thus examines the environmental protection aspects and their possible effects regarding the entire life cycle of the object of public procurement ("cradle to grave" principle). The provisions of Section 78 of the Public Procurement Act shall be interpreted closely together with this definition, which show that life cycle costs can basically be divided into two groups: (i.) internal costs and (ii.) costs attributable to environmental externalities. Internal costs include costs such as acquisition, use and maintenance costs. The costs that can be attributed to environmental externalities include, for example, the costs incurred during the extraction of the raw materials used to produce the product (Deák, 2019).

The European Union has developed green public procurement requirements for many product and service groups, which it regularly reviews and updates. The requirements can be inserted directly into the public procurement documents and contain information on the inspection methods. Most of the requirements are available in all official languages of the EU.

The European Green Deal designates the strengthening of the importance of environmental protection aspects in all EU policy areas in order to achieve sustainable and environmental protection goals. The document states, among other things, that the authorities and, in particular, the institutions of the Union must lead by example and conduct green public procurement

procedures, and the Commission must create additional legislation and guidelines for the member states and contracting authorities regarding green public procurement.

Regarding the content of these laws and guidelines, the Sustainable Europe investment plan issued by the Commission states in more detail that the Commission will propose green minimum requirements and target values to the Member States in order to green their public procurement within the framework of various sectoral initiatives, EU funding or product-specific legislation. In 2015, the EU adopted a document called "the realization of material circulation - the EU action plan for the circular economy" (Action Plan), which states that the Commission will begin to develop green criteria at the EU level, which contracting authorities will be able to apply voluntarily during their procurement. Subsequently, in 2020, it adopted the document titled "new action plan for a circular economy serving a cleaner and more competitive Europe" (new Action Plan), which was created as a result of the revision of the previous Action Plan. The new Action Plan recognizes that instruments such as the EU eco-label or the EU criteria for green public procurement have a wider scope of application, but due to the limitations of voluntary application arising from the directive regulations, they have a less significant effect. The Commission will make proposals regarding the minimum mandatory criteria and objectives of green public procurement with regard to certain sectoral legislation, and will introduce mandatory reporting to the Member States to monitor the spread of green public procurement, without thereby imposing an administrative burden on the contracting authorities conducting public procurement procedures.

Although the aforementioned public procurement directive recognized the need to green the public procurement process by introducing green aspects and wanted to create a feasible regulatory tool in order to achieve environmental protection objectives, the non-binding regulation led to the creation of a one-sided, on the one hand dynamic - but full of legal uncertainties - toolkit (Pouikli, 2020) and despite the many efforts made by the EU legislator, the spread of green public procurement remained limited (Melon, 2020). The contracting authorities are not successful in the application of green public procurement aspects, the level of spread and application, knowledge related to green public procurement aspects is insufficient and therefore fragmented due to sectoral and geographical conditions (Melon, 2020).

Several authors have dealt with some issues of the global rise of GPP. Some of the authors examine the obstacles to the spread of GPP (Brammer and Walker, 2011; Cheng et al., 2018; I would travel et al., 2020), while others focus on the possible support tool system for the spread of GPP (Luzzini et al., 2015, Harland et al., 2019, Wontner et al., 2020, Johnsson et under _ 2022, Raj et al under _ (2020)).

According to representatives of the Hungarian literature, GPP requirements can be divided into four broad categories. Based on this, they can be enforced in the public procurement technical specifications, in the selection criteria (exclusion grounds, suitability criteria), in the evaluation criteria (award criteria) and in the stipulations regarding the performance of the contract (Paksi, 2020).

GPP is increasingly being used as a national strategy as a means of transitioning to a circular economy (Marian et under., 2020; Yuhong, 2020, Wijayasundara et al., 2022, Obwegeser and Müller, 2018, Kristensen et al., 2021; Rainville, 2021). At the same time, some authors point out that the express relationship between GPP and CE is not yet fully developed (Fuertes et under _ 2020).

In our previous research, we have already pointed out that the application of environmental protection criteria in public procurement procedures can be suitable for promoting environmental protection goals (Boros (2017)). These are suitable for triggering positive

sustainability effects in relation to the given procurement, while indirectly supporting the green economic development of the entire value chain.

In addition, some authors highlight that the public sector, due to its huge purchasing power, is exceptionally suitable to contribute to the achievement of local, national and international innovation and sustainability goals (Kundu et al., 2020; Uyarra et al., 2020; Stokke et al., 2022).

Here we should also refer to the concept of circular public procurement (CPP). The essence of the new procurement method, apostolized as a type of "green" public procurement, is to return the goods or materials back into circulation at the end of their useful life. Through public procurement that goes beyond the classic lifetime of goods, services and buildings, contracts are created whose central element in achieving the goals of sustainable development is circularity (Roleders, V. (2022), Farooq et al., 2019; Lahane et al., 2020), i.e. maintaining the closed economic loop. CPP differs from previous procurement types (Sönnichsen and Clement, 2020). Sustainable Sourcing (SP) and Green Sourcing (GP) always strive for environmentally friendly materials, but CP strives to regenerate, recycle, rework, redesign, reduce, recycle, remanufacture and improve to achieve zero waste (Quazi et al., 2022). The concept of sustainable public procurement (SPP) is distinguished from the concept of green public procurement, which is a procedure during which the public authorities try to achieve an appropriate balance of the three pillars of sustainable development - from the economic, social and environmental point of view - when procuring goods, services or public works for the project at all stages. In sustainable public procurement, authorities implement public procurement aspects as part of a more comprehensive approach to sustainability, which also addresses economic and social aspects.

According to some authors, CE creates new jobs and sectors that have a positive impact on society (Zhang et al., 2021).

In the view of Quazi (2022), "the integration of circular procurement into the procurement process, whereby organizations seek to procure regenerated biological materials towards a zero-expiry life cycle concept. It not only closes the loop of the same supply chain, but also the loop of another sector's supply chain based on close cooperation between stakeholders."

Statistical analysis of the 2021 development of public procurements containing environmental protection aspects

Starting from 2012, the legislative environment enables the collection of data of procedures that include environmental (green) and/or social aspects as award criteria or other requirements, which is only possible below EU thresholds, as due to the shortcomings of the standard forms, such data are not available for procedures reaching or exceeding EU thresholds.

Social public procurement, i.e. socially responsible public procurement, means a public procurement activity in which at least one of the following social aspects is taken into account: job opportunities, fair work, respect for social and labor rights, social inclusion (including the disabled), equal opportunities, accessibility and design suitable for all users; in addition, they also consider sustainability criteria, including issues of ethical trade, and apply voluntary social responsibility more widely, adhering to the principles contained in the Treaty on the Functioning of the European Union and public procurement directives (Rezső, 2022).

From January 1, 2012, the Public Procurement Authority also collects statistical data on social aspects applied in public procurement procedures. In the contract award notice of procedures

conducted below EU thresholds, the contracting authority is obliged to indicate whether it applied a social aspect in the procedure.

The development of public procurements containing social aspects between 2012 and 2020 is illustrated in the graph in Figure 1.

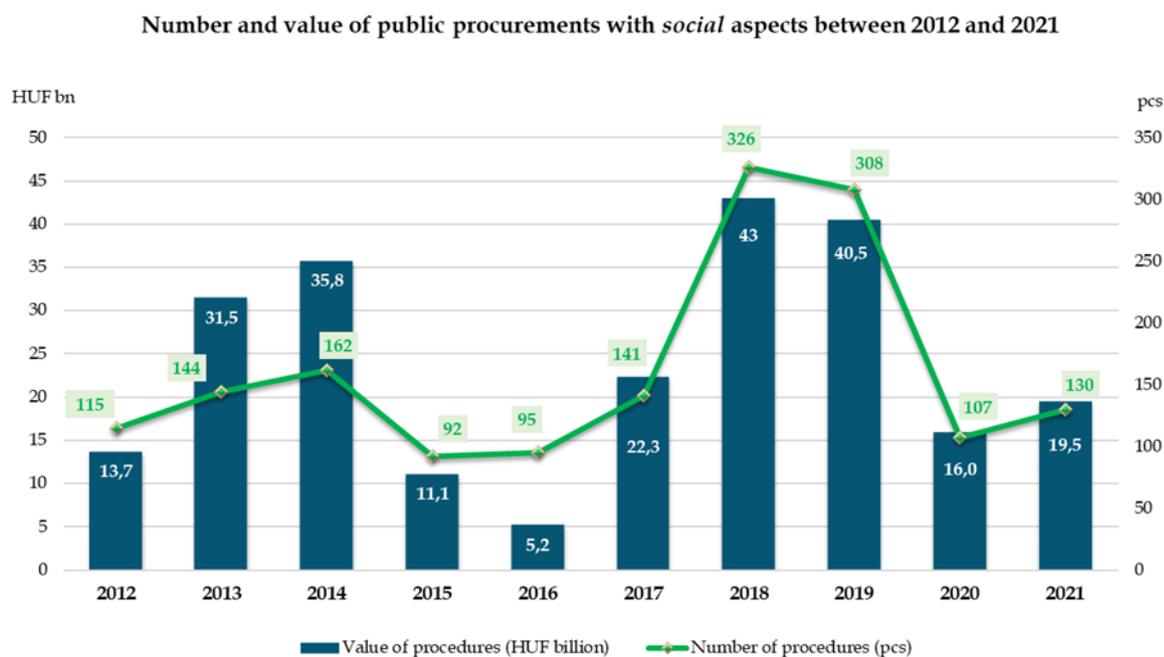


Figure 1. Development of the number and value of procedures containing social aspects between 2012 and 2021

Source: Public Procurement Authority, Annual report, 2021.

In the case of public procurements below EU thresholds, which also include social aspects as award or other criteria, the number of procedures and their contract value increased slightly in 2021 compared to the previous year. In 2021, 130 public procurement procedures applying social aspects were conducted, in the framework of which contracting authorities spent a total of HUF 19.5 billion.

According to the data of the Public Procurement Authority, in 2021, 2.9% of all public procurement procedures conducted below EU thresholds contained a social aspect, and in terms of value, which is 3.5% of the total value of public procurement procedures below EU thresholds.

The vast majority of social aspects, more than three quarters, represent award criteria in the relevant public procurements, the proportion of procedures containing social aspects formulated as contractual conditions is around 15 percent, the frequency of occurrence of the other requirements is not significant (Rezső, 2022).

In 2020, due to the negative impact of the coronavirus pandemic, the number of social proceedings fell to approximately a third of the 2019 figure, and the total value of the proceedings fell to less than half, approximately 40%. In 2021, the number and value of public procurement procedures with a social aspect increased considerably, by more than 20 percent compared to the previous year: 130 such procedures were conducted, during which contracting authorities spent HUF 19.5 billion. In 2020, 107 public procurement procedures involving social aspects were conducted, with a total value of HUF 16 billion.

Social public procurement represents a significantly smaller proportion below EU thresholds than procedures with environmental (green) aspects. For both years, it is true that the ratio of the number and value of green public procurements was over 10 percent (both were approximately 11 percent in 2021), while in the case of social procedures, these ratios amounted to less than 5 percent.

Analyzing the public procurements containing social aspects by the subject of the procurement, we can see that the vast majority of such procedures, more than 90 percent (91.5% in 2021) were public works, so it can be said that contracting authorities considered social aspects primarily at public works (Rezső, 2022).

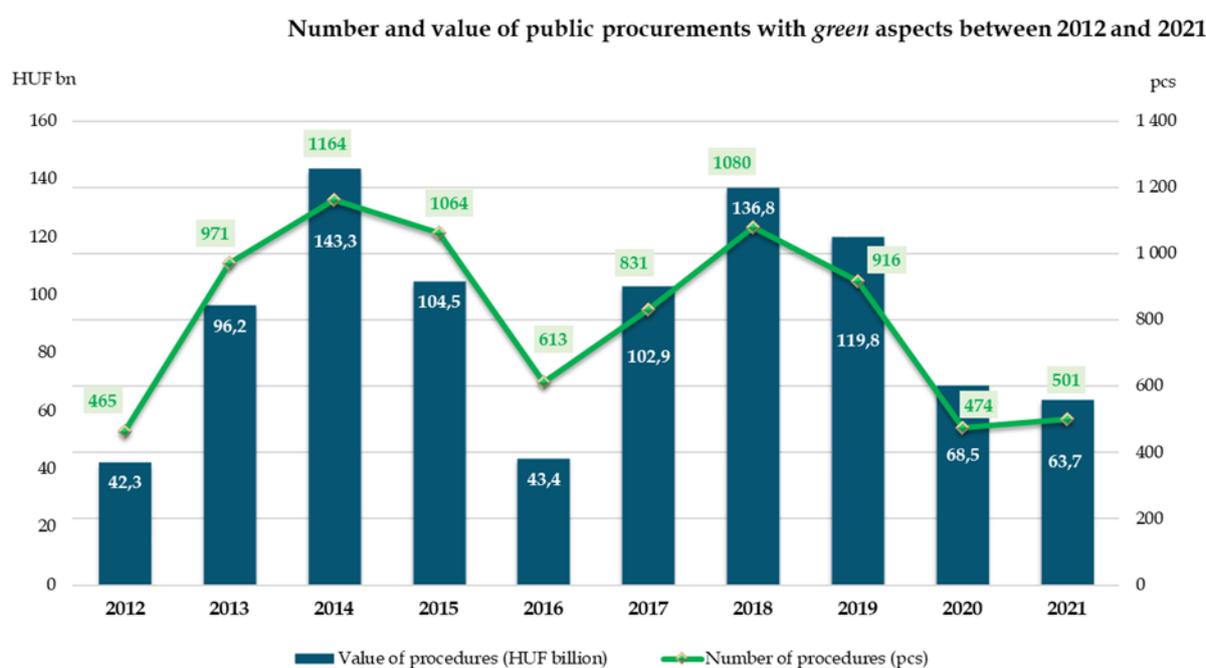


Figure 2. Development of the number and value of procedures containing green aspects between 2012 and 2021

Source: Public Procurement Authority, Annual report, 2021.

In 2021, 501 green public procurement procedures were conducted below EU thresholds, where contracting authorities spent a total of HUF 63.7 billion, which means that compared to the previous year, the number of green procedures increased slightly, while their value decreased slightly. According to the data of the Public Procurement Authority, 11.1% of the public procurement procedures carried out below EU thresholds included an environmental aspect in 2021, so the proportion of public procurements including environmental aspects increased by about 1 percentage point compared to the rate in 2020 (10.3%). 11.3% of the total value of public procurement procedures carried out below EU thresholds included an environmental aspect, which represented a decrease of only 1.8 percentage points compared to the previous year's ratio (13.1%).

Based on the grouping by main subject matters, contracting authorities considered environmental aspects again in the case of public works: 16% of the number of public works carried out below EU thresholds, and 12.3% of their value, contained environmental aspects.

According to Rezső's study (2021), a total of 7,431 public procurement procedures worth HUF 3,263.6 billion were conducted in 2020, of which 474 included green aspects, with a total value of HUF 68.5 billion. Compared to the local maximum experienced in 2018, there was a slight decrease in both the number of procedures and the value of procedures in 2019, and in 2020 the decline became significant, which specifically means that the number of green procedures was almost halved (to 51.7%), and the total value represented by them dropped to around 60% (57.2 %). In 2020, 10.3 percent of the public procurement procedures conducted below EU thresholds included an environmental, i.e. green, aspect, so their proportion decreased by 2.3 percentage points compared to the proportion in 2019 (12.6%). Regarding the total value of the procedures, only 13.1 percent of them included an environmental aspect below EU thresholds, and this represents a decrease of 1.4 percentage points compared to the previous year's ratio (14.5%).

Environmental aspects were mainly implemented by contracting authorities in the case of public works. About 15 percent of the number and value of public works carried out below EU thresholds included an environmental aspect, in the case of public supply and public services, this ratio was only between 4-6 percent in terms of both their number and value, so only 4-6 percent of the procurement of public supplies and public services below EU thresholds included a green aspect. In 2020, the vast majority of public procurement procedures containing green aspects, approximately 60 percent, were limited to only 6 counties: Bács-Kiskun-; Borsod-Abaúj-Zemplén-; Hajdu-Bihar-; Szabolcs-Szatmár-Bereg-; Pest County and Budapest. From this point of view, the Central Hungarian region, i.e. Budapest and Pest counties, is also very relevant, where 23.5% of green public procurement can be linked.



Figure 3. Development of the number of public procurements with green aspects by county, 2020.

Source: Rezső (2021).

Conclusions

In Hungary, the conditions are right for green public procurement aspects to spread and green technologies to be applied. Evidence of this can be seen in the significant number of procurements that include environmental aspects. In addition, the Public Procurement Authority supports contracting entities obliged to conduct public procurement in their activities aimed at conducting green public procurement procedures with a number of events and informational publications, and in general the implantation of green public procurement in the public consciousness. According to our point of view, a fundamental condition for the rise of green public procurement would be the mandatory requirement of the application of green aspects, as well as the stricter stipulation of environmental and sustainability criteria in the technical specifications of public procurement, even in line with the expectations defined by law. The other tool on the bidder's side is the existence of sustainability policy and activity certification, as well as the widespread implementation of life cycle costing methods into practice.

In addition, it is essential to provide detailed information on the characteristics of green, sustainable and circular public procurement, as well as the possible ways and means of its application.

Literature used

1. Anita Boros (2017): The question of sustainability in the application of Hungarian public procurement law, with particular regard to the practice of state-owned economic companies. PUBLIC PROCUREMENT REVIEW 12 pp. 47-56, 10 p.
2. Brammer, S. - Walker, H. (2011). Sustainable procurement in the public sector: an international comparative study. International Journal of Operations & Production Management. DOI:10.1108/01443571111119551
3. Bressanelli, G. - Perona, M. - Saccani, N. (2019). Challenges in supply chain redesign for the Circular Economy: A literature review and a multiple case study. International Journal of Production Research, 57(23), 7395-7422. DOI: 10.1080/00207543.2018.1542176
4. Cheng, W. - Appolloni, A. - D'Amato, A. - Zhu, Q. (2018). Green Public Procurement, missing concepts and future trends – A critical review. Journal of Cleaner Production, 176, 770-784. DOI: 10.1016/j.jclepro.2017.12.027
5. Commission of the European Communities, (2008), Communication from the Commission like the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Public Procurement for a Better environment <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52008DC0400> (Date of download: 31.10.2020).
6. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - The Sustainable Europe Investment Plan p. 12; Available at: <https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=CELEX:52020DC0021> (Date of download: 21.10.2022).
7. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Achieving circularity - the EU action plan for the circular economy; p. 2 Available at: <https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=CELEX:52015DC0614.COM/2015/0614final> (Date of download: 21.10.2022).
8. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new circular economy action plan for a cleaner and more competitive Europe (2020);

- COM/2020/98 final p. 4 Available: <https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=CELEX:52020DC0098#footnote12> (Date of download: 21.10.2022).
9. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions (2019) Available at: <https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=CELEX:52019DC0640> (Download date: 10/21/2022).
 10. Directive 2014/24/EU, Article 2, point 20 - "life cycle": all successive and/or interconnected phases of the existence of a product, a construction investment or a service provision - including the research and development to be carried out, production, trade and its conditions, including delivery, use and maintenance, from the procurement of raw materials and the creation of resources to the removal/disposal, the restoration of the original condition of the given areas and the end of the service or use;
 11. EU GPP Criteria http://ec.europa.eu/environment/gpp/eu_gpp_criteria_en.htm (Date of download: 31.10.2022).
 12. European Commission (2018) Directorate -General for Employment, Social Affairs and Inclusion, Palaric, E., Thijs, N., Hammerschmid, G., A comparative overview of public administration characteristics and performance in EU28, Publications Office. <https://data.europa.eu/doi/10.2767/13319> (Date of download: 23.10.2022)
 13. European Commission (2020) Communication from the Commission - the new circular economy action plan. For a cleaner and more competitive Europe
 14. Farooque, M. - Zhang, A. - Thüerer, M. - Qu, T. - Huisinigh, D. (2019). Circular supply chain management: A definition and structured literature review. *Journal of cleaners production*, 228, 882-900. <https://doi.org/10.1016/j.jclepro.2019.04.303>
 15. Fuertes Giné, L. - Vanacore, E. - Hunka, AD (2022). Public Procurement for the Circular Economy: a Comparative Study of Sweden and Spain. *Circular Economy and Sustainability*, pp. 1-21. DOI: 10.1007/s43615-022-00150-4
 16. Gábor Paksi (2020): Green evaluation criteria for the implementation of sustainable public procurement Part I. *Public Procurement Notice Plus*. 2020. II. year, issue 6, 44-54. side. DOI: 10.37371/KEP.2020.6.4
 17. Green public procurement: Handbook on environmentally friendly public procurement. European Union, (2016). In.: https://ec.europa.eu/environment/gpp/pdf/handbook_hu.pdf (Date of download: 11/02/2022).
 18. Harland, C. - Telgen, J. - Callender, G. - Grimm, R. - Patrucco, A. (2019). Implementing government policy in supply chains: an international coproduction study of public procurement. *Journal of supply chain management*, 55(2), 6-25. DOI: 10.1111/jscm.12197
 19. Johnson, PF. - Klassen, RD. (2022). New directions for research in green public procurement: the challenge of inter-stakeholders tensions. *Cleaner Logistics and Supply Chain*, 3, DOI: 10.1016/j.clscn.2021.100017
 20. Kristensen, HS. - Mosgaard, MA. - Remmen, A. (2021). Circular public procurement practices in Danish municipalities. *Journal of Cleaner Production*, 281, 124962. <https://doi.org/10.1016/j.jclepro.2020.124962>
 21. Kundu, O. - James, AD. - Rigby, J. (2020). Public procurement and innovation: a systematic literature review. *Science and Public Policy*, 47 (4), 490-502. <https://doi.org/10.1093/scipol/scaa029>
 22. Lahane, S. - Kant, R. - Shankar, R. (2020). Circular supply chain management: A state - of-art review and future opportunities. *Journal of Cleaner Production*, 258, DOI: 10.1016/j.jclepro.2020.120859

23. Luzzini, D. - Brandon -Jones, E. - Brandon -Jones, A. - Spina, G. (2015). From sustainability commitment to performance: The role of intra- and inter -firm collaborative capabilities in the upstream supply chains. *International Journal of Production Economics*, 165, 51-63. <https://doi.org/10.1016/j.ijpe.2015.03.004>
24. Melon, L. (2020): More than a nudge? Arguments and tools for mandating green public procurement in the EU. *Sustainability* 12, 1–24 p. 3. Available at: <https://www.mdpi.com/2071-1050/12/3/988>.
25. Obwegeser, N. - Müller, SD. (2018). Innovation and public procurement: Terminology, concepts, and applications. *Technovation*, 74, 1-17. <https://doi.org/10.1016/j.technovation.2018.02.015>
26. Orsolya Rezső (2020): Statistical analysis of the 2020 development of public procurements with environmental protection aspects *Public Procurement Bulletin Plus*. 2021. III. year, issue 6, pages 49-56. DOI: 10.37371/KEP.6.6.2021
27. Orsolya Rezső (2022): A detailed statistical analysis of the development of public procurements with social aspects in 2021. *Public Procurement Notice Plus*. 2022. IV. volume 10. page 32-41 DOI: 10.37371/KEP.2022.10.4
28. Pouikli K. (2020): Towards mandatory Green Public Procurement (GPP) requirements under the EU Green Deal: reconsideration the role of public procurement as an environmental policy tool 2020.10. (Pouikli) p. 704 Available at: <https://link.springer.com/article/10.1007/s12027-020-00635-5#Fn19>.
29. Public Procurement Authority guide on life cycle costing methodologies, K.É. No. 35 of 2017, March 10, 2017, p. 11.
30. Qazi, AA. - Appolloni, A. (2022). The systematic review you barriers and enablers toward circular procurement management. *Sustainable Production and Consumption*. DOI: 10.1016/j.spc.2022.07.013
31. Rainville, A. (2017). Standards in green public procurement – A framework lake enhance innovation. *Journal of Cleaner Production*, 167, 1029-1037. <https://doi.org/10.1016/j.jclepro.2016.10.088>
32. Raj, A. - Agrahari, A. - Srivastava, SK (2020). Thu pressures foster sustainable public procurement? An empirical investigation comparing developed and developing economies. *Journal of Cleaner Production*, 266, 122055. DOI: 10.1016/j.jclepro.2020.122055
33. Richárd Deák (2019): Public procurement in the service of sustainable development. *Public Procurement Notice Plus*. Year I of 2019 Number 12.
34. Roleders, V. (2022). Circular Public Procurement as a Component of Global Security.
35. Siminică, M. - Avram, M. - Roxana, LP. - Avram, L. (2020). The adoption of national green procurement plans from the perspective of circular economy. *Amphitheater Economic*, 22(53), 15-27. DOI: 10.24818/EA/2020/53/15
36. Sönnichsen, SD. - Clement, J. (2020). Review of green and sustainable public procurement: Towards circular public procurement. *Journal of cleaners production*, 245, 118901. <https://doi.org/10.1016/j.jclepro.2019.118901>
37. Stokke, R. - Kristoffersen, FS, - Stamland, M. - Holmen, E. - Hamdan, H. - De Boer, L. (2022). The role of green public procurement in enabling low-carbon cement with CCS: An innovation ecosystem perspective. *Journal of Cleaner Production*, DOI: 10.1016/j.jclepro.2022.132451
38. Sustainability - Sustainability separate page <https://fenntarthato.kozbeszerzes.hu/> (Date of download: 25.10.2022).

39. Sustainable Public Procurement (SPP) is also the process by which public authorities seek to achieve the appropriate balance between the three pillars of sustainable development - economic, social and environmental - when procuring goods, services and works at various stages of the project. Source: https://ec.europa.eu/environment/gpp/versus_en.htm
40. The annual report of the Public Procurement 2021 https://www.kozbeszerzes.hu/media/documents/KH_Eves_Beszamolo_2021.pdf (Date of download: 25.10.2022).
41. Uyarra, E. - Zabala-Iturriagoitia, JM. - Flanagan, K. - Magro, E. (2020). Public procurement, innovation and industrial policy: Rationales, roles, capabilities and implementation. *Research Policy*, 49(1), DOI: 10.1016/j.respol.2019.103844
42. Vejaratnam, N. - Mohamad, ZF. - Chenayah, S. (2020). The systematic review of barriers impeding the implementation of government green procurement. *Journal of Public Procurement*. DOI: 10.1108/JOPP-02-2020-0013
43. Wijayasundara, M. - Polonsky, M. - Noel, W. - Vocino, A. (2022). Green procurement for a circular economy: What influences purchasing of products with recycled material and recovered content by public sector organizations? *Journal of Cleaner Production*, 133917. <https://doi.org/10.1016/j.jclepro.2022.133917>
44. Wontner, KL. - Walker, H. - Harris, I. - Lynch, J. (2020). Maximizing "Community Benefits" in public procurement: Tensions and trade-offs. *International Journal of Operations & Production Management*. DOI: 10.1108/IJOPM-05-2019-0395
45. Young, S. - Nagpal, S. - Adams, CA (2016). Sustainable procurement in Australian and UK universities. *Public Management Review*, 18(7), 993-1016. <https://doi.org/10.1080/14719037.2015.1051575>
46. Zhang, A. - Wang, JX. - Farooque, M. - Wang, Y. - Choi, TM (2021). Multi-dimensional circular supply chain management: A comparative review of the state-of-the-art practices and research. *Transportation Research Part E: Logistics and Transportation Review*, 155, 102509. <https://doi.org/10.1016/j.tre.2021.102509>