

# **GREEN PUBLIC PROCUREMENT: AN OVERVIEW OF IMPLEMENTATION, MEASUREMENT AND REPORTING SYSTEMS IN THE EUROPEAN CONSTRUCTION SECTOR**

**Kinga Szabó\***

\*Széchenyi István University Doctoral School of Law and Political Sciences  
szabo.kinga3@sze.hu

The European Commission has historically advocated for green public procurement (GPP) as a voluntary mechanism; however, recent initiatives suggest a transition towards obligatory measures. In addition, documents from EC Committees and the European Parliament, along with reports from the OECD and scholarly articles, recommend the implementation of mandatory GPP. This is due to the limited effectiveness of voluntary measures in integrating sustainability into procurement decision making. Since the beginning of the 21st century, GPP has developed towards sustainable and circular procurement. Currently, Sustainable Public Procurement (SPP) is also recognised as a catalyst for innovation. However, the evaluation and analysis of the performance and implications of the GPP / SPP criteria remain a complex challenge.

Over the past decade, mandatory sector-specific regulations have been adopted at the national level among European states, including Hungary. For the implementation of mandatory regulations, effective policies and frameworks and comprehensive analysis of detailed procurement information are needed. In addition, assessments of the lifecycle costs and environmental impacts of the goods and services purchased are essential.

This research entails a comprehensive review of contemporary findings within the scientific literature. Provides a comparative analysis of the various implementation, measurement, and reporting systems of GPP across member states, and attempts to propose potential solutions for the effective spread of GPP.

## **1. Introduction**

This study explores the legal and policy implications of implementing mandatory green public procurement (GPP), with a particular focus on the European regulatory framework, especially that of Hungary, and the construction sector. Adopting a trial-method approach that combines a systematic literature review with an analysis of procurement data from Hungary and other EU Member States, the research examines national regulations and the observable outcomes of their application.

In Hungary, as a result of the legislation of 2023-2024 years, GPP tools have become mandatory in a narrow and well-defined circle of works funded by the central budget. This makes my topic very relevant and current. It is worth examining, based on academic and Member State experiences, what direction the current Hungarian regulatory framework may take in shaping the public procurement market, and what legal steps are still required to ensure the successful implementation of GPP.

In academic literature, as well as within EU and OECD expert platforms, there is a growing body of criticism regarding the effectiveness and success of voluntary GPP. These critiques typically advocate for mandatory implementation as a means of achieving the strategic sustainability goals of the EU. At the same time, it is evident that in leading, exemplary Member States advancing in GPP, its application is not necessarily driven by binding legal regulations. To illustrate and explore this contrast in greater depth, the present study examines the GPP regulations of EU Member States, focussing on whether they are mandatory or discretionary in nature, and also investigates the state of the art in the field through a detailed analysis of the most relevant results from the HeinOnline, WoS and Elsevier databases.

The EU's public procurement market represents approximately 2–2.4 109 EUR/y, or about 13–14 % of its GDP, while globally public procurement accounts for approximately 12–13 % of GDP (World Bank, 2020). Within this, the construction sector has particular significance, not only because of its economic weight but also because of its substantial environmental impact.

The European academic literature typically focusses on western and northern European case studies, where environmental awareness is more advanced and supported by stronger traditions. However, there is a notable gap in mapping the legal context, procurement markets, and related strategies of Central and Eastern Europe, which are more relevant for our analysis. Both stakeholders and the literature are increasingly advocating for the mandatory implementation of GPP instruments.

The results of the OECD 2022 GPP survey ("Harnessing Public Procurement for the Green Transition", 2024) show that countries increasingly recognise GPP as a major driver for innovation and sustainability (29 of 38 countries). 92 % of the countries surveyed have set mandatory GPP requirements and targets in public procurement on different levels or in different sectors, however, compliance is not always monitored and impact evaluation is missing. Although the OECD does not impose binding legal obligations, it strongly encourages member states to introduce mandatory GPP requirements, particularly in high-impact sectors accompanied by legal provisions and measurable targets, due to the limited effectiveness of purely voluntary approaches. The OECD also recommends that reporting and monitoring should be mandatory for contracting authorities on the use of green criteria in public tenders.

The European Commission defines SPP as 'a process by which public authorities seek to achieve the appropriate balance between the three pillars of sustainable development - economic, social, and environmental - when purchasing goods, services, or works at all stages of the project' (COM(2008) 400).

Existing research presents a diverse set of terms and approaches to sustainability in procurement, including concepts such as green and sustainable public procurement, environmentally responsible purchasing, and sustainable supply chain management. Grandia and Voncken (2019) drew six types of SPP, one of them is GPP. Due to COM(2008) 400, GPP is within the framework of Strategic Public Procurement, together with Socially Responsible Public Procurement (SRPP) and Innovation Procurement.

The study by Grandia and Voncken (2019) investigates whether the perceived ability (knowledge and skills), motivation (affective commitment), and opportunity (organisational learning capacity) influence the implementation of six types of sustainable public procurement (SPP), including GPP. The key findings were that ability, motivation, and opportunity significantly affect the implementation of GPP, but not other

types of SPP, highlighting that findings based on GPP cannot be generalised and that social types of SPP can require different drivers. GPP was the type of sustainable procurement that was implemented the most frequently in the study and its adoption was significantly influenced by affective commitment to sustainability, organisational learning capacity, and -indirectly - knowledge related to sustainability. The article does not systematically examine the legal obligation as a factor that influences the implementation of the GPP.

Stokke et al. (2022) highlighted that public buyers actively influence GPP and that it is possible to effect a change in the ecosystem from the supplier side. Badell and Rosell (2021) investigated whether EU institutions are still credible “green actors” by empirically analysing their adoption of GPP practices from 2009 to 2019. The focus was on contracts using environmental criteria in award procedures. The key finding was that, despite the EU's self-image as a global green leader, EU institutions have the lowest GPP adoption rates (2.65 %) compared to local (8.4 %), regional (6.7 %), and national (5.3 %) governments. They suggested that GPP should be made mandatory in EU institutions to strengthen their credibility and help achieve their environmental goals.

Iurascu (2023) pointed out that mandatory GPP can be an effective tool to align public procurement with sustainability goals, but legal enforceability alone is not enough. Her article employs a legal-doctrinal and case-based methodology, combining analysis of EU and Italian regulatory frameworks with judicial interpretation. As the Italian example shows, judicial oversight and institutional capacity are key to turning rules into results.

## **2. Methods**

On the one hand, this study uses legal analysis through the processing of available legal sources and policies. On the basis of the available statistical data – available on international forums, from literature sources or on the websites of member state organisations – it presents the differences in the incidence of compulsory and optional introduction.

On the other hand, it performs literature analysis using keyword searches of the subject. Based on the literature findings, it draws parallels between the already existing frameworks and legal solutions and the literature positions on the mandatory introduction of green criteria.

The literature search was conducted in three databases: Web of Science, Science Direct, and Hein Online, among the open access articles available, using the search words ‘GPP’, ‘mandatory’, and ‘construction’ to generate the sets that were also itemised when writing the article. The results are analysed in Chapter 5.

## **3. EU Policy background**

### **3.1 The evolution of EU public procurement law at a glance**

EU public procurement law began in the 1970s to harmonize national systems. Early directives covered works and supplies, followed by services and remedies. By the 1990s, legislation distinguished between traditional and utility sectors. Key reforms in the 2000s introduced Directives 2004/18/EC and 2004/17/EC, with further modernization in 2014 via Directives 2014/24/EU and 2014/25/EU. These now form the backbone of EU procurement rules, increasingly integrating sustainability goals.

### **3.2 Green aspects and sustainability goals in the EU public procurement policy**

Environmental protection became a core EU objective alongside international legal developments. Article 11 TFEU requires environmental considerations to be integrated into all EU policies, including public procurement. Recognizing procurement's potential, the Commission encouraged Member States from 2003 to adopt greener approaches, first reflected in the 2004 directives and reinforced by the 2005 Buying Green! handbook.

To support implementation, the EU developed GPP criteria for numerous product groups, regularly updated and published as Staff Working Documents. These criteria cover sectors like construction, transport, IT, cleaning, and public space maintenance. By the 2010s, EU strategies—especially Europe 2020—highlighted procurement as a tool for sustainable and innovative growth, and the 2014 directives embedded related requirements.

Further efforts emerged through the 2013 Green Paper on 2030 energy and climate goals, which emphasized policy coherence, though not procurement-specific. One central tool is Life Cycle Costing (LCC), particularly where no fixed criteria exist. The EU also promoted the Product and Organisation Environmental Footprint methodologies to improve consistency in sustainability assessments.

The European Green Deal (2019) set a long-term goal of climate neutrality by 2050 and called for sector-specific green procurement rules. The subsequent Circular Economy Action Plan proposed legally binding minimum GPP criteria and mandatory reporting, noting that voluntary approaches alone have proven insufficient.

## **4. Legal Background in Member States Regulation**

This chapter of the study provides a detailed analysis of the legislation adopted by EU member states. Identify those cases where GPP criteria are mandatory, exploring the underlying intentions and objectives of the policy that have led to such regulatory choices. Furthermore, it evaluates the results achieved in terms of effectiveness. The chapter also aims to extract key lessons and best practices relevant to the implementation of binding GPP regulations.

### **4.1 The Pioneers – Austria and the Netherlands**

#### **4.1.1 Austria**

Since the early 2000s, Austria has gradually moved from voluntary to structured GPP, supported by legal and strategic tools. The Federal Ministry for Climate Action (BMK) was central in developing procurement criteria, leading to the naBe Action Plan, first adopted in 2009 and updated in 2021, which set sustainability targets for key procurement categories at the federal level.

Austria's BVergG 2018 fully transposes the 2014 EU directives, explicitly permitting environmental and social criteria throughout the procurement process. While not universally mandatory, it strongly promotes sustainable practices.

The naBe Plan, though not legally binding, functions as a quasi-mandatory framework for federal authorities, especially in sectors like construction. It includes minimum requirements, monitoring, and reporting mechanisms, coordinated by BMK. Together with BVergG 2018, Austria's model provides a coherent and widely cited example at the EU and OECD levels—though it applies primarily at the federal level.

#### **4.1.2. The Netherlands**

The Netherlands has long been a GPP leader in the EU. After introducing GPP targets in 2005, the Sustainable Procurement Programme (Duurzaam Inkopen) was launched in 2008. In 2010, the government committed to 100 % sustainable procurement at the central level.

While the Aanbestedingswet implements EU directives and allows environmental criteria, Dutch GPP is driven more by national policy than legal obligations. The key actor is PIANOo, an expertise centre offering criteria, tools, templates, and training for over 45 product and service categories.

Central bodies are required to apply PIANOo's criteria, and compliance is monitored through sustainability audits. The construction sector focuses on low-carbon and circular materials. PIANOo defines three ambition levels (basic, significant, ambition), promoting LCC and innovation. Despite its nonlegal nature, the Netherlands achieved full GPP integration by 2015 across all public levels.

### **4.2 Sector-specific Followers – Italy, France, Germany, Portugal, and Spain**

All five countries – Germany, Italy, France, Spain, and Portugal – have adopted national action plans or governmental policies on GPP that define strategic goals, priority sectors, and implementation tools at the national level. In each country, GPP requirements are mandatory in specific sectors such as construction, transport, IT equipment or public buildings, often based on EU directives and reinforced through national regulations. Germany's Act against Competition Restraints (Gesetz gegen Wettbewerbsbeschränkungen, GWB) allows the integration of environmental criteria throughout all procurement phases. The German AVV Klima regulation establishes binding federal-level requirements for climate-friendly public procurement. In the construction sector, the application of energy performance standards (nZEB), as defined in national legislation, is mandatory, and both eco-labels (e.g. Blue Angel) and life-cycle costing (LCC) guidelines have been introduced.

#### **4.2.1. The Italian Job**

The Italian Public Contracts Code amended by Law 221/2015 implemented a Minimum Environmental Criteria (MEC) mandatory across all public tenders for goods, services, and works, regardless of contract value or threshold. Since 2015, CAM have included mandatory environmental and circular economy criteria for public buildings (new builds and renovations), covering recycled material content, pre-demolition audits, selective deconstruction, and waste recovery. Italy is the only EU member state to require 100% compliance with these criteria in public building contracts. Tender documents that do not comply with CAM can be legally challenged, and noncompliance may lead to contract invalidity. (Iurascu, 2023)

#### **4.2.2. Mandatory in Spain**

Since 2018, the Spanish Public Procurement Act (Law 9/2017) mandates that all public authorities include sustainability criteria in the procurement. However, only central administration is mandated, local governments are not mandated, and often lag in implementation. Studies find that Green criteria appear only in about 19–20 % of tenders. (Rosell, 2023)

### **4.3 Northern states - Danish Kingdom, Norway, Sweden**

The GPP systems of Denmark, Sweden, and Norway as EEA member share several common features: all three countries have national strategies, sector-specific environmental criteria, and make use of life-cycle costing and ecolabels (such as the Nordic Swan). The main difference lies in legal enforceability. Sweden and Norway have introduced mandatory environmental requirements in certain sectors since 2022, while Denmark continues to follow a voluntary, strategy-driven approach. Sweden also has the most advanced monitoring framework.

### **4.4 Central and Eastern Europe**

Most Central and Eastern European countries have adopted GPP National Action Plans, but their implementation remains uneven, and only a few integrate binding targets or dedicated monitoring systems. While the GPP remains largely voluntary throughout the region, countries like Slovenia and Poland have introduced mandatory environmental criteria in selected sectors such as transport and EU-funded projects, whereas others rely mainly on soft-law instruments.

In Poland, the GPP is mandatory in the transport sector according to EU law, in public construction through energy efficiency standards, and in all EU-funded projects, while central purchasing frameworks also impose environmental criteria in IT and office equipment procurement.

In Slovakia, the mandatory GPP applies only to energy-efficient products and specific vehicle categories, as required by EU directives. The latest NAP covers 12 product groups aligned with EU GPP criteria (Malatinec, 2017).

#### **4.4.1. *Slovenia as a regional leader***

In Slovenia, the first GPP-Decree adopted in 2011, expanded in 2017, requires environmental criteria across mandatory categories. Among these 20 specific procurement categories, electricity, transport, office supplies, cleaning, catering services, and construction (Uredba 51/2017) are included. Slovenia is considered a regional leader in Green Public Procurement, thanks to its mandatory GPP requirements in 20 product categories, strong regulatory framework, and active support tools such as LCC calculators and eco-label guidelines.

#### **4.4.2. *Hungary***

Hungary adopted a GPP strategy (2022-2027) in December 2022 that aimed to achieve 30 % of all public tenders with green criteria by 2027. Although Hungary's legal framework has allowed the tracking of environmentally conscious public procurement since 2012, data collection remains limited to procedures below EU thresholds due to limitations in standard notices. Despite the introduction of eForms in late 2023, which include fields on strategic considerations, these are rarely used in practice, leaving data on above-threshold procedures incomplete.

According to data collected by Hungary's Public Procurement Authority (KÉ+ 2024, Figure 1), in 2023, within national public procurement procedures (totalling 4,534 procedures with a combined value of HUF 440.5 billion), 695 green procurements were carried out, which is HUF 80.8 billion. Among these, 60 procedures incorporated social and environmental criteria, with a total value of HUF 8.3 billion, representing approximately 1 % of all national procedures by number and 2 % by value. It can also be estimated that around 80 % of national procedures, approximately 3,700 cases, did not include any sustainability criteria

at all. In 2024, contracting authorities carried out 900 green procurements below EU thresholds, totalling HUF 78 billion. While the number of such procedures fell by more than 10 % from the previous year, its overall value declined more moderately, by 3.5 % (Public Procurement Authority, 2024).

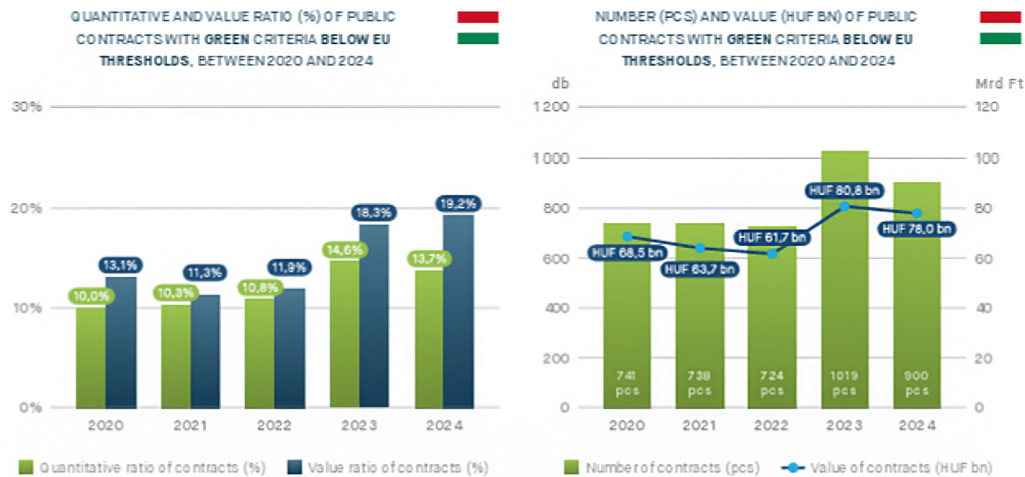


Figure 7. Source: Hungarian Public Procurement Authority (2024)

In the legal and regulatory context mentioned above, Legal Decree 235/2024 entered into force on 1 January 2025, mandating that all public procurement procedures falling above national thresholds must include at least one environmental criterion when they concern certain specified product and service categories, such as paper, cleaning services, IT equipment, furniture, and construction works. The requirements set out in this Regulation shall apply to the design and execution of construction activities affecting existing buildings and roads if the estimated value of the works reaches the EU threshold.

## 5. Research results in the literature

Green Public procurement has a wide range of academic literature. The study's bibliometric analysis shows that Central and Eastern European countries are largely absent from the top publishing nations and research networks, suggesting regional under-representation in GPP-related literature.

In the Web of Science database, only 10 results occurred for 'GPP' and 'mandatory' words, while 50 results occurred for 'GPP' and 'construction'. In terms of 'GPP' and 'mandatory', the Scopus database found 96 documents while the HeinOnline database 151 documents during the years 2016 to 2025. The search was done on 30 June 2025. In the HeinOnline database, US articles were in the majority (80 pcs) followed by and European ones (18). In the Scopus articles, Italian and Dutch affiliations won (14-14).

Ahmed et al. (2024) conducted a systematic review to investigate any research gaps associated with GPP in the construction sector. Above all, the writers point out the absence of a systems approach and a need for a more standardised procedure within the construction industry, integrating LCA tools, BIM or LEED.

In the GPP literature, case studies (Sparrevik et al., 2018)) are essential to understand how policies are implemented in practice, identify success factors and barriers, present innovative approaches, and evaluate the real-world effects of legal and strategic frameworks.

Several authors like Pouikli (2020) argue that mandatory implementation is necessary; combined with the previous point, this suggests that introducing binding elements would not only enhance legal clarity and enforceability, but also respond to growing expert consensus on the need for a compulsory GPP framework to increase uptake across Member States.

Researchers from Hong Kong to Europe have emphasised that government involvement plays a causal role in the successful implementation of green procurement, highlighting that mandatory environmental policies and regulations are crucial for its effectiveness. (Wong et al., 2016; Zou et al., 2025)

Although the GPP is widely recognised as an effective tool to reduce environmental impact, countries continue to face significant barriers to its implementation, including limited market availability of compliant products, insufficient information on its benefits, resource constraints, and unclear eligibility criteria. (Malatinec, 2017; Nemec et al., 2023) Existing strict legal structures can also limit the effectiveness of the development of GPP tools in promoting sustainability in private markets (Mélou, 2020).

## **6. Conclusions**

Laws and regulations, as well as the maturity of GPP implementation, differ significantly between countries. Furthermore, factors such as environmental expertise, organisational culture, and modes of public governance are likely to vary considerably between projects and national contexts. Although mandatory GPP provisions can improve uptake, the highest levels of implementation are often achieved when legal requirements are combined with institutional capacity, political will, and effective monitoring, rather than legal obligation alone. Sweden and Denmark have achieved high levels of GPP adoption for years within voluntary frameworks, thanks to strong political commitment, capacity building, and monitoring systems. Member states that are considering or approaching the mandatory implementation of GPP should thoroughly examine the practices, frameworks, and complex enabling conditions of leading countries with successful GPP systems, in order to ensure an effective and well-informed transition.

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