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Stewardship and administrative capacity in green public procurement in the Czech Republic: evidence from a large-N survey

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Abstract

Background: The uptake of green public procurement in the Czech Republic is known to lag behind the European standards. We trace this condition back to the adverse effects of a specific type of decision-making trade-off faced by the Czech public procurement officials, namely the trade-off between stewardship and administrative compliance. The trade-off means that public procurers are aware of administrative risks and complications attendant on the conscientious non-perfunctory implementation of green public procurement.

Results: The overall result is that public procurers ultimately come to prioritize the contract criterion of the lowest price over ecological criteria. The existence of this trade-off has been generally confirmed by the results of a unique large-N survey of more than 1100 respondents from a group of local public officials and mayors in the Czech Republic.

Conclusion: We have found that the decision-making of Czech public procurers is affected by the trade-off between stewardship and administrative compliance, which turn out to be mutually conflicting goals. On the one hand, many public procurers do possess a stewardship motivation that shapes their positive attitude to GPP. On the other hand, they are painfully aware of, and seek to forestall, administrative risks and complications attendant on the conscientious, i.e., non-perfunctory, implementation of GPP.

Keywords: Green public procurement, Stewardship, Administrative capacity, Large-N survey, Czech Republic

Background

In this paper, we examine the implications of the trade-off between stewardship and administrative compliance in green public procurement by drawing on a unique large-N survey of more than 1100 respondents from a group of local government officials and mayors in the Czech Republic. The statistical analysis of the data confirms the existence of the trade-off. The results obtained are important not only for theory, but also for public policy-making. The results suggest the administrative barriers to

GPP arise from the formalistic attitudes toward GPP and are particularly acute in decentralized governance settings. Thus, policy-makers must be made responsible for overcoming these barriers to GPP, as well as for stimulating a deeper systemic change aimed at restoring the potential of stewardship.

The public procurement expenditure of the EU states exceeds 19% of their GDP, which amounts to about 2.3 trillion Euro annually [55]. In view of its tremendous economic proportions, public procurement is widely recognized as a potentially important tool for implementing the EU Circular Economy Action Plan. However, the effectiveness of this tool depends on the extent to which the classic public procurement model is converted into

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the green public procurement (GPP) model, which may be understood as “a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured” [3, 47]. Drawing on the analysis of the EU’s Europe 2020 Strategy and Renewed Sustainable Development Strategy ([79], p. 1) note that GPP presents “an essential market-based instrument for attaining the EU’s economic and environmental objectives.”

Yet, the significance of GPP within public procurement varies widely across Europe. According to Yu et al. [79], GPP accounts for 21.81% of the total procurement value, and green contracts accounts for 9.49% of all contracts’ volume. The highest uptake of GPP is characteristic of countries with a long history of EU membership, such as Denmark, Belgium, France, and Ireland. In contrast, the role of GPP remains relatively insignificant in the Czech Republic. This country’s GPP is currently limited to about 2% of GDP, with the share of green contracts being less than 5% of the total public procurement value [79]. In an EU-wide comparison of the uptake of GPP, the Czech Republic lags far behind. The present paper inquires into the possible causes of this situation.

Much of the current GPP scholarship foregrounds a variety of decision-making trade-offs that influence the uptake of GPP across institutional settings. The most fundamental trade-off faced by procurers and policy-makers is probably the one between economic and sustainability goals [56]. Gelderman et al. [20] discuss further trade-offs occurring between complexity, procurers’ risk aversion, political relationships and green public procurement goals. The significance of these trade-offs seems largely confirmed by Yu et al. [79] recent empirical study of the public procurement of 33 EU states in 2018. The authors found that green contracts tended to be associated with large contract value and less open procedures, implying negotiations with competitors. Thus, green procurement projects turned out to be more complex than conventional ones. Following Sönnichsen and Clement [65], a key part of this complexity can be taken to arise from the decision-makers’ need for the awareness and knowledge of circular public procurement attributes, as specified in the circular policy and strategy documents.

The key contention of the present paper is that the relatively poor track record of GPP in the Czech Republic can be traced back to yet another variety of the decision-making trade-offs faced by public procurement officials. This is the trade-off between individual stewardship and compliance with the administrative setting. This trade-off posits that, in the Czech Republic, administrative compliance tends to be achieved at the cost of stewardship,

thus resulting in the low overall rates of GPP uptake. A key conceptual source for identifying this trade-off is stewardship theory [33] which argues that public procurers are honest rather than selfish and are genuinely interested in achieving societal goals. If they act as stewards, public procurers seek intrinsic intangible rewards such as “opportunities for growth, affiliation and self-actualization” ([31], p. 960), but are hindered by undesirable properties of administrative systems. These properties may pertain, e.g., to information asymmetries, lack of administrative capacities, and problematic aspects of decentralization. These administrative hindrances may turn public procurers into “honest incompetent actors” [31]. Over time, however, stewardship turns out to be irreconcilable with the lack of competence and gives way to the formalistic and bureaucratic attitude well-described by the expression “check-the-box-mentality” [48]. In the public procurement literature, the problems of stewardship have been widely acknowledged in areas as diverse as the Covid recovery [26], social investment, and military procurement [17].

Stewardship, administrative compliance, and trade-offs in GPP: exploring the conceptual foundations

Decision-making about GPP at the coal face of public administration practice entails trading off the criterion of lowest price against other criteria related to ecological sustainability [56]. The ability to bring this fundamental trade-off to fruition is tantamount to high GPP performance. The implementation of GPP is, however, widely recognized to be challenging, especially at local levels [14, 65]. One of the crucial obstacles on the way to high GPP performance is the lack of the adequate resource base of municipalities [57]. Wang et al. [75], p. 292, explain that the key types of the required resources are material, information, and social capital, no less important are ethics and professionalism of the individual public procurers, as well as the availability of the sufficient working capacity (ibid).

The impact of the resource provisioning of public authorities on GPP performance has been the subject of extensive scholarship that has emphasized the importance of capacity, training, and moral commitment of public procurers [14, 40, 57]. In view of the importance of resource provisioning, Rosell [57] hypothesizes that richer countries are more likely to exhibit superior GPP performance, interestingly, within these countries, better GPP performance was observed within larger and richer municipalities [37, 41]. One option of fulfilling the considerable resource requirements of high GPP performance is promoting the collaboration of stakeholders, such as policy-makers, users, buyers, vendors [75],

p. 292). While stakeholders may exert pressure on local authorities to engage in GPP, they may also supply some of the resources needed by local authorities for this purpose [32, 57].

What is remarkable about the current state of the art of GPP scholarship is that the resolution and adjudication of the fundamental trade-off between the criteria of the lowest price and ecological sustainability is supposed to depend on the quality of stakeholders collaboration. This supposition seems to go against the grain of stakeholder theory which pays considerable attention to trade-offs between stakeholder interests but is nevertheless conflicted about the matter [49]. Understanding business as “a set of value-creating relationships among groups that have a legitimate interest in the activities and outcomes of the firm” (ibid., p. 3), stakeholder theory has recommended managers to create “as much value as possible for stakeholders, without resorting to trade-offs” [18], p. 28). The obvious problem with this advice is that some trade-offs may turn out to be difficult to avoid or overcome [24]. If so, trade-offs may well present “a key puzzle for stakeholder theorists” [21], p. 30. In a similar fashion, Crilly [13], p. 251 concedes that “from the view of stakeholder theory, one of the most complex problems facing organizations concerns how to address multiple, potentially conflicting, stakeholder demands”.

The upshot is that for stakeholder theorists, stakeholder collaboration is about overcoming the trade-offs, and transforming managerial mindsets in such a way that trade-offs turn out to be “more apparent than real” [19], p. 213. While the economic, social, and ecological pillars of sustainable development may not always mesh perfectly and thus give rise to trade-offs, stakeholder theory recommends to employ business models which transform these trade-offs into win–win potentials [63]. Thus, stakeholder theory seems to be far from believing that high sustainability performance, such as the one achievable through GPP, necessitates the deliberate sacrifice of the criteria of the lowest price in favor of those of ecological sustainability.

One possible explanation for the thought-provoking divergence between GPP scholarship and stakeholder theory is that the former appears to implicitly rely on a specific understanding of trade-offs that can be reconstructed along systems-theoretic lines. It is noteworthy that today’s commentators on Niklas Luhmann’s social systems theory speak of the complexity–sustainability trade-off giving expression to the radical precariousness of the relationship of social systems to their environment [44, 70]. According to Valentinov [70], p. 14, the complexity–sustainability “trade-off emerges because the growing systemic complexity entails the increasing risk that systems develop insensitivity to those environmental

conditions on which they critically depend”. Valentinov (ibid) derives this trade-off by juxtaposing Luhmann’s [39] ideas on systemic closure with Bertalanffy’s [74] theory of open systems. On Luhmann’s view, closure of social systems is conditioned by their main function of complexity reduction, summarizing these ideas, Valentinov (ibid, p. 18) speaks of the “complexity reduction principle”, according to which “systems increase their complexity by becoming increasingly insensitive to the complexity of the environment”. Summarizing Bertalanffy’s [74] conception of systemic metabolism, Valentinov (ibid) introduces “the critical dependence principle” which “posits that the increasing complexity of systems is associated with their growing dependence on environmental complexity”. Considered together, these two principles suggest that social systems may gain sustainability at the cost of sacrificing some intra-systemic complexity which can be fully unfolded only if the complexity-reducing function holds full sway.

For systems such as corporations or economy as a whole, the complexity–sustainability trade-off captures the key challenge of balancing the economic, social, and ecological pillars of sustainable development [58, 69]. For these systems, realizing the trade-off basically means aligning the principles of complexity reduction and critical dependence in such a way as to remain in a sustainable state. Moreover, as shown by Valentinov et al. [73], this systems-theoretic argument is not at all alien to stakeholder theory. As shown by the authors, the meaning of stakeholder management can be found precisely in aligning the complexity reduction and critical dependence aspects of corporate operations. What is, however, noteworthy in the GPP context is that this alignment crucially depends on the resource provisioning of specific local authorities, as well as on the prevalent moral climate. Systems-theoretic approaches to the theory of the firm suggest that the alignment of complexity reduction and critical dependence aspects necessitates trust, loyalty, commitment, and goodwill. Similar requirements are posed by the task of the development of competence and capabilities [62, 68]. In the GPP context, these requirements translate into the importance of stewardship which underpins the genuine commitment of individual public procurers to the cause of ecological sustainability [33].

If Luhmann [39] is right to locate the main function of social systems in complexity reduction occurring in the amoral (not immoral!) fashion, then stewardship may be rightly perceived as a rare asset which can by no means be taken for granted. Moreover, Valentinov and Perez Valls [72] envision the possibility that the very complexity-reducing function, foundational in the modern society as it is, may promote the formation of reductionist

mindsets which have been explicitly criticized by stakeholder theory [18]. In the corporate context, such mindsets predispose managers to selfish behaviors. In the GPP context, such mindsets indicate the predominant concern of public procurers with administrative compliance and minimization of risks, this concern would likely result in the unwillingness of individual decision-makers to trade the criterion of the lowest price against other criteria related to ecological sustainability. If the systemic function of complexity reduction indeed promotes reductionist mindsets which make decision-makers insensitive to the ecological repercussions of their actions, then stakeholder collaboration as well as high GPP performance may be difficult, if not impossible, to achieve in practice.

At this point, the current state of the art of GPP scholarship holds the potential to illuminate at least some of the prerequisites of the successful realization of the trade-off between the economic and ecological components of sustainability [56], or more generally speaking, the complexity–sustainability trade-off [70]. These prerequisites encompass the adequate resource provisioning of local authorities and specifically their knowledgeability about the meaning and procedures of GPP [57, 75]. It is clear that the decision-making by local public procurers, just like managerial decision-making in general, entails an appreciable share of what Barnard [5] famously called “non-logical thought processes”, including hunches, gut feelings, intuition, and other forms of subtle judgment [72]. Given that these processes are hardly thinkable apart from stewardship behaviors, we argue that the “non-logical thought processes” on the part of individual public procurers reflect the stock of the available knowledge about the meaning and procedures of GPP within the respective local authorities [57, 75]. The empirically testable implication of this argument is that public procurers acting in the resource-constrained contexts will be unable to exercise judgment and discrimination required for the successful realization of the trade-off between the economic and ecological components of sustainability. In the following sections, this implication is more firmly anchored within the Czech institutional context of GPP as well as within the empirical GPP scholarship.

Czech Republic institutional context and research questions

The Public Procurement Act plays a key role. This law has an interesting history and development. In its historical trajectory it is possible to see the development of the GPP concept in the Czech Republic. The first Public Procurement Act in the Czech Republic was adopted in 1995 [10] (the Czech Republic was established in 1993). The drafters of this law had no experience in creating this regulation for public procurement and the actors of

public procurement had no experience with the public procurement agenda. This law was therefore marred by imperfections and it has been frequently amended. The reasons for these amendments were basically threefold: (1) efforts to improve the law and the competitive environment (e.g., an anti-corruption amendment to increase transparency in public procurement); (2) correcting emerging imperfections in the law (e.g., one amendment removed a blockage in the procurement procedure); (3) responding to dynamic changes in the environment. The category “responding to dynamic changes in the environment” includes the GPP concept.

A significant milestone in the development (history) of the Public Procurement Act was in 2001 when the Czech Republic was preparing to join the EU. In 2004, a new law transposing the European procurement directives was published. This law came into force in 2006 and was in force until 2016. The law was again frequently amended due to similar reasons to those from the previous period.

The Czech Republic’s EU membership became a new impetus for GPP implementation. EU public procurement directives (Directive 2014/EU) seek to ensure greater inclusion of common societal goals in the procurement process. These goals include environmental protection, social responsibility, innovation, climate change actions, employment, public health and other social and environmental considerations.

However, the adoption (implementation) of the GPP concept in the Czech Republic has been very slow and gradual. It was a reaction to the (im)mature institutional environment in the Czech Republic. The Law on Public Procurement (2006) left it up to the contracting authority to decide how to conduct public procurement. It established two basic types of criteria—the lowest bid price and multi-criteria evaluation (the so-called economic advantage of the bid). The economic viability of a tender could have different sub-criteria.

Furthermore, the environmental criterion has been rarely used. The lowest tender price criterion was preferred. Until 2016, over 80% of public contracts were evaluated according to the lowest tender price criterion. This was a vestige of the past. Environmental protection was not a priority in the former Czechoslovakia, nor in the Czech Republic. The new Public Procurement Act [9] initiated the change strengthening the principles of GPP as a direct response to Directive 2014/EU. For the first time, the Public Procurement Act contains a separate section on GPP as it explicitly mentions “social, environmental or innovative aspects” as one of the quality criteria.

A significant change is brought by the latest amendment to the Public Procurement Act (1 January 2021). The contracting authority is obliged to take into account

the environmental impact, sustainable development, the life cycle of the public contract and other environmental impacts of the public contract. This is a significant change in the adoption of GPP. The government has issued several methodologies to promote GPP. The new law (incorporating GPP ideas) opens new chances (new window of opportunity) to implement the "green agenda" in public procurement. However, to implement the green agenda, appropriate policy adoption is needed, both for agenda setting and decision-making [28], 2017). However, the GPP problem is influenced by multiple factors (see [57] including (in addition to the aforementioned public procurement law): related standards and instruments, accompanying and supporting instruments, environmental education, training and awareness.

Related standards play an important role for GPP and shaping the relationship to environmental sustainability. These standards and tools are used to support the setting of environmental criteria. They can be subdivided, for example, into signal behavior norms, norming, and awareness and educational tools. An overview of the most commonly used standards and tools in the Czech Republic is given in Table 1:

The point of departure for deriving our research questions is the study by Plaček et al. [51], who found significant differences in the efficiency of public service provision among Czech municipalities. The key finding of the authors is that the smaller municipalities perform worse than bigger ones, for reasons related to economies of scale, limited municipal fiscal capacity, and the effects of grant funding (ibid). Crucially for the present paper, Plaček et al. [51] show that the role of stewardship is systematically weakened by fiscal illusion, low public involvement and rational inattention of voters. These results are broadly in line with the current scholarship exploring the relationship between decentralization and the performance of local governments. This relationship can be generally taken to depend on information

asymmetry, rational ignorance and rational abstention [6, 23], bureaucratic behavior [1], competition among municipalities [67], fiscal illusion [6], intergovernmental grants and transfers [7], and municipality size [15].

A similarly precarious relationship between stewardship and administrative capacity is likewise suggested by recent research into the capacity of local governments in the Czech Republic to implement new managerial tools or policies. Several studies have found the efficiency of local governments to remain unaffected by the adoption of management tools supported by funds from the EU such as benchmarking, CAF, ISO, and national excellence policy [52, 53]. The authors take these findings to be indicative of a number of administrative problems, including a predominantly ceremonial and formalistic approach to the implementation of public policies, and purely verbal commitment to reforms on the part of local policy-makers (ibid). In view of the lack of support from and control by the central government, local governments focus on the formal, perfunctory fulfillment of EU funding requirements (ibid).

The significance of these problems is further confirmed by a recent comparative study of the EU states exhibiting low GDP performance [50, 54]. Drawing on a uniquely large sample of public procurement in 11 Central and Eastern European countries, the study employed hierarchical regression to analyze factors influencing the types of public contracts (ibid). The authors found that institutional factors such as the level of administrative decentralization, quality of governance and corruption climate have a greater impact on overpricing than individual decisions by the contracting authority. Again, the emerging pattern is that stewardship considerations, which could potentially inform these decisions, turn out to be trumped by administrative bottlenecks.

In the light of these studies, we can formulate several more specific conjectures about how the trade-off between stewardship and administrative compliance plays out in the decentralized governance context of the Czech Republic. Drawing on the insight that education, information, and awareness are the most important factors of individual acceptance of GPP [22, 36, 45], we consider stewardship behaviors to be more likely forthcoming from public officials with experience in the area of GPP and who exhibit a high degree of genuine acceptance of GPP. We hypothesize, however, that these officials will tend to be concentrated in bigger municipalities, which have specialized buying departments and are able to deliver appropriate information and training for their staff. We are skeptical whether these advantages would be equally possible in smaller municipalities, which often face more severe fiscal stress while having weaker administrative capacities.

Table 1 Standards and tools used to support GP. Source: authors on the basis of European Union [8] and websites of Czech Ministry of Environment, Ministry of Labour and Social Affairs, Ministry of Regional Development

Name of the standard/tool	Specification
ECOLABEL	EU Ecolabel. It is being introduced into the national standards of the Czech Republic
Certificates	E.g., the certificate on fluorinated greenhouse gases
Testimonials	E.g., certificate of exclusion of hazardous properties of waste
Standards	Technical standards included in the tender documentation

At the same time, in line with the trade-off logic, we consider the GPP experience of public officials to result in their intimate familiarity with the bureaucratic requirements of the Czech public procurement system. Reacting to these requirements, public officials would tend to adjust their GPP decision-making in such a way as to minimize the risks of administrative complications and the attendant administrative transaction costs. In practice, this means that over time, the GPP decision-making will come to prioritize evaluation criteria based on the lowest price rather than adequate ecological sustainability impact. This interpretation of the meaning of experience accords with Gelderman et al. [20] argument that in public service, risk aversion considerations may come to trump enthusiastic and honest effort to achieve societal goals. This interpretation thus yields a valuable contribution to scholarship underlining the importance of experience for the governance of particularly complex projects [12], for enabling positive learning and sunk cost asymmetries [30], and for the evolution of long-term procurer–supplier relationships [66].

Based on the arguments above we formulate the following research questions:

1. Is municipality size positively associated with GPP experience and acceptance on the part of local public officials?
2. Is previous experience with GPP associated with declining enthusiasm about it on the part of local public officials?

Methods and data

Our data come from a unique large-N survey, which took place during summer 2020. The survey was carried out with the help of an electronic questionnaire that was sent out to the official email addresses of all Czech municipalities, accompanied by a cover letter. The target respondents group comprised persons in charge of green public procurement implementation, a designation that is not specified precisely in the documentation of many organizations. Thus, respondents included politicians at the level of mayors or vice-mayors, as well as upper echelon bureaucrats at the level of department head. The exact position of respondents also depended on the size of municipalities.

Having approached 6,248 municipalities, we obtained 1,117 responses (a response rate of 17.88%), with a majority of males (799 respondents, 71.53%) and with both functions within municipalities represented (842–75.38% politicians, 223–19.96% civil servants, 52–4.66% blank responses). In terms of population, the size of the respondents' municipalities varied from

29 inhabitants to approximately 290,000, with an average of 3,036.222 (standard deviation 13,474.46) and a median value of 557. The questionnaire included seven questions dealing with respondents' attitude towards green procurement. The authors formulated the questions themselves. Six questions employed a Likert-type scale offering a range of five answers from "absolutely disagree" to "absolutely agree". One question had the binary form of yes/no and another allowed the selection of an option. We also asked respondents to provide information about the size category of their municipality.

The crucial part of the questionnaire included questions asking respondents to indicate their level of agreement with statements reflecting the trade-offs affecting green procurement. These trade-offs took account of the possibilities of a preference for the lowest price, of the risk of a higher probability of an appeal to the Office for Protection of Competition, and a preference for particular contract criteria. The structure of the questionnaire is explained in Table 2.

Pearson's Chi-square test of independence (referred to here simply as the Chi-square test) is one of the most useful and commonly used statistics for answering questions about the association between categorical variables, such as in the present case. However, while the Chi-square test describes that association between independent (categorical) variables, its value alone is unable to describe the strength of the association between them, given that its value is largely dependent on sample size, which likewise influences whether or not a significant association exists between the variables. The strength of the association between such variables can be explored and described with the help of Cramer's V, which varies between zero and one without any negative values. Cramer's V is similar to Pearson's r , in that a value close to zero means no association. Furthermore, a value higher than 0.25 indicates a very strong relationship [2].

Finally, as Chi-square test is not accurate with small sample sizes, Fisher's exact test (referred here simply as the Fisher's test) will be used to prove the nonrandom associations between two categorical variables in the case of small samples. It has to be noted that even though in practice Fisher's test is employed when sample sizes are small, it is valid for all sample sizes.

We have only used correlations and this decision may have had an impact on our findings as correlation does not imply causation because that correlation might come from a common cause. However, it tends to give a clue on the causation. Hence, further research will be needed to be able to prove the cause for the decisions on GPP.

Table 2 Structure of questionnaire. Source: authors

No. of question	Wording	Possible answers	Type of question
1	Do you have experience in awarding public contracts with ecological (or environmental) criteria?	Yes/no	
2	It is socially useful to award green public contracts, i.e., contracts taking into account environmental criteria	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Personal attitude towards green public procurement
3	I am in favor of awarding public contracts that take into account the environmental criteria	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Personal attitude towards green public procurement
4	Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental criteria	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Trade-off between stewardship and bureaucratic accountability rules
5	If I have information that a public contract with an environmental criterion increases the risk probability of an appeal to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criteria	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Trade-off between stewardship and bureaucratic accountability rules
6	If the contract has the following evaluation criteria: "employment criterion", "criterion of the support for local companies", and "criterion of ecological impact of public procurement on the environment"; then I will always (or mostly) consider "criterion of ecological impact" as most important	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Trade-off between stewardship and bureaucratic accountability rules
7	If I wanted to include a criterion of ecological impact on the environment in the contract, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree, somewhat disagree, do not know, somewhat agree, absolutely agree	Trade-off between stewardship and bureaucratic accountability rules
8	Size category of municipality	Up to 500 inhabitants, between 501 and 999, between 1000 and 9,999, between 10,000 and 49,999, 50,000 and more	

Results

Research question 1: Is the size of municipality positively associated with GPP experience and acceptance on the part of local public officials?

As it has already been mentioned, a total of 1,117 valid questionnaires were obtained. In terms of population, the size of the respondents' municipalities varied from 29 inhabitants to approximately 290,000, with an average of 3,036.222 (standard deviation 13,474.46) and a median value of 557.

Table 3 indicates that larger municipalities seem to have a higher likelihood of having experience with awarding public contracts with ecological (or environmental) criteria. Furthermore, there is a clear association between municipality size and respondents' experience with awarding public contracts with ecological (or environmental) criteria (Chi-squared = 36.672, $df=4$, p -value = 0.0000002104). Moreover, Cramer's V test ($V=0.1811935$) shows that the association between the two variables is strong.

Table 4 shows the degree of respondents' agreement with specific statements offered in the questionnaire. For all sizes of municipalities, and for most questions, respondents most often chose the option "somewhat agree", with "do not know" being the second-most popular option. Respondents are more divided over the statement, "If the contract has the following evaluation criteria: 'employment', 'support for local companies', and 'ecological impact of public procurement on the environment', then I will always (or primarily) consider 'ecological impact' as the most important criterion of public procurement." Here, the most common answers encompass "somewhat disagree", "do not know", and "somewhat agree."

The Chi-squared test statistic p -value is larger than the significance level of 0.05 for only one statement, namely, "If the contract has the following evaluation criteria: 'employment criterion', 'criterion support for local companies', and 'criterion of ecological impact of public

procurement on the environment', then I will always (or primarily) consider 'criterion of ecological impact'."

This allows the rejection of the null hypothesis for all remaining statements, and the conclusion on this basis that respondents' answers are associated with the size of the municipalities. However, these associations are mostly weak (smaller than 0.10), with the only exception being the statement, "If I have information that a public contract with an environmental criterion increases the risk probability of an appeal to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion." For this statement, the association of respondents' reactions with municipality size is moderate (larger than 0.05).

As politicians and civil servants may have different views on GPP we decided to repeat the previous analysis for each of both groups separately. Tables of the detailed results can be found in Appendix B.

Table 7 indicates that only civil servants from the biggest cities answered the survey, and those seem to have a higher likelihood of having experience with awarding public contracts with ecological (or environmental) criteria. In all the other cases, the percentage of people without that experience seems to be higher. Furthermore, there is a clear association between municipality size and respondents' experience in awarding public contracts with ecological (or environmental) criteria for both groups (Politicians: Fisher's exact test p -value = 0.002084, Civil servants; Fisher's exact test p -value < 0.00001).

Tables 8 and 9 show the degree of respondents' agreement with specific statements offered in the questionnaire separately for both groups. For all sizes of municipalities, and for most questions, Politician respondents most often chose the option "somewhat agree", with "do not know" being the second-most popular option. However, Civil servants responses are more divided between the options "somewhat disagree", "do not know", and "somewhat agree".

Tables 8 and 9 also show the Fisher's exact test p -values. For Politicians, there are three items whose p -value is smaller than 0.05 (in bold in Table A2 meaning that respondents' answers are associated with the size of the municipalities. There are another two with p -value smaller than 0.1 meaning that association is weak. In the case of Civil servants, there are also three items whose p -value is smaller than 0.05 (in bold in Table A3 meaning that respondents' answers are associated with the size of the municipalities. However only in item "If I have information that a public contract with an environmental criterion increases the risk probability of appealing to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion" is the association significative in both groups.

Table 3 Experience with GPP according to municipality size. Source: authors

Municipality size category	Q1—Experience in awarding public contracts with ecological (or environmental) criteria		
	No	Yes	Count
50,000 and more	37.5	62.5	16
10,000–49,999	53.7	46.3	41
1000–9999	67.7	32.3	300
501–999	72.7	27.3	238
Up to 500	80.3	19.7	522

Table 4 Survey questions response percentages by size of municipality. Source: authors (values in bold are important for interpretation)

Questions	Answer	Size of municipality					Tests results	
		Up to 500	501–999	1000 –9999	10,000 –49,999	50,000 and more	Chi-squared	p-value Cramer V
It is socially useful to award 'green public contracts', i.e., contracts that include an environmental criterion in the evaluation criteria	Absolutely disagree	1.7	1.3	1	2.4	6.2	0.02983	0.07946
	Somewhat disagree	5.7	6.7	7.3	14.6	18.8		
	Do not know	46.9	43.3	39.3	24.4	18.8		
	Somewhat agree	37.5	41.2	44.3	46.3	31.2		
	Absolutely agree	7.1	7.6	8	12.2	25		
I am in favor of awarding public contracts that take into account the environmental criterion	Absolutely disagree	1.5	1.7	0.7	0	0	0.00141	0.09
	Somewhat disagree	3.6	2.9	2.7	4.9	18.8		
	Do not know	39.3	40.8	28	22	25		
	Somewhat agree	43.3	40.8	54	46.3	37.5		
	Absolutely agree	12.3	13.9	14.7	26.8	18.8		
Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental characteristics	Absolutely disagree	2.5	1.3	1.7	2.4	0	0.0015	0.09226
	Somewhat disagree	16.1	21.8	28.7	43.9	31.2		
	Do not know	28.5	30.7	30	17.1	18.8		
	Somewhat agree	41.4	35.7	32.3	29.3	43.8		
	Absolutely agree	11.5	10.5	7.3	7.3	6.2		
If I have information that a public contract with an environmental criterion increases the risk probability of an appeal to the Office for Protection of Competition, then I would clearly prefer a public contract without an environmental criterion	Absolutely disagree	2.1	1.3	2.3	7.3	18.8	<0.00001	0.11412
	Somewhat disagree	7.7	5	10	19.5	6.2		
	Do not know	31	21.4	23	9.8	6.2		
	Somewhat agree	38.9	49.6	39.7	36.6	31.2		
	Absolutely agree	20.3	22.7	25	26.8	37.5		
If the contract has the following evaluation criteria: "employment", "support for local companies", and "ecological impact of public procurement on the environment", then I will always (or usually) consider "ecological impact" to be the most important criterion of public procurement	Absolutely disagree	3.4	2.5	2	7.3	6.2	0.09566	0.07287
	Somewhat disagree	22.8	26.9	29.3	31.7	37.5		
	Do not know	29.9	28.6	35	31.7	25		
	Somewhat agree	35.1	34.9	30	26.8	31.2		
	Absolutely agree	8.8	7.1	3.7	2.4	0		
If I want to include an environmental impact criterion in the contract, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree	1	1.7	0.7	2.4	0	0.02966	0.07949
	Somewhat disagree	4.8	4.6	5.7	9.8	25		
	Do not know	23.9	21	25.7	19.5	25		
	Somewhat agree	56.7	54.6	59.3	58.5	43.8		
	Absolutely agree	13.6	18.1	8.7	9.8	6.2		

The answer to research question 1: Public procurers' experience with GPP varies according to municipality size. The procurers from larger municipalities seem be more experienced with GPP, as well as more optimistically disposed toward it. The most remarkable difference between larger and smaller municipalities concerns the trade-off between ecological criteria and the criteria of the lowest price. With respect to this trade-off, procurers from larger cities do not prioritize the lowest price criteria over the ecological impact, while the procurers from smaller municipalities have the opposite preference. Similar variation is observed in respondents' reactions to the question dealing with

the risk of probability of an appeal to the Office for Protection of Competition.

Research Question 2: Is previous experience with GPP associated with declining enthusiasm about it on the part of local public officials?

Table 5 provides insights into the way the experience in awarding public contracts with ecological (or environmental) criteria influences the level of agreement with the statements offered in the survey. Most respondents chose the options of "somewhat agree" or "do not know" for all offered statements. As the Chi-squared *p*-value is smaller than the significance level of 0.05, respondents' reactions to all the statements are correlated with the above-noted experience, with

Table 5 Survey questions response percentages by experience in awarding public contracts with ecological (or environmental) criteria. Source: authors

Questions	Associations with: Answers	Experience in awarding public contracts with ecological (or environmental) criteria		Tests results	
		Yes	No	Chi-squared	<i>p</i> -value
It is socially useful to award "green public contracts", i.e., contracts in which the evaluation criteria include an environmental criterion	Absolutely disagree	1.7	1.5	<0.00001	0.22498
	Somewhat disagree	11.6	5.8		
	Do not know	25.2	49.2		
	Somewhat agree	49.3	37.2		
	Absolutely agree	1.4	1.2		
I am in favor of awarding public contracts that take into account the environmental criterion	Absolutely disagree	1.4	1.2	<0.00001	0.17816
	Somewhat disagree	3.4	3.5		
	Do not know	24.1	39.9		
	Somewhat agree	49	44.5		
	Absolutely agree	22.1	10.9		
Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental characteristics	Absolutely disagree	2.4	1.8	<0.00001	0.16405
	Somewhat disagree	27.6	19.9		
	Do not know	18.4	32.6		
	Somewhat agree	37.1	37.4		
	Absolutely agree	14.6	8.3		
If I have information that a public contract with an environmental criterion increases the risk probability of an appeal to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion	Absolutely disagree	2.4	2.4	<0.00001	0.15986
	Somewhat disagree	11.6	6.9		
	Do not know	15.6	29.3		
	Somewhat agree	41.5	41.1		
	Absolutely agree	28.9	20.3		
If the contract has the following evaluation criteria: "employment", "support for local companies", and "environmental impact of public procurement", then I will always (or mostly) consider "environmental impact" as the most important criterion of public procurement	Absolutely disagree	2	3.4	0.43	0.05853
	Somewhat disagree	25.9	26		
	Do not know	28.6	31.8		
	Somewhat agree	35.4	32.6		
	Absolutely agree	8.2	6.2		
If I want to include an environmental impact criterion in the contract, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree	1.4	5.00	<0.00001	0.14812
	Somewhat disagree	6.8	5		
	Do not know	15	26.7		
	Somewhat agree	58.2	56.4		
	Absolutely agree	18.7	10.9		

the only exception pertaining to the statement “If the contract has the following evaluation criteria: ‘employment’, ‘support for local companies’, and ‘environmental impact of public procurement’, then I will always (or mostly) consider ‘criterion of ecological impact’ as the most important criterion of public procurement.” Moreover, the effect of this experience is strong (Cramer $V > 0.15$) in all cases where the Chi-squared p -value is significant.

For research question 2, respondents’ reactions are more ambivalent. The results seem to be mixed. Whereas a significant percentage (49.3%) of the respondents with previous GPP experience “somewhat agree” on the social usefulness of including GPP criteria and also favor utilizing GPP criteria, another significant part of the sample (25.2%) remain indifferent. Furthermore, a very significant group of respondents (49% somewhat agree and 22.1% absolutely agree) are in favor of prioritizing the ecological criterion over other social criteria, while another, although smaller, significant group of respondents remain indifferent (24.1%).

With regard to the trade-off between the criterion of lowest price and the ecological criterion, a significant percentage of the sample respondents prioritize the former (37.1%), while a smaller yet significant percentage (27.6%) reveal the opposite preference. This sample is also larger than the group of respondents without previous GPP experience.

Regarding respondents’ responses to the question dealing with the probability of an appeal to the Office for Protection of Competition, a significant group of respondents would not prefer the ecological criterion (41.5% somewhat agree and 28.9% absolutely agree). It is noteworthy that, of all the questions in the questionnaire, this one has the largest share of “absolutely agree” answers rejecting the preference for the ecological criterion.

Last, but not least, a statistically significant group of respondents would prefer the incorporation of ecological criteria as a general obligation for suppliers (58.2% somewhat agree and 18.7% absolutely agree).

Similarly to research question 1, we decided to repeat the previous analysis for each of both politicians and civil servants groups separately. Tables of the detailed results can be found in [Appendix B](#). Tables 10 and B5 show the response percentages by experience in awarding public contracts with ecological (or environmental) criteria separately for Politicians and Civil servants, being the sample larger for the group without previous GPP experience in both cases.

For Politicians all items but the one about prioritizing the ecological criterion over other social criteria show significant differences between those respondents with

previous GPP experience and those without GPP previous experience. The results are similar for the Civil servants respondents, but in their case also item about the incorporation of ecological criteria as a general obligation for suppliers is not significant.

Discussion and public policy recommendations

Our results reinforce street-level bureaucracy theory’s insights into the adverse effects of accountability pressures and resource deficits on the implementation quality of regulatory procedures [34]. We also confirm the results of Hall et al. (2016), who conclude that the centralization of administrative processes could lead to a higher uptake of green public procurement. Our study provides grounds for conjecture that the excessive decentralization in the Czech Republic presents a barrier for GPP implementation, insofar as small municipalities turn out to lack experience and capacity. These problems are exacerbated by the pervasive risk aversion of the Czech policy-makers and bureaucrats who are keen on minimizing the risk of an appeal to the Office for Protection of Competition, even at the cost of giving up on the attainment of GPP goals. In view of the complicated regulatory environment and the absence of secondary policy objectives in the Czech public procurement system, it is small wonder that our results are at variance with those of Lerusse and van de Walle [34] who found that public managers in Belgium, Norway, Estonia, and Germany are willing to pay more for the support of innovative ecological and social public procurement goals.

Even though our findings yield a generally pessimistic outlook on the implementation of GPP in the Czech Republic, they point out some positive developments. We found that a significant amount of public procurers and mayors have positive attitudes to GPP. This is in line with Lerusse and van de Walle [35] study that demonstrated similar results for waste contracting in Belgian municipalities. Moreover, a statistically significant part of Czech procurers and policy-makers would not prioritize the criterion of the lowest price after having acquired GPP experience. At the same time, a statistically significant number of respondents are indifferent to such trade-offs, a finding which could be explained by the generally low experience with GPP in the Czech Republic.

Based on these results, we can offer policy recommendations aimed at increasing the uptake of GPP. We propose that policy measures should be realized at the systemic and individual levels. At the systemic level, the key task of these measures should be to accompany the effects of what the public governance theory describes as the erosion of traditional decision-making processes and decision-making schemes [46]. In view of the ongoing shift from traditional vertical decision-making schemes

to more deliberative horizontal schemes [77], we do not consider centralization to be an effective tool. Instead, we recommend coordination mechanisms based on municipal cooperation. In the Czech context, these mechanisms have already proven their viability in the area of municipal waste management. Inter-municipal cooperation could strengthen the administrative and fiscal capacity and improve knowledge sharing, especially in small municipalities with low GPP uptake. Another type of systemic policy measure could be targeted at increasing the legitimacy of GPP within the procurement system, along the classic dimensions of legitimacy such as trust, majority and morality [77]. Such measures could dampen the excessive accountability requirements which fuel extreme sensitivity to administrative risks. Finally, at the individual level, public policy should give much more weight to promoting education and forging awareness of GPP benefits.

Moreover, it deserves note that the conceptual framework proposed in the paper breaks new ground by anchoring the decision-making trade-offs faced by individual public procurers in the systems-theoretic construct of the complexity–sustainability trade-off which arguably captures a key implication of the Luhmannian view of precarious system–environment relations [70]. This conceptual framework informs stakeholder theory by suggesting that stakeholders, of both corporations and public authorities, may act on the demand side and supply side. On the demand side, stakeholders exercise pressure and potentially draw attention of responsible managers to the sustainability problems of their organizations, on the supply side, the same stakeholders potentially offer resources, such as knowledge, wisdom, and perspective, which may be helpful in addressing the organizational sustainability problems. The Luhmannian systems theory may likewise derive from this conceptual framework the valuable insight that the systemic degrees of freedom created by the complexity-reducing function may be used for both the aggravation and resolution of systemic sustainability problems. While Luhmann's [38] book on ecological communication lends credence to the former scenario, recent systems-theoretic scholarship on stakeholder theory [73], corporate social responsibility [59, 60, 69] and multifunctional business models [61] gives much more weight to the latter one.

Concluding remarks

All over the world, sustainability goals are high on political agendas, and are actively pursued by governments through many strategies, of which GPP is becoming increasingly prominent. It is, however, becoming no less clear that the uptake and effectiveness of GPP depend not only on political ambitions but also on high-quality

implementation at the street level of bureaucracy [25]. Among GPP scholars and practitioners, there is a growing recognition that it is at the level of practical decision-making by local public procurers that the rubber meets the road. While not much is known about the processes of this decision-making [22], three facts are fairly clear. First, public procurers need to deal with trade-offs between the criteria of the lowest price and adequate ecological impact [34]; second, the way public procurers do so depends on their cognitive and especially affective characteristics [22, 56], third, the lack of skills, expertise, and resources prevents public procurers from achieving high GPP performance.

All of these facts are borne out by the results of our large-N survey of the Czech local government officials and mayors engaged in GPP and delineate the contours of our explanation of why the uptake of GPP in the Czech Republic has been lagging behind European standards. We have found that the decision-making of Czech public procurers is affected by the trade-off between stewardship and administrative compliance, which turn out to be mutually conflicting goals. On the one hand, many public procurers do possess stewardship motivation that shapes their positive attitude to GPP. On the other, they are painfully aware of, and seek to forestall, administrative risks and complications attendant on the conscientious, i.e., non-perfunctory, implementation of GPP. The overall result is that public procurers ultimately come to prioritize the contract criterion of lowest price over ecological criteria. This pattern is particularly characteristic of smaller municipalities, which have more limited access to administrative and financial resources, quite in line with Liu et al.'s [36] findings about GPP in China.

We are also aware of several limitations of our research. Except of statistical issues mentioned in methods section, we must note that our questionnaire is based on the perceptions of the respondents which might not be consistent with the whole reality. The picture we provide describes the specific administrative and regulatory framework of Czech Republic. To reach the higher level of assurance we need to provide external validity check in different administrative and regulative framework.

Our findings have at least three major implications for further research. In conceptual and theoretical terms, they provide new impetus for the debate between the advocates of agency and stewardship theories. While a traditional public administration approach to explain a poor track record on GPP would stress the problems of agency and opportunism [76], we build on the idea of stewardship implying motivation by pro-organizational rather than personal goals [33]. Yet not even stewardship guarantees high performance. While some of the known problems of stewardship take the form of “honest

incompetence" [27], we suggest that further research could investigate an alternative phenomenon of what may be called "honest overburdening by administrative problems." This overburdening does not imply opportunism and hence does not restore the idea of agency, but does depart from the full-fledged idea of stewardship, in ways that still need to be examined.

In empirical terms, future research is called for to estimate and quantify precise impacts of the trade-off between stewardship and administrative compliance on a variety of GPP indicators, at the levels of local and national government in the Czech Republic and elsewhere. This would be helpful for gaining a clearer insight into the practical and political salience of the trade-off. Finally, in political terms, there is an urgent need for action directed at dissolving and transcending this trade-off, in such a way that administrative compliance would no longer occur at the expense of stewardship motivation on the part of public procurers. While we have suggested some very basic policy instruments for reaching this goal, we sense that in the longer term, the only way to determine the right policy is through stakeholder discourse, which we hope our paper helps to get off the ground.

In terms of the conceptual development of stakeholder theory, an exciting area of further research may be concerned with specifying the appropriate strategies of dealing with decision-making trade-off. While GPP scholarship and the systems-theoretic construct of the complexity–sustainability trade-off concur in recommending the relevant trade-offs to be accepted and implemented, stakeholder theory pleads for supplanting trade-offs by win–win cooperation potentials. What remains to be clarified is whether trade-offs can be generally considered to be embodied in win–lose interactions, or whether the complexity–sustainability trade-off can admit win–win solutions.

Appendix A

ECOLABEL (EU Ecolabel, established in 1992) is used throughout Europe. The 2021 amendment to the Public Procurement Act introduces this label, which is a mark of environmental excellence. It is awarded to products and services that meet strict environmental standards throughout their life cycle: from raw material extraction, to production, distribution and disposal. ECOLABEL establishes the so-called National Environmental Labeling Programme, in which ISO series standards are referenced, among others: ISO 14020, 14021, 14024, 14025, 14040, 21930, CSN EN 15,804 (MoE, 2017).

Certificates are another important tool supporting GPP. Also the category "certificates" is explicitly included in the last mentioned amendment to the Public Procurement

Act. Specific mention can be made of the certificate on fluorinated greenhouse gases. This certification is mandated by Regulation (EU) No 517/2014 of the European Parliament and of the Council on fluorinated greenhouse gases. In the Czech Republic, certification is regulated by Act No. 89/2017 Coll. [11] on substances that deplete the ozone layer and on fluorinated greenhouse gases.

An important tool to be used in the procurement of GPPs is the requirement of "attestation" and "communication". An example of a certificate and communication is the "Assessment of hazardous properties of waste" followed by a communication on the properties. The "Hazardous Waste Characteristics Assessment" (HWCA) is a system for issuing electronic certificates (Certificate of Exclusion of Hazardous Waste Characteristics) and notices (Notice that a waste has one or more hazardous characteristics). The basic legislative rule for this area is Act No 541/2020 on waste. Through this system, the generator or authorized person handling hazardous waste can, in certain circumstances, request an authorized person to assess the hazardous properties of the waste. There is thus an important tool for GPP that is environmentally friendly. The contracting authority can also use the institution of 'standards.' This is a tool whereby the contracting authority can include references to technical standards containing environmental characteristics in the tender documentation.

In the area of accompanying and supporting instruments, there are several accompanying and supporting instruments used in the Czech Republic (see Table 6).

Table 6 gives a basic overview of the most commonly used tools for GPP support in the case of the Czech Republic. These are mainly handbooks published by the European Union, such as A handbook "Buy Green!".

From the category of "government projects", we can mention the Ministry of Labour and Social Affairs (MoLSA) project "Support for the implementation and development of socially responsible public procurement" implemented in the Czech Republic since 2016 (<https://www.sovz.cz>). The MoLSA has established the Institute of Responsible Procurement, which within the framework of this project prepares practical guides for municipalities containing, among other things, guidance manuals, methodologies, examples of good practice from the Czech Republic and abroad, instructions on the suitability of using various criteria and also, on the contrary, on the unsuitability of other criteria for a given contract.

Within the framework of this project of the MoLSA, "Public Procurement as a Tool for Supporting the Local Community, Economy and Environment" was published (MoLSA, 2021) for all contracting authorities seeking support for responsible public procurement.

Table 6 Accompanying and supporting tools used in the Czech Republic to promote GPP

Name of instrument	Specification
Manuals and books published by the EU and/or by Czech government authorities	e.g., A handbook "Buy green!" (EU, 2016)
Government projects	Usually prepared by ministries
Portals	Usually administered by government (ministries) and local government
Institute for Responsible Public Procurement	Educational platform providing training services to public procurement specialists

Source: authors on the basis of European Union [16] and websites of Czech Ministry of Environment, Ministry of Labour and Social Affairs, Ministry of Regional Development

An important source of information for the GPP is also provided by the "Portal on Public Procurement, which is managed by the Ministry for Regional Development of the Czech Republic. On this portal, one can find methodologies to Act No. 134/2016 Coll., the Public Procurement Act, methodological recommendations, opinions of the expert group of the Ministry of Regional Development on the Public Procurement Act, including joint opinions of the Ministry of Regional Development and the Public Procurement Office, as well as a database of their decisions.

Other ministries have similar portals. For example, the portal of the Ministry of the Environment of the Czech Republic provides information on various environmental tools. The Ministry is the guarantor of environmental education. Last but not least, it provides advice on environmental protection.

The Institute for Responsible Public Procurement is playing an increasingly important role. It is an institute belonging to the Ministry of Labour and Social Affairs. The Institute has its own portal where it informs interested parties about the educational and advisory services offered in the field of public procurement. It focuses on responsible public procurement. It offers training (seminars) to develop participants' competences in the field of GPP.

Last but not least, environmental education, training and awareness raising are related to GPP and the natural environment. This is focused on two strategic directions. The first is directed at public procurement actors. They are targeted by the activities of the Government and the Union of Towns and Municipalities of the Czech Republic. The central government and municipalities have issued several methodologies to support the implementation of GPP. The most important of these is the "Methodology for Responsible Procurement". It is a document inspired by A Handbook on green public procurement "Buy Green!" (EU, 2016).

The second strategic direction is aimed at building public acceptance and motivating the public to adopt

GPP. To this end, environmental education, training and awareness raising is implemented by the government, local governments and non-governmental organizations. Educational activities and courses are offered, both for public procurement actors and the public. Family, school, interest organizations, television, radio, press, internet, social networks, etc., are also involved in the process of environmental education.

Environmentally responsible behavior (ERB) is understood as responsible personal, civic and professional behavior concerning the treatment of nature and natural resources, consumer behavior and active influence on one's environment using democratic processes and legal means. ERB prepares and motivates such behavior, the behavior itself is a matter of the individual's free decision" (MoE, 2016, p. 4). "The State Programme on ERB and environmental planning is a methodological support for the elaboration of ERB and environmental planning concepts of regions and cities as well as a support for the evaluation of the impacts of all forms of ERB and environmental planning at all levels.

The obligation to prepare the "State Programme of Environmental Education, Education and Awareness in the Czech Republic" and submit it to the Government for approval arises for the Ministry of the Environment from Sect. 13, paragraph 3, letter a) of Act No. 123/1998 Coll., on the Right to Information on the Environment" [42, 43], p. 3.

To meet these objectives, action plans are developed for a given period of time. Thus, as it is evident, even in the area of environmental education, education and awareness factors, significant changes that can contribute to the formation of a positive attitude towards GPP are taking place. This is a topical issue that also affects other EU countries (see [4]).

Appendix B

See Tables 7, 8, 9 and 10.

Table 7 Answers to Q1 question by size category of municipality and function of respondents

Size category of municipality	Q1—Experience of awarding public contracts with ecological (or environmental) criteria						Total count
	Politicians			Civil servants			
	No	Yes	Count	No	Yes	Count	
50,000 and more	0	0	0	33.3	66.7	15	16
10,000–49,999	50	50	6	53.1	46.9	32	41
1000–9999	67.3	32.7	196	67.7	32.3	93	300
501–999	72.0	28.0	211	89.5	10.5	19	238
Up to 500	79.7	20.3	429	89.1	10.9	64	522

Table 8 Survey questions response percentages by size of municipality for Politicians

Questions	Answer	Size of municipality					Fisher's Exact Test
		Up to 500	501–999	1000–9999	10,000–49,999	50,000 and more	
It is socially useful to award 'green public contracts', i.e., contracts which they have in evaluation criteria include an environmental criterion	Absolutely disagree	2.1	1.4	1.5	16.7	0	0.2509
	Somewhat disagree	6.8	6.6	7.7	0	0	
	Do not know	44.8	41.7	39.3	0	0	
	Somewhat agree	39.2	42.7	43.4	50	0	
	Absolutely agree	7.2	7.6	8.2	33.3	0	
I am in favor of awarding public contracts that take into account the environmental criterion	Absolutely disagree	1.9	1.4	0.5	0	0	0.07596
	Somewhat disagree	4	2.8	1.5	0	0	
	Do not know	36.4	40.8	28.6	16.7	0	
	Somewhat agree	45	41.7	54.6	33.3	0	
Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental characteristics	Absolutely disagree	2.8	1.4	2.6	0	0	0.04348
	Somewhat disagree	15.2	20.9	25	50	0	
	Do not know	25.6	28.9	28.6	0	0	
	Somewhat agree	44.5	38.4	36.7	33.3	0	
	Absolutely agree	11.9	10.4	7.1	16.7	0	
If I have information that a public contract with an environmental criterion increases the risk probability of appealing to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion	Absolutely disagree	2.3	1.4	3.1	0	0	0.009995
	Somewhat disagree	8.4	5.2	9.7	33.3	0	
	Do not know	28.7	19	19.8	0	0	
	Somewhat agree	38.5	50.7	38.8	33.3	0	
If the contract has the following evaluation criteria: "employment criterion", "criterion support for local companies" and "criterion of ecological impact of public procurement on the environment", then I will always (or mostly) consider "criterion of ecological impact" as the most important criterion of public procurement	Absolutely disagree	3.7	2.8	2	16.7	0	0.3188
	Somewhat disagree	24	28	29.1	16.7	0	
	Do not know	29.8	27.5	32.7	50	0	
	Somewhat agree	33.3	34.1	32.1	16.7	0	
If I would like to include in the contract a criterion of ecological impact on the environment, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree	1.2	1.4	1	0	0	0.06297
	Somewhat disagree	5.4	5.2	4.6	33.3	0	
	Do not know	22.6	19.9	24.5	16.7	0	
	Somewhat agree	57.1	53.6	61.2	33.3	0	
	Absolutely agree	13.7	19.9	8.7	16.7	0	

Bold values are statistically significant

Table 9 Survey questions response percentages by size of municipality for Civil Servants

Questions	Answer	Size of municipality					Fisher's Exact Test
		Up to 500	501–999	1000–9999	10,000–49,999	50,000 and more	
It is socially useful to award 'green public contracts', i.e., contracts which they have in evaluation criteria include an environmental criterion	Absolutely disagree	0	0	0	0	6.7	0.006497
	Somewhat disagree	4.7	5.3	7.5	15.6	20	
	Do not know	59.4	52.6	36.6	28.1	13.3	
	Somewhat agree	29.7	31.6	48.4	46.9	33.3	
	Absolutely agree	6.2	10.5	7.5	9.4	26.7	
I am in favor of awarding public contracts that take into account the environmental criterion	Absolutely disagree	0	5.3	1.1	0	0	0.01749
	Somewhat disagree	1.6	5.3	5.4	6.2	20	
	Do not know	50	42.1	23.7	21.9	20	
	Somewhat agree	37.5	42.1	54.7	46.9	40	
	Absolutely agree	10.9	5.3	15.1	25	20	
Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental characteristics	Absolutely disagree	0	0	0	3.1	0	0.4093
	Somewhat disagree	25	36.8	34.4	40.6	33.3	
	Do not know	40.6	47.4	33.3	18.8	20	
	Somewhat agree	25	10.5	23.7	31.2	40	
	Absolutely agree	9.4	5.3	8.6	6.2	6.7	
If I have information that a public contract with an environmental criterion increases the risk probability of appealing to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion	Absolutely disagree	0	0	1.1	9.4	20	0.0009995
	Somewhat disagree	6.2	5.3	10.8	15.6	6.7	
	Do not know	42.3	47.4	26.8	9.4	6.7	
	Somewhat agree	40.6	36.8	43	37.5	33.3	
	Absolutely agree	10.9	10.5	18.3	28.1	33.3	
If the contract has the following evaluation criteria: "employment criterion", "criterion support for local companies" and "criterion of ecological impact of public procurement on the environment", then I will always (or mostly) consider "criterion of ecological impact" as the most important criterion of public procurement	Absolutely disagree	0	0	2.2	6.3	6.7	0.3743
	Somewhat disagree	20.3	26.3	30.1	34.4	40	
	Do not know	31.2	36.8	39.8	31.2	20	
	Somewhat agree	43.8	31.6	24.7	25	33.3	
	Absolutely agree	4.7	5.3	3.2	3.1	0	
If I would like to include in the contract a criterion of ecological impact on the environment, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree	0	0	0	3.1	0	0.1819
	Somewhat disagree	1.6	0	7.5	3.1	26.7	
	Do not know	29.7	31.6	26.9	18.8	20	
	Somewhat agree	56.2	68.4	55.9	65.6	46.7	
	Absolutely agree	12.5	0	9.7	9.4	6.7	

Bold values are statistically significant

Table 10 Survey questions response percentages by experience in awarding public contracts with ecological (or environmental) criteria for Politicians

Questions	Associations with Answers	Experience in awarding public contracts with ecological (or environmental) criteria		Tests results Fisher's Exact Test p-value
		Yes	No	
It is socially useful to award 'green public contracts', i.e., contracts which they have in evaluation criteria include an environmental criterion	Absolutely disagree	1.9	1.9	< 0.00001
	Somewhat disagree	9.9	5.9	
	Do not know	27.7	47.4	
	Somewhat agree	48.8	38.5	
	Absolutely agree	11.7	6.4	
I am in favor of awarding public contracts that take into account the environmental criterion	Absolutely disagree	1.9	1.3	0.00001
	Somewhat disagree	0.9	3.8	
	Do not know	25.4	39	
	Somewhat agree	50.2	45	
	Absolutely agree	21.6	11	
Personally, I would prefer to announce a tender for a cheaper contract (without environmental requirements) before awarding a more expensive public contract with environmental characteristics	Absolutely disagree	3.3	2.1	0.00045
	Somewhat disagree	21.6	18.3	
	Do not know	16.4	30.5	
	Somewhat agree	44.1	40.1	
	Absolutely agree	14.6	9.1	
If I have information that a public contract with an environmental criterion increases the risk probability of appealing to the Office for Protection of Competition, then I will clearly prefer the public contract without environmental criterion	Absolutely disagree	2.3	2.2	0.00147
	Somewhat disagree	10.8	7.2	
	Do not know	15.5	26.9	
	Somewhat agree	40.4	42	
	Absolutely agree	31	21.8	
If the contract has the following evaluation criteria: "employment criterion", "criterion support for local companies" and "criterion of ecological impact of public procurement on the environment", then I will always (or mostly) consider "criterion of ecological impact" as the most important criterion of public procurement	Absolutely disagree	1.4	3.8	0.3953
	Somewhat disagree	27.2	25.8	
	Do not know	28.6	30.5	
	Somewhat agree	33.8	32.9	
	Absolutely agree	8.9	7	
If I would like to include in the contract a criterion of ecological impact on the environment, then I would classify it as a general obligation of the supplier under the contract	Absolutely disagree	1.4	1.1	0.00021
	Somewhat disagree	5.6	5.2	
	Do not know	13.6	25.3	
	Somewhat agree	57.7	56.8	
	Absolutely agree	21.6	11.6	

Bold values are statistically significant

Acknowledgements

Not applicable.

Authors' contributions

All authors contributed equally to this manuscript. All authors read and approved the final manuscript.

Funding

This research received funding from the Czech Grant Agency [GA19-06020S].

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Received: 31 May 2021 Accepted: 27 July 2021

Published online: 16 August 2021

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