

Review

Environmentally Responsible Behavior and Sustainability Policy Adoption in Green Public Procurement

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Abstract: Research has identified that there is a paucity of reviews covering green public procurement (GPP) in terms of environmentally responsible behavior and sustainability policy adoption. Using, comprehensively, the most recent (2017–2020) and relevant (Web of Science- and Scopus-indexed) empirical sources, our paper fills the gap in the literature by focusing on the main developing streams of research, that is: How GPP drives the circular economy; GPP of construction and building materials; environmental and supply chain management measures in GPP; the procurement of sustainable innovation; environmental policy objectives of GPP as regards energy, pollution, carbon footprint, and climate change; GPP as an environmental policy mechanism for production and use of sustainable goods and services; and GPP as an integral component of sustainable development and performance. Further investigations can explore hot topics related to the role of GPP in the automated algorithmic decision-making processes taking place in data-driven smart sustainable cities because the harnessing, among other things, of sensing and computing technologies, network connectivity systems, and the Cognitive Internet of Things will fulfill the incessant exigencies of public administration.

Keywords: environment; responsible behavior; sustainability; green public procurement

1. Introduction

The main aim of green public procurement (GPP) is to carry out the exigencies of public administration. Guidelines and control processes in public procurement regulate purchasers' freedom of action [1]. Enhancing GPP operation is adversely related to low administrative level [2]. Making the adequate procurement decision in the public sphere may have significant ecological, economic, and social consequences [3]. Public procurement and more purposeful social safety nets are undertakings of national governments, together with education and consumer involvement [4]. Governments attempt to react to growing urgencies to carry out goals satisfactorily and affordably, and competition generally results in objective, optimal outcomes [5]. The integration of strategic patterns in public procurement may lead to the exemplary costs of public resources and the decrease of corruption in the operation of procurement [6]. Procurement regimes display a significant responsiveness to issues regarding the adoption of public purchase to promote labor rights protection worldwide. GPP is a pivotal tool in consolidating appreciation for labor criteria globally [7]. Endeavors in setting up resilient computer technology architecture, online portals, and staff capacity to harness data processing provide less advanced economies with a valuable platform for distributing and conveying

GPP procedures. E-government enables a broad pattern for market readiness evaluation and a consolidated e-procurement system designed for adequate GPP monitoring and assessment. Public sector organizations can harmonize with established types of training approaches with online rating tools and preparation material so as to improve the GPP capacity of stakeholders and implementation of GPP standards [8].

Using, comprehensively, the most recent (2017–2020) and relevant (Web of Science- and Scopus-indexed) empirical sources, our paper fills the gap in the literature by focusing on the main developing streams of research, that is: How GPP drives the circular economy; GPP of construction and building materials; environmental and supply chain management measures in GPP; the procurement of sustainable innovation; environmental policy objectives of GPP as regards energy, pollution, carbon footprint, and climate change; GPP as an environmental policy mechanism for production and use of sustainable goods and services; and GPP as an integral component of sustainable development and performance.

2. How GPP Drives the Circular Economy

Circular economy is progressively promoted as a way of separating economic growth and environmental consequences [9]. Low-carbon use and production mechanisms enable circularity and bolster the implementation of sustainable development objectives [10]. Circular economy strives to even out environmental protection, resource sustainability, and economic growth [11]. GPP can supply prospects for circular quick fixes without thoroughly altering procedures. Sustainable procurement of cutting-edge technologies and services can be employed more intensely to capture value [12]. The advancement of a corporate circular economy procurement approach can cut down expenses of maintenance and waste management, in addition to energy and carbon emission taxes [13]. The move to a circular economy is related to the imperative to put into practice innovative business models. Alterations required for setting in motion a circular business model are attained by incorporating and deploying heterogeneous, harmonizing, and jointly supportive organizational roles. The participation and teamwork of various stakeholders are decisive in circular business model performance [14]. An important aspect of the notion of circular economy is the appraisal of materials within a closed-looped system, attempting to enable natural resource utilization while cutting down pollution or staving off resource limitations and carrying on economic growth [15].

Public procurement can further circular economy and associated business models that aim to preserve the value of goods, materials, and resources by closing material loops and decreasing waste production by establishing standards and guidelines for the prolonging of product duration, coherence and/or extent of utilization, and systematized stream of biological and technical materials, in addition to the strengthening of clean and nonhazardous successions. Circular procurement can materialize via the acquisition of first-rate goods in circular terms, the purchase of new circular items, the adoption of business notions that reinforce the circular economy, and investments in circular environments [16]. Comprehension of circular public procurement determinants, derived from circular procedure enforcement, is pivotal in the handling of circular public procurement. The purchaser's principles and values are important in the transition towards circular public procurement, identifying a precise mix that encompasses risk, swiftness, and expenses for public organizations in a long-run balance. Eco-labels, criteria, life cycle evaluations, and expenditures constitute essential components of the process. The setting-up of stipulations for superior circular public procurement routines constitutes an adequate mechanism to thoroughly further ecological, social, and ethical kinds of production and use than standard business. Sound circular public procurement operations are determined by the involvement of stakeholders having an intrinsic belief in the upsides of circular public procurement routines, reinforced by organizational structures, a significant degree of perceived procedural justice, and a purposeful perspective that reinforces satisfying the demands of the future without jeopardizing the current exigencies via circularity [17].

3. GPP of Construction and Building Materials

GPP is decisive in endeavors for diminishing the environmental consequences from construction sector-related goods, services, and operations, and in bringing about ecofriendly and innovative social value in the interest of a more sustainable economy [18]. The construction industry is instrumental in sustainable development via green procurement of construction works [19]. Adaptive recycling of buildings is decisive in the shift from a resource-based economy to a circular one in the construction sector, possibly increasing the additional utility and value of present assets via green design procedures (e.g., selective disassembly planning) [20]. The construction sector confronts increasing socio-environmental exigencies to close its material loops, as the recycling of building components can diminish both new production and waste [21].

GPP is being gradually proposed to harmonize with prevalent approaches, thus ensuring the intensified acceptance of environmental construction routines. Green-oriented procurement is facilitated by a stakeholder value, e.g., engagement, performance, and driving forces, which assists in catalyzing the logistics into real action [22]. The green performance of construction goods and assemblies represents an important driver for the environmental sustainability of buildings. Growing compliance of stakeholders in the construction industry for green procurement, insightful decisions, and understanding of environmental characteristics consolidate the urgency of unambiguous, impartial, and independent data on the green operation of construction products [23]. The negative impact of the construction and building industry on the biosphere is noticeable from the statistics, which bring to public attention the volume of materials, energy, and water consumption, in addition to the resulting waste production. Important endeavors in enhancing the green awareness and sustainability of the construction and building industry are materializing via the initiation of various procedures, regulations, and proposals [24].

4. Environmental and Supply Chain Management Measures in GPP

GPP represents a core element in green supply chain management, while top management backing constitutes an essential aspect in the carrying out of environmental routines in organizations. The influence process between green procurement and top management backing can be regulated by environmental instruction on cognizance and commitment and on technical knowledge and abilities [25]. Green supply chain management and environmental data systems constitute relevant mainstays of ecologically sound innovation that are pivotal for ecosystem protection and sustainable development at the corporate level [26]. GPP is an important climate change intervention measure, as procurement policies and routines in both the public and private spheres may shape low-carbon modes of production and the supply of more environment-friendly products and services [27].

GPP regulation integrates liberalization in green and social procedures, shaping government options as regards the supply of public services [28]. Purchasing and supply management act jointly with supply network participants, shaping how the company's value creation is distributed [29]. Sustainable innovation routines are chiefly focused on enhancing the technological operations, resource distribution, and decrease of production expenditures among supply chain partners [30]. Decision making and logistics with respect to procurement, as a component of supply chain management, represents a core business operation associated with the economic efficiency of the entire supply chain related to service and product distribution [31].

5. The Procurement of Sustainable Innovation

Expanding economic development can result in compromises between economic growth and environmental deterioration, but business model innovation may be instrumental by reprioritizing value creation and capture in the direction of less greenly detrimental undertakings, constituting a pivotal mechanism in the implementation of sustainable development [32]. Public sector procurement constitutes a relevant tool for stimulating innovation in the private sphere, harnessing it either as an

external policy mechanism to further the competitiveness of companies in particular industries and revitalizing economic growth, or as a catalyst that participates in internal organizational objectives of the procurement entity or deal with certain demands or societal challenges [33]. Innovative public procurement can develop in various configurations, from the procurement of an extremely enhanced item or, alternatively, to a product-service system or a synergistic one [34].

The procurement of sustainable innovation requires the acquisition of a new item, service, or system by a public organization that necessitates technological innovation viably, but distinct features of procurement officials influence such operations [35]. The innovation strength of companies positively impacts environmental procurement implementation, which can be shaped by their staff's commitment to change. Top management and public servants should reassess their personal values and involvement in particular matters while crafting environmental procurement strategies, codes of practice, and training methodologies targeted at procurement officials [36]. GPP and public procurement for innovation may shape the consumption of goods and services and the patterns that should adhere to the procurer's standards [37].

Technological advancements, institutional reorganizations, and improvements of social practices are instrumental for eco-innovation, which represents a key mechanism in greening the economy [38]. Public agencies should focus attention on GPP and the eco-innovation of its logistics network, eco-efficiency in utilization of materials and services, biofuels, significant energy operation in public buildings, and innovative management approaches (e.g., the home office) [39]. GPP denotes buying that diminishes environmental consequences throughout product or service life cycles. Standardization is a demand side-measure that harmonizes GPP by determining criteria that, when judiciously utilized in tenders, can influence market demand for green goods and services, in addition to accelerating eco-innovation, but the acceptance of GPP, adoption of criteria, and analysis of innovation in public procurement are insubstantial [40].

Setting up and harnessing innovative capability for the carrying out of greenly-oriented public procurement necessitates putting into effect low-carbon routines at the top-management level, and the taking on of routines associated with ecological criteria at the operational stage. The steady and concentrated effort of top management to the bionetwork is paramount for bolstering important greenly-oriented procurement approaches, e.g., establishing environmental criteria, checking out sustainable packaging of products, and the inspection of the life-cycle expenses of goods, all of them stimulating innovation in greenly-oriented procurement. Companies can bring about a competitive edge by judiciously employing uncommon or nonsubstitutable resources to attain greenly-oriented procurement. Grasping the intricate links between the drivers of greenly-oriented public procurement is crucial for legislators in formulating applicable policies for the carrying out of greenly-oriented public procurement [41].

GPP is related to a strict legislation that establishes and puts into effect strategic objectives, e.g., innovation or sustainability. The perception of well-thought-out prime concerns and goal disagreements is determined by the particularity of each public procurement entity and its employees [42]. Public procurement represents a means of attaining policy objectives. The manners of carrying out policy objectives via public procurement differ per economy. Public procurement represents government expenditure for works, products, and services. Governments administer the manner in which public procurement is performed by their laws and standard procedures. Sustainable and groundbreaking public procurement policies may be carried out at various levels. Sustainability and innovation are deep-rooted and commonly established policy objectives that can result in value production for society [43]. Instrumental in enhancing sustainability through the embracing of environmental innovations by companies, innovative public procurement is important in galvanizing the acceptance of environmental innovations, and consequently, by implication, in playing a part in the tremendous societal concern of climate change. Innovative public procurement may be decisive in the implementation and dissemination of sustainable manufacturing technologies, enabling economies to attain a decarbonized and manageable growth route that is consistent with competitiveness objectives.

Demand may influence the rate of integration of environmental innovations, and innovative public procurement considerably motivates environmental innovation implementation [44].

6. Environmental Policy Objectives of GPP as Regards Energy, Pollution, Carbon Footprint, and Climate Change

Environmental proposals consolidate worldwide competitiveness and recognition. Green procurement has, as a condition, the minimal utilization of energy and systematized waste disposal [45]. GPP comprises the adoption of power purchase stipulations for non-polluting electricity and energy efficiency directives for public buildings [46]. GPP stabilizes the network between energy-efficient, economic, and social determinants that are considered in buying decisions, constituting a mechanism to improve organizational competitiveness and favorable reception. The position of top management and the cultural features of a company's operation represent the chief obstacle in adequately putting sustainable procurement into operation, followed by organizational and financial capacity, in addition to approaches. A positive position and backing from the top management as well as a coherent grasp of the sustainable procurement notion, satisfactory sustainable procurement assimilation into the entire organizational strategy, and written procurement methodology and register are imperative to carrying out sustainable procurement routines [47].

Product-based environmental procurement addresses the regulation of recyclable materials, which has been developed to handle explicit capability and is associated with internal teamwork and management. Product-based procurement operations are directly associated with production and performance as a consequence of their explicit characteristics. The process-based environmental procurement deals with lasting enhancement and system optimization, which necessitates the significant efforts of external teamwork and management. By decreasing the expenses of energy input and regulating the pollution and preventing remedy, GPP can improve the cost-effectiveness of resource use and operation, which may boost a company's financial performance. Process-based environmental procurement is developed on inherent or soft managerial operations, e.g., the management system, organizations, notions, and advancement. The entire mechanism of supplier management comprises the green concept together with the analysis, selection, training, and assessment for providers such as a well-connected network optimizing trust, and diminishing transaction expenditures, and protects companies from providers' expediency. GPP influences operational efficiency that shapes firm performance, evidencing a mediating impact of operational efficiency on the link between GPP and firm performance. In particular situations, because of a decreased industry entry barrier and unprincipled rivalry, customers may be more interested in price and early distribution, which is disadvantageous to the carrying out of process-based environmental procurement due to lasting input and substantial investment that may increase the expenses of goods. The process-based environmental procurement necessitates a lot of time for impact and enhancement, being rather implicit to performance. The investors' awareness of green protection that can optimize the social perception of environmental matters is a far-reaching constraint for companies to initiate GPP. Enterprises that satisfy the demands of the government may drive forward the performance of carrying out GPP by sharing data and gaining support and appreciation from public administration [48].

Sustainable advancement and climate change alleviation constitute regulatory policy criteria in numerous welfare states: There can be economic, social, and green sustainability concomitantly, but that would necessitate disconnecting economic growth from natural deterioration. The welfare state has relevant characteristics that enhance the carbon balance between individuals. To attain absolute decoupling and diminishing environmental consequences generated by economic processes, public and private green investments are needed. Escalated carbon pricing may improve environmental investments and stimulate green innovation. The ratio of public outgoings of carbon and material footprints is significant, and welfare states considerably enhance carbon coherence between households. With the intention of attaining sustainable advancement, environmental obstacles should be disassociated from economic growth, and green investments are the most feasible manner to accomplish

absolute decoupling. Within countries, the economy can advance while local green impacts decline, but concomitantly worldwide environmental consequences may amplify because of global trade. The impact of public outgoings on entire carbon and material repercussions per unit of population is considerable. The incorporation of wellbeing services in domestic carbon footprints consolidates the carbon coherence between diverse income groups without altering the general model that green obstacles raise with growing returns. The income transfers are settled up with the users who can establish what products and services they acquire. Environmental investments may be improved by instituting sounder green economic policies (e.g., carbon pricing). More expensive greenhouse gas emissions would further the cost-effectiveness of low-carbon and negative emission technologies, accelerating their advancement [49].

7. GPP as an Environmental Policy Mechanism for Production and Use of Sustainable Goods and Services

The acquisition of goods and services from an external provider by a public entity is labeled as public procurement. Regional requirements can shape the feasibility of general procurement patterns and guidance. GPP may generate environmental enhancement and dissemination of green technologies. The quantity of procured products and the magnitude of the area shape the adoption and fluctuations in the effectiveness of GPP. The impact of cost aspects is context reliant and is associated with the strategic design in relation to regional public procurement. A major objective of procurement is to identify an exemplary consonance between quality and diminished expenses. The adoption of strategy and stipulations is thoughtfully associated with how the relevance of expenses is grasped in public procurement. While rising expenses constitutes a significant concern, GPP may also result in decreasing costs. Issues over escalated expenditures represent relevant grounds to establish not so wide-ranging stipulations, but the relevance of payment required as an obstacle is context reliant and associated with the strategic design [50].

Procurement is an organization's operation of acquiring goods and services with the intention of accomplishing its functions, being a mechanism whereby entities satisfy their demands in a manner that attains satisfactory buying perpetually and enables the provision of features beyond savings. Public procurement represents an intricate system of operations that result in the acquisition of works, products, and services. Public and private procurements represent a prearranged advancement of an organization. Both public entities and private actors can perform business soundly, take a command approach in society and regard sustainable problems as important to their own business processes, and be unambiguous regarding their operations. Private and public organizations confront comparable concerns and hindrances when integrating sustainability stipulations into their procurement operations. Sustainable procurement can both reduce expenses and increase the returns of organizations. Market drivers represent the most pressing determinants for the incorporation of sustainability issues into private procurement operations. The main reputational risk is related to both the implementation and the dodging of sustainability stipulations in private procurements operations [51].

Public procurement capacity may be a relevant determinant in the direction of green procurement. The public sector may shape green procurement, both by formulating applicable policies and by targeting environmental markets via the relevant characteristics of public acquisitions. GPP may be instrumental in altering groundless consumption and production practices, being a progressively employed tool, albeit at distinct frequencies, in various economies. Such a demand-led policy tool may assist in accomplishing convenient green outputs and in furthering environmental services and goods by adopting public procurement. In carrying out green public procurement, provider selection represents an essential procurement operation to assess whether bidders can implement the agreed environmental stipulations that, related to procurement, amplify the intricacies of the process and cut down qualified bids. Throughout the procurement operation, product- and organization-related green standards gain ascendancy in the technical stipulations and criteria. In GPP operation, an assessment of bids encompasses compulsory environmental standards. The data concerning present environmental

consequences and lasting conservational goals may function to shape the green standards. Carrying out GPP should integrate and adjust to suitable and convenient green operational tools to attain the goals' final intention. Current procurement policies cause nearly all public procurers to integrate green stipulations in the demand for tenders, instead of entailing them in the selection operation. Authorities undergo problems with the adoption and continuance of environmental purchasing policies. The routine of GPP should surmount important challenges, e.g., requiring conservational knowledge and cognizance, organizational objectives and structure, political determination, financial concerns, etc., environmentally robust products are viewed as more costly, and budgetary confines preclude the enlargement of GPP routines. Instruction and education may improve the comprehension of policy implication and enhance the likelihood of green public procurement being carrying out. To stimulate the GPP in less advanced economies, organizational performance, determinants, and stakeholders' exigency offer the most favorable prospects for embracing GPP routines. In opposition to GPP that addresses environmental procurement, sustainable procurement highlights commitment to the social and economic characteristics of procurement. The difficulty to attain cost efficiency for GPP resides in its command and supervision characteristics, which originate from the imperative nature of environmental standards. A cost-inefficient policy mechanism may be adequate if it preserves a tangible effect on the environment [52].

GPP, a key environmental policy mechanism for sustainability [53], attempts to assimilate green guidelines into public tender as a tool to advance and stimulate production and use of sustainable goods and services [54]. With the purpose of enabling the implementation of environmental regulations in public procurement, the European Commission has expanded the GPP standards for diverse typologies of goods and services, chiefly demanding green labels as indication that the products or supplies are in agreement with the specified low-carbon features [55]. Public procurement assists the governments in distributing the budget adequately. Adherence to carrying out procurement directives can enhance the quality of public services. Bureaucrats have characteristic positions of authority and supervision of the procurement process, and are decisive in serving the citizens and preserving public assets while having the capacity to work jointly with officeholders and business participants in corrupt procurement routines [56].

In GPP, policy-oriented environmental criteria are put forward in the formal procurement operation, attempting to cut down the ecological consequences via the flux of the procured goods and services. Procedural governance and policy regulations frequently appear uncoordinated, consequently hindering the advancement of GPP endeavors [57]. GPP is, at the moment, being harnessed to drive the market to move to a constant delivery of ecologically friendly goods and services to the public sector [58]. The relevance of procurement in both private and public spheres has the determinants, components, and corporate significance to further a sustainable strategy to inbound logistics via the process of acquiring goods and services [59].

8. GPP as an Integral Component of Sustainable Development and Performance

Procurement constitutes a strategic function of numerous companies, being essential in their sustainability performance [60]. GPP represents an integral component of sustainable development due to systematic escalating government costs. Sustainable procurement is aimed at interconnecting companies and policy makers so as to accomplish the shared objective of sustainable development, but significant support from the public authorities is needed [61]. Efficiency and preferential procurement in the interest of national suppliers are significant in public procurement decisions, while being surpassed in public backing by the goals of sustainable procurement [62].

Pivotal in the implementation of state-run policies, sustainable public procurement is a mechanism for environmental protection in addition to economic and social development, by encompassing green, economic, and social standards in organizations' hiring stages, and being crucial in preparing managers and government officials to exigently assess purchases [63]. Public authorities must make the contract public, bring to completion a standard procurement operation, handle bids in

the qualification and selection phases in conformity with pre-established standards, and award the contract as indicated by specific guidelines, all while complying with binding time frames. Public procurement regulation is typified by an intense disharmony between budgetary evidence that would support the most economically rewarding bids and the exploration of statistics associated with social or environmental objectives. EU public procurement rules progressively enable the incorporation of particular environmental data, and feeling concerned about objections to their procurement methods, contracting authorities frequently make use of normal tenders. The GPP standards supply an example archive of admissible tender stipulations, thus attempting to expedite the acceptance by contracting authorities of environmental guidelines in their tenders [64]. When taking into account environmental standards, public purchasers are stimulated by their conviction that they can cause a change. Their occupational status and the character of procurements dictate how purchasers try to find statistics regarding green standards and the information sources they employ. A purchaser's operating position, the kind of procurement undertaking, and organizational dimensions can shape its behavior. Keeping in mind the intricacy of green public procurement, choices tend to be activated by bounded rationality. Having more practice as procurement experts does not clarify how individuals seek statistics concerning green standards [65].

Public authorities carry out GPP by taking into account environmental issues when dealing out contracts to private providers. When carrying out green public procurement, an authority should employ present policy tools, aiming for the same goals, its market capacity, and the elasticities of provision and demand in the private sphere. Each procuring authority should clarify the proportion of the price premium it aims to pay. To be successful, green policy tools should be planned so that they are tested as circumscribed to the starting point of the environmental issues as possible. The permanence of market non-performances stimulates the harnessing of green policies whose goal is to remedy such indications of resource decreasing and to offset the rectification between upsides and expenses that entails establishing adequate green purposes (the benefits) and identifying practical policy procedures to attain the aims (the costs) for the purpose of increasing welfare as regards green, social, and economic sustainability [66]. Environmental consciousness can have a subsequent impact on purchase intention through perceived behavioral control [67].

9. Conclusions and Implications

The GPP mechanism is the core of the procurement system in public organizations, because its operations are the chief drivers of final performance, reinforcing or impeding policy-level decisions [68]. Path dependency and bounded rationality may clarify the expansion of public procurement: Strategy alteration brings about a revision of policy mechanisms and approaches, while the chief objectives remain unmodified. The current procurement rules attempt to streamline the approaches, making them more adjustable, with the declared purpose of intensifying competitiveness and facilitating straightforward market access for small and medium-sized enterprises [69]. Economies of scale emerge when marginal expenses drop while activity level builds up, and consequently procurement purchase expenditures diminish as purchase volume rises. Curtailed rates typically are reliant on the superior use of providers' available resources [70]. A main approach to improve the status of small- and medium-sized companies in public procurement is to separate tenders into lots, as such enterprises may have increased opportunities of awarding reduced or specially designed contracts, but a significant volume of lots in a tender may not boost the success level of small- and medium-sized enterprises. Other determinants, e.g., the type of public procurement method, the amount of involved organizations, and the entire tender quantity, considerably determine their positive result [71].

Our research has synthesized first-rate recent evidence in a systematic way, covering the main developing streams of investigation in the area of green public procurement. We think further investigations can explore hot topics related to the role of GPP in automated algorithmic decision-making processes taking place in data-driven smart sustainable cities, as the harnessing, among other things, of sensing and computing technologies, network connectivity systems, and the Cognitive Internet

of Things will fulfill the incessant exigencies of public administration. There is already a significant body of literature developed on the relationship between algorithmic decision-making and artificial intelligence in personalized pricing in GPP [72], indicating that, in smart cities, public organizations should approach the design, GPP, and carrying out of algorithmic operations in more considerate and unambiguous manners. Contracts with public organizations should ask vendors to set up and provide records clarifying pivotal policy decisions and validation endeavors, without actually conveying accurate formulas or algorithms [73]. Within urban infrastructures, smart digital technologies can be incorporated [74] so that they can create GPP governance networks that, with the assistance of the Cognitive Internet of Things, supply sustainable real-time data that is instrumental in the circular economy and the construction sector, among others, as regards energy, pollution, carbon footprint, and climate change. Innovative data-driven urban ecosystems connected through sensor-based big data applications [75] articulate networked digital technologies in the information technology-driven economy that consolidate the role of GPP as an environmental policy mechanism for the production and use of sustainable goods and services. The environmental and supply chain management of GPP is thus shaped by cutting-edge innovation, development, and performance.

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