

THE INCREASING DEVELOPMENT OF PUBLICATION ON SUSTAINABLE PROCUREMENT AND ISSUES IN PRACTICE

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This paper provides an overview of the developments in relation to sustainable procurement through a review of 63 publications indexed in Scopus and found published between 1996 and 2013. The increasing development of standards, guidance notes and research papers on sustainable procurement offers a means to examine ongoing developments and trends. The research aim was to review studies that contribute to our understanding of sustainable procurement; and critically examine some of the current sustainable procurement trends. The developments since 1996 have culminated in the publication of *Procuring the Future* (2006) which was a UK government Sustainable Procurement National Action Plan; BS8903: 2010 which is a generic standard on sustainable procurement; CIRIA 695: 2011 which is a guide on sustainable procurement in construction; training courses on sustainable procurement offered by the Chartered Institute of Purchasing and Supply (CIPS) for example; and development of policies on sustainable procurement by businesses. ISO 10845: 2010 defines procurement as the process through which contracts are created, managed and fulfilled. However, sustainable procurement requires the use of procurement to achieve wider objectives based on a mix of social, environmental and economic considerations. A content analysis shows the 63 papers from 16 countries are published in 58 different journals which reflect a multidisciplinary subject of growing international interest. More interdisciplinary research is needed to develop a consistent body of knowledge. In practice, the dominance of traditional competitive procurement approaches that focuses heavily on price and lead to wasted resources, exploitation of the “sustainability” label by businesses, and questions relating to the development of a comprehensive method for measuring sustainable procurement reveals significant gaps between theory and practice that should be addressed.

Keywords: literature review, procurement, Scopus, sustainable procurement.

INTRODUCTION

Procurement has been identified as a primary means through which sustainability and adaptation of the built environment to climate change can be achieved (*Procuring the Future*, 2006). This is because of the stage at which procurement occurs in the construction process including the early occurrence of activities such as specification, contractor selection and award of a contract (EU 2004). For construction procurement

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to be sustainable requires the whole process of how contracts are created, managed and fulfilled need to be fully compliant with considerations of economic, social and environmental factors in a balanced way (CIRIA 695: 2011). The purpose here is to develop a systematic understanding of research papers and standards that have evolved around the subject of sustainable procurement. This was done to identify some of the emergent issues associated with the sustainable procurement concept and trends from the literature particularly in relation to dissemination outlets, countries of origin of the research and issues of investigation by authors. The results flowing from the detailed literature search is summarized in Table 1.

LITERATURE REVIEW METHOD

A comprehensive method was needed for the literature review aspects of this kind of research. The literature review began with a detailed search for publications on the subject of “sustainable procurement”. In order to be systematic, it was decided to conduct an identification of research papers published on SP through a rigorous bibliographic search in Scopus. Thereafter a further search was conducted through the internet and references of publications to identify other seminal publications and developments in the field. This helped to identify and examine 60+ publications. The reason for opting for Scopus is that it offers the world’s largest abstract and citation database of peer-reviewed literature.

It was decided to conduct an initial search using “sustainable procurement” as the main keyword. An initial search in Scopus for all documents with sustainable procurement in the article title, abstract or keywords of the publication identified 609 papers published between 1990 and 2013 (as at 20th April 2013). The reason for searching through “title, abstract and keywords” was based on the assumption that if a paper bears strong connection to the theme of sustainable procurement, then it is likely that phrases such as ‘sustainable procurement’, ‘green procurement’ and ‘responsible procurement’ will be captured in one of these three areas of the paper (i.e. title, abstract or keywords). The 609 papers initially identified show a wide range of general publications in relation to sustainable procurement. For the purpose of conducting a detailed literature review it was further decided to identify the papers within this range that are peer-reviewed research papers on sustainable procurement. This led to identification of 34 papers with “sustainable procurement” as part of the article title and 29 with “green procurement” as part of the article title. The 63 are all published between 1996 and 2013 (see Table 1).

The 63 papers here formed the core of the literature review and they originate from 16 different countries: Belgium (1 paper), Brazil (1), China (2), Finland (2), France (2), Germany (2), Ireland (1), Italy (4), Japan (4), Lithuania (1), Netherlands (2), Norway (1), South Africa (3), Sweden (7), UK (18) and US (8). The UK is the leading source of research papers summarized in Table 1 although the first paper originating from UK (Rimington *et al.*, 2006) was published ten years after the first one by Wentzel (1996) on sustainable energy procurement. A close examination of Table 1 reveals that 12 of the papers have a citation record of more than 10 in Scopus over the period 1996 and 2013 (see Table 1). These may be considered as seminal publications despite the limitation that a paper published for longer is likely to have a higher citation record. The 63 papers published in 58 different journals present sustainable procurement as a multidisciplinary subject of growing international interest in both public and private sector. From the content of the 12 better cited papers in Table 1, the major themes of discussion that provide a context for this research relate to changes

needed to traditional procurement practices, green public procurement of buildings and infrastructure, development of procurement codes and redesign of procurement systems to attain sustainability, actions by firms to become sustainable in purchasing activities, and factors influencing the uptake of green procurement practices.

DEFINITION OF SUSTAINABLE PROCUREMENT

According to the ISO 10845 (2010) series of standards on construction procurement, procurement can be defined as the process through which construction contracts are created, managed and fulfilled. The widely cited Brundtland Report (1987) defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” The concept of sustainable development has often been broken out into three constituent parts, that is, environmental sustainability, economic sustainability and social sustainability.

Therefore, sustainable procurement, referred to in parts of this paper as “SP” may be seen as procurement that helps to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. SP aims to find the best balance between environmental, social and economic factors (BS 8903). A content analysis of the abstracts of 69 papers in Table 1 showed that this is also referred to in various aspects of the literature as responsible procurement, green procurement, low carbon procurement, and good procurement (see for example, BS8903: 2010, Dubey et al., 2013, Palmujoki et al., 2010, Sterner, 2002). The essential feature of SP is that the procurement process should take economic, environmental and social factors into account simultaneously in procurement actions. The UK government report on Procuring the Future (2006: 1) defines SP as “using procurement to support wider social, economic and environmental objectives, in ways that offer real long-term benefits”. The British Standard (BS8903) does not state a definition *per se* for SP but defines its objective as follows: “Procuring sustainably allows organizations to meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organization, but also to society and the economy, whilst minimizing damage to the environment”.

The relationship between procurement and sustainability is complex and research is needed to examine how the best balance between objectives can be achieved. BS8903 summarizes four key aims to address when integrating sustainability into procurement, as follows: minimizing demand for resources; minimizing any negative impacts of goods, works or services across their life cycle and through the supply chain; ensuring that fair contract prices and terms are applied and respected and that minimum ethical, human rights and employment standards are met; and providing opportunities for small and medium businesses, voluntary sector organizations and also supporting jobs, diversity, training and skills development. These broad aims align with prescriptions in the Guide on sustainable procurement in construction (C695: 2011) published by the Construction Industry Research and Information Association (CIRIA). The focus of this study is to develop a systematic understanding of sustainable procurement and discussion of three main issues arising in its practice

TRADITIONAL PRACTICES STILL DOMINATE PROCUREMENT PRACTICES

The EU procurement rules (2004) divides the procurement process into three stages, that is, selection, specification and award. The specification stage refers to how

requirements must be specified including technical and performance specifications. Selection refers to the stage where suppliers are rejected or selected based on evidence of their overall suitability, economic and financial standing and technical capacity. Award stage refers to the use of various specified criteria for determining which offer is the “most economically advantageous” to the procurer or purchaser (i.e. best value for money). Research by Hughes et al. (2006) on procurement in the UK construction industry helps to understand how procurement has been traditionally focused on price and hence economic considerations. The concept of SP requires a balance between economic, environmental and social factors in procurement to enhance the relationship between procurement and sustainability. This has seen significant push in recent years. However, the heavy reliance on traditional techniques like competitive tendering in the procurement process in construction seems to go against the grain of SP theory in some respects. This issue is examined and discussed.

One traditional feature of the construction sector is that price formation and contractor selection takes place as a simultaneous process (Murdoch and Hughes, 2008). This implies that a contractor who is hungry for work needs to address the price aspect of their bid to a significant extent in order to be attractive. Tender evaluation criteria and points are still heavily skewed in favour of a contractor’s financial offer (see for example, Laryea 2013). There is little doubt that many clients of the construction industry use competitive tendering as a mechanism for obtaining bargain bids from contractors (Smith and Bohn, 1999). There is a significant emphasis on economic interests and a genuine desire to achieve SP should seek to balance the triple bottom line factors. There is evidence to prove that many contractors would intentionally pitch a bid lower than cost in order to win work in times when they are desperate (see Rooke et al., 2004). Such commercial behaviours have a tendency to wipe out firms and this may then go on to affect the local economy including job losses. A situation like that will affect the well-being of families and hence goes against the grain of SP.

Second, there is a lot of wasted effort when several companies are bidding for the same work and inevitably some will be wasting resource that could be used elsewhere. This has also been highlighted in the UK Government Construction Strategy (2011) and attempts are ongoing to identify alternative procurement models that help to minimize this kind of wasted resource and effort. A multiplication of the wasted resource throughout the construction industry would reveal the enormous amount of resource and money being wasted. A research project on why clients only feel comfortable in entering into a competitive procurement strategy and awarding on price would be of benefit. The reasons may be many and complex but this procurement process has been shown not to be the most successful often ending in dispute, wasting even more resource. A better understanding of the drivers from the perspective of clients may enable an alternative procurement strategy that reduces bidding cost and contributes to reducing the current wasted effort to be developed. If construction companies were able to reduce their bidding costs their overhead would reduce and the cost of construction could reduce.

The UK Government Construction Strategy (2011: 16) sets out some principles of such an alternative approach towards procurement, designed to eliminate the wastefulness of teams completing and costing a series of alternative designs for a single project, only one of which will be built. This has been the subject of continuing dialogue with the industry, seeking a more collaborative, integrated model that nonetheless maintains competitive tension and the ability to demonstrate value for money. Two propositions have currently been put forward by industry teams, which

offer opportunities for demonstration projects. One effectively pitches framework contractors against a challenging cost benchmark, with the understanding that if no member of the framework can beat the benchmark, then the project will go to tender without the initial framework contractors being permitted to bid. This provides opportunities for new entrants. The other proposition offers a guaranteed maximum price underwritten by insurance, which also extends to protection against defects. Both propositions assume the full engagement of an integrated team – with designers, other professional consultants and constructors offering an integrated proposition, and with key trade contractors and manufacturers involved in developing the design.

This issue was further examined at a seminar marking the 30th Anniversary of the Association of Construction Economists in Finland (RAKI) on 20 March 2013 by Joe Martin, Executive Director of the Building Cost Information Service (BCIS) (RICS). The three main strands in the construction strategy for achieving reduction in carbon emissions are procurement, benchmarking and building information modelling (BIM). Three 'New' methods of procurement at the heart of the strategy are Cost-led procurement, Integrated Project Insurance, and Two stage open-book. Cost-led procurement will be based on four main variables, that is, Cost benchmarks and outline brief, Framework of integrated teams, Programme of work, and Value for money. Integrated project insurance procurement will be based on four variables namely: Cost benchmarks and outline brief, Framework of integrated teams, Third party verification, and Insurance policy – all risks including cost overrun. Two stage open book procurement will be based on five variables namely: Cost benchmarks and outline brief, Framework of integrated teams, First stage – capacity, capability etc. (pre-qualification), Second stage – open book proposal, and Independent stage gate reviews. A detailed examination of these “new” procurement models do not provide much in terms of a framework for achieving SP in construction. The main focus is still on the economic aspects of construction procurement although if the approaches help to minimize wasted resource in procurement, it still will contribute towards the relationship between procurement and sustainability in construction.

OBTAINING COMMITMENT FROM ORGANISATIONS

Observations from the literature and company websites show that nearly all businesses seek to appear “sustainable”. The problem occurs when this is done merely for reason of commercial advantage rather than a true spirit of the need to reduce carbon emissions. It seems that the tag of “sustainability” needs to be attached to almost everything nowadays in order for it to be “acceptable”. There are examples to demonstrate this in industry and even academia. For example, procurement now has the prefix of “sustainable” procurement. Design has the prefix of “sustainable” design. Innovation has the prefix of “sustainable” innovation. Built environment has the prefix of “sustainable” built environment. Construction has the prefix of “sustainable” construction. Architecture has the prefix of “sustainable” architecture and so on. Despite these developments, not much seems to have changed in practice and the quest on the part of some to merely appear “sustainable” is a major problem.

Businesses obviously want to appear green so as to align themselves to be eligible to tenders and business from public agencies that are driven by SP policies imposed on them by central governments. As Correia et al (2013) put it, governments world over are using “the power of procurement” to drive policy change towards global conservation, literary forcing abidance to certain standards using public procurement. Governments, for example, spend significant amounts on public procurement and

therefore can use this massive “carrot” to influence suppliers to be in line with sustainability (Correia et al 2013). Firms are pushing to become “green” as part of their corporate social responsibility with some big firms visibly embarking on policies that are pushing the green agenda (Walker et al., 2008; Andersen and Skjoett-Larsen, 2009; Spence and Bourlakis, 2009). There is no doubt that sustainability has become an essential part of the corporate social responsibility and public relations agenda of most businesses. They want to be on the right side of the public and the sustainability agenda. That in itself is not a problem. The problem occurs when some organisations simply use the image of being “green” to boost their business prospects. Some procurers also pay lip service to the sustainability agenda. On one hand they state policies in favour of SP, and in practice they focus heavily on economic interests. This creates a problem of imbalance that should be addressed. The important milestone here is for firms to be, rather than to seem to be “sustainable”.

HOW IS SUSTAINABLE PROCUREMENT MEASURED?

Correia et al (2013) argue that despite there being a strong drive by governments to push the SP agenda, there are no clear definitions on specific actions that will promote low carbon economies. They put forward that policies are often too broad and vague in terms of providing specific guidance on how SP is to be achieved and how low carbon emissions are to be accounted for. As they put it, “despite a growing political pressure for its implementation, not only is there a problem of lack of clarity over what low carbon procurement (LPC) means, but also lack of strategy and guidance for practice” (ibid).

With most organisations claiming to be doing sustainable procurement, there is a need to be able to measure and assess the progress and challenges of this journey. It seems that the clearest publication to date pertaining to the measurement of SP is by Wilkinson and Kirkup (2009). This publication breaks down the overall measurement of SP into various methodologies used for measuring aspects of sustainability. These comprise of methodologies for measuring the environmental impacts of procurement including carbon measurement technologies; methodologies for measuring the economic impacts of procurement including multipliers, LM3 model and input-output model; and methodologies for measuring the social impacts of procurement including social indicators framework. The key issues around the SP measurement technologies hinge around the gateway criteria, measurement selection and measurement scoring (see explained in Wilkinson and Kirkup, 2009). These techniques do not however provide a means for benchmarking organisational performance in relation to sustainable procurement practices.

A practical technique proposed to businesses and organisations for the measurement of SP is the Flexible Framework (see <http://sd.defra.gov.uk/documents/flexible-framework-guidance.pdf>). The Flexible Framework is a widely used self-assessment mechanism developed by the business-led SP Task Force, which allows organisations to measure and monitor their progress on SP over time. The framework was designed so that it could be used by all organisations: from those with significant levels of procurement expertise and resource to those with very limited resource at their disposal. The recommended approach to implementing the Flexible Framework is to systematically work through each one of five themes (people; policy strategy and communications; procurement process; engaging suppliers; measurement and results) from levels one (foundation), level two (embed), level 3 (practice), level 4 (enhance) and level 5 (lead). This framework is mainly for self-assessment and a comprehensive

framework for assessing and benchmarking the SP performance of organisations is needed.

DISCUSSION AND CONCLUSIONS

Three discussion points emerging from the literature are the need for appropriate incentives to facilitate the diffusion and implementation of SP throughout construction supply chains, developing appropriate measurement techniques for SP, and replacing traditional practices with new approaches that can support the SP concept. Research is needed into some of these emergent issues as part of developing a way forward.

SP has become of great significance within both the public and private sector in recent years particularly since 1996 when research publications started to emerge on the subject (see Table 1). The main focus of research papers has been on the environmental aspects, reduction of carbon emissions and waste and the avoidance of continued depletion of natural resources to combat negative effects of global warming which causes climate change. As a business process, procurement is clearly well positioned to help achieve adaptation of the built environment to sustainability. This will require genuine motivations from society and corporate organisations in particular, appropriate incentives and a suitable institutional framework. Despite having basically the same meaning, several terminologies are used in the literature to refer to “SP” including sustainable sourcing, environmentally preferable purchasing, environmentally preferable procurement, sustainable purchasing, sustainable supply chain management and green procurement and all these are practiced in an effort to achieve sustainable development. Several aspects have to be considered with regards to SP and these are best value for price, lowest price of all life cycle, responsiveness to environmental issues and using of measures of social effects.

In recent years, a wide range of industries have implemented SP strategies including healthcare, agriculture, education as well as construction. For the construction industry, this is a relevant issue as the industry provides social and economic development but it has a negative impact on the environment and consumes large quantities of non-renewable resources. SP therefore provides a primary means for better decision making and more efficient use of resources which results in mitigation of negative environmental effects. These new developments cannot be achieved by the traditional methods of procurement hence the reason a dominance of traditional practice seems to hold back progress.

There is a greater need for both public and private sectors to embed sustainability in their procurement processes and throughout their supply chains. For the private sector, the implementation of sustainable practice in the supply chain proves the corporate social responsibility the organization has and could be used to determine its success in terms of its image and productivity. However, this is sometimes done merely for commercial advantage rather than a genuine effort to reduce carbon emissions.

The table of literature in Table 1 shows countries that are ahead in pushing forward the SP agenda on the basis of published research on the subject. These are less than 20 countries and a clear minority in a global environment of 200+ countries. National institutions ought to provide a leadership through facilitating the availability of guidance documents, training opportunities and better connectivity between published guidance documents and what people actually do in practice. Thus, effective public education is required to adequately support this agenda in various countries. Without adequate policies and education mechanisms in place, the goals of sustainable

development cannot be globally achieved. Where legislation and sustainable regulations exist, it has to be ensured that these are complied with and hence an effective mechanism for monitoring and measurement of SP is required.

The next stage of the research is to examine and analyse the emergent issues from the literature review in greater detail and this will then be used to develop a theoretical framework for empirical investigations into the major issues effecting the successful diffusion and implementation of sustainable procurement throughout the various levels of governance and construction supply chains.

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Table 1: Research papers on “sustainable procurement”

Authors	Title of publication	Year	Source title	Vol.	Iss.	Pages	Citation record	Country of origin of research paper
Wentzel M.	Songai perspective on sustainable energy procurement and small-scale farming: possible applications for South Africa	1996	J Energy South Afr	7	1	11-15		South Africa
Marron D.B.	Buying green: Government procurement as an instrument of environmental policy	1997	Public Financ. Rev.	25	3	285-305	3	US
Helfer L., Daves S.	Investing in sustainable energy: Changing procurement practices at the World Bank	1997	Corp. Environ. Strategy	4	2	73-78	0	-
Ngowi A.B.	Is construction procurement a key to sustainable development?	1998	Build Res Inf	26	6	340-350	7	South Africa
Miller M.E., Sanders P.H.	The Trappers Point site (48SU1006): Early Archaic adaptations and pronghorn procurement in the upper Green River Basin, Wyoming	2000	Plains Anthropologist	45	174	39-52	9	US
Rwelamila P.D., Talukhaba A.A., Ngowi A.B.	Project procurement systems in the attainment of sustainable construction	2000	Sustainable Dev.	8	1	39-50	19	South Africa; Kenya; Botswana
Sterner E.	'Green procurement' of buildings: A study of Swedish clients' considerations	2002	Constr. Manage. Econ.	20	1	21-30	11	Sweden
Da Cunha Lemos A.D., Giacomucci A.	Green procurement activities: Some environmental indicators and practical actions taken by industry and tourism	2002	Int. J. Environ. Sustainable Dev.	1	1	59-72	3	Brazil; Italy
van Calster G.	Green procurement and the WTO - Shades of grey	2002	Rev. Eur. Comm. Int. Envir. Law	11	3	298-305	4	Belgium
Riley D., Pexton K., Drilling J.	Procurement of sustainable construction services in the US: The contractor's role in green buildings	2003	Ind Environ	26	03-Feb	66-69	8	US
Furuta K.	The movement of the environment regulations and green procurement survey standardizing efforts - In Canon. Inc	2004	Kami Pa Gikyoshi	58	11	77-86	0	Japan
Schizzerotto F.	The main European and Italian measures about Green Public Procurement	2004	Riv. Giuridica Ambiente	19	6	967-973	0	Italy
Waugh H.	Paths to sustainable procurement	2004	English	58	10	31-32	0	
McKenzie C.	Green procurement meets energy targets.	2005	Health Estate	59	3	29-32	0	-
Gunther E., Scheibe L.	The hurdle analysis. A self-evaluation tool for municipalities to identify, analyse and overcome hurdles to green procurement	2006	Corp. Soc. Responsib. Environ. Manage.	13	2	61-77	15	Germany
van Asselt H., van der Grijp N., Oosterhuis F.	Greener public purchasing: Opportunities for climate-friendly government procurement under WTO and EU rules	2006	Clim. Policy	6	2	217-229	8	Netherlands
Byggeth S., Hochschoer E.	Handling trade-offs in Ecodesign tools for sustainable product development and procurement	2006	J. Clean. Prod.	14	15-16	1420-30	48	Sweden
Rimmington M., Smith J.C., Hawkins R.	Corporate social responsibility and sustainable food procurement	2006	Br. Food J.	108	10	824-837	19	UK
Appleby C.	The Mayor's green procurement code	2007	Local Econ.	22	1	98-101	1	UK
Dawson G.F., Probert E.J.	A sustainable product needing a sustainable procurement commitment: The case of green waste in Wales	2007	Sustainable Dev.	15	2	69-82	3	UK
Matsubayashi Y.	Efforts for green procurement of raw materials	2007	Kami Pa Gikyoshi	61	4	24-30	0	Japan
Thomson J., Jackson T.	Sustainable procurement in practice: Lessons from local government	2007	J. Environ. Plann. Manage.	50	3	421-444	15	UK
Gardiner B.	Briefing: Delivering sustainable development through procurement	2007	Proc. Inst. Civ. Eng.:Eng.	160	3	113-114	0	UK
Parikka-Alhola K.	Promoting environmentally sound furniture by green public procurement	2008	Ecol. Econ.	68	02-Jan	472-485	19	Finland
Hosogai M., Tomotani M., Oheda K.	Fujitsu group's activities for green procurement	2009	Fujitsu Sci Tech J	45	1	22-27	0	US
Varnas A., Faith-Ell C., Balfors B.	Linking environmental impact assessment, environmental management systems and green procurement in construction projects: Lessons from the City Tunnel Project in Malmö, Sweden	2009	Impact Assess. Proj. Appraisal	27	1	69-76	2	Sweden
Varnas A., Balfors B., Faith-Ell C.	Environmental consideration in procurement of construction contracts: current practice, problems and opportunities in green procurement in the Swedish construction industry	2009	J. Clean. Prod.	17	13	1214-22	12	Sweden
Michelsen O., de Boer L.	Green procurement in Norway: a survey of practices at the municipal and county level	2009	J. Environ. Manage.	91	1	160-167	7	Norway
Rice S.	Positive procurement for a sustainable future	2009	Offshore Eng.	34	2		0	
Sonnino R.	Quality food, public procurement, and sustainable development: The school meal revolution in Rome	2009	Environ. Plann. A	41	2	425-440	13	UK
Walker H.L., Gough S., Bakker E.F., Knight L.A., McBain D.	Greening operations management: An online sustainable procurement course for practitioners	2009	J. Manage. Educ.	33	3	348-371	11	UK
Harvie J., Mikkelsen L., Shak L.	A new health care prevention Agenda: Sustainable food procurement and agricultural policy	2009	J. Hunger Environ. Nutr.	4	04-Mar	409-429	2	US
Preuss L.	Addressing sustainable development through public procurement: The case of local government	2009	Supply Chain Manage.	14	3	213-223	20	UK
Walker H., Brammer S.	Sustainable procurement in the UK public sector	2009	Supply Chain Manage.	14	2	128-137	23	UK
Haake H., Seuring S.	Sustainable procurement of minor items - Exploring limits to sustainability	2009	Sustainable Dev.	17	5	284-294	8	Germany
Sporrong J., Brochner J.	Public procurement incentives for sustainable design services: Swedish experiences	2009	Arch. Eng. Des.	5	02-Jan	24-35	0	Sweden
Ho L.W., Dickinson N.M., Chan G.Y.	Green procurement in the Asian public sector and the Hong Kong private sector	2010	Nat. Resour. Forum	34	1	24-38	4	UK; Hong Kong
Palmujoki A., Parikka-Alhola K., Ekroos A.	Green public procurement: Analysis on the use of environmental criteria in contracts	2010	Rev. Eur. Comm. Int. Envir. Law	19	2	250-262	0	Finland
Qi B., Yu X., Guo L.	Establishment and application of green procurement model in government incentives based on evolutionary game theory	2010	Shenyang Jianzhu Daxe Xuebao	26	4	813-816	0	China
Willis K.G.	Is all sustainable development sustainable? a cost-benefit analysis of some procurement projects	2010	J. Environ. Assess. Policy Manage.	12	3	311-331	2	UK
Young W., Costelloe P., Kerr L.	Sustainable procurement: Human rights and greenhouse gas emissions	2010	Int. J. Environ. Sustainable Dev.	9	4	364-377	0	UK
Molenaar K.R., Sobin N., Antillon E.I.	A synthesis of best-value procurement practices for sustainable design-build projects in the public sector	2010	J. Green Build.	5	4	148-157	1	US
de Leonardis F.	Green public procurement: From recommendation to obligation	2011	Int. J. Public Adm.	34	02-Jan	110-113		Italy
Tarantini M., Loprieno A.D., Porta P.L.	A life cycle approach to Green Public Procurement of building materials and elements: A case study on windows	2011	Energy	36	5	2473-82	3	Italy
Fet A., Michelsen O., Boer L.	Green public procurement in practice - The case of Norway	2011	Soc. Econ.	33	1	183-198	0	Norway
Otsuki K.	Sustainable partnerships for a green economy: A case study of public procurement for home-grown school feeding	2011	Nat. Resour. Forum	35	3	213-222	1	Japan
Meehan J., Bryde D.	sustainable procurement practice	2011	Bus. Strategy Environ.	20	2	94-106	3	UK
Brammer S., Walker H.	Sustainable procurement in the public sector: An international comparative study	2011	Int. J. Oper. Prod. Manage.	31	4	452-476	6	UK

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Preuss L., Walker H.	Psychological barriers in the road to sustainable development: Evidence from public sector procurement	2011	Public Adm.	89	2	493-521	1	UK
Otsuki K.	Sustainable partnerships for a green economy: A case study of public procurement for home-grown school feeding	2011	Nat. Resour. Forum	35	3	213-222	1	Japan
Ultam K., Faith-Ell C., Balfors B.	EIA and green procurement: Opportunities for strengthening their coordination	2012	Environ. Impact Assess. Rev.	33	1	73-79	0	Sweden
Arvidsson A., Stage J.	Technology-neutral green procurement in practice-an example from Swedish waste management	2012	Waste Manage. Res.	30	5	519-523	0	Sweden
Testa F., Iraldo F., Frey M., Daddi T.	What factors influence the uptake of GPP (green public procurement) practices? New evidence from an Italian survey	2012	Ecol. Econ.	82		88-96	0	Italy
Nijaki L.K., Worrel G.	Procurement for sustainable local economic development	2012	Int. J. Public Sect. Manage.	25	2	133-153	0	US
Melissen F., Reinders H.	A Reflection on the Dutch Sustainable Public Procurement Programme	2012	J. Integr. Environ. Sci.	9	1	27-36	0	Netherlands
Lang A.H., Mendell B.C.	Sustainable wood procurement: What the literature tells us	2012	J. For.	110	3	157-163	0	US
Oruezabala G., Rico J.-C.	The impact of sustainable public procurement on supplier management - The case of French public hospitals	2012	Ind. Mark. Manage.	41	4	573-580	0	France
Oltean-Dumbrava C., Watts G., Miah A.	Procurement of sustainable noise-reducing devices: State-of-the-art review from EU project QUIESST	2012	J Manage Eng	28	3	324-329	1	UK
Tvaronaviciene A.	The possibilities to use public procurement as one of the instruments of implementation of sustainable development concept in Republic of Lithuania	2012	Bus. Theory Pract.	13	3	197-207	0	Lithuania
Erridge A., Hennigan S.	Sustainable procurement in health and social care in Northern Ireland	2012	Pub. Money Manage.	32	5	363-370	0	Ireland
Walker H., Brammer S.	The relationship between sustainable procurement and e-procurement in the public sector	2012	Int J Prod Econ	140	1	256-268	0	UK
Crespin-Mazet F., Dontenwill E.	Sustainable procurement: Building legitimacy in the supply network	2012	J. Purch. Supply Manage.	18	4	207-217	0	France
Cao J., Hu L., Wen H.	The incentive mechanism of green supply chain for raw material procurement	2013	Res. J. Appl. Sci. Eng. Technol.	5	12	3359-63	0	China

Notes: The 63 papers here formed the core of the literature review and they originate from 16 different countries as follows: Belgium (1 paper), Brazil (1), China (2), Finland (2), France (2), Germany (2), Ireland (1), Italy (4), Japan (4), Lithuania (1), Netherlands (2), Norway (1), South Africa (3), Sweden (7), UK (18) and US (8). Most of the publications originate from the UK and 12 of the papers have a citation record of more than 10 in Scopus over the period 1996 and 2013. These are seminal papers although an inherent limitation lies in the fact that papers published for longer are likely to have a higher record of citation.