

**Successful business and
procurement:
what lessons for sustainable
public procurement can be drawn
from successful businesses?
Rapid Research and Evidence
Review**

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The Sustainable Development Research Network

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Executive summary

This Rapid Research and Evidence Review was commissioned by the Sustainable Development Research Network (SDRN). It aims to provide an improved understanding of successful businesses and their approaches to procurement and the relevance of these to the debate on sustainable public procurement. The approach was to conduct a structured literature review, identifying and reviewing over 200 academic papers and 100 articles of grey literature.

The questions addressed by the Review and findings related to them are summarised below.

What is the role of sustainable/strategic procurement in creating successful organisations?

- Seven of the studies reviewed showed a positive relationship between strategic purchasing and firm performance, and many others comment on different aspects of purchasing and supply strategy and performance. It can be concluded with moderate certainty that strategic purchasing and supply has a positive impact on a firm's performance.
- Strategic purchasing and supply chain management (SCM) go beyond traditional cost-reduction, are aligned with internal integration and a firm's business strategy, and entail buyers being aware of the strategic direction of the firm.
- Strategic purchasing practices include supply base reduction, supplier evaluation and information exchange. Strategic purchasing assists in managing supply relations and involves sharing knowledge and driving innovation.
- Strategic purchasing differs across countries, but all buyers indicate a desire to be more strategically involved with their firms.
- There are many different definitions of sustainable procurement, supply chain management and operations.
- Eighteen studies identify a positive link between different aspects of sustainable procurement and firm performance.
- Sustainable supply chain management can be thought of in terms of social, environmental and economic issues.
- Collaboration in supply chains enhances sustainability performance.

What accounting, finance tools and other business process tools are currently used by successful organisations to deliver sustainable and strategic procurement practice and choices?

- Tools identified in the academic literature include those from the public sector, supplier assessment questionnaires, life cycle assessment tools, and mathematical modelling.

- There were no links in the academic literature between the use of sustainability tools and firm performance.
- FTSE4Good company websites infrequently mention sustainable purchasing and supply, and only three tools were identified. These were focused on supplier assessment and management.
- Some FTSE4Good companies emphasise the importance of integration of sustainable purchasing with business strategy and top management support.
- Tools are more commonly provided by public sector organisations than private.

What lessons are there for sustainable procurement in the areas of construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities?

- Construction, ICT and energy all have large environmental impacts, particularly in regard to waste. They also form a large proportion of public procurement spending.
- Public-private partnerships and collaboration between policy-makers and contractors seem good ways to support sustainable construction procurement.
- Barriers to sustainable construction procurement include lack of knowledge of sustainable technologies, lack of project management, lack of appropriate procurement systems, lack of market, lack of political will and focus on short term profitability.
- In ICT, public sector buyers are key players for environmentally responsible computer purchasing and can achieve this by incorporating environmental criteria in the evaluation of contractors, as well as adding environmental criteria into contracts.
- ICT contracting processes in the public sector are currently too rigid and slow to keep up with market and technology changes.
- Few studies were found on facilities management and commodities such as energy.
- Nine studies were identified on sustainable food procurement. Of the three areas, food procurement seems to be the most active area for research. There is also a lot of guidance on sustainable food procurement and buying from local producers and doing so within EU guidelines.

What lessons can be drawn for public sector policy-makers?

- All the reviewed studies finding links between strategic purchasing and sustainable procurement performance have been in the private sector. Studies in the public sector are needed.
- Policy-makers should consider working with industry bodies that are developing codes and guidance for greening construction, energy and ICT.
- There is a gap between the rhetoric of corporate environmental policies and the reality of their environmental supply chain practices.

- Regulation is an important aspect of encouraging sustainable SCM in firms.
- Policy-makers need to consider developing guidance for how to balance/integrate the social, economic and environmental impacts of sustainable procurement.
- Policy-makers need to consider how sustainable procurement policy fits with the SME agenda, and if there is a role for government to encourage SME sustainability performance through supply chains.
- Policy-makers need to develop policy on sustainable SCM issues in global supply chains and could work with NGOs and industry bodies to provide procurement policy on fair trade.

What lessons can be drawn for public sector practitioners?

- Buyers indicate a desire to be more strategically involved with their firms. The Chartered Institute of Purchasing and Supply (CIPS) has a role in promoting the strategic importance of purchasing. Practitioners can ensure they are aware of the strategic direction of the organisation, and that procurement strategy is aligned with that.
- There is an issue around how procurement is valued within firms and as a profession, and UK practitioners were found to rate themselves particularly low. The reasons for this and how it might be redressed are unclear, but are likely to apply in the public as well as private sector.
- Strategic purchasing in the private sector is characterised by practices such as supply base rationalisation, supplier evaluation, information exchange, sharing knowledge, driving innovation, and has a high status and professionalism. Public sector practitioners could adopt similar practices to their private sector counterparts. Some public sectors such as HMRC, the Home Office and Department for Work and Pensions have already taken action in this regard.
- Sourcing from local SMEs can support local economic development.
- Collaboration with customers and suppliers on sustainable supply issues is beneficial.
- Practitioners may want to approach their sustainable procurement strategies in terms of minimising exposure to environmental, social, economic and reputational risk.
- Many private firms approach sustainable SCM with supplier assessment, and tools for this are available on many websites.
- A range of tools to support sustainable procurement are available for practitioners, and the majority are easily accessible on public sector websites.

What are the implications for (the commissioning of) future research?

- There are few studies on i) estates and facilities management; ii) ICT; iii) commodities, which could be a direction for future research.
- There is far more environmental-focused research compared to social or economic-focused research suggesting areas for future research.

- Research is needed on how to balance the social, environmental and economic elements of sustainable procurement.
- There are far more studies conducted in the private than public sector, (which reaffirms the need for this Review drawing lessons from the private sector), but also indicates that much more research is needed in the public sector.
- In the era of globalisation and offshoring, studies investigating sustainable procurement in developing and newly industrialised countries are a priority.
- A comparative analysis of sustainable procurement policy in different countries would be useful.
- A study of the effects of a recession on sustainable procurement would be useful.
- Research could refine a set of outcome measures for both sustainable procurement and its impact on organisational performance. Such metrics seem crucial to understand whether the UK's performance on sustainable procurement is improving.

1 Introduction

Public procurement concerns the acquisition of goods and services by government or public sector organisations and is one of the key economic activities of government. *Sustainable* public procurement involves integrating a concern for broader social and environmental impacts within procurement undertaken by government or public sector bodies.

It has been suggested that between 8 and 25 per cent of the GDP of OECD countries and 16 per cent of EU GDP is attributable to government purchases of goods or services (OECD, 2006). In the UK government spends around £220 billion annually on routine products and services¹. As such sustainable procurement has recently acquired a high degree of salience in international and domestic policy circles reflecting broader concerns about the need to achieve sustainable development. For example, at EU level the European Commission has set a target that, by 2010, 50 per cent of all public tendering procedures should be green² and the UK government remains committed to this.

The previous administration aimed to achieve ‘best value’ through public procurement and the review of Public Sector Efficiency (Gershon, 2004). This sought to identify opportunities to deliver ‘sustainable efficiencies in the use of resources within both central government and the wider public sector’. It highlighted that significant savings in procurement were expected to be obtained through ‘better supply side management... seeking to communicate and manage likely aggregate public sector demand in a strategic way with the supply sector [and] further professionalization of the procurement function within the public sector’. Consistent with a focus on ‘sustainable efficiencies’, through a focus on whole life costing, ‘best value’ gives scope to public bodies to take social and environmental policy objectives into account in their procurement activities. This was recognised by the UK Government in its 2005 Sustainable Development Strategy, and a Sustainable Procurement Task Force was established in 2005 to develop guidance. The UK government stated its goal to be amongst the leaders in the EU on sustainable procurement by 2009 (DEFRA, 2007).

The Coalition government’s approach to public procurement will be tempered by the cuts in public sector spending aimed at reducing the deficit. The desire to deliver efficiencies within government means that public sectors spend on goods and services will decrease, and the influence of government buyers with private sector suppliers may diminish. The question remains to be answered as to whether in this context sustainable

¹ See <http://ww2.defra.gov.uk/environment/economy/purchasing/>.

² The objective of the European Union Communication ‘*Public procurement for a better environment*’ (COM (2008) 400, 16 July 2008), is to provide guidance on how to reduce the environmental impact caused by public sector consumption and how to use green public procurement (GPP) to stimulate innovation in environmental technologies, products and services. The European Commission set a target that, by 2010, 50 per cent of all public tendering procedures should be green.

procurement will become less of a priority as economic, rather than social or environmental, criteria take precedence.

This report aims to provide an improved understanding of successful businesses and their approaches to procurement, and the relevance of these to the debate and policy on sustainable public procurement. The report is based on the results of a structured literature review, identifying and reviewing over 200 academic papers and 100 articles of grey literature. (See section 1.3 for more details of the Review methodology.)

There is a large body of mainstream business literature and research on business operations and supply chain management (SCM) which is potentially relevant to the debate on public sector sustainable procurement. This work is not just about delivering better and sustainable procurement, but also how procurement can be used as a driver of broader organisational strategic objectives and added value. Many research studies have investigated the relationships between aspects of procurement/supply chain management and firm performance in the private sector. That is to say procurement is not only important in terms of the products and services it procures but also for the impact it has on transmitting broader organisational objectives through a business and onto its customers and suppliers. Successful organisations value procurement as an important part of overall business delivery.

This SDRN Rapid Research and Evidence Review considers the mainstream business literature and research in this area and its relevance to sustainable public procurement. What is the role of procurement in successful businesses and are there lessons to be learnt from this for sustainable public procurement?

The commissioning of this Review by SDRN should not be taken to suggest a presumption that the public sector procurement is failing or lacking in innovative approaches compared to the private sector. There is a range of levels of performance of public sector, some good and some poor, as there is in the private sector. However, the aim of this review is to try and add a new perspective to the debate on sustainable public procurement. There may be lessons from successful businesses in the private sector that could be usefully transferred to public sector procurement. The focus of this work is on successful businesses and understanding the role that procurement plays in these organisations and the relevance of this to sustainable public procurement. In addition, three areas were considered to be of particular interest because they represent considerable amounts of public procurement spend: construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities. Articles were sought to inform sustainable public procurement in these areas.

1.1 Review Aim and Objectives

The aim of the Review was to generate an improved understanding of successful businesses and their approaches to procurement and the relevance of these to sustainable public procurement.

The research questions and sub-questions the review was intended to answer were set at its outset:

Question 1: What is the role of sustainable/strategic procurement in creating successful organisations?

- 1a) What is the relationship between strategic procurement (supply chain management, strategic purchasing etc) and firm performance?
- 1b) What is the relationship between sustainable procurement (green supply, ethical supply, purchasing social responsibility etc) and firm performance?

Question 2: What accounting, finance tools and other business process tools are currently used by successful organisations to deliver sustainable and strategic procurement practice and choices?

- 2a) What evidence is there of such tools in the academic literature reviewed for Q1?
- 2b) What evidence is there of such tools in a review of the websites of successful sustainable procurement companies, drawn from FTSE4Good, Dow Jones Sustainability index, and Business in the Community Supply Chain Awards.

Question 3: What is the relevance of 1 and 2 to public sector sustainable procurement, particularly in the areas of construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities?

- 3a) What lessons can be drawn for public sector policy-makers?
- 3b) What lessons can be drawn for public sector practitioners, drawing out any distinguishing features in the procurement of i) estates and facilities management; ii) ICT; iii) commodities?
- 3c) What are the implications for (the commissioning of) future research?

The remainder of the review follows the structure provided by these questions as outlined in section 1.5.

1.2 Definitions

This review considers strategic purchasing, sustainable procurement and sustainable supply chain management (SCM). Definitions of each these terms are given below.

The report begins with a review of the strategic purchasing literature. Strategic purchasing is referred to in this report according to the following definition:

‘Strategic purchasing involves having a formal business planning process, reviewing and adjusting purchasing’s plans to match changes in company plans, consistently providing input to top management on future supply needs and constraints, and developing supply strategies to support company strategies.’ (Carr & Pearson, 2002)

The report goes on to consider sustainable procurement, a phrase commonly used in the public sector. Throughout this report, we adopt the following definition developed by the Sustainable Procurement Task Force:

*‘Sustainable Procurement is a process whereby organisations 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 organisation, but also to **society** and the **economy**, whilst minimising damage to the **environment**.*

Footnote: Sustainable Procurement should consider the environmental, social and economic consequences of: Design; non-renewable material use; manufacture and production methods; logistics; service delivery; use; operation; maintenance; reuse; recycling options; disposal; and suppliers’ capabilities to address these consequences throughout the supply chain.’

(DEFRA, 2007)

Finally, the phrase sustainable SCM is generally used in reviewing articles from the mainstream business literature. We broadly define it as:

Sustainable supply chain management is the pursuit of sustainable development objectives through the purchasing and supply process.

Sustainable procurement can be viewed as part of the broader concept of sustainable³ SCM, that encompasses not just buying but a variety of issues along the supply chain, and there are a variety of related terms covering social, environmental and economic issues. Where authors have referred to

³ Sometimes the word ‘sustainable’ can be used to mean ongoing, such as ‘sustainable competitive advantage’ or ‘sustainable growth’. To avoid confusion, we have replaced this usage of sustainable with ‘ongoing’.

aspects of sustainable SCM such as ‘environmental purchasing’ or ‘green buying’, we have endeavoured to keep the author’s terminology in this report. However, when we summarise across articles we tend to refer to the collective as ‘sustainable SCM’ studies, as this is the dominant term used in the academic literature.

The extent to which definitions of sustainable SCM vary is highlighted in [Table 1](#). An expanded version of this table, highlighting the variety of terms relating to sustainable SCM, can be found in the Appendices.

Table 1: Definitions of sustainable supply chain management

Concept	Definition	Author
Sustainable SCM	‘Such a diversity [of definitions] was predictable as the topic of sustainability in the supply chain took a number of labels in the literature including green supply chain (Bowen, Cousins, Lamming and Faruk 2001; Vachon and Klassen 2006), socially responsible purchasing (Carter and Jennings 2002; Carter 2004) or closed-loop supply chain (Seitz and Peattie 2004; Guide and Van Wassenhove 2009) just to name a few.’ (p. 18)	(Krause, Vachon, & Klassen, 2009)
	A focus on supply chains is a step towards the broader adoption and development of sustainability, since the supply chain considers the product from initial processing of raw materials to delivery to the customer. However, sustainability also must integrate issues and flows that extend beyond the core of supply chain management: product design, manufacturing by-products, by-products produced during product use, product life extension, product end-of-life, and recovery processes at end-of-life. (p. 1078)	(Linton, Klassen, & Jayaraman, 2007)
	The strategic, transparent integration and achievement of an organisation's social, environmental, and economic goals in the systemic coordination of key interorganisational business processes for improving the long-term economic performance of the individual company and its supply chains. (p. 368)	(Craig & Dale, 2008)
	Sustainable supply chain management (is defined) as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements. In sustainable supply chains, environmental and social criteria need to be fulfilled by the members to remain within the supply chain, while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria. This definition is rather wide and combines those given for sustainability and supply chain management. It is also able to integrate green/environmental supply chain management as one part of the wider field. (p. 1700)	(Seuring & Müller, 2008b)
	In a world concerned more and more with the optimal use of the scarce resources, supply chains need to re-align themselves to adjust to this trend. In addition, firms have thrived so far by providing the optimal service level at the lowest price, paying little attention to how supply chain decisions and actions affect other aspects of human life, such as the environment and sustainability of natural resources. (p.193)	(Piplani, Pujawan, & Ray, 2008)

1.3 Methodology

This report is the output of a review of relevant articles in both the academic and grey literature⁴, which sought to find evidence to answer the research questions given above. A full list of the references included in the

⁴ Grey literature is produced by government agencies, professional organisations, research centres, universities, public institutions, special interest groups, and associations and societies whose goal is to disseminate current information to a wide audience.

review is given in section 6, while further details of the review approach are given in the Appendices.

Following agreement of the review approach, a structured academic literature review was conducted focusing on leading journals in the areas of: operations and supply, environmental and corporate social responsibility, and general management. The identified articles were initially subject to descriptive analysis (given in the Appendices), and then thematic analysis, and were reviewed to answer the research questions. The approach to searching the grey literature was to conduct four different sets of searches. Further information about these searches and their results can be found in the Appendices.

Inevitably a structured literature review of this sort will not capture everything, as it employs necessarily limited search terms and focuses on specific journals. Also, delays in academic publishing mean that an article can take anything up to three years to go from first submission to final journal publication. This means that the review may not fully capture the up-to-the-minute climate of sustainable procurement activities. We have attempted to take this into account by focusing on articles from 2000 onwards, and by searching grey literature. However, future research could capture the zeitgeist in this fast-changing field by conducting interviews with key actors in organisations in the public and private sector.

1.4 Workshop

Further input and comments on a draft of the literature review and its findings and recommendations were gained through a small workshop of experts and policy-makers held on 2nd July 2008. An agenda and list of attendees at this event is given in the Appendices.

1.5 Structure of report

Following this introductory section the findings of the Review are presented below, answering each of the research questions (as given in section 1.1) in turn.

Section 2 considers the evidence in relation to research question 1: *‘What is the role of sustainable/strategic procurement in creating successful organisations?’*, and considers the relationship between firm performance and both strategic procurement and sustainable procurement.

Section 3 considers research question 2: *‘What accounting, finance tools and other business process tools are currently used by successful organisations to deliver sustainable and strategic procurement practice and choices?’*, and draws on both academic and grey literature in order to review tools used by successful organisations.

Research question 3, *‘What is the relevance of 1 and 2 to public sector sustainable procurement’* is addressed in sections 4 and 5. Section 5

considers the relevance of the findings from questions 1 and 2 to public sector sustainable procurement in the areas of construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities. The review concludes in section 5 with the more general lessons drawn from addressing research question 3, for policymakers, practitioners, and implications for the commissioning of future research.

At the beginning of each section, a summary box is provided that draws together the main findings from the section and where appropriate some commentary on them.

Where possible, causality has been identified in the literature, to see if writers are reporting that green supply management had a positive impact on firm performance, for instance. As regards firm performance, one aspect of the literature review is to identify transferable lessons from the private sector for the public sector. For example, do companies who adopt green supply practices perform better, and what are transferable lessons for the public sector? It is acknowledged that public and private organisations do not necessarily face the same strategic and environmental supply drivers, but that some common lessons might nevertheless be identifiable. In particular, attention is paid to the particular tools used by organisations, and what they are measuring and valuing.

1.6 Key articles

Throughout the report, key articles are highlighted with gold stars. These provide a good starting point for readers interested in exploring sustainable SCM issues further and include:

- Kleindorfer, Singhal, & Van Wassenhove, 2005 - provides a good overview on sustainable operations management, which is focused at the firm level.
- Carter & Rogers, 2008 - introduce a conceptual framework for sustainable SCM.
- Srivastava, 2007 - a review of articles focused on bringing products back along the supply chain e.g. reuse, recycling, remanufacturing, closed loop supply chains etc.
- Montabon et al., 2007 - useful approach to analysing corporate reports, which could be replicated in public sector.
- Hopkins et al., 2009 - a survey of what practitioners think of sustainability in business.
- Carter & Jennings, 2004 - the first study to encompass all three elements of sustainable SCM.
- Fromartz, 2009 - interesting cases of how companies vary in their approach to sustainable SCM.

2 What is the role of sustainable/strategic procurement in creating successful organisations?

This section considers the literature in relation to the Review's first research question to evaluate how strategic purchasing can contribute to successful organisations, and what evidence exists that sustainable procurement contributes to firm performance.

It is necessary to raise a note of caution about measures of firm performance in academic literature. The majority of studies of strategic purchasing come from the Centre for Advanced Purchasing and Supply (CAPS) group at Arizona State University, with authors such as Carr, Ellram, Carter and Zsidisin conducting large scale surveys in the US manufacturing sector. Similarly, studies of green purchasing often entail large scale surveys (Min & Galle, 2001). One of the issues with such large scale surveys is that they rely on asking respondents such as purchasing professionals to rate survey items around how the performance of their firm has improved, say over the last 3 years or compared to its competitors. Examples of survey items measuring firm performance are given in the Appendices, and vary from paper to paper including measures of economic, financial, and operational performance.

As such, these survey items are not 'objective' measures of firm performance, as compared to, for example, the audited annual reports of firms or performance on a market index. These surveys instead measure self-reported perceptions of firm performance. (Issues of response rates to surveys and whether respondents are typical of the sector being surveyed also need to be considered.) It is also worth bearing in mind that some of these measures may not directly translate to the context of the public sector (e.g. competitive position, market share) whereas others will have more relevance (e.g. customer satisfaction). Such surveys do, however, allow an exploration of what factors influence the success of firms, which has broad relevance to the research questions. The public sector has been pursuing the efficiency agenda under the previous administration (e.g. Gershon, 2004) and it is clearly an important part of the Coalition government's agenda. Given these developments it may be appropriate to review efficiency measures along with private sector measures, to develop appropriate metrics for measuring improvements in performance with strategic and sustainable procurement.

2.1 Review question 1a: What is the relationship between strategic procurement and firm performance?

This section of the report considers the evidence for a relationship between strategic procurement and firm performance and confirms there is a positive relationship between strategic purchasing and firm performance. The literature reveals a list of key factors associated with strategic purchasing and supply.

Strategic purchasing and SCM:

- go beyond traditional cost-reduction,
- are positively related to firm performance,
- are aligned with internal integration of business functions,
- are aligned with and seen as contributing to a firm's business strategy,
- entail buyers being aware of the strategic direction of the firm,
- practices include supply base rationalisation, supplier evaluation and information exchange,
- assist in managing supply relations and allows firms to compete 'supply chain vs supply chain',
- involve sharing knowledge and can add value by driving innovation,
- involve professionalism, status and supply management,
- differ across countries, but all buyers indicate a desire to be more strategically involved with their firms.

Thirty-three of the identified studies have investigated the relationship between strategy, purchasing and supply chain management (SCM) and firm performance. They are all broadly investigating whether a more strategic approach in the purchasing and supply functions lead to firms being more successful. It has been observed that many purchasing professionals still need evidence of the impact of purchasing on firm performance to justify the relevance of their work (Carr & Pearson, 1999). A different view is that most firms recognise the importance of strategic purchasing because they spend a large percentage of their sales income on purchased inputs (Carr & Pearson, 2002), and are responsible for more than half of the production costs of a firm's products (Zsidisin & Ellram, 2001).

There is increasing recognition of the strategic role of purchasing in the literature (Andersen & Rask, 2003). The shift toward strategic purchasing was emphasised when Porter (1980) listed buyers within a company as one of the five forces impacting on the competitive nature of an industry. Purchasing has evolved from a mere clerical buying function into a strategic function (Ellram & Carr, 1994), and is recognised as critical to the strategic management of supply chains (Chen, Paulraj, & Lado, 2004). However, the shift from a traditional model of price-driven procurement can be a slow one (Cousins & Spekman, 2003). Strategic purchasing represents the efforts taken by the purchasing function that may include a variety of roles ranging in nature from supportive to strategic (Cavinato, 1999; Cousins & Spekman,

2003). A firm's purchasing function may operate non-strategically, strategically or somewhere in between (Reck & Long, 1988).

Researchers have investigated what features define strategic purchasing and supply chain management. These factors are reviewed below, after reviewing specific studies of firm performance.

2.1.1 Strategic purchasing and firm performance

Although the consensus in the literature is that strategic purchasing can enhance firms' performance, only a handful of studies have specifically examined the effect of strategic purchasing on the buying firm's performance, and measured this in terms of financial indicators (Carr & Smeltzer, 1999; Chen et al., 2004; Paulraj, Chen, & Flynn, 2006). However, **taken as a whole the literature suggests the positive causality that firms that engage in strategic purchasing perform better**, though one study was found that argued the reverse causality, that firms that perform well also happen to engage in strategic purchasing (Niezen, Weller, & Deringer, 2007).

Survey items measuring firm performance vary from paper to paper and include measures of economic, financial, and operational performance. Examples of these are given in the Appendices. The review found no evidence of studies measuring environmental or social performance as part of firm performance. However, we return to environmental and social performance and its relation to firm performance in the section below (Review question 1b: What is the relationship between sustainable procurement and firm performance?).

Case study: strategic purchasing at BMW

Some academic authors provide case studies to illustrate how strategic purchasing can benefit performance. At the vehicle manufacturer, BMW, the purchasing function adds value by driving innovation and superior long-term cost performance (Wolf, 2005). Purchasing at BMW was transformed by (1) changing purchasing from an administrative function to a strategic function that influences demand for goods and services, (2) building and sharing deep knowledge, (3) working as a fair and competent partner with all external and internal business contacts, (4) committing to improving in all areas and becoming a benchmark for others, and (5) developing a team approach reliant on shared values. These changes have led to apparent measurable financial results, which are reported in the article (Wolf, 2005).

A survey was conducted of the procurement practices of 156 firms in the US (Niezen et al., 2007). About 20 per cent of firms stood out from the rest, with the leading firms growing at 20 per cent a year, and supply managers contributing significantly more to overall revenue than their counterparts at lower-performing companies. The companies stood out in terms of viewing procurement as an agent of innovation. The supplies managers do not try to find lowest price, but which supplier is likely to be the 'strongest horse in

the race'. For these companies supply management is not only concerned with cost savings but increased shareholder value.

The effect of strategic purchasing on buyer performance has been examined not only on financial but also operational measures (Paulraj et al., 2006). This study differentiated between three stages in strategic purchasing development in firms and found that the strategic status of a firm's purchasing function will have a positive effect on supply chain performance, measured in terms of operational and financial indicators. They found that the higher the level of strategic purchasing, the better the firm's financial performance. Also, the higher the level of strategic purchasing, the better the performance of a firm's suppliers, on operational measures such as quality, flexibility, delivery and responsiveness.

The relationship between SCM practices and firm performance has been investigated (Tan, Lyman, & Wisner, 2002). They found that firms that locate close to customers or suppliers increase their market share. Just In Time (JIT) capability and supply chain characteristics had a positive relationship with overall product quality. One study found purchasing/supplier involvement has a positive impact on strategic purchasing, which has a positive impact on a firm's financial performance (Carr & Pearson, 2002). The study showed that strategic purchasing has a significant relationship with firm performance, and can add value to the firm. This was true across industries and across firms of different size.

Other factors have been associated with strategic purchasing. These are reviewed below.

2.1.2 Factors affecting strategic purchasing

Internal integration

Strategic purchasing seems to be aligned to internal integration. A purchasing function is strategic in nature when it is proactive with respect to the firm's goals, integrated with other firm functions and has a long-term focus (Carr & Pearson, 2002). Strategic purchasing plays a role in promoting cross-functional, intra-organisational relationships (Ellram & Carr, 1994). One study found that if a firm's purchasing and manufacturing functions have consensus regarding their competitive priorities, this can lead to higher levels of performance (Pagell & Krause, 2002).

Alignment to business strategy

Strategic purchasing should also be aligned with business strategy. A strategic purchasing function can be viewed by top management as an important resource of the firm (Keough, 1994). Purchasing is treated as an equal to other functions in the firm (Freeman & Cavinato, 1990). It has been found that as purchasing becomes involved in a firm's strategic planning activities such as product development, the firm is more capable of making strategic purchasing decisions (Carr & Pearson, 2002). Several studies

suggest that purchasing strategy needs to be aligned with business strategy and purchasing professionals need to be knowledgeable about the strategic direction of the firm (Paulraj et al., 2006; Porter, 1980). Strategic purchasing facilitates organisation-environment alignment (Carter & Narasimhan, 1996). The integration of strategic purchasing practices and goals with the firm's objectives can lead to higher firm performance (Narasimhan & Das, 2001). Strategic orientation and supply management practice alignment have been suggested to have a positive impact on organisational performance (Day & Lichtenstein, 2006).

Strategic purchasing practices

Some argue that the contribution of the purchasing function to business performance lies in the implementation of a series of concrete purchasing practices and initiatives (Narasimhan, Jayaram, & Carter, 2001), such as supply base reduction, supplier evaluation or information exchange. Others argue that the degree of involvement of the purchasing function in strategic planning processes determines the level of implementation of certain advanced purchasing practices: Chen et al (2004), for example, investigated the relationships among strategic purchasing, supply management capabilities (communication, limited number of suppliers, and long-term relationship orientation), customer responsiveness, and buyer firm financial performance.⁵

Strategic purchasing and supply relationships

Strategic purchasing has been found in some cases to have a positive effect on buyer-supplier relationships, communication and firm performance. Firms with strategic purchasing are able to foster long-term co-operative relationships and communication, and achieve greater responsiveness to the needs of their suppliers (Carr & Smeltzer, 1997). Strategic purchasing fosters communication, which is critical to achieving effective integration throughout the supply chain (Kraljic, 1983). Strategic purchasing can engender ongoing competitive advantage by enabling firms to (a) foster close working relationships with a number of suppliers; (b) promote open communication amongst supply chain partners and (c) develop long term strategic relationship orientation to achieve mutual gains (Chen et al., 2004).

Strategic SCM

In the supply chain literature, there is suggestion that modern competition is being fought 'supply chain vs supply chain', rather than 'firm vs firm' (Ketchen & Hult, 2007), shifting the strategic focus for how to compete to supply chains rather than individual firms. Supply networks can be viewed from a strategic perspective dynamically, seeking opportunities to improve

⁵ See Gonzalez-Benito (2007) for a discussion of the role of purchasing capabilities as opposed to practices in the context of purchasing's contribution to business performance.

the firm's position in an existing network or creating a new network (Mills, Schmitz, & Frizelle, 2004). While traditional supply chains often focus primarily on one key outcome such as speed or cost, best value supply chains excel along a range of uniquely integrated priorities - cost, quality, speed, and flexibility. **Strategic SCM is the use of a supply chain not merely as a means to get products to where they need to be, but as a means to enhance key outcomes that drive firm performance** (Hult, Ketchen Jr, & Slater, 2004). Strategic SCM elevates SCM from a function that supports strategy to a key element of strategy. It is aligned to three attributes; agility, adaptability and alignment (Lee, 2004).

There is some evidence that supply chain relationship quality has an impact on supply chain performance quality, and that the competitive environment moderates this relationship (Fynes, De Burca, & Voss, 2005). Mutual trust and adaptation are essential to managing supply chain quality relationships. Interdependent relationships are necessary to move away from the traditional arms-length adversarial model which is grounded in power-based bargaining. This requires frequent co-operation on issues such as product and process design, quality and scheduling.

Knowledge management

In attempting to understand why some supply chains outperform others, several writers have looked at the links between strategic SCM and knowledge management (Hult et al., 2004). Capitalising on knowledge can create superior performance in supply chains, but only if knowledge elements align with strategy (Hult, Ketchen, Cavusgil, & Calantone, 2006). Purchasing can be transformed by building and sharing knowledge (Wolf, 2005). Greater absorptive capacity helps organisations to cultivate and transform knowledge acquired in the supply chain more effectively (Vachon & Klassen, 2008).

How does strategic purchasing vary between countries?

Some authors have looked at strategic purchasing in different countries (Ogden, Rosetti, & Hendrick, 2007). Three factors are identified that are associated with strategic purchasing, (1) professionalism - purchasing's skills, knowledge and professionalism, (2) status - purchasing's status within the organisation and (3) supply management - purchasing's sophistication in managing external relationships. These varied with country, with Hungary identified as lowest and Canada as highest on professionalism. For the status dimension, the UK was identified as lowest and France as highest. For supply management differences, the UK again came lowest and Canada was highest. Germany and the UK had the largest gaps between current and desired involvement in strategic purchasing. Reasons given by survey respondents included organisational structure, top management support, organisational history and organisational culture. On average, respondents from all countries indicated a desire to be more strategically involved with their firms.

2.2 Review question 1b: What is the relationship between sustainable procurement and firm performance?

Summary

This study reviewed literature from mainstream business, environment, corporate social responsibility (CSR) and public administration journals to draw out lessons for sustainable SCM.

- The review identified a range of social, environmental and economic issues in the literature on sustainable SCM and factors affecting it including collaboration with suppliers, risk, service supply chains and the influence of the public sector.
- The themes identified in the literature review are summarised in a conceptual framework, which incorporates the triple bottom line (Elkington, 1998) of social, economic and environmental dimensions, that is presented in the Discussion and Conclusions (section 5). The conceptual framework is useful as it indicates how different themes sit within and constitute social, economic and environmental SCM, and expands upon the factors affecting sustainable SCM.
- Eighteen studies were found that argued that engaging in sustainable SCM makes firms perform better, but no studies argued the reverse causality that firms that perform better also happen to engage in sustainable SCM. More in-depth studies are needed to explore the direction of this relationship.
- Questions regarding the relationship between sustainable SCM and firm performance are particularly important during a period of economic recession. Can only successful firms afford to focus on doing good, or does the economic climate moderate engagement in sustainability activities as firms focus resources on economic survival, and demonstrate corporate social responsibility by safe-guarding jobs for employees?

2.3 Emerging themes: firm performance and sustainable procurement

Through the course of the literature review, a number of themes emerged to answer the research question ‘*What is the relationship between firm performance and sustainable procurement?*’ These themes are set out in Figure 1 and guide the structure of the subsequent sections in report, and what the report does and does not include.



Figure 1: Sustainable supply chain management (SCM) themes emerging from the literature review.

There have been an increasing number of special journal issues on sustainable SCM and related issues in recent years⁶. This is an indication that it is a critical and timely area of research interest for the academic purchasing and supply community.

The majority of previous research has focused on environmental issues (Seuring & Müller, 2008b), with social and economic issues significantly less researched (Seuring, Sarkis, Müller, & Rao, 2008). This dearth of research in sustainable operations management addressing social issues is affirmed by Kleindorfer et al in their review of the first fifty issues of the *Production and Operations Management Journal* where they observe ‘*The people part is notably absent from OM [operations management] research to date; the recent renewed emphasis on behavioural OM may bring this element back into focus*’ (p. 490). This study will include environmental, social and economic themes in its analysis (points 1-3 on Figure 1).

Second, this literature review focuses in particularly on the forward supply chain (Seuring & Müller, 2008b), as opposed to studies that investigate bringing products back through the supply chain, such as closed loop supply chains and reverse logistics. It also moves beyond focusing on product supply chains to consider service supply chains.

⁶ For example, Jayaraman, V., Klassen, R., & Linton, J. D. 2007; Lindgreen, A., Maon, F., Swaen, V., & Vanhamme, J. 2008; Krause, D., Vachon, S., & Klassen, R. 2009; Leopold-Wildburger, U., Weber, G.-W., & Zachariassen, M. 2009; and forthcoming in *Production and Operations Management* with the call for papers entitled ‘Measuring the impact of sustainable operations’ Corbett, C. J., Kleindorfer, P. R., & Wassenhove, L. N. V. 2008.

Third, in some previous sustainable SCM literature reviews, economic aspects have not been specifically searched for because they are ‘assumed as being covered by all papers, as only management related publications and journals form part of the [sustainable SCM literature review]’ (Seuring & Müller, 2008b). Our journal searches have utilised the search term ‘economic’ in combination with other terms in order to identify additional articles. We have also searched beyond management journals and included ethical, environmental and public administration journals. We identify those studies that consider how sustainable SCM impacts upon a firm’s financial performance (Carter & Rogers, 2008). Further, this study will deviate from previous research, by adopting a broader view of the economic aspects of sustainable SCM, to identify studies that have a wider economic impact beyond the boundaries of the organisation e.g. buying from local suppliers to support local economic regeneration (point 3 on Figure 1).

Fourth, this study will identify studies that have investigated all three aspects of sustainable SCM and their interaction (Carter & Rogers, 2008; Seuring & Müller, 2008b). Finally, sustainable SCM may have supporting factors (Carter & Rogers, 2008), which will be analysed in the literature review (points 4-6 on Figure 1).

These observations from previous literature guided the identification of themes and provided a structure to the literature review. The following sections relate to each of the themes in Figure 1.

2.3.1 Environmental SCM

This section presents research on green SCM, Environmental Management Systems and SCM, and environmental issues in global supply chains. The following observations can be made:

- Firms face internal and external enablers and barriers to green SCM,
- Firms engage in green supply if they have the internal capabilities and management support,
- Firms engage in green supply in response to regulation, and tend to be larger firms in sectors where environmental regulation is important,
- Firms are facing increasing pressure from a wide variety of stakeholders to engage in green SCM,
- Firms are deterred from green supply because of the perceived costs involved,
- EMS is positively related to green supply implementation,
- There are positive links between environmental SCM and firm performance in global supply chains.

Green SCM

The number of articles published on environmental and green SCM management has increased in the last 20 years (Linton et al., 2007;

Srivastava, 2007), and are situated within broader interest in sustainable operations management (Kleindorfer et al., 2005) and greening businesses (MacLean, 2008). Zhu et al comment that the boundary of green SCM is dependent on researcher goals and the problems at hand, for example, should it just be the procurement stage or the full logistics channel that should be investigated? (Zhu, Sarkis, & Lai, 2008b).

The focus in green SCM research has been diverse, as highlighted by the focus of reviewed papers on:

- Product design, manufacturing by-products, product life extension, and closed loop supply chains (Defee, Esper, & Mollenkopf, 2009; Georgiadis & Besiou, 2008; Guide Jr & Van Wassenhove, 2006; Guide & Van Wassenhove, 2006; Huang, Yan, & Qiu, 2009; Kleindorfer et al., 2005; Kusumastuti, Piplani, & Hian Lim, 2008; Östlin, Sundin, & Björkman, 2008)
- Reuse (French, 2008)
- Recycling (Brodin & Anderson, 2008),
- Recovery at end-of-life (Chan, 2008; Jaber & El Saadany, 2009; Krikke, le Blanc, van Krieken, & Fleuren, 2008; Li, Zhang, Gonzalez, & Yu, 2008; Walther, Schmid, & Spengler, 2008), and
- Reverse logistics⁷ (Lau & Wang, 2009; Li & Olorunniwo, 2008; Quariguasi Frota Neto, Walther, Bloemhof, van Nunen, & Spengler, 2009; Ravi, Shankar, & Tiwari, 2008; Rubio, Chamorro, & Miranda, 2008; Srivastava, 2007; Srivastava, 2008; Tsai & Hung, 2009).

It is clear that a range of issues along the supply chain have been covered in green SCM research. However, in line with a previous literature review (Seuring & Müller, 2008b) our exclusion criteria determined that research focusing on products coming back along the supply chain such as reverse logistics, closed loop supply chains and remanufacturing⁸ were not included



(Srivastava, 2007) – for a review of articles focused on bringing products back along the supply chain e.g. reuse, recycling, remanufacturing, closed loop supply chains etc



in the review, and have been the subject of other reviews (Srivastava, 2007). The environmental SCM research presented below instead centres on the forward supply chain.

Firms engage in green supply for a variety of reasons, and internal and external barriers and enablers to environmental supply have been identified (Walker, diSisto, & McBain, 2008). Regarding internal organisational enablers,

⁷ Reverse logistics is ‘the process of planning, implementing and controlling backward flows of raw materials, in process inventory, packaging and finished goods, from a manufacturing, distribution or use point, to a point of recovery or point of proper disposal’ according to the European Working Group on Reverse Logistics, (REVLOG) (de Brito, M., & Dekker, R. 2004).

⁸ Remanufacturing is an industrial process whereby used products, referred to as ‘cores’, are restored to useful life (Subramoniam et al., 2009).

previous research has identified capabilities, management support, attitude to regulation, project champions and being a larger organisation as contributing to green SCM. The green supply capabilities of a firm are jointly developed by a proactive corporate environmental approach and a strategic purchasing and supply process (Bowen, Cousins, Lamming, & Faruk, 2001), suggesting the need to focus on internal resources rather than external pressures. It has been found that there are positive relationships between organisational learning, management support and the adoption of green SCM practices of Chinese firms (Zhu, Sarkis, Cordeiro, & Lai, 2008a). Project champions are important to gain commitment for environmental projects, particularly amongst purchasing managers (Gattiker & Carter, 2010).

Those firms that take environmental regulation more seriously are more likely to be involved in green purchasing practices (Min & Galle, 2001). Regulation can be viewed not as a barrier or requirement but instead as an opportunity to innovate and achieve an advantage over competitors (Carter & Dresner, 2001; Porter & Van de Linde, 1995). Buying firms with larger purchasing volumes are more likely to be involved in green purchasing than smaller ones (Min & Galle, 2001). Large corporations in industries already in the limelight over their environmental performance tend to be the ones that are more likely to pursue environmental supply chain initiatives (Preuss, 2005).

Considering internal barriers, the main issue seems to be the cost of green SCM projects. One study investigated the green purchasing practices of US firms (Min & Galle, 2001) and found economic investment was viewed as the largest obstacle to green purchasing. A further study uses game theory⁹ to illustrate that for shared savings contracts for indirect materials in supply chains, the goals of maximising joint profits and minimising consumption are generally not aligned (Corbett & DeCroix, 2001).

Moving to consider influences outside the organisation, firms are increasingly feeling pressure from stakeholders - employees, customers, consumers, supply chain partners, competitors, investors, lenders, insurers, nongovernmental organisations, media, the government and society overall - to act on sustainability issues (Darnall, Potoski, & Prakash, 2009; Hopkins et al., 2009; Kovács, 2008; Walker et al., 2008).

In a study of the US wind energy sector, it was noted that suppliers and other stakeholders may present external barriers due to lack of knowledge, being sceptical and withholding support (Sine & Lee, 2009). Conversely, suppliers and other stakeholders can be engaged in green initiatives. A study proposing a method for assessing the lifecycle of a building (Banaitiene, Banaitis, Kaklauskas, & Zavadskas, 2008) allows everyone (i.e. client, investor, contractor, etc.) who has to make decisions to design alternative

⁹ Game theory is a powerful tool for analyzing situations in which the decisions of multiple agents affect each agent's payoff. As such, game theory deals with interactive optimisation problems. See Cachon, G., & Netessine, S. 2004.

building life cycles and to evaluate their qualitative and quantitative aspects. One study of environmental purchasing develops an ‘Analytical Hierarchy Process’¹⁰ as a decision support model to help managers understand the trade-offs between environmental dimensions when evaluating suppliers (Handfield, Walton, Sroufe, & Melnyk, 2002).

In this section on green SCM, it is apparent that research has covered a wide range of issues along the supply chain, and this review focuses on the forward supply chain. There are internal and external pressures to engage in green SCM. Previous research has identified internal organisational factors such as capabilities, management support, attitude to regulation, project champions and being a larger firm as all contributing to green SCM, whereas cost is the main factor holding organisations back. External pressures come from stakeholders, customers, competitors, consumers, supply chain partners, investors, lenders, insurers, nongovernmental organisations, media, the government and society.

Environmental Management Systems (EMS) and SCM

As the following section will go on to discuss, it is apparent that EMS adoption is positively related to green SCM, and cooperation with suppliers and involving stakeholders helps.

One factor that emerges strongly as having a positive influence on green SCM is the adoption of Environmental Management Systems¹¹ (EMS) such as Environmental Management Standards ISO 14000 and ISO 14001. EMS adopters seem to have a greater propensity to expand their focus beyond their organisational boundaries and utilise green SCM practices to minimise system-wide environmental impacts (Darnall, Jolley, & Handfield, 2008). To best integrate environmental issues into SCM, companies should begin by evaluating the role of environmental issues in commodity strategies and develop an EMS to better monitor and manage environmental issues (Handfield, Sroufe, & Walton, 2005).

One paper highlights the importance of including green purchasing in the framework of ISO14000, encouraging pollution prevention and green consumption, with a focus on environmental and financial performance (Chen, 2005). In a study of Spanish automotive suppliers, a positive relationship was found between possession of EMS certification and the environmental demands those organisation place on their suppliers

¹⁰ Analytic Hierarchy Process is a multiple criteria decision-making tool that has been used in applications related with decision-making (Vaidya, O. S., & Kumar, S. 2006).

¹¹ An Environmental Management System (EMS) (e.g. ISO 14001:2004) is a management tool enabling an organisation of any size or type to identify and control the environmental impact of its activities, products or services, and to improve its environmental performance continually, and to implement a systematic approach to setting environmental objectives and targets, to achieving these and to demonstrating that they have been achieved (http://www.iso.org/iso/iso_14000_essentials).

(González, Sarkis, & Adenso-Díaz, 2008). Another paper highlights the importance of a long-term perspective in terms of cooperation with suppliers and developing a supply chain perspective for EMS, and emphasises the role of foreign partner companies in stimulating the spread of EMS (Nawrocka, 2007). Cooperation between the purchasing and environmental functions within a company is frequently not sufficiently achieved in implementation of ISO 14001 (Nawrocka, Brorson, & Lindhqvist, 2009); this makes the communication of customer requirements to suppliers less efficient. Building close relationships with suppliers is important to overcome initial difficulties, but this often conflicts with having a large supplier base.

In a survey of Spanish manufacturing firms, it was found that environmental performance following EMS adoption was linked to managers' belief in the existence of a 'win-win' between environmental and financial performance, and they tend to integrate other stakeholder demands into their business strategies (Plaza-Úbeda, Burgos-Jiménez, Vazquez, & Liston-Heyes, 2007). One study analyzes the mechanisms that link the adoption of the ISO 14001 to firms' competitive advantage (Magali, 2001). It shows that the perceived competitiveness impact of the standard depends mostly on the involvement of firms' external stakeholders (distributors, customers, community members, and regulatory agencies) in its design. Stakeholders' involvement in a firm's ISO 14001 standard becomes a valuable organisational capability, which is difficult to imitate by competitors.

Environmental issues in global supply chains

Research indicates that globalisation is increasing pressure on suppliers in developing countries to improve their environmental performance, which can benefit their economic performance. Studies that have focused on environmental aspects of sustainable SCM in global supply chains have found that the greening of global supply chains can improve competitiveness and firm performance. Globalisation results in pressures for Chinese enterprises to improve their environmental performance (Zhu & Sarkis, 2004; Zhu, Sarkis, & Lai, 2007), yet as a developing country China has to balance economic and environmental performance. Pressures include regulation, competition and marketing (Zhu & Sarkis, 2007; Zhu, Sarkis, & Geng, 2005). It was found that adoption rates of green SCM practices are still low amongst companies in China, and 'Quality Management' and 'Just-In-Time' programmes were positive moderators between adopting green SCM practices and economic performance (Zhu & Sarkis, 2006).

A further study of green SCM in Asia found that greening different phases of the supply chain leads to an integrated green supply chain, which ultimately leads to competitiveness and economic performance (Rao & Holt, 2005). One study of Taiwanese and US manufacturing firms found positive relationships between investments in buyer-supplier relationships, investments in environmental management and firm performance (Pagell, Krumwiede, & Sheu, 2007). A study of the SCM literature finds an increasing interest in research in global supply chains, and anticipates that global,

social and environmentally focussed SCM research will increase in the future, with increasing interest in green and carbon footprint areas (Giunipero, Hooker, Joseph-Matthews, Yoon, & Brudvig, 2008).

2.3.2 Social SCM

This social SCM section reviews a variety of studies including CSR and social issues in supply chains, fair trade and CSR issues in global supply chains. Key lessons to draw from the literature are:

- Certain industries face difficulties with CSR e.g. tobacco, petroleum, food,
- Retailers vary in their commitment to fair trade, but fair trade can lead to competitive advantage, and there are gaps between supply and demand in fair trade,
- Globalisation means that CSR is being encouraged amongst suppliers in emerging and developing countries, and auditing and a collaborative approach with suppliers helps,
- CSR in global supply chains may be confined to larger companies that can afford it,
- Suppliers in developing countries may respond to CSR initiatives effectively by combining forces in trade associations,
- Humanitarian aid is an emerging area of research that demonstrates CSR in supply chains.

This section of the review considers research on corporate social responsibility¹² (CSR) in SCM, studies of fair trade, and how social issues have been researched in global supply chains. Evidence suggests that the distinction between CSR and environmental research in supply chains is sometimes blurred. CSR research has sometimes focused on particularly challenging industries such as food, tobacco and petrochemicals. The ethical behaviour of buyers and supplier codes of conduct can be seen as part of organisations demonstrating CSR in their supply chains.

Corporate social responsibility in supply chains

While the focus here is on studies that have explored social issues in supply chains, an initial observation is that the distinction between CSR and environmentally focused SCM research is sometimes blurred. For example, Cruz et al have sought to model optimal approaches to social responsibility in supply chains, considering how manufacturers and retailers determine their production quantities, transaction quantities, and the amount of social

¹² Corporate social responsibility (CSR) is the idea that organisations are obliged to work for social betterment, and has been described as ‘the firm’s consideration of, and response to, issues beyond the narrow economic, technical, and legal requirements of the firm . . . (to) accomplish social benefits along with the traditional economic gains which the firm seeks.’ (Davis, K. 1973).

responsibility activities they want to pursue that maximise net return, minimise emission and waste, and minimise risk over the planning horizon (Cruz, 2008; Cruz & Matsypura, 2009; Cruz & Wakolbinger, 2008). However, what Cruz et al refer to as social responsibility on closer inspection seems to focus on environmental rather than social issues. Cruz et al focus on how organisations demonstrate 'social responsibility' by improving environmental performance, which might more accurately be termed 'environmental responsibility', but this illustrates the point that the boundaries between the various elements of sustainable SCM are somewhat blurred.

Studies have focused on CSR and sustainability issues in the food industry (van der Vorst, Tromp, & Zee, 2009), an industry which faces many significant risks from public criticism of CSR issues in the supply chain, while other supply chain CSR issues that have been considered include community and procurement (Maloni & Brown, 2006). More specific examples at a company level include Grover's investigation of Burger King and its CSR programme (2008), and finds that the volunteer advisory panel develops ideas and policies that are related to the food industry and animal rights, such as supply-chain issues or the use of cage-free chicken products in the restaurant chain. Another study focused on Waitrose the supermarket retailer and how it has had an evolutionary approach to CSR with its suppliers (Spence & Bourlakis, 2009).

Certain industries face particular hurdles with CSR in supply chains, as they are perceived as providing products that damage the environment or health. Corporate responsibility in the tobacco industry is based upon a 'thin' approach to CSR and has been conceptualised with a focus on transactional integrity across the tobacco supply chain (Palazzo & Richter, 2005). One study provides a case study of the Shell Group, and considers the different ways in which energy companies can contribute to sustainable economic development through enhancing local employment and supply chain opportunities (Fossgard-Moser, 2003).

CSR in supply chains includes socially responsible buying (Park & Stoel, 2005), and socially responsible purchasing to support supplier diversity aimed at ethnic minority businesses (Worthington, 2009). The (un)ethical behaviour of buyers could also be considered as part of CSR in supply chains (Svensson, 2009; Svensson & Bååth, 2008). Purchasing is a boundary spanning function that, because it does interact with other members of the supply chain and is thus exposed to a firm's external environment, may be under considerable pressure to depart from accepted norms of behaviour and ethics set by the firm (Carter, 2000). Violations of trust in the buyer-supplier relationship have been the subject of research (Hill, Eckerd, Wilson, & Greer, 2009), and other authors have considered supply management ethical responsibility (Reham, Gavin, & Larry, 2009).

A further aspect of CSR in supply chains is whether suppliers follow codes of conduct. Codes of conduct need to be incorporated into the sustainability strategies of companies, and their sourcing and supply policies (Seuring & Müller, 2007). One study investigates codes of conduct that stipulate CSR

criteria for suppliers (Preuss, 2009b) by examining ethical sourcing policies adopted by all the FTSE100 corporations. A case study was undertaken of the Westpac Banking Corporation to examine how it approached the challenge of managing CSR in its supply chain (Keating, Quazi, Kriz, & Coltman, 2008), focusing on supplier assessment and governance mechanisms including a sustainable SCM tool and supplier codes of conduct. Jiang observes that there is a huge gap between the requirements of the supplier codes of conduct imposed by buyers from advanced economies and actual compliance with codes of conduct in developing countries (Jiang, 2009). The study reveals that if buyer's governance efforts move away from threat and toward cooperation, supplier's compliance with codes of conduct could be more sustainable.

Fair trade

From the review of fair trade research, it appears that organisations vary in their approach to fair trade, and can differentiate themselves and communicate their mission through ethical sourcing.

Ethical and fair trade, involving codes of conduct for worker welfare, have recently emerged as a form of corporate self-regulation for global commodities. The ethical trading strategies of leading UK food and clothing retailers are investigated in one study (Hughes, 2005). Variations are observed between retailers in terms of their commitment to ethical trade, which are shaped by issues of corporate culture, financial management, and corporate restructuring, and such variations have the capacity to shape the regulation of labour conditions at sites of export production. In a study in 2003, consumer demand for Fairtrade certified coffee was at an all-time high, yet cooperatives that produce it were only able to sell about half of their crops at the established fair trade price. (Levi & Linton, 2003).

A further fair trade study identifies issues associated with fair trade (including issues of human rights, fair wages, sustainability reporting procedures and codes of conduct on ethics) and associated tools of analysis (guaranteed prices, codes of conduct and end price audits) (Welford, Meaton, & Young, 2003), and suggests that fair trade could provide companies with a new competitive strategy based on ethical standards communicated to the consumer through a strategy of differentiation.

Another study of fair and ethical trade investigates a range of organisations that are restructuring their operations, so that their mission is reflected in ethical practices throughout their operations, including product sourcing and product sales (Low & Davenport, 2009). They find that ethical purchasing policies operated by non-profits and public sector agencies represent markets through which fair/ethical products reach end consumers. The efforts discussed to create ethical spaces through direct democracy and electoral mandate build on a broad-based affinity with the principles of fair and ethical trade. Zoos and aquaria can also reflect their conservation message through ethical sourcing in their cafes and gift shops.

CSR in global supply chains

Evidence relating to CSR in global supply chains suggests that the role of purchasing managers is influential, that a company's culture needs to spread to subsidiaries, and that partnerships with suppliers in developing countries, while sometimes haphazard in their approach, are important. Studies of Asian supply chains have found the social dimension lacking to date and that smaller suppliers may benefit from collaboration through industry associations when looking to implement international standards. Consumer and investor pressures, helped by auditing, are increasingly influencing CSR in China, while humanitarian aid is emerging as a new focus for global CSR SCM research.

Some studies have considered the role of purchasing managers in global supply chains. One study considers the need to rethink procurement in the era of globalisation and offshoring (den Butter & Linse, 2008). In addition to traditional transaction costs such as transport costs and tariffs, managers need to recognise such elements as cultural and legal differences, government regulation, social preferences, environmental issues, political stability and risks involved in unethical business behaviour. The authors argue that for procurement managers to know the risks and opportunities of the different exposures is a critical management competence influencing strategic decisions throughout the company. Another study identifies that purchasing managers need to be aware that their perceptions of sourcing from low cost countries may be biased by cultural stereotypes (Carter, Maltz, Yan, & Maltz, 2008). A study of procurement in the United Nations found there is a digital divide between buyers within the UN and suppliers in developing countries, and so traditional procurement processes need to be maintained alongside e-procurement when sourcing from developing countries (Walker & Harland, 2008).

Some studies have researched Scandinavian companies and their approach to sustainable SCM in the era of globalisation. One study examines corporate responsibility in the supply chains of four of the largest Scandinavian multinational corporations - IKEA, Nokia, Novo Nordisk, and StatoilHydro (Strand, 2009), and found these Scandinavian companies have developed a 'cooperative advantage' in their ability to form successful, long-term partnerships with suppliers in developing countries in their respective supply chains. A further study focuses on IKEA and CSR in its global supply chains (Andersen & Skjoett-Larsen, 2009), and finds CSR embedded within the entire organisation, including subsidiaries abroad and offshore suppliers. It includes employee training and sharing of experience, training of key personnel at the supplier level, positive incentives for suppliers in the form of long-term contracts and enlarged purchasing orders, and regular auditing of suppliers' performance. A study of Finnish companies found that they are progressively managing CSR locally, but when looking at global supply chains problems include lack of information and structured management system, different views and interpretations, supply chain complexities, overlap with environmental issues, etc. often lead some companies to manage CSR haphazardly (Panapanan, Linnanen, Karvonen, & Phan, 2003).

Some studies have investigated CSR issues in Asia associated with offshoring. A survey was conducted in the German automotive industry and its global supply chains in Asia, and found the social dimension of sustainable SCM to be lacking in implementation so far (Beske, Koplin, & Seuring, 2006). While environmental standards such as ISO 14001 are commonly accepted, social standards such as SA 8000 (a standard for certifying labour practices in an organisation's facilities and those of their suppliers and vendors) and AA 1000 (addresses the need for a single approach to sustainability reporting) have hardly been applied so far. Some authors have considered the move to develop ISO 26000 international guidance standard on social responsibility (Castka & Balzarova, 2008a, b), and evaluate which organisations and supply chains will adopt ISO 26000. Propositions are made in relation to social responsibility orientation of organisations/networks, differences in regulatory systems, and the role of governments and national environments.

The recent trend to offshoring, to reduce manufacturing costs may give way to 'right-shoring'¹³, in the face of increases in freight rates, the focus on sustainability and changing consumer trends. CSR in global supply chains tends to be confined to a small number of larger companies who can afford the time and resources to spend on CSR practices, while the large majority of smaller companies will find themselves confined to markets where CSR is trumped by pricing and delivery pressures (Welford & Frost, 2006). Another study takes a different perspective on the tension between global pressures and local responses and suggests local collective action amongst suppliers in developing countries through industry associations can potentially reduce costs and promote local embeddedness of CSR initiatives (Lund-Thomsen & Nadvi, 2010). A study based in the Netherlands found companies can efficiently implement corporate social responsibility in international product chains by taking into account the particularities of their supply chain relationships (Cramer, 2008), depending on both the diversity and the complexity of the product chain, the power of the company in the chain and the level of ambition set.

Some studies investigate sustainable SCM in China as the leading offshoring destination. China has gained growing importance as 'production site of the world' for the electronics industry especially (Plinke & Ashida, 2004). The challenges for companies are related to human rights issues, labour conditions and environmental standards. The challenges are increasingly perceived by the public, a fact that consumer goods companies have had to experience in recent years. Social and environmental aspects are also an issue for investors, although Socially Responsible Investment may be more concerned with the risk aspects of the social challenges in China, rather than the ethical ones. A further study investigates social requirements in global supply chains in the context of labour condition auditing in China (Kortelainen, 2009), and finds it a beneficial tool for inducing continuous improvement in SCM, but it requires a new set of skills from the auditors. A

¹³ A combination of outsourcing simple and not-so-important processes to other countries, with retaining the complex, business-critical processes in-house.

further area of research that addresses CSR in global supply chains is that of humanitarian aid and emergency relief and how it is delivered through logistics and supply chains (Kovács & Spens, 2009; Maon, Lindgreen, & Vanhamme, 2009; Oloruntoba & Gray, 2009; Pettit & Beresford, 2009; Trestrail, Paul, & Maloni, 2009). This is an expanding area of research, which may contribute to conceptualisations of CSR in supply chains in the future.

2.3.3 Economic aspects of sustainable SCM

This section reports on a variety of studies that identify a link between different aspects of sustainable SCM and firm performance. It also considers how sourcing from SMEs can lead to local economic benefits, and shared economic benefits along global supply chains.

- There is a positive relationship between firm performance and recycling, proactive waste reduction, remanufacturing, environmental design, specific design targets and surveillance of the market for environmental issues.
- There is a positive relationship between firm performance and EMS and environmental management practices, and environmental projects need to show both environmental and financial performance to be seen as successful.
- Environmental performance should be incorporated in operations performance.
- We can conclude with a moderate degree of certainty that there is a positive causal relationship between aspects of SCM and firm performance. Organisations that adopt sustainable SCM practices tend to perform better. We found no studies arguing the reverse causality, that firms that perform better also happen to engage in sustainable SCM. Some of the findings reported here concern manufacturing, and will have limited relevance to the public sector. However, taken as a whole they suggest that public sector organisations that engage in sustainable SCM may see improvements in performance.
- SME studies either focus on local or global supply issues.
- Local sourcing from SMEs can support local economic development.
- SMEs themselves rarely apply sustainable SCM to their own suppliers.
- In global SME studies, there is a role for government to encourage SMEs to improve their environmental performance, and SMEs need slack resources to participate in initiatives. Sustainability standards set by NGOs and multinational corporations need to include SMEs.

This section considers economic aspects of sustainable SCM. First, the contribution that sustainable SCM can make to a firm's performance is considered. Next, sustainable SCM in the context of Small to Medium-sized

Enterprises¹⁴ (SMEs) is addressed. SME research is presented in this section because some studies have identified that involving SMEs in sustainable SCM can have positive economic impacts beyond the boundaries of the buying firm.

Sustainable SCM and firm performance

A variety of studies identify a link between different aspects of sustainable SCM and firm performance¹⁵. We can conclude with a moderate degree of certainty that there is a positive causal relationship between aspects of SCM and firm performance. Organisations that adopt sustainable SCM practices tend to perform better. We found no studies arguing the reverse causality, that firms that perform better have more available resources and also happen to engage in sustainable SCM. Further research explicitly exploring the directional of the relationship would be beneficial, to scrutinize in-depth which comes first, the ‘chicken or egg’ of sustainable SCM and firm performance.

Some studies have looked at environmental performance as a broad concept, rather than focusing on purchasing and supply. These are worth considering as they may have lessons for procurement. One study was



(Montabon, Sroufe, & Narasimhan, 2007) – useful approach to analysing corporate reports, which could be replicated in public the sector

innovative in using content analysis to investigate environmental and business performance data from 45 corporate reports (Montabon et al., 2007). One limit of the study is the lack of standards in environmental reporting, another is the focus on leading firms. Nevertheless, the study is interesting in its approach, and whilst not specifically an investigation of supply chain management, some factors have resonance with supply issues. Six environmental management practices were found to be positively related with firm performance; recycling, proactive waste reduction, remanufacturing, environmental design, specific design targets



and surveillance of the market for environmental issues.

Focusing specifically on purchasing and supply research, eighteen studies were identified that investigated the relationship between sustainable SCM and firm performance. The Business of Sustainability Survey (Hopkins et al., 2009) sought the views of more than 1500 worldwide executives and managers about their perspectives on the intersection of sustainability and business strategy. It was found that experts believed more strongly in the

¹⁴ Small to medium sized enterprises are defined as having fewer than 250 employees (European Commission. 2005. Small and Medium Enterprises: SME Definition, *Enterprise and Industry* Brussels: European Commission.

¹⁵ A variety of ways of measuring firm performance have been identified in the studies reviewed and examples of these are given in the Appendices. We have also scrutinized the various constructs and survey items that researchers use to measure environmental and social performance, particularly in the context of purchasing and supply, and these are also given the Appendices.

importance of engaging suppliers across the value chain. Sixty two per cent of the experts surveyed considered it necessary to hold suppliers to specific sustainability criteria; only 25 per cent of surveyed novices felt the same. The expert's views were consistent with those of the fifty thought leaders interviewed as part of the same study. The authors suggest that the more people know about sustainability, the more thoughtfully they evaluate it and the more opportunity they see in it, and the more they think it matters to how companies position themselves and operate.

One study provides case studies of Nike Inc, start-up electric vehicle supplier Better PLC, General Electric Co, mining giant Rio Tinto, and Wal-Mart Stores Inc to consider how approaches to sustainability vary, including supply chain issues (Fromartz, 2009). Though it takes investment and commitment, the rewards are seen in cost savings, new products, customer engagement and employee commitment. In this way, sustainability becomes a competitive advantage.

Links have been drawn between competitive performance objectives and sustainable development (Krause et al., 2009), by viewing sustainable SCM in the context of Kraljic's seminal article 'Purchasing must become supply management' (Kraljic, 1983). A further theoretical development is purchasing social responsibility, which has been found to have a positive impact on firm performance (Carter, 2005). Purchasing social responsibility includes constructs of diversity, the environment, human rights, philanthropy and safety. It was found that organisational learning and supplier performance act as key mediating variables. Purchasing social responsibility leads to organisational learning, improved supplier performance and ultimately reduced costs.

Focusing specifically on environmental SCM research, case studies have revealed that to view an environmental supply project as successful, it needs to improve both financial and environmental performance (Carter & Dresner, 2001). It has been found that firms start environmental initiatives to improve their own environmental performance, but this can also lead them to help suppliers and contractors turn green (Rao, 2002). A number of studies have found links between environmental SCM and economic performance in Asia (Pagell et al., 2007; Rao & Holt, 2005; Zhu & Sarkis, 2004; Zhu & Sarkis, 2006; Zhu & Sarkis, 2007; Zhu et al., 2007; Zhu et al., 2005). Companies such as Interface have become well-known for gaining a competitive advantage through engaging suppliers to 'green the supply chain' (Posner, 2009), with the CEO Ray Anderson telling suppliers, 'It's up to you, but those who come with us will get the business, and those who don't won't'.

Several studies have looked at the role of collaboration in the supply chain for enhancing environmental management and manufacturing performance (Vachon & Klassen, 2006a, 2008). Environmental collaboration in inter-organisational interactions between supply chain members includes joint environmental goal-setting, shared environmental planning, and working together to reduce pollution. The benefits of collaboration were most

evident with suppliers, rather than downstream with customers. One study found that firms with closer supplier partnerships and solid continuous improvement practices are more likely to develop a proactive environmental management programme, which in turn enhances competitive advantage through cost savings, quality improvement, and process/product innovation (Yang, Lin, Chan, & Sheu, 2010).

There were methodological variations across the articles in ways of measuring sustainable and firm performance, which may lead to variations across findings. Similarly, a study of the environmental and economic performance of firms analysed previous studies, and found variability across studies (Wagner, Schaltegger, & Wehrmeyer, 2001). They were unable to ascertain whether the variability in results was due to methodological artefacts (i.e. portfolio studies, event studies or multiple regression were used to scrutinise the relationship) or other factors such as environmental performance measures used, sectors analysed, countries covered, or economic performance measures applied.

Some studies have focused on exploring performance measurement of sustainable SCM, and detailed the way performance of the green supply chain might be measured (Clift, 2004; Hervani, Helms, & Sarkis, 2005; Tsoufas & Pappis, 2008). One study reviews metrics, indicators, and frameworks of social impacts and initiatives relative to their ability to evaluate the social sustainability of supply chains (Hutchins & Sutherland, 2008).

Small and medium-sized enterprises

Research into small and medium-sized enterprises (SMEs) has either focused on local or global supply chain issues. Considering local sourcing from SMEs first, economic benefits have been observed that extend beyond the buying firm. The role of public procurement in buying from SMEs to support sustainability has been investigated (Walker & Preuss, 2008). Buying from small businesses can create benefits in a variety of forms, ranging from a contribution to local economic development through providing innovative green products and services, particularly in the food sector, to helping the public sector organisation to better align its operations with its community. Local government has been found to be particularly supportive of sustainable procurement from SMEs, as it meets complementary objectives such as local economic regeneration (Walker & Brammer, 2009b). Such local economic benefits are not only pursued by the public sector. Energy companies can contribute to sustainable economic development through enhancing local employment and supply chain opportunities (Fossgard-Moser, 2003). It should be noted that the boundaries between social and economic aspects of sustainable SCM involving SMEs are blurred. For example, sustainable SCM issues associated with SMEs are categorised in the economic dimension here, yet could also be considered to overlap with the social dimension, as sourcing from local SMEs can have positive social impacts upon a community, such as the reduction of unemployment.

Based on a survey of sustainable SCM practices among 300 Danish SMEs, Jorgenson and Knudson (2006) conclude that SMEs face requirements from their buyers much more frequently than they apply such requirements to their own suppliers and that many buyer requirements in the value chain seem to be latent, in that they are neither contractual nor subject to verification. Another Danish study found only a small group of SMEs actually engaged in CSR in supply chains (Pedersen, 2009), while research on SMEs in Italy found companies use different strategies as well as diverse management systems and tools to address CSR issues along their supply chains (Ciliberti, Pontrandolfo, & Scozzi, 2008a).

Turning to global supply chains and SMEs, Zhu et al conducted a survey of over 200 China-based organisations, and compared the implementation levels of five green SCM practices among different sized organisations in China (Zhu, Sarkis, Lai, & Geng, 2008c). They found that medium- and large-sized organisations are more advanced than their SME counterparts on most aspects, but not necessarily all, of these green SCM practices. They suggest that for Chinese SMEs to better market themselves to potential business partners, more policies should be designed and implemented by government and professional groups to encourage SMEs to improve their environmental performance.

A Korean automotive sector study argues that the limited capabilities and resources available within many SMEs frequently hamper an effective response to environmental pressures, which in turn hurts large buying firms (Lee & Klassen, 2008). Buyers' green SCM initiated and then enabled the improvement of suppliers' environmental capabilities. Synergistic linkages emerged in supportive buyer-supplier relationships, resource acquisition, and capability development. A further study of the engagement of SMEs in green supply chains (Lee, 2008), found that buyer environmental requirements and support were positively linked to their suppliers' willingness to participate in green supply chain initiatives. The government can play an important role in motivating these suppliers, and the more slack resources and organisational capabilities suppliers had, the more willingly they were to participate in those initiatives.

Looking at social issues in global supply chains and SMEs, Social Accountability 8000 (SA8000) has been found to help manage supply chains with SMEs by solving the problem of incomplete contracts as well as replacing trust in new partnerships, especially with respect to intangible performance indicators (Ciliberti, Groot, Haan, & Pontrandolfo, 2009). One study discusses partnerships between multinational corporations and nongovernmental organisations (NGOs) as related to social and green issues in global-level supply chains (Perez-Aleman & Sandilands, 2008), examining the manner in which this alliance can include SMEs in developing countries rather than excluding them, to prevent sustainability standards set by NGOs creating barriers of entry for SMEs.

2.3.4 Studies combining social, environmental, and economic aspects of SCM

An increasing number of studies are broadening their perspective to include all three dimensions of sustainable SCM. A review of these reveals:

- Most of the studies combining the social, environmental, and economic aspects of SCM have been published in the last few years. Carter and Jennings (2004) were some of the first researchers to incorporate all three aspects in their research on purchasing social responsibility.
- Studies have focused on sustainable SCM issues in a particular city or region, particularly in Europe and Canada. A holistic approach to considering sustainability issues for a region emerges as appropriate.
- Studies that have compared the approaches adopted across different countries have found that the aspect of sustainable SCM focused upon depends on the country's policy context and priorities.
- Studies that focus on particular sectors separately, such as food, the cut flower sector and the fashion retail sector, tend to consider the trade offs between the different aspects of SCM within each sector. Studies that have looked *across* cases in different sectors, emphasize how different organisations will focus on different aspects of sustainable SCM and argue against a 'one size fits all' approach.
- Although some studies have focused on implementing social and environmental standards in supply chains and others on the decision-makers involved in sustainable SCM, there are still only a small number of studies investigating all three aspects of sustainable SCM compared to the vast majority investigating environmental SCM issues or focusing

Increasingly, studies are broadening their perspective to include all three dimensions of sustainable SCM. A large survey of sustainability in business (Hopkins et al., 2009) found that while sustainability's novice practitioners thought of the topic mostly in environmental and regulatory terms, with any benefits stemming chiefly from brand or image enhancement, practitioners with more knowledge about sustainability expanded the definition for sustainability well outside the 'green' silo. They tended to consider the economic, social and even personal impacts of sustainability-related changes in the business landscape, and saw sustainability as an integral part of value creation.



(Hopkins et al., 2009) – a survey of what practitioners think of sustainability in business



Some authors have adopted the three aspects of sustainable SCM to consider sustainable development issues for a city or region, with studies conducted in Europe and Canada. Quak and de Koster suggest local governments in Western Europe increasingly use city time-access regulations to improve social sustainability (Quak & de Koster, 2007). These regulations significantly influence the distribution process of retail chain organisations. Their paper studies the impact of governmental time-window pressure on retailers' logistical concepts and the consequential financial and environmental distribution performance. Sonnino (2009)

focuses on the recent ‘quality revolution’ implemented in the school meals system in Rome, and examines the process through which city authorities have integrated different (and at times contrasting) quality conventions. The analysis shows that procurement policies such as those implemented in Rome have the power to create an ‘economy of quality’ that can deliver the economic, environmental, and social benefits of sustainable development. In another study, a more holistic approach is employed encompassing an inter-generational ethic to explore sustainable development in the context of the city of Bristol, in the south west of the UK (White & Lee, 2009). The authors observe that operations research tends to deal with the relationships between environmental management and product supply chain and rarely focuses on the social dimension, and attempt to address this in their research.

Moving outside Europe, a Canadian study extends concepts of waste reduction in supply chains to consider industrial symbiosis in the Sarnia-Lambton area of Ontario in Canada (Bansal & McKnight, 2009), which emphasises community, cooperation and coordination among firms, which serves to protect the environmental integrity, social equity and economic prosperity of the region - all hallmarks of sustainable development. The supply chains of three small and medium enterprises (SMEs) operating in the Burnside Industrial Park in Nova Scotia, Canada were investigated to explore the opportunities to improve environmental performance of SMEs linked in supply chains (Côté, Lopez, Marche, Perron, & Wright, 2008). Time and financial resources to address solid waste and energy issues are the greatest limiting factors, but opportunities to work together in industrial parks are substantial.

Studies that have compared sustainable SCM across countries have found supply chain strength positively linked to environmental performance, corporate environmental practices, and social sustainability, though the emphasis on these varies across countries according to policy context. One study has investigated the potential link between supply chain strength (the number and quality of the suppliers and customers in a country) and the three dimensions of sustainable development at the country level (Vachon & Mao, 2008). Using archival data from The Global Competitiveness Report (2004-2005) and the 2005 Environmental Sustainability Index, a statistical assessment of the linkage was conducted. The results indicate that supply chain strength is positively linked to all three dimensions of sustainable development. Another study compares sustainable public procurement across countries, and finds that which aspect of sustainable SCM is emphasised depends on the policy context (Brammer & Walker, 2010).



(Carter & Jennings, 2004) – the first study to encompass all three elements of sustainable SCM



Other studies have sought to develop a theoretical approach to sustainable SCM that encompasses the three elements of sustainability. Carter and Jennings (2004) was the first study to encompass all 3 elements of sustainable SCM. Their study aimed to incorporate CSR into purchasing management, and found the areas of diversity, the environment, safety,

human rights, and philanthropy are all aspects of purchasing social responsibility (2004), and are positively related to firm performance (Carter, 2005). The scales developed by Carter et al to investigate purchasing social responsibility were utilised with purchasing managers in Thailand (Salam, 2009), and it was found that individual values and people-oriented organisational culture are the most powerful predictors of PSR. Purchasing social responsibility was also explored in the context of the UK public sector, leading to the conclusion that sustainability practices varied across different parts of the public sector (Walker & Brammer, 2009b). A further study has a different conceptualisation of purchasing social responsibility as part of logistics social responsibility, also encapsulating sustainable transportation, sustainable packaging, sustainable warehousing, and reverse logistics (Ciliberti, Pontrandolfo, & Scozzi, 2008b).

Research focused on environmental and social standards in supply chains suggest social dimensions remain underdeveloped. For example, a study in the Korean electronics industry (Lee & Kim, 2009) shows that ‘environmental’ pressures and standards are widely accepted and implemented for supply management, but that ‘social’ pressures and standards are still not commonly used and there is a lack of implementation in the entire supply chain in the industry. Another study considers the approach to integrate social and environmental standards into the purchasing process at Volkswagen AG, and found that changes of sourcing and supply structures were required (Koplin, Seuring, & Mesterharm, 2007).

Within the SCM literature, a number of studies have focussed on particular sectors that face sustainability challenges. For example, Holt and Watson (2008) consider the environmental, social and economic aspects of sustainable supply by contrasting the benefits and costs of local sourcing compared to international development in the case of the cut flower industry (Holt & Watson, 2008), while another study investigated how to move towards a sustainable fashion retail supply chain in Europe, and encompassed all three elements of sustainable SCM (de Brito, Carbone, & Blanquart, 2008). Sustainability issues are particularly sensitive to the fashion supply chain, given current fierce competition, intensive resource use, and the exposure of penurious labour conditions in some regions. Pullman et al take on the task of simultaneously exploring all three elements of sustainability in a survey of the US food and beverage industry (Pullman, Maloni, & Carter, 2009). They found links between social and environmental practices and a set of performance metrics, and identified links between social practices and quality but not environmental performance. They suggest managing the interrelated aspects of sustainability is both complex and competitively rewarding.

★★★★★

(Fromartz, 2009) – interesting cases of how companies vary in their approach to sustainable SCM

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An alternative approach is employed by Fromartz (2009) who uses a series of case studies to explore how different approaches to sustainability vary across different industries. Each case company was found to address different social and environmental supply chain issues which contribute to

competitive advantage: Nike redesign to reduce waste, a electronic vehicle firm targets markets receptive to low energy vehicles, General Electric sell eco-solutions to other companies, Rio Tinto focuses on social issues and Walmart revamp supplier practices (Fromartz, 2009).

Yet another approach can be found in studies which focus on the decision-makers that influence sustainable purchasing. A study of purchasing medical resonance imaging equipment found environmental and social sustainability dimensions were personally relevant to purchasing decision-makers but professionally secondary to cost, performance, and ability to use the equipment in their organisations' physical infrastructure (Lindgreen, Antico, Harness, & van der Sloot, 2009). They also found that incorporating a product's environmental and social credentials within the marketing of MRI scanning equipment enhances the perception of the product offering in decision-making stakeholders' minds and provides a means of differentiation. In a complexity approach to sustainability, Espinosa et al develop a holistic viable systems model, and highlight how purchasing choices at consumer and organisational levels contribute to sustainability (Espinosa, Harnden, & Walker, 2008).

2.3.5 Factors affecting sustainable SCM

This section reports on the main factors influencing sustainable SCM themes or that have the potential to influence sustainable SCM in the future and identifies several key findings:

- Looking across the factors affecting sustainable SCM, it appears that the majority of studies have again focused on environmental issues.
- Collaboration in the supply chain benefits sustainable SCM, including a partnership approach, sharing knowledge and information, and investing in the relationship.
- Sustainable SCM can be viewed in terms of minimizing exposure to environmental, social, economic and reputational risk in supply chains.
- The public sector spends a significant amount on goods and service, which means large public sector customers have the power to stimulate and influence markets. Though the public sector has the potential to be influential in promoting sustainable SCM.
- There is a need for more research on service supply chains.

This section reports on the main themes that emerge from the literature review that are factors influencing sustainable SCM, or that seem to have the potential to influence sustainable SCM in the future. These include collaboration, risk, service supply chains and sustainable SCM in the public sector. It should be noted that other barriers and enablers to sustainable SCM have been identified that are both internal and external to an organisation. Such factors have been addressed elsewhere (e.g. Lee & Klassen, 2008; Walker et al., 2008). Instead, we focus here on the main themes emerging from previous research in sustainable SCM, and in the case

of services and the public sector nascent areas of research that seem important to the future of the field. Each factor is addressed in turn below.

Collaboration and sustainable SCM

It seems that collaboration between customers and suppliers is important to sustainable SCM. As the following section will go on to illustrate, a partnership approach, building up trust between customers and suppliers, information sharing and investment are all suggested by studies to be important, while supply chain performance can be improved as a result of collaboration on sustainable SCM. Most studies have focused on environmental issues; it would be valuable therefore to explore if collaboration is also important for the social and economic aspects of sustainable SCM.

Some studies look at sustainable supply from a collaborative paradigm, with one study based on the views of experts in sustainable SCM which suggests a cooperative approach is required (Seuring & Müller, 2008a). Most of the studies identified in the review on collaboration have focused on the environmental aspects of sustainable SCM (e.g. Vachon & Klassen, 2006a, 2008; Vachon & Klassen, 2007). A study of the antecedents of green supply practices found that technological integration with primary suppliers and major customers was positively related to environmental monitoring and collaboration, and as the supply base reduced, the extent of environmental collaboration with primary suppliers increased (Vachon & Klassen, 2006a).

It seems that working with suppliers and building up trust is important. It has been found that supplier integration is an important aspect of cleaner production, entailing proper selection of suppliers and their development (Rao, 2004). Another study found that inter-firm trust, uncertainty and proactive environmental management most directly affect the extent to which firms engage in cooperative supply-chain environmental management (Sharfman, Shaft, & Anex Jr., 2009).

A partnership approach between buying and supplying organisations has been emphasised in some studies. In a study of the automotive industry, strong partnerships with suppliers supported by appropriate incentive systems, were a significant element of the successful application of environmental technologies (Geffen & Rothenberg, 2000). An Australian study has emphasised the importance of partnerships between government and suppliers for resource efficiency, recycling and process optimisation as identified in the supply chain trials on timber furniture manufacturing and food industries (Schliephake, Stevens, & Clay, 2009). A study in the Danish textile sector found three approaches to environmental SCM practices (Forman & Sogaard, 2004), (1) the 'wake' strategy, where companies follow in the wake of others, which place the same requirements on their suppliers, (2) the asymmetric partnership, where long-term relationships with a supplier are based on control, and (3) the symmetric partnership, with long-term relationships and mutual partnership with a supplier.

Some studies have focused on how collaboration in green SCM can improve supply chain performance. A study of the textile industry found that cooperation in supply chains allow companies to improve the competitiveness of the chain while reducing environmental burdens (Seuring, 2004). A further study finds that environmental innovation in industrial packaging systems requires a cooperative supply chain approach to ensure the environmental and commercial costs are reduced and efficiencies optimised for the chain as a whole (Verghese & Lewis, 2007). A further study found environmental purchasing activities are facilitated through increased coordination with suppliers as well as downstream members of the supply chain including retailers (Carter & Carter, 1998), and there is a need for increased coordination within the firm, particularly between the purchasing function on the inbound side and marketing and distribution functions on the outbound side.

One element that may be important in collaboration for green SCM is knowledge and information sharing, leading to reciprocal learning. One study identifies the link between information sharing and environmental performance of supply chains, explained as distance to end-consumer in terms of supply chain stages (Solér, Bergström, & Shanahan, 2010). Another study found trust and knowledge-sharing to influence collaboration in green SCM, even where competition exists between supply chain partners (Cheng, Yeh, & Tu, 2008). A study of environmental requirements in road maintenance contracts in Sweden emphasises the importance of actively involving, informing and training all relevant parties (Faith-Ell, 2005). Another paper examines how relations between customers and suppliers affect environmental performance as indicated by waste reduction in chemical firms (Theyel, 2001). There is evidence of reciprocal learning, and firms that collaborate with customers tend to collaborate with suppliers, with greatest waste reduction in firms that meet customer environmental standards and in turn set standards for their suppliers.

Collaborating on green supply chain activities requires investment between customers and suppliers. In a study of automotive supply chains, it was found that suppliers are more responsive to their customer's environmental performance requirements where increasing levels of relationship-specific investment occur (Simpson, Power, & Samson, 2007). Studies of the US and Canadian package printing industry have focused on green interactions between organisations in the supply chain (Klassen & Vachon, 2003; Vachon, 2007). Environmental collaboration with suppliers was positively associated with greater investment in pollution prevention technologies, and was associated with fewer investments in management systems. Green supply chain practices with customers have very little impact on environmental investment decisions. In a further article based on this research (Vachon & Klassen, 2006b), it was found that green project partnership with customers was positively linked to quality, flexibility and environmental performance while partnership with suppliers was associated with better delivery performance.

Risk and sustainable SCM

Having a risk management approach is important to sustainable SCM. The role of risk has been explored, again tending to focus on the environmental aspects of sustainable SCM. One study explores risk in environment-related supplier initiatives in a conceptual paper (Cousins, Lamming, & Bowen, 2004). The perceived losses associated with environmental incidents are considered in relation to available resources of the purchasing function, leading to classifying firms as 'no choice', 'why bother', 'enthusiasts' and 'go first' in terms of how they approach environmental supply initiatives. In a study of J. Sainsbury's supermarket and its suppliers, it was found that firms invest in environmental supply chain innovation because suppliers with poor environmental practices can expose the customer to high levels of environmental risk (Hall, 2001), dependent on environmental pressure, firm capabilities and the degree to which customer firms are able to control their suppliers. One study of GMO-Free Soybeans provides a framework to help the participating companies reduce their risk exposure and make progress in sustainable SCM (Teuscher, Gruninger, & Ferdinand, 2006). Risk is identified as important in a conceptual framework of sustainable SCM (Carter & Rogers, 2008), and supply chain risk management is seen as the ability of a firm to understand and manage its economic, environmental, and social risks in the supply chain. Studies in SCM have increasingly considered the links between better profitability for companies that understand and manage their risks properly, while also promoting responsible operations that respect all of the 3Ps (Profits, People and Planet) (Cohen & Kunreuther, 2007; Kleindorfer et al., 2005).

Services and sustainable SCM

There is an emerging literature that moves beyond a preoccupation with product supply chains in sustainable SCM, to considering how services can be provided by suppliers in a more sustainable way. Some authors have taken a service approach to sustainable SCM, again predominantly focusing on environmental aspects. Some studies have focused on specific service sectors such as tourism (Adriana, 2009; Font, Tapper, Schwartz, & Kornilaki, 2008; Sigala, 2008). The shift from buying products to purchasing sets of services makes the re-use of recovered materials, parts and products desirable (Lu, Wu, & Kuo, 2007). Another study observes that industries are increasingly being held accountable for the clean-up costs of their pollution and the long-term damage on health and eco-systems, and that increasing responsibility for post-sale management of products will increasingly influence product design (Tsoufas & Pappis, 2006). Interface, a leader in sustainability, has changed the basis of its business model from producing carpets to providing a floor covering service, and incorporating green issues along its supply chains (Posner, 2009).

Public sector sustainable SCM

There is a small but growing literature considering how the public sector can contribute to sustainable SCM, although only one article has appeared in public administration journals to date.

In contrast to the wealth of literature on private sector organisations (177 articles), comparatively little research has investigated sustainable SCM practices in the context of the public sector (26 articles). Existing research has tended to focus on the development of tools to assist green procurement policy implementation (Coggburn, 2004; Günther & Scheibe, 2006; Li & Geiser, 2005; Swanson, Weissman, Davis, Socolof, & Davis, 2005), and on how sustainability can be encouraged when the public sector buys from suppliers in specific industries, such as construction (Hall & Purchase, 2006), food (Sonnino, 2009) and information technology (Matthews & Axelrod, 2004). Some articles report on case studies of sustainable procurement, such as Universitat Autònoma de Barcelona (Bala, Muñoz, Rieradevall, & Ysern, 2008) and Belfast City Council (Murray, 2000). Other studies have investigated the prevalence of sustainable procurement across the UK public sector (Preuss, 2009a; Walker & Brammer, 2009a), and across countries (Brammer & Walker, 2010), and also in the context of buying from SMEs (Walker & Preuss, 2008). Several papers have considered how sustainable development policy can best be analysed, and include consumers and suppliers within their conceptualisation (Cannon, Kouvaritakis, & Huang, 2005; Munda, 2009). A few studies of sustainable supply chain issues have been conducted across the public and private sector (New, Green, & Morton, 2002; Walker et al., 2008). These show there are some commonalities between public and private sectors in being large organisations using purchasing power to green the supply chain. However, the public sector, because it is concerned with societal well being rather than focusing on profits, may have a greater propensity to sustainable procurement.

The public sector spend on goods and services can be between 16 and 25 per cent of the GDP of a country (OECD, 2006). As such large public sector customers have the power to stimulate and influence markets, sustainable public procurement may be an important facet of sustainable SCM that warrants further investigation.

Government procurement can play a role as a stimulus for innovative activity among companies within a region. Public procurement has been at the centre of recent discussions on innovation policy on both European and national levels (Aho, Cornu, Georghiu, & Subira, 2006). This theme is consistent with research in the private sector that has shown how value chain activities affect innovation. For example, within the value chain procurement activities are associated with greater product quality and innovation (Prajogo, McDermott, & Goh, 2008). In the context of the public sector, research in this area has shown that government procurement is a

key part of a demand-oriented innovation policy (Aschhoff & Sofka, 2008; Edler & Georghiou, 2007). The potential of government to stimulate innovation in supply markets may also apply to sustainable products and services.

The interrelationship between factors and sustainable SCM

Some factors that affect the different aspects of sustainable SCM have been combined in studies. For example, studies have looked at CSR in global supply chains and how it benefits from a collaborative approach with suppliers (Andersen & Skjoett-Larsen, 2009; Strand, 2009). Environmental issues in global supply chains have been linked with improved economic performance (Rao & Holt, 2005; Zhu & Sarkis, 2004; Zhu et al., 2007), which has also been linked with collaboration (Vachon & Klassen, 2006a, 2008). In addition, some companies have an approach that combines the factors affecting the various dimensions of sustainable SCM. For example, Interface (Posner, 2009) has positive environmental impacts through working collaboratively with suppliers in product and service supply chains, and have positive social impacts through increased employee, supplier and other stakeholders' involvement, and their approach to sustainable SCM has also improved the firm's economic performance.

It would be good to see future studies that explore further combinations of factors and their impacts the different aspects of sustainable SCM, for example, (1) an investigation of a collaborative approach between larger firms and SMEs to improve their social and economic performance, or (2) social aspects of sustainable SCM in global service supply chains, or (3) social, economic and environmental issues in service supply chains in the public sector, or (4) risk management through collaboration with suppliers from developing countries. Organisations focus on different aspects of sustainable SCM (Fromartz, 2009), as do regions and countries (Brammer & Walker, 2010; Vachon & Mao, 2008), and exploring this variation in approaches to sustainable SCM and the interrelationships between the factors that affect sustainable SCM in more depth would be valuable.

3 What tools are currently used by successful organisations to deliver sustainable and strategic procurement?

This section reviews the academic and grey literature for evidence of whether any accounting, finance and other business process tools are currently being used by successful organisations to deliver strategic and sustainable procurement. In summary:

- Tools identified in the academic literature include those from the public sector, supplier assessment questionnaires, life cycle assessment tools, and mathematical modelling.
- No links were found in the academic literature between use of sustainability tools and firm performance.
- About 20 per cent of FTSE4Good company websites mention sustainable purchasing and supply. Only three tools were identified, and tools may be considered commercially sensitive and not shared on websites if they create competitive advantage
- Tools in FTSE4Good are focused on supplier assessment and management.
- Companies emphasize the importance of integration of sustainable purchasing with business strategy and top management support.
- Firms and public sector organisations are buying locally.
- Guidance tends to be provided by public sector organisations more than private.
- Sector specific organisations provide support for sustainable procurement.

This section addresses the second review question, ‘What accounting, finance tools and other business process tools are currently used by successful organisations to deliver sustainable and strategic procurement practice and choices? It is divided into two sub-questions, the first which considers the academic literature and the second, the grey literature.

3.1 Review question 2a: What evidence is there of such tools in the academic literature?

The academic literature review did not link the use of any accounting, finance or other business process tools with organisations successfully delivering sustainable and strategic procurement. There is acknowledgment that more analytic tools are needed to help companies evaluate the environmental aspects of SCM (Handfield et al., 2005). Links between such tools and firm performance were not drawn by authors. Tools identified in the academic literature include those from the public sector, supplier

assessment questionnaires, life cycle assessment tools, and mathematical modelling approaches. These tools are reviewed below.

Despite an absence of evidence relating to the current use of business process tools, some attempts have been made to develop tools to assist green purchasing within the public sector. For example, Swanson et al., (2005b) developed a priority setting tool for environmentally preferable purchasing for the State of California's Procurement Division, which considers purchasing volume, environmental impacts, potential for improvement and institutional factors. The tool has been adopted by the State and has influenced sustainable procurement prioritising in the public sector in California. Similarly, a self-evaluation tool has been developed in Germany to aid municipalities in identifying, analysing and overcoming hurdles to green procurement (Günther & Scheibe, 2005, 2006). This may be made available through the International Council for Local Environmental Initiatives (ICLEI).

Other studies present supplier assessment questionnaires. One study develops a questionnaire to measure green SCM practices implementation within companies (Zhu et al., 2008b), including factors such as internal environmental management, green purchasing, cooperation with customers, eco-design, investment recovery, and environmental, economic and operational performance. One study provides a supplier assessment questionnaire for green supply chain management, developed in a firm called Advanced Micro Devices (Trowbridge, 2001). A further study develops a supply chain framework for assessing a firm's disposition towards throwing away, re-using or recycling residual materials (Young, 2000).

Some studies employ and develop the Life Cycle Assessment approach. One study develops LCA to include the triple bottom line, utilising cases in oil and agricultural supply chains (Matos & Hall, 2007). Another study develops and employs LCA techniques in the automotive industry (Brent & Visser, 2005). A further study develops a tool called COMPLIMENT that integrates LCA, multiple-criteria analysis and environmental performance indicators, and is illustrated in the Thai pulp industry (Hermann, Kroeze, & Jawjit, 2007).

Some studies employ mathematical modelling approaches to investigate green supply issues. One study proposes a multi-objective decision process for green SCM to help supply chain managers in evaluating supplier performance, drawing on fuzzy logic and an analytical hierarchy process (Lu et al., 2007). Another study uses mathematical modelling to consider life cycle analysis in environmentally-conscious long-range planning and design of supply chain networks (Hugo & Pistikopoulos, 2005). A further study uses simulation and modelling tools to determine how factory locations can balance economic benefits with environmental stewardship (Khou, Spedding, Bainbridge, & Taplin, 2003). Another study uses mathematical

modelling to develop a strategic decision framework for green SCM (Sarkis, 2003).

3.2 Review question 2b: What evidence is there of such tools in a review of the websites of successful sustainable procurement companies?

The review also investigated grey literature, and looked across the websites of firms and public sector organisations (the approach used for these searches is detailed in the Appendices). At the centre of the debate surrounding sustainable development is a recognition that companies can make a major contribution by being environmentally and socially responsible and that tools associated with these concepts can enhance the competitiveness and economic performance of the firm.

In a eb-based search of the companies within the FTSE4Good UK 50 Index, nearly all had a link directly from their homepage to a Corporate Responsibility (or similar) page. However, the prominence of statements about sustainable purchasing (or procurement) within these pages varied considerably.

Of the 49 companies investigated¹⁶, 14 made no specific mention of purchasing, procurement or supply chains within their CSR report or policy. Ten of the remaining companies audited or assessed their suppliers against CSR criteria (we were only able to locate three of these assessment tools on the companies' websites). Seven of the companies mention prominently membership of national or trade specific initiatives on sustainability.

The majority of tools that we were able to identify were located on public sector or advisory bodies' websites (summaries of these are given in Table 2 at the end of this section. The range of approaches and tools are described below.

Supplier Assessment

Supplier Assessment questionnaires are available from companies such as Vodafone (Vodafone, 2008), B&Q (Kingfisher, 2008) and Standard Chartered (Standard Chartered, 2008). These companies use such tools to assess their suppliers, identify any which are at risk of breaching the criteria and then work with the supplier.

B&Q defines environmental performance standards for suppliers and then assess performance against them. In 2004, Allied Domecq plc (since taken over by Diageo) began a programme to embed its ethical trading policy into

¹⁶ Royal Dutch Shell A and B shares were both included in the Index.

its supply chain. It achieved this by training global ‘champions’ to manage the programme locally and then by working with suppliers to identify where they may have issues in complying with the policy. It also undertook a risk assessment of its supply chain the result of which was a scoring system, which ranked suppliers’ risk levels and enabled it to prioritise work with higher risk suppliers. The initiative benefited from senior level buy-in and credibility from independent audits, and external recognition with ‘best in class’ ratings on the two procurement sections of the Dow Jones Sustainability Index.

Alfred McAlpine Project Services (AMPS) have carried out environmental awareness training for 36 of their key suppliers (Business in the Community, 2007). They feel that in addition to any sustainability improvements the programme has strengthened AMPS’s relationship with its supply chain, enabling better communication and understanding on both sides. Some companies are also encouraging their suppliers to carry out supplier assessments on their own suppliers; thereby ensuring compliance throughout the supply chain.

Integration within company policy

A key point made in the CSR policies of a number of the FTSE4Good constituent companies was the need for buy-in from the very highest level in order to promote sustainable procurement in an organisation. For example BT have a CSR Champion who chairs the Corporate and Social Responsibility Steering Group, a body of BT business leaders that includes the Chief Procurement Officer (Business in the Community, 2005).

Buying Locally

A number of companies and public sector organisations are promoting buying local products as part of their CSR policy. Tesco claim to have over 3,000 locally source products on their shelves (Tesco, 2008). The Sustainable Development Commission website contains a number of case studies relating to the use of local suppliers including the creation of a virtual organisation to allow hotels and restaurants to buy in season produce from local farmers (Sustainable Development Commission, 2008). Food seems to be the most popular product for this approach. In addition, some firms buy from social enterprises, to support sustainable development and communities.

Guidance

A large amount of guidance and sharing of best practice on sustainable procurement was identified. However, this again tended to be from the public sector. The Office of Government Commerce website contains advice on how sustainable procurement can be pursued in line with Government Value for Money policy and EU rules (Office of Government Commerce,

2005). The IDEA website has a guide on making sustainable procurement happen (IDEA, 2003).

The *Procurement Cupboard* (New Economics Foundation, 2008) is a user driven resource centre allowing people to share work to help one another. It currently includes a *Guide to Social Return on Investment*, a *Sustainable Commissioning Model*, and a tool to calculate an organisation's economic contribution to its community. The Environment Agency website has a section containing guidance on sustainable procurement including guidance on commodities purchased by the Agency has been produced in areas such as IT, Aggregates, Sand, Electronics etc. (Environment Agency, 2003)

Large amounts of information, case studies and guides can be found on websites of organisations like the Sustainable Development Commission, Action Sustainability and Forum for the Future.

Sector specific organisations

The survey of FTSE4Good constituent companies identified a number of sector specific organisations which produce guidance and codes. Most of these will not be relevant to the public sector as they relate to specific products (such as coffee beans or sugarcane (Better Sugarcane Initiative, 2007). However, the principle of an industry coming together to decide upon a common set of standards which can then be communicated to suppliers is transferable. Such an approach would benefit public sector organisations as they would not have to develop standards from scratch and would allow economies of scale for suppliers.

There are a number of sector specific organisations which public sector organisations can belong to or access for information, advice and tools. In Higher Education for example there is EAUC (The Environmental Association for Universities and Colleges, 2005) which has an open access website with a variety of tools to enable sustainable procurement. The Mayor of London has a website, Green Procurement Code (Mayor of London, 2008) which is aimed specifically at organisations within the capital. The site contains a toolkit which claims to be a step-by-step guide to introducing green procurement. The SPIN network (Sustainable Procurement Information Network, 2008) is a website dedicated to supporting local authorities in their efforts to procure sustainably, and claims to provide a 'one-stop' website containing the very best information relating to the sustainable procurement agenda.

The tools identified from the search of grey literature are provided in Table 2.

Table 2: Procurement toolkits identified in grey literature

Name	Overview	Weblink
'Electronics-Tool for Accountable Supply Chains' (E-TASC) Internet Database	A Web-based information management system that provides companies with a platform to collect, manage and analyze social and environmental data provided voluntarily by their respective suppliers. Information is owned by the suppliers and provided by request	http://e-tasc.achilles.com/default.aspx
Action Sustainability - Flexible Framework pilot benchmarking tool	This pilot benchmarking tool is designed to help firms understand how their supply chain compares to the good practice recommended by the Sustainable Procurement Task Force	http://www.action-sustainability.com/evaluation/flexible-framework/
Aggregate Specifier Tool	This tool helps specifiers and buyers choose the right aggregate for the right application, see which recycled and secondary aggregates which can be used in the chosen application and download detailed technical notes and case studies	http://www.aggregate.org.uk/specifier/index.html
BAT Business Evaluation Survey Tool	The Business Enabler Survey Tool, BEST, establishes the standards BAT expect from suppliers of raw materials other than leaf. BEST is designed to identify the suppliers who meet their requirements and to help selected suppliers and BAT's business to develop through a mutually beneficial continuous improvement process.	http://www.bat.com/group/sites/uk_3mnfen.nsf/vwPagesWebLive/DO86EL3N?opendocument&SKN=1
BREEAM	BREEAM LCA: Certified system for providing information about the environmental impacts of construction materials measured over the whole life cycle of the product. BREEAM Specification: an easy-to-use publication outlining the relative environmental impacts of over 250 elemental specifications for roofs, walls, floors etc. BREEAM Envest: a web-based tool that simplifies the complex process of designing buildings with low environmental impact and whole life costs.	http://www.breem.org/page_1col.jsp?id=54
CAESER	CAESER (Corporate Assessment of Environmental, Social and Economic Responsibility) is a supplier assurance programme primarily adopted by public sector procurement specialists.	https://www.caeser.org/
Defra Catering Services and Food Procurement Toolkit	The toolkit is designed to help public bodies put Public Sector Sustainable Food Procurement Initiative (PSFPI) objectives into practice in their contracts for food and catering services.	http://www.defra.gov.uk/foodfarm/policy/publicsectorfood/toolkit/index.htm
EICC Supplier Self-Assessment Questionnaire	A self-administered survey for suppliers to provide information relative to their social and environmental performance and management systems.	http://www.eicc.info/downloads/ICT_Self-AssessmentQuestionnaire.pdf
Forum for the Future. Public Sector Sustainable Procurement Assessment Tool	This self-assessment Tool has been designed by Forum for the Future, in conjunction with the Welsh Procurement initiative, and is intended to ascertain the extent to which Sustainable Procurement is being considered in an organisation. It is designed to be an assessment tool for your organisation to undertake an initial evaluation-"where are you now?"	http://www.forumforthefuture.org.uk/node/1407

Name	Overview	Weblink
Getting on target. A Sustainable Energy Toolkit and Benchmark for Local Authorities	The seven 'sustainable energy' beacon authorities have created two self-assessment tools - a draft benchmark and an interactive toolkit. These interrelated tools will help councils evaluate their own performance and provide guidance for improvement. There are three steps for councils to follow: 1. assess current practice, 2. identify priority areas for action and 3. learn from others to improve service delivery in key areas of energy management.	http://www.idea.gov.uk/idk/core/page.do?pageId=5747988
Kingfisher Supplier Assessment Questionnaire	A key priority for Kingfisher is to establish consistent environmental and social standards across its diverse international operations. Kingfisher seeks to do this through its Steps to Responsible Growth environmental and social management programme.	http://www.kingfisher.co.uk/index.asp?pageid=30
LM3 Online	LM3 Online enables calculation of an organisation's economic contribution to its community.	http://www.lm3online.org/
Local Authority Environmental Management and Procurement (LEAP).	<p>Tool A - Green Procurement Policy: A five step process based on the Procura+ milestone model and contains examples of good green procurement policies.</p> <p>Tool B - Integrating green procurement into EMS: A set of EMS procedures to control and improve the environmental impacts throughout the procurement process.</p> <p>Tool C - Barriers to effective green procurement: A self assessment tool to help organisations identify barriers to green procurement and identify priority areas.</p> <p>Tool D - Joint procurement models: Examples of joint procurement activities in Europe and guidance on how to initiate joint procurement.</p> <p>Tool E - Standard specifications; Guidance on developing specifications for seven key products that local authorities buy.</p> <p>Tool F - Environmental demands in procurement: Information on how to include environmental criteria into procurement and how to evaluate tenders.</p> <p>Tool G - Information on specifications, products etc: A database of information sources to help identify green alternatives to current purchases.</p> <p>Tool H - Promoting a green market: Guidance on how to work with suppliers to improve the environmental performance of goods and develop markets through the supply chain.</p>	http://www.leap-gpp-toolkit.org/index.php?id=3115
Mayor of London's Green Procurement Code	Find out how to introduce green procurement into a workplace with this step by step guide. From writing an environmental policy to securing staff participation and writing specifications, the toolkit is everything you need to know about green procurement. (Member access only)	http://www.greenprocurementcode.co.uk/index.php?q=node/119
New Economics Forum guide to Social Return on Investment	The site provides easy, step by step instructions for organisations who want to prove and quantify the social returns that they deliver, and draws on previously unpublished SROI analysis by the New Economic Forum of two social firms, MillRace IT in Essex, and Pack-IT in Cardiff to show how to do it.	http://www.neweconomics.org/publications/guide-social-return-investment

Name	Overview	Weblink
Sustainable Procurement Task Force Flexible Framework	The Sustainable Procurement Task Force created a series of 'building blocks' for public sector organisations to use to help introduce changes that would facilitate the delivery of more sustainable procurement. The first of these is a framework of key behavioural and operational change programmes against which progress can be measured between the date an established baseline is determined and 2009 (and beyond).	http://www.s-p-i-n.co.uk/TFActionPlan.asp?ID=6
Sustainable Procurement Task Force Prioritisation Model	Method for assessing significant areas of public expenditure to identify priority sectors where added focus on sustainable procurement will give the greatest return	http://www.defra.gov.uk/sustainable/government/documents/full-document.pdf
Vodafone Supplier Risk Assessment Tool	Vodafone carry out risk assessments for all new suppliers to identify those that are high-risk and will require follow up on-site evaluations. Their 'qualification risk index' is determined by potential spend, the product or service supplied and the degree of association with their brand and customers. It also takes into account the position of the country where the supplier is based on the Freedom House Index on political freedom and the Transparency International Corruption Perception Index.	http://www.vodafone.com/content/index/about/sustainability/supplychain/supplier_assessments.html
Waste and Resources Action Programme (WRAP) Recycled Content Toolkit	Using more recycled material in construction is a powerful way of making a contribution to sustainable development by diverting materials away from landfill and limiting the depletion of finite resources. To help project teams to assess, increase and report on the recycled content of their projects, WRAP has developed an online Recycled Content toolkit	http://aggregain.wrap.org.uk/procurement/quick_wins/wraps.html
Local food organisation	Best practice in sustainable public-sector food procurement. Guidance.	http://www.localfood.org.uk/library/Defra-FLUK%20best%20practice%20final%20June%2006.pdf
Defra case studies	Public Sector Sustainable Food Procurement Initiative (PSFPI) Case studies.	http://www.defra.gov.uk/foodfarm/policy/publicsectorfood/casestudies/index.htm
Defra toolkits and resources	Public Sector Food Procurement Initiative (PSFPI) Tools and guidance.	http://www.defra.gov.uk/foodfarm/policy/publicsectorfood/resources.htm
Food Vision	Sustainable food procurement toolkit.	http://www.foodvision.gov.uk/pages/local-authority-sustainable-food-procurement
Centre for Environmental Studies in the Hospitality Industry	Sustainable Food Procurement for Contract Caterers and Foodservice Companies - report	http://www.business.brookes.ac.uk/research/files/Companion.pdf

Name	Overview	Weblink
Sustainable Development Commission	Sustainable food procurement in the NHS	http://www.sd-commission.org.uk/publications/downloads/020501%20Sustainable%20food%20procurement%20in%20the%20NHS.pdf

4 What is the relevance of review's findings to public sector sustainable procurement of construction, IT and commodities?

- This section reviews the academic and grey literature for lessons for the procurement of construction, ICT and commodities. Though relatively little academic literature was found for these three areas, the following findings emerge:
- Construction, ICT and energy all have large environmental waste impacts. Public-private partnerships and collaboration between policy-makers and contractors appear a good ways to support sustainable construction procurement.
- Barriers to sustainable construction procurement include lack of knowledge of sustainable technologies, lack of project management, lack of appropriate procurement systems, lack of market, lack of political will and focus on profitability.
- In ICT, public sector buyers are the key players for environmentally responsible computer purchasing, and can do this by incorporating environmental criteria in the evaluation of contractors, as well as adding environmental criteria into contracting language.
- ICT contracting processes are currently too rigid and slow to keep up with market and technology changes.
- Middle managers in energy companies emerge as supportive of environmental action, but frustrated in practice.
- Green purchasing of coal reduces mercury emissions and LCA shows that don't pay a premium for this.
- Studies of sustainable food procurement have found a variety of barriers to sustainability in the food industry. Studies have ranged from investigating CSR, environmental issues, and risk exposure in supply chains.
- A variety of websites are available to assist food procurement practitioners including Defra and Food Vision; this is one area where there is a lot of information for practitioners.

This section of the Review addresses the third main review question: What is the relevance to public sector sustainable procurement of the findings from review question 1 (the role of strategic/sustainable procurement in successful organisations) and review question 2 (tools used to deliver strategic/sustainable procurement), particularly in the areas of construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities?

This section focuses on the findings in relation to construction/FM, ICT and commodities. These three sectors were chosen for review as together they cover the vast majority of public procurement activity and also typify very

different types of procurement, for example, long term infrastructure, fast evolving electronics and commodities that tend to be high volume/low cost.

The general lessons drawn from considering review question 3 for sustainable procurement policy, practice and research 3 are given in section 5: Discussion and conclusions.

Few articles on these areas were identified in the initial review, and further searches were conducted using specific search terms (e.g. construction, facilities, IT, commodities etc) in combination with existing search terms (environment, supply, etc). The searches still did not yield many articles, suggesting that little research has been published in these areas. As they are deemed to be important by the commissioners of this literature review, these under-researched areas may present opportunities to fund future study.

Construction/facilities management

This section considers opportunities for sustainable construction. Articles and websites on sustainable ‘facilities management’ were not identified in the review, so we decided that searches on ‘construction’ might provide some useful findings. We found five academic articles and two websites that provided information on sustainable construction, and these are reviewed below. The construction industry makes a contribution to social and economic development of a country, but has major impacts on the environment. Construction is a major consumer of non-renewable resources (energy in particular), a substantial source of waste, a polluter of air and water and an important contributor to land dereliction.

The UK government has established an agenda for ‘greening’ government activity. As the government accounts for approximately 40 per cent of all UK construction procurement, it is actively encouraging sustainability initiatives in this particular sector. However, there have been criticisms of its approach. One paper identified in the review investigates whether sustainability targets are being met in the construction of social housing, and finds that sustainability is currently seen as a low priority and that government initiatives have yet to make a significant impact (Hall & Purchase, 2006).

A study in the US suggests that the key to clean, renewable and healthy futures for society(s) can be seen in the need to consider how all infrastructure areas such as water, waste and transportation, energy are treated. They suggest public-private partnerships can create and provide ‘funds’ for infrastructure development along with private sector innovation (Clark, 2007). A study of Canadian engineering projects reviews the impact of procurement policy, contract pricing, prescriptive codes, and public policy on innovation in sustainable construction (Hartshorn, Maher, Crooks, Stahl, & Bond, 2005). Several examples of innovative design and sustainable

development are provided. The authors suggest that the most effective means of promoting the sustainability of built environment and civil infrastructure systems will be through inter- and intra-industry collaboration with the support of public policy-makers.

A study has developed a method of assessing the life cycle of a building which allows everyone (i.e. client, investor, contractor, etc.) who has to make the decision to design alternative building life cycles and to evaluate their qualitative and quantitative aspects (Banaitiene et al., 2008). This approach, in which various criteria can be employed, is intended to support the decision making on a building's life cycle selection and increase the efficiency of the resolution process. The procedure for evaluating a building's life cycle is discussed using an example.

A study in Bahrain identified constraints to sustainable construction, and differentiated between how policy-makers, lead consultants and contractors viewed barriers to implementing Building-Integrated Photovoltaic (BIPV) or Wind Energy (BIWE) (Alnaser & Flanagan, 2007). The policy-makers saw constraints as a lack of awareness of sustainable technology, low cost of electricity, gas and oil and difficulty in applying local environmental taxes. The consultants attributed the constraints to ignorance of life cycle costs of BIPV and BIWE, lack of education in sustainable design, the political system, shortage of markets importing sustainable technologies and client worries over profitability and the pay-back period. The contractors are found to be very enthusiastic towards sustainable building projects and prefer to have a construction manager to coordinate between the design and contracting team. Design and Build was found to be the favourable procurement method in Bahrain for conducting BIPV or BIWE projects. Another study identifies the lack of sustainable construction in the Southern Africa Development Community (SADC) public building sector. Inappropriate project organisational structures and a poor procurement system are barriers, and EMS is viewed as the way forward (Rwelamila, Talukhaba, & Ngowi, 2000).

In our search of websites we found a few relevant sites. Building works require long term planning but give opportunities for sustainable procurement projects. The Building Research Establishment Environmental Assessment Method (BREEAM) allows the sustainability of the building to be assessed. A number of tools are available on the BREEAM website (Building Research Establishment Environmental Assessment Method, 2008). The Waste and Resources Action Programme (WRAP) has also developed an online Recycled Content toolkit to help construction project teams to assess, increase and report on the recycled content of their projects with the aim of keeping material away from landfill sites (Waste and Resources Action Programme, 2008).

ICT

This section reviews articles and websites on the sustainable procurement of ICT, with one article on the green purchasing of computers in California being particularly helpful. Environmentally responsible public procurement has been investigated in the context of computer purchasing at US state level, and is seen as a driving force in the integration of environmental policy instruments (Li & Geiser, 2005).

Li et al (2005) make some interesting observations regarding computer and electronic waste:

'Electronics are the fastest growing product in the municipal solid waste stream. The volume of electronics waste is rising at 3-5 per cent per year. In 1998, more than 20 million computers became obsolete, among them only 11 per cent were recycled. By 2004, as many as 315 million disposed, obsolete computers could introduce 4 billion pounds of plastic, 1 billion pounds of lead, 2 million pounds of cadmium, and 400,000 pounds of mercury into the waste stream (EPA., 2001). Of 5-7 million tons of computers, monitors and other peripherals that become obsolete in the US each year, up to 80 per cent of them, often collected under the name of 'recycling', are sent to less developed countries such as China, India and Pakistan to be manually recycled. These wastes are managed there with very low technology, no or little knowledge of risks, and, sometimes, with bare hands. The land, air, and water are heavily polluted. The health of workers is threatened (Silicon Valley Toxic Coalition, 2002). Materials "mined" this way, some of them toxic, may end up in the products that are produced in these developing countries and exported back to the countries where those electronic wastes originated. The end-of-life management (if the manual separation of those electronics can be called that) and the disposal of them give rise to severe impacts to both the environment and the human health, especially to those who work in these operations and live next to them. The total costs of dealing with these wastes are not incorporated into the purchasing process, therefore the environment and the public are the ones who ultimately pay the costs in the form of deteriorated environmental quality and impaired health. The most effective way to avoid this situation would be by dealing with this problem at an early stage of its life-cycle, i.e. at the point of purchasing.' (Li & Geiser, 2005)

They summarise the requirements for an environmentally preferable computer as follows:

- Environmental responsibility at the corporate level,
- Established environmental management system,
- Proper end-of-life management,
- Cooperation with professional electronics recycling companies,
- Offering take-back or trade-in program,

- Environmentally benign product design,
- Reduced or eliminated toxic substances in products and batteries,
- Design for longevity and recyclability,
- Not using materials that have persistent impact on the environment such as ozone depleting substances and chlorinated solvents,
- Environmentally responsible packaging,
- Reduced packaging materials and reduced harmful substances in packaging materials,
- Manufacturing packaging materials without using materials that have persistent impact to the environment such as ozone-depleting substances and chlorinated solvents,
- Energy conservation and high energy efficiency.

Their research identified that contracting officials are the key players for environmentally responsible computer purchasing, and can do this by incorporating environmental criteria in the evaluation of contractors, as well as adding environmental criteria into contracting language. They also observe contracting processes are currently too rigid and slow to keep up with market and technology changes.

In our search of websites for tools to help with ICT procurement, we found Computing.co.uk has a simple seven point Green Computing Charter which aims to offer guidelines for IT departments to reduce their environmental impact (Computing.co.uk, 2006). ICT equipment is included in Defra's list of Government Buying Standards which provide links to full specifications, information on the key issues around sustainable procurement in the area and tools to help decision-making. (Defra, 2010). The Electronic Industry Code of Conduct (EICC) (Electronic Industry Citizenship Coalition) is a code of best practice adopted and implemented by some of the world's leading electronics brands and their suppliers. EICC members have developed tools and the organisation acts as a forum for sharing best practice.

Commodities

Our review of articles and websites on commodities focused on studies of energy and of food. For energy, we found very little in the academic review, but a few websites seemed relevant. For food, there were more academic articles and websites.

Energy

No studies were found that investigate how the private sector purchases green energy. One study investigated managers' views of environmental issues in two electricity companies heavily reliant on coal. It found managers were sincerely committed to environmental action, but often frustrated by confusing regulatory requirements, perceived costs, and other challenges. It identifies ways of enabling middle managers to act on their commitment (Fischhoff, 2007).

One study in the US investigates green selective purchasing of low-mercury coal to reduce mercury emissions, without a significant premium (Johnson, Lai, & Wortman, 2008). A study in South Africa uses a LCA methodology to evaluate and compare environmental performance with the economic value of coal products (Mangena & Brent, 2006).

In our search of websites, we found the utility sector has an independent sector-specific pre-qualification scheme called Verify which provides detailed assessments of supplier performance and capabilities in the areas of health & safety, environmental management and quality (Achilles, 2008). By completing one questionnaire suppliers are able to pre-qualify for supplying 50 utilities companies; a similar scheme for the public sector would be an interesting proposition.

The Energy Consortium are a not-for-profit organisation established to purchase energy exclusively for the higher education sector (The Energy Consortium, 2008). The Energy Consortium is taking a lead role working with other environmental bodies over the pursuit of sustainability and green initiatives and offers sustainability advice to its members.

Food

One study aimed to support the UK Public Sector Food Procurement Initiative by working with leading contract caterers to develop principles of sustainable food procurement and key performance indicators to measure progress in putting them into practice. Public sector catering is only 7 per cent of the total catering market by value. Therefore progress in this sector has a limited impact on the overall catering food supply chain. Only five of the original nine principles were adopted, so not all aspects of the sustainability agenda may be addressed (Rimington, Smith, & Hawkins, 2006).

Another study uses Sustain's 'sustainable food' criteria, and analyses the sustainability of a number of 'speciality' food supply chains operated by small rural enterprises in the Scottish/English borders. Results indicate that the case study businesses are not particularly sustainable; instead, driven by a strong economic imperative, they often have to 'dip' into various 'links' associated with more conventional (commodity-based) food supply chains. The paper concludes by warning against the tendency to conflate terms such as 'local', 'alternative', 'speciality' and 'sustainable' (Ilbery & Maye, 2005).

The food industry faces many significant risks from public criticism of corporate social responsibility (CSR) issues in the supply chain. One study develops a framework which details unique CSR applications in the food supply chain including animal welfare, biotechnology, environment, fair trade, health and safety, and labour and human rights. General supply chain CSR issues such as community and procurement are also considered. The framework serves as a tool to support food industry practitioners and

researchers in the assessment of strategic and operational supply chain CSR practices (Maloni & Brown, 2006).

Some studies have focused on specific food supply chains. One study of GMO-Free Soybeans suggests a framework to help companies reduce their risk exposure and make progress in sustainable supply chain management, following consumer pressure to remove genetically modified soybeans from products (Teuscher et al., 2006). The tomato ketchup supply chain is the focus of a study of integrating environmental policy into the supply chain (Mintcheva, 2005), identifying indicators for measuring impacts and recommending a holistic approach. One study investigates the environmental impact of future milk supply chains in Sweden, using scenario planning and mathematical modelling (Sonesson & Berlin, 2003). They suggest a LCA approach is helpful, and identify the amount of packaging materials and the transport of dairy products to households as important factors.

One study investigates the UK pork sector, and uses value chain analysis to increase a cooperative approach between supply chain members, ultimately encouraging UK supermarkets and consumers to buy UK pork and keep jobs local (Taylor, 2006). A further study of environmental management of the meat supply chain found the need for greater analysis of environmental impact categories and problems (Schiefer, 2002).

One study examines the Dutch potato supply chain and identifies constraints on conversion to organic potato production from a business administration and a public administration perspective, including the demand for ecologically produced products and the problem of cultivating potatoes. Conversion is constrained by the limited influence of network parties such as NGOs and current government policies. They conclude that the ecological approach (organic farming) may not be as effective as strengthening a more generic approach stimulating the sustainability of the sector (Smit, Driessen, & Glasbergen, 2006).

In our search of websites, we found a lot of guidance and case studies available through Defra, the Sustainable Development Commission, the Soil Association and the Food Ethics Council. Food Vision and Environmental Practice at Work provide sustainable procurement toolkits. Industry websites are also available, such as the Centre for Environmental Studies in the Hospitality Industry. Information is also provided by the King's Fund, London Development Agency and other local government sites. Some companies have established themselves to meet this market (e.g. Sustainable Food, f3).

5 Discussion and conclusions

This study reviewed literature from mainstream business, environment, CSR and public administration journals to draw out lessons for sustainable SCM. It identified a range of social, environmental and economic issues in the literature on sustainable SCM, as well as factors affecting it including collaboration with suppliers, risk, service supply chains and the influence of the public sector. The themes identified in the literature review are summarised in a conceptual framework in Figure 3, which incorporates the triple bottom line (Elkington, 1998) of social, economic and environmental dimensions (Carter & Rogers, 2008; Seuring & Müller, 2008b) yet fleshes out the details of what themes sit within and constitute social, economic and environmental SCM, and expands upon the factors affecting sustainable SCM.

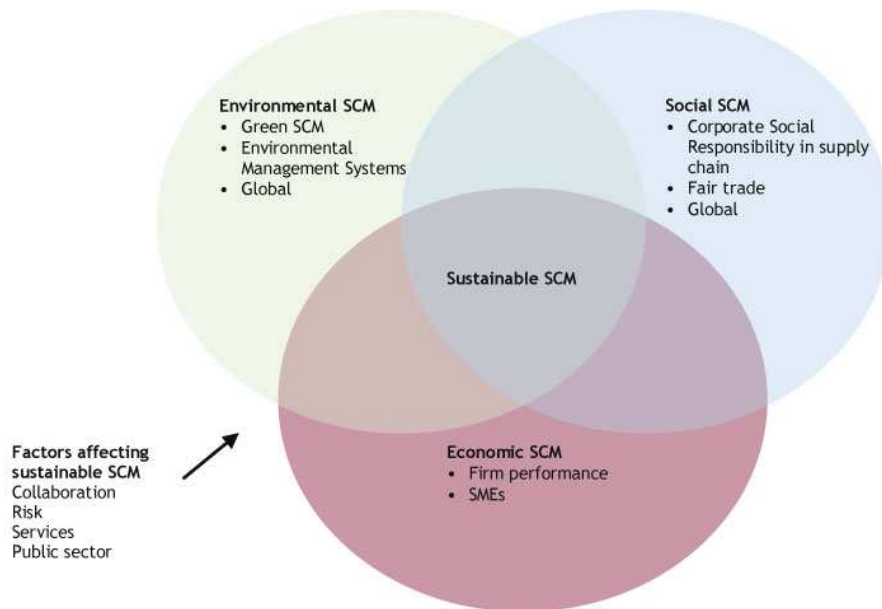


Figure 2: A conceptual framework for sustainable supply chain management (SCM)

This section considers the general lessons for sustainable procurement policy, practice and research that can be drawn from the literature in relation to the third review question, ‘What is the relevance of 1 and 2 to public sector sustainable procurement?’ The previous section considered the lessons in relation to the specific areas of construction/facilities management (FM), information and communication technology (ICT) and procurement of commodities.

5.1 Review question 3a: What lessons can be drawn for public sector policy-makers?

Looking across the academic and grey literature we can draw out lessons for policy-makers across a range of government departments, for example, Defra, OGC, HMT, and at different levels of government, local, regional, national and European. These are summarised below.

Lessons for policy-makers

- This study assumes that the public sector can learn something from the private sector about strategic and sustainable procurement. The majority of research in sustainable procurement in the private sector has been conducted in manufacturing settings, which may at first appearance have limited directly transferable lessons for the public sector. However, such studies investigate how firms buy and supply, and how they manage relationships with suppliers in pursuit of sustainability objectives. As such buyers in the public and private sector share common ground in the need to manage strategic purchasing and supply relationships, and it follows that insights may be drawn from the private sector.
- Evidence from the private sector suggests that organisations that engage in strategic purchasing and sustainable supply chain management tend to perform better.
- It follows that if the same is true in the public sector, strategic purchasing and sustainable procurement may improve performance in public sector terms such as efficiency and value for money rather than profits.
- All studies measuring improvements in performance have been in the private sector. Studies in the public sector are needed (see lessons for research).
- Policy-makers should consider working with industry bodies that are developing codes and guidance for greening construction, energy and ICT. There are indications that firms that are in direct competition are beginning to collaborate on sustainability as they consider it an important issue to share best practice on. Industry bodies and trade associations may be good conduits for collaboration across firms, and for government to engage with.
- The public sector, by virtue of being concerned with societal well-being and due to being a big customer (16 per cent GDP in UK spent by public sector on goods and services), seems the natural lead for sustainable procurement. Public procurement has the ability to stimulate markets and innovation, and encourage greener products and services onto the market that will be available to all.
- Private sector firms have a variety of reasons for being involved with sustainable procurement, and a review of the websites suggests many may be paying ‘green lip service’ by providing sustainability policies that are not backed up by action. There is a gap between the rhetoric of corporate environmental policies and the reality of their environmental supply chain practices (Preuss, 2005).
- Very few firms share sustainable procurement tools on their websites, due in part to their desire to protect competitive advantage. Public sector sites are better sources of sustainable procurement tools.
- Whilst it has been argued that government, consumers and businesses all play a role in sustainable SCM and consumption (McCrudden, 2004; National Consumer

Council & Sustainable Development Commission Roundtable, 2006), governments need to recognise that their position as one of the biggest customers of goods and services in a country, they can have an important role in leading the way. Regulation is an important aspect of encouraging sustainable SCM in firms. Firms engaging in green supply often do so in response to regulation (some are more pro-active than reactive), and tend to be larger firms in sectors where regulation is high.

- Progress towards the environmental aspects of sustainable procurement by member states of the EU is available in the form of National Action Plans (European Commission, 2010).
- The government may look at incentive schemes for green businesses as they are often deterred by perceived or upfront costs.
- Policy-makers need to consider developing guidance for how to balance the three elements of sustainable procurement, and how procurement practitioners should choose between social, economic and environmental impacts.
- Policy-makers need to consider how sustainable procurement policy fits with the SME agenda, as buying from local SMEs can support local economic development.
- Policy-makers need to develop policy on sustainable SCM issues in global supply chains, considering CSR performance of suppliers in developing and rapidly emerging economies. They need to consider exposure to reputational risk if found to be buying from suppliers with poor environmental, labour, health and safety practices etc.
- Policy-makers could work with NGOs and industry bodies to provide procurement policy on fair trade for public sector buyers.
- Government need to encourage the implementation of environmental and social standards.

5.2 Review question 3b: What lessons can be drawn for public sector practitioners?

Looking across the academic and grey literature we can draw out lessons for practitioners. These are summarised below.

Lessons for practitioners

- Considering strategic purchasing first, looking across countries, buyers indicate a desire to be more strategically involved with their firms. The Chartered Institute of Purchasing and Supply (CIPS) has a role in promoting the strategic importance of purchasing. Practitioners can ensure they are aware of the strategic direction of the organisation, and ensure that procurement strategy is aligned with that. The procurement function in companies would also benefit from being represented at board level.
- Across the literature (and indeed debated at conferences such as the International Research Study on Public Procurement in Paris (2007) and the International Purchasing and Supply Education and Research Association conference (2008) in Perth) there is an issue about how procurement is valued within firms and as a profession, and UK practitioners were found to rate themselves particularly low (Ogden et al., 2007). The reasons for this and how it might be redressed are unclear, but are likely to apply in the public as well as private sector.
- Strategic purchasing in the private sector is characterised by practices such as supply base rationalisation, supplier evaluation, information exchange, sharing knowledge, driving innovation, and has a high status and professionalism. Public sector practitioners may benefit from adopting similar practices to their private sector counterparts, but may be constrained in following best practice from the private sector for fear of infringing EU Procurement Directives that seek to support an open market and level playing field.
- With sustainable procurement, successful firms introduce the following practices: recycling, proactive waste reduction, remanufacturing, environmental design, specific design targets, surveillance of the market for environmental issues, EMS, and implementing projects that show both financial and environmental benefits.
- There is a positive relationship between firms that engage in sustainable SCM and improved performance.
- Increasingly, organisations need to consider sustainability issues in complex global supply chains.
- Collaboration with customers and suppliers on sustainable supply issues has been found to be beneficial in quite a lot of studies.
- Practitioners may want to approach their sustainable procurement strategies in terms of minimising exposure to environmental, social, economic and reputational risk in their supply chains.
- As well as focusing on product supply chains, companies need to consider sustainable SCM in their service supply chains.
- Many private firms approach sustainable SCM with supplier assessment, and tools are available on websites.
- A range of tools to support sustainable procurement are available for practitioners, and the majority are easily accessible on public sector websites.

5.3 Review question 3c: What are the implications for (the commissioning of) future research?

A descriptive analysis was conducted of the academic literature (see the Appendices for details), that revealed that publications on strategic and sustainable procurement are increasing each year, indicating this is a ripe area of investigation. We have identified over 200 articles in the original searches (which expanded when we explored papers referenced within these articles); this seems a sufficient number for this literature review - too few or too many and the literature review would be less rigorous. The following observations can be made from the descriptive analysis, and from looking across the literature review, regarding future research directions.

Lessons for research

- Of the identified articles in this review, 127 articles were published in operations and supply journals, with 78 in environmental and business ethics journals and only 14 in general management journals. This suggests studies of sustainable procurement may be of interest and conducted by the operations and supply academic community, with less purchasing and supply research prevalent in the environmental and business ethics community (although there will be overlap). The lack of studies in general management journals is reflective of the lack of general management articles on purchasing and supply as a whole.
- Commissioning of sustainable procurement research might therefore do best to focus on those operations and supply academics conducting sustainability research, rather than looking to the environmental/business ethics community.
- The lack of articles in general management journals seems to affirm the view that management still has not woken up to the value of strategic purchasing. Purchasing professionals still need evidence of the impact of purchasing on firm performance to justify the relevance of their work (Carr & Pearson, 2002). Purchasing and supply academics can play a role in evidencing the value of strategic and sustainable procurement for their practitioner colleagues.
- We have not identified many academic articles, grey literature or tools on the three specific sectors of interest: i) estates and facilities management; ii) ICT; iii) commodities. This represents a knowledge gap, and the three sectors could provide the setting for future research studies.
- Some of the tools identified in the search of academic journal articles rely on mathematical modelling techniques and are not very practical; the searches of grey literature and company websites identified more practical tools. Future research could focus on the development and testing of practical tools, in the tradition of applied research that is both scholarly and relevant to practitioners.
- There are far more environmental SCM (146) papers than social or economic ones (44), suggesting a knowledge gap and an area for future research. In recent years an increasing number of studies (22) combine all three aspects of sustainable SCM.
- In terms of the causal relationship between sustainable SCM and firm performance, we found studies arguing that engaging in sustainable SCM makes firms perform better, but no studies argued the reverse causality that firms

that perform better also happen to engage in sustainable SCM. More in-depth studies are needed to explore direction of the relationship. This could be an important interrelationship for future research to tease out during a period of economic recession, to explore whether it is only successful firms that can afford to focus on doing good, or if the economic climate moderates engagement in sustainability activities as firms focus resources on economic survival. The moderating effect of an economic recession on sustainable SCM is therefore a further area for future research.

- Exploring the economic elements of sustainable procurement could expand from a restricted view of economic benefit generated within the boundaries of the firm, to having a more holistic view that encompasses economic benefits generated for the community and beyond, as has been observed in studies of sustainable procurement in the public sector. However, having broader economic benefits need not be the preserve of public sector organisations. Just as business ethicists are arguing for the need for responsible businesses to moved beyond a preoccupation with shareholder value to consider other stakeholders (e.g. Freeman, 1984), it may be that sustainable SCM generates a variety of benefits for such stakeholders beyond the boundaries of the firm.
- More research is needed that combines measurement of all three elements of sustainable SCM, and considers how to balance these social, environmental and economic aspects. This would help with buyers' conundrums such as is it more important to support suppliers in developing countries or local suppliers? For example, is it better to buy cut flowers for sale in Europe from Kenya to support producers in developing countries, despite the carbon emissions associated with transportation, or is it better to buy from a European supplier that grows flowers in greenhouses, with less transportation and benefits for local employment, but with more energy used in the process?
- Balancing the social, environmental and economic elements of sustainable procurement relates to policy, as there is currently no guidance on how to balance the three elements.
- There are far more studies conducted in the private (177) rather than public sector (14), which reaffirms the need for this Review which draws lessons from the private sector, but also indicates that much more research is needed in the public sector.
- It would be good to have in-depth analysis of the sustainable procurement policy context in different countries.
- It would also be valuable to see more service sector studies, as this is a nascent area of interest in the SCM field.
- It would be interesting to conduct more studies at the level of purchasing decision-makers, to consider how individual factors such as a personal interest in sustainability or attitude to ethical buying influence sustainable SCM. It would also be interesting to explore whether purchasing and supply professionals experience sustainable SCM 'fatigue', and whether the sustainability agenda can seem overwhelming, making it difficult to know where to start or which issues to prioritise.
- More research could be conducted adopting a risk perspective on sustainable SCM, assessing social, economic and environmental risks along supply chains. This could include consideration of organisations paying green lip service to sustainable SCM and treating it as a public relations exercise, and the extent to which firms engage in sustainable SCM in order to manage reputational risk.
- The majority of studies have been in North America, Canada and South East Asia. More studies could be conducted in developing countries including South

America and Africa. Ethics, acceptable labour practices and other sustainable SCM issues mean different things in different companies and countries (Carter, 2000; Cooper, Frank, & Kemp, 2000; Gonzalez-Padron, Hult, & Calantone, 2008; Tadepalli, Moreno, & Trevino, 1999). Concern for cultural relativism needs to be considered in sustainable SCM research, and whether developed countries' conceptualisations of sustainability and CSR are being imposed upon developing countries along global supply chains (e.g. Robertson & Crittenden, 2003). In the era of globalisation and offshoring, studies investigating sustainable SCM in developing and newly industrialised countries are a priority.

- The methods adopted for investigating the various aspects of procurement are mainly surveys (62) and case studies (66), indicating a balance between quantitative research describing sustainable SCM, and qualitative research exploring in more depth the 'why and how' of sustainable SCM. Some articles reveal novel ways of analysing CSR reporting (Montabon et al., 2007), which may prove a fruitful research direction for comparing country, sector or organisational sustainable procurement policies and practices in the public sector.
- There is a proliferation of ways of measuring strategic and sustainable procurement, with different metrics used across the 62 survey articles, and metrics being the focus of a few papers (Clift, 2004; Hervani et al., 2005). There are just as many different ways to measure firm performance (see the Appendices for further details). These metrics could be reviewed in more detail and compared with, for example, efficiency metrics and national indicators for local government, to refine a set of outcome measures for both sustainable procurement and its impact on organisational performance. If we are to evidence the value of sustainable procurement policy and practice, such metrics seem a crucial area for further research.¹⁷

This review has aimed to provide an improved understanding of successful businesses and their approaches to procurement and the relevance of these to the debate on sustainable public procurement. Sustainable procurement is viewed here as the pursuit of sustainable procurement objectives through the purchasing and supply process, incorporating environmental, social and economic elements. The review found that businesses that engage in strategic purchasing and supply practices tend to perform better. It also found that businesses that engage in a range of sustainable purchasing and supply practices tend to perform better. It seems that sustainable SCM is an important and expanding area of research. The better sustainable SCM is understood, the more organisations can contribute to the sustainable development agenda through their purchasing and supply activities.

Three sectors, (1) construction/facilities management (FM), (2) information and communication technology (ICT) and (3) procurement of commodities, were chosen for review as together they cover the vast majority of public procurement activity and also typify very different types of procurement, for example, long term infrastructure, fast evolving electronics and

¹⁷ Defra has already commissioned research on determining which metrics best assess how successfully the UK procures sustainably to be published in late 2010.

commodities that tend to be high volume/low cost. Few academic articles on these sectors were identified, and as they are deemed to be important given the proportion of public procurement spending they account for, these under-researched areas may present useful areas for future study. Other areas for future research include how to balance the social, economic and environmental impacts of sustainable procurement, how sustainable procurement policy fits with the SME agenda, and sustainability issues in global supply chains especially developing countries and emerging economies. Sustainable procurement research and practice are changing apace, and future research could usefully include more qualitative research to get a better depth of understanding of this important policy issue.

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