

A field-level examination of the adoption of sustainable procurement in the social housing sector

1. Introduction

Sustainability is receiving an ever-increasing amount of attention from the media (Thøgersen, 2006) and over the last decade has found its way onto many boardroom agendas, owing largely to stakeholder pressure (Eesley and Lenox, 2006), regulation (Zhu and Sarkis, 2007), and competition (Nikolaeva and Bicho, 2011). In line with corporate interest in sustainability it is becoming a popular area of academic research in the management domain (Crespin-Mazet and Dantenwill, 2012; Walker and Jones, 2012; Meehan and Bryde, 2014). Procurement plays a key role in delivering sustainable outcomes through creating, developing, controlling and sustaining the links between organisations and their supply chains to avoid commitments that are only “superficial and non-compulsory” (Hassini, Surti and Searcy, 2012, p.69). Managing external relationships and third-party spend is important as there is a potential mismatch between the rhetoric of sustainability policies and the extent to which they are reflected in organisations’ operations. The misalignment in part stems from the various definitions and foci of the term sustainability which can add confusion for the basis for action (Glavič and Lukman, 2007).

The extant sustainability literature derives largely from exploratory cross-industry research to identify common trends and patterns. Cross-industry research helps our understanding of generic progression but can mask contextual nuances that are

necessary to support sound decision-making and the application of findings. As the sustainable supply chain field matures, a number of detailed country/sector studies are emerging providing deeper analyses of core contextual issues (see, Bergenwall, Chen and White, 2012; Liu, Li, Wang and Dong, 2012; Yusuf, Gunasekaran, Musa, El-Berishy, Abubakar and Ambursa, 2013). These studies have led to a call for more industry-specific research on sustainable supply chain management (Hassini et al., 2012) as the studies' results highlight different levels of maturity between industries owing to different contextual, competitive, isomorphic and regulatory pressures. The majority of sector-based studies focus on mature, global manufacturing supply chains of multinational organisations (Hoejmose, Brammer and Millington, 2013; Dam and Petkova, 2014; Huq, Stevenson and Zorzini, 2014) and centre predominantly on the environmental aspects of sustainable procurement (Blome, Paulraj and Schuetz, 2014; Lo, 2014; Simpson and Sroufe, 2014) with economic and social dimensions gaining little coverage. Sustainable procurement in public sector contexts is also underrepresented in the extant literature (Walker and Brammer, 2012) despite the considerable economic, financial and social consequences inherent in public procurement.

In response to the calls to address under-represented areas of study and to provide more detailed industry-level analysis, this paper reports on a field-level examination of the adoption of sustainable procurement in the social housing sector. The research explores the dimensions of sustainable procurement and considers the contextual opportunities and challenges for the sector in relation to network structures. Through a case study of the UK social housing sector and an online survey (N=116), sustainable procurement activities are delineated to identify

prevailing attitudes at a field level and to explore the role of consortia structures in delivering sustainability. The underpinning context of the study is situated in the broader public sector policy landscape, which is timely and significant given the ideological shifts in conceptualisations of the state and collaborative working (Ashworth, Ferlie, Hammerschmid, Moon and Reay, 2013), and the broader impacts arising for operations and procurement management.

2. The global impact of social housing

Housing has deep rooted connections to sustainability. Through the provision of shelter, security and societal inclusion it affects peoples' quality of life. Under the Universal Declaration of Human Rights (Article 25), housing is a basic human need alongside food, clothing, medical care and social services (United Nations General Assembly, 1948). The location, construction and maintenance of housing contributes to community identity and environmental impact and the significant spend in their supply chains, which totalled £8.8bn in the UK for 2013 (Homes and Communities Agency, 2014), drives economic growth.

Social housing provision differs by country and there is no common definition or concept, even across EU member states. In the UK, social housing describes residential properties available for rent at affordable rates from local authorities or housing associations. Across the globe, social housing provision is set against different national and regional economic, political and social backdrops. For example, in the Middle East and North Africa the absence of affordable housing has been linked to social unrest and political instability (Kan, 2014). The poor health of

the world economies has reduced banks' willingness to provide mortgages to homebuyers and investors (Adair, Berry, Haran, Lloyd and McGreal, 2009) and increased social housing demand (Wilcox, Perry and Williams, 2014). On a macro-economic level, the emphasis of sustainability varies according to wider geo-political systems in place, market demands, and the nature of supply. In developing and emerging countries the need to construct new homes to meet demand is a key challenge and economic and social sustainability-related criteria are important. To illustrate, data from 16 countries with emerging economic markets (Iran, Iraq, Saudi Arabia, Russia, China, Pakistan, India, Vietnam, Philippines, Mexico, Brazil, Argentina, Nigeria, South Africa and Egypt) suggested a shortfall of 35million affordable housing units creating a global opportunity to build homes with a combined value of \$600-\$700bn (McKinsey & Co, 2013). In developed countries, as well as looking to meet demand through construction of new housing there is the major challenge of maintaining and upgrading existing housing stock. Studies of countries across Europe (Kolokotsa and Santamouris, 2014) and of the United States (Walliner, Rajkovich and Forester, 2012), highlight that environmental sustainability and improving the energy efficiency of housing is high on the agenda.

Procurement drives substantial economic impact of both product and labour demand. Projections estimate the construction of two million affordable homes create demand for 16M tonnes of cement, 6M tonnes of steel, \$1.1bn of plumbing, \$0.7bn of electrical equipment, \$0.5bn of paint and \$0.2bn of wood (McKinsey & Co, 2013). The extraction, transportation, processing, construction, maintenance and disposal of materials use high quantities of energy, water and create waste and pollutants. In the UK, over 90% of non-energy minerals extracted are used for

building materials (Cooper and Jones, 2009). In addition to balancing the trade-off of this environmental impact with the benefits of the economic stimulus it brings, the social housing sector seeks to deliver improved social outcomes to a range of community issues including crime, health, employment and education (Monk, Tang and Whitehead, 2010).

2.1 The UK social housing sector

In the UK, social housing is technically outside of the public sector, but is often considered as a quasi-public sector (Kellaway and Shanks, 2007) as it is government-regulated operating under central government's housing and welfare policy frameworks and adheres to EU public procurement regulation. Moreover, two-thirds of social housing providers' rental income is from government-controlled Housing Benefit (Laffin, 2013). The sector is economically important; in 2013, the typical cost base for a UK provider was £210M and the sector's total expenditure was £8.8bn (Homes and Communities Agency, 2014), which was dominated by local supply chains (Dayson, Lawless and Wilson, 2013). In addition to the economic consequences the sector views sustainability as a priority to connect local economic stimulation, environmental impact, social justice and personal wellbeing (Homes & Communities Agency, 2014).

Social housing represents approximately a fifth of UK homes but regulation and influence of government policy differentiate it from other housing sectors (Reeves, Taylor and Fleming, 2010). In the UK, the sector in its current form is relatively new. Municipal housing was traditionally the domain of local authorities and council

housing accounted for 92% of all social housing in 1981 (Pawson and Sosenko, 2012), dropping to 40% by 2006 (Cowan and Morgan, 2009) following the rise of large-scale stock transfers from local authorities to housing associations (HAs). The transfers were a result of changes in the regulatory framework during the early 2000s which prevented local authorities from subsidising housing development and improvements from local taxes (Dayson et al., 2013) and led to the social housing sector in its current form. HAs are regulated by the government and financed through a mix of government grants, investment loans and tenant rents (Pawson and Sosenko, 2012), the latter being subject to welfare reform comprising of universal credit, direct payments to tenants (rather than providers) and under-occupancy penalties.

The UK social housing sector comprises of approximately 1,500 providers, who own or manage about 2.7M homes. HAs also engage in diverse activities including regeneration, provision of community centres, training facilities and other community services (Homes and Communities Agency, 2014). Through these activities HAs play a critical role in initiating a sustainability agenda (Meehan and Bryde, 2014) through connecting environmental impact, local economic stimulation, social justice and wellbeing.

The sector's turnover in 2013 was £14.9bn, an 8.1% increase on the previous year, and total operating costs were £11bn. Turnover is projected to grow steadily to an estimated £19.6bn by 2018 (Homes and Communities Agency, 2014). The sector arguably has the greatest need for sustainable solutions. Social housing tenants proportionally spend more of their income on energy yet are often least able to afford

environmental improvements and the sector is often characterised by high levels of worklessness and social exclusion amongst tenants (Hills, 2007).

3. Conceptual background

3.1 Sustainable procurement

Sustainable development is commonly conceptualised as the 3Ps reflecting the dimensions of the triple bottom line (TBL) (Elkington, 1997) – namely, economic (profit), environmental (planet), and social (people). Purchasers need to extend traditional considerations to include the 3Ps (profit/planet/people) in their decision-making criteria and drive positive impacts in these areas through what they buy (Vachon and Klassen, 2006), who/where they buy from, the terms and conditions of what they buy, and the processes of production used in what they buy.

The ability for buyers and sellers to influence each other, and their organisations, across a range of areas covering commercial, operational, strategic and attitudinal issues (Meehan and Wright, 2011) highlights the impact that supply chains can have on corporate sustainability (Seuring, 2004). The links between procurement and environmental management in operations have been established (Klassen and Whybark, 2007; Carter and Rogers, 2008) and the social housing sector dominates many government-led energy efficiency and environmental construction initiatives (Swan, Ruddock and Smith, 2013). Yet there remains a paucity of research on the social aspects of the TBL (Huq et al., 2014).

Natural tensions exist between different TBL considerations (Sneddon, Howarth and Norgaard, 2006) creating complexities in procurement decision-making. Through a sustainability lens even the economic dimensions of traditional purchasing models are challenged. For example, buyers traditionally translated economic sustainability as using procurement to drive cost from their own organisation through global sourcing, supply base consolidation, lean and e-procurement. While these approaches deliver important commercial contributions, economic principals in the TBL go beyond an internal organisation-centric view of profitability. Issues of supply chain stability, equitable value appropriation, local economic regeneration and supply base diversity come to the fore and procurement needs to extend its view of sustainable 'profit' across a range of supply chain partners and wider beneficiaries. Extending this dimension, and the inclusion of environmental and social criteria increases the necessity to collaborate with multiple stakeholders (Camarinha-Matos and Boucher, 2012), adding further complexity to the procurement process.

3.2 Sustainable procurement issues for the UK social housing sector

The significant purchasing power of the public purse in stimulating sustainable development is emerging as a growing area of interest for academics, practitioners and policy makers (Weiss and Thurbon, 2006; Walker and Jones, 2012). The public sector has wider objectives concerned with societal wellbeing and economic development that align with TBL's principles, yet there is still relatively little research that explores sustainable procurement outside of central government or the key departments of health and education. Social housing's quasi-public status and its relative newness as a sector in its current form provide unique opportunities to

explore how sustainable procurement as a theoretical field and as professional practice is embedded by HAs. The following sections explore the conceptual framework of sustainable procurement specifically for the UK's social housing sector to identify the contextual challenges of regulatory frameworks and network consortia that frame this study.

3.3 *Regulatory frameworks*

Since April 2012, the Homes and Communities Agency has regulated the social housing sector in England with similar provision for Wales and Scotland. The regulators have a statutory duty to contribute toward sustainable communities (Homes & Communities Agency, 2012). Despite this duty the focus of activity is geared toward maintaining lender confidence and protecting taxpayers' financial risk, managed through audits of HAs' governance, financial viability and value for money.

Procurement in the UK's social housing sector is subject to the legal framework in the EU Public Procurement Directives that seek to deliver value for money, appropriate quality and service, and governance. The regulations apply when contracting authorities procure supplies, services, or works and they set out mandatory procedures to be followed before awarding a contract when its value exceeds set financial thresholds (OGC, 2011). Public procurement regulations permit sustainable procurement and the EU legislative framework through the Consolidated Directive allows for social and environmental considerations to be made in tenders and contracts (Directive 2004/18/EC, 2004) . The Consolidated Directive and associated case law have competitive principles that regulate the use

of TBL considerations in the procurement process. For example, to specify sustainability criteria certain conditions must be met; the procurement documents or process must not disadvantage non-local bidders through demanding a local base of materials or local labour market knowledge; requirements must be measureable and verifiable; fair-trade or environmentally-sourced produce can be requested but specific brands or labels cannot be specified. Sourcing decisions can be made on environmental and social criteria rather than economic benefits providing the requirements address a buyer's policy objective.

Navigating the legal procurement framework can be complex and there is conflicting evidence from the academic literature on the role that regulatory pressures play in delivering on the TBL. One school of thought is that regulation is a positive driver as it obliges companies to adopt sustainable practices through their supply chains (Ageron, Gunasekaran and Spalanzani, 2012). Other studies show that regulatory 'direct steering' (Grekova, Bremmers, Trienekens, Kemp and Omta, 2013, p.183) is less impactful on externally-orientated environmental management in the supply chain and changes are driven instead from normative pressures from within the industry.

An issue arising from a reliance on regulation is that the legal framework legislates for the procurement process but not the outcomes that must be achieved. Regulation is designed to ensure transparency and competition in the procurement process although in practice public sector buyers feel this can be restrictive to decision-making and limits their ability to engage with small companies (McLintock, 2011). Fear of contractor challenge for non-compliant procurement processes is high and

there has been a steady increase in the number of incidents in which advice was given in relation to legal challenges (Arrowsmith and Craven, 2013). Compliance to regulatory pressure, in comparison to compliance to social norms and values experienced at a field/sector level, is based on expedience (Grekova et al., 2013). The danger is that regulative pressures push buyers to prioritise process compliance at the expense of other considerations, particularly considerations like sustainability that are complex and difficult to evidence.

3.4 *Network consortia*

Individual organisations cannot meet their sustainability goals single-handedly (van Bortel and Elsinga, 2007), so a network of organisations working together is needed (Blome et al., 2014). Network perspectives are underpinned by sustainable procurement's enabling factors (Preuss, 2009) that stress the importance of broad network perspectives for stakeholder engagement. Without a synchronised network approach organisations tend toward internal benefits and short-term adaptations (Levinthal and Warglien, 1999) and thus conflict with the externally-orientated impacts and long-term temporal dimensions of sustainability. The TBL demands a collective, integrative interpretation to foster goal congruency to avoid contradictory outcomes. Harnessing a collective, shared vision of the diverse stakeholders in the network is essential, particularly for assessing social impacts (Hall and Vredenburg, 2003). A collaborative approach can be difficult to achieve in the social housing sector as their operating networks are complex, consisting of public sector regulators, third sector HAs, private sector suppliers and contractors, procurement consortia, tenants and local communities (Meehan and Bryde, 2011). In addition,

HAs' ability (or perceived ability) to engage with their supply base prior to any competitive processes is limited by the regulatory framework. Compliancy issues centre on the extent to which communications reduce the competitive tension, limit the market and enable transparency and equity to be assured. The rise in legal challenges to process compliance (Arrowsmith and Craven, 2013) can create a perceived risk to supplier engagement.

Collaboration in business communities and networks is of particular importance in implementing an effective sustainability strategy (Walker and Jones, 2012).

Procurement consortia in the sector are increasingly used as vehicles to deliver social and economic benefit and to embed the core values of sustainable procurement (Smith and Swan, 2012). Consortia provide framework contracts and are common in the wider public sector to drive commercial efficiency and benefit within supply networks (Essig, 2000). Consortia traditionally negotiate framework agreements with suppliers on behalf of member organisations at sector, regional or national levels with ordering from these contracts often locally retained. Research from the private sector contexts finds leveraged volumes provide commercial savings averaging at 10-15%, with some sectors reporting 20-35% (Nollet and Beaulieu, 2003). Less tangible benefits are claimed in relation to process efficiencies (Trautmann, Bals and Hartmann, 2009) and knowledge sharing (McCue and Pitzer, 2000).

Coopetition, the strategy of cooperating with competitors (Brandenburger and Nalebuff, 1996), is an emerging concept in the management field (Peng, Pike, Yang and Roos, 2012; Ritala, 2012) and is influenced by a number of structural network

properties and network dynamics (Gnyawali and Madhavan, 2001). Many of the extant studies on the phenomenon of coopetition focus on mature markets, where simultaneous competition and cooperation with competitors is used to secure market positions, drive additional mutual value, or lower resource costs. This study differs as the social housing sector is relatively new and the motivations for coopetitive working differ. Social housing procurement consortia emerged as there were considerable opportunities to pool and leverage spend across HAs on major, and complex, government-funded capital programmes as the sector developed (e.g. Decent Homes, Welsh Housing Quality Standard, and Scottish Housing Quality Standard). Another key motivation was that individual HAs lacked the resource and procurement skills to procure and manage these contracts. Consortia provided co-procurement economies of scale to enable greater influence through HAs' supply networks. Procurement consortia typically provide long-term supply chain partnering contracts to suppliers to minimise major programmes' peaks and troughs, improve delivery outcomes, tenant satisfaction and provide social benefit through training and local jobs (Varnäs, Balfors and Faith-Ell, 2009). Social housing consortia have also grown in response to severe budget constraints and the increased regulatory pressures to deliver sustainable outcomes for tenants and communities.

Larger organisations can adopt sustainable practices easier than SMEs (Hassini et al., 2012). Although the reasons are not clear in the literature, access to more resource, absorptive capacity (Cohen and Levinthal, 1990), and their potential to influence others in their network are likely to explain this advantage. However, a deeper critique suggests that it is perhaps procurement maturity, rather than size *per se*, that contribute to more sustainable activities. For example, enablers identified

include; e-procurement and supply chain communication systems (Walker and Brammer, 2012); segmentation strategies and feasibility assessments of suppliers and sub-suppliers (Grimm, Hofstetter and Sarkis, 2013); risk management planning and supplier capability assessment (Foerstl, Reuter, Hartmann and Blome, 2010); and in-depth, onsite supplier audits (Darnall, Seol and Sarkis, 2009). Strategic sophistication is implicit in these activities mirroring multiple dimensions of procurement maturity - planning, internal structure and status, embedded organisational processes, leadership and procurement controlling structures (Schiele, 2007), in comparison to lower levels of procurement maturity with goals commonly focused towards cost reduction (Reck and Long, 1988). In its current form, the social housing sector is relatively young. HAs have inherited a cultural legacy from their bureaucratic local council roots and consequently procurement is immature and lacks strategic and commercial positioning internally in HA organisations, and externally in supply networks (Meehan, 2013). Low levels of procurement maturity raise an important challenge for consortia, suggesting they need to develop beyond purely economic notions of leverage to deliver sustainable procurement outcomes.

As sustainability is still a relatively new concept (Tan, Ahmed and Sundaram, 2010), collaborative stakeholder networks are important to reconfigure the decision-making landscape of sustainability and accelerate its diffusion and adoption. Commitment to sustainability can stem from external network pressures and diffuse into, and across, organisations. For example, supply chain collaboration can engender partners' commitment to sustainability (Jenkins, 2006) as can pressure from competitors (González-Benito and González-Benito, 2005), customers (Walker, Di Sisto and

McBain, 2008) and communities (Delmas, 2001). There has been a call for further network research to examine sub-suppliers (Grimm et al., 2013), yet given the importance of demand-side pressures (Walker et al., 2008; Delmas and Montiel, 2009) only extending engagement with supply-side stakeholders may provide an attenuated understanding of sustainable procurement.

To investigate sustainable procurement's conceptual framework, outlined above, in respect of the contextual challenges posed by the social housing context, the study seeks to explore the following overarching research questions:

RQ1: How is sustainable procurement operationalised in the social housing sector?

RQ2: What is the level of sustainable procurement activity in the sector?

RQ3: What are the sector's dominant attitudes towards sustainable procurement?

RQ4: What role do procurement consortia play in delivering sustainable procurement?

4. Methods

Primary data collection consists of an online survey to UK social housing provider organisations. Previous scales of sustainable procurement (Walker and Brammer, 2009) assess the extent to which sustainable procurement is practiced. Minor contextual amendments to the scales and terms were made following a pre-test and pilot of the questionnaire with 15 procurement and sustainability professionals working in HAs. Changes included the addition/rewording of items referring to

tenants and third sector organisations, and the removal of some global macro-level indicators. Specifically, the pilot group deemed questions related to human rights abuse inappropriate for procurement profiles in social housing, which are dominated by local and national supply chains with less/no international sourcing. The resultant scale comprised of 15 items (see Table 1). Batteries of attitudinal questions were included centred on the issues emerging from the literature, notably, awareness and knowledge, use of consortia and network involvement. The level of consortia use acts as a proxy for procurement maturity. Level of agreement against the questions was measured using 5-point Likert scales. To provide measures of calibration, questions were included to identify external awards won for sustainability, how the organisation was benchmarked in the sector and against other industrial sectors in relation to sustainable procurement performance. Classification and demographic variables include organisation size, number of properties and regional locations served.

Table 1: Sustainable procurement scale variables

Has a sustainability policy
Trains staff in sustainability
Has a sustainability action plan
Assess the impact of procurement policy on the local economy
Encourages its tenants to behave sustainably
Promotes sustainability in the wider supply network
Encourages its suppliers to behave sustainably
Has an environmental management system accreditation
Ensures the safe incoming movement of products
Checks the sustainability credentials of the supply chain
Has a waste reduction plan
Assesses the life cycle impact of its products/service provision
Purchases from small to medium sized suppliers
Purchases from local suppliers
Purchases from charities or social enterprises
<i>(Adapted from Walker and Bramner, 2009)</i>

An online questionnaire was appropriate to reduce costs, environmental impacts and to enable a broad reach. The questionnaire was emailed to 500 named individuals responsible for procurement in UK HA organisations from a database provided by Procurement for Housing (PfH). PfH are a UK social housing procurement consortium and their members are representative of the wider HA population by turnover, number of properties, scope of activities and geographical location. In addition, 100 non-PfH member organisations were contacted via an online database of HAs.

Following an initial return of 65 usable questionnaires, a reminder email was sent resulting in a further 51 usable responses. The number of respondents in the second wave (51) is considerably higher than the recommended number (30) for late respondents indicating high confidence of generalizability (Lindner, Murphy and Briers, 2001). The final sample was $N=116$, giving a response rate of 19.3%. Respondents were grouped into early and late respondents to test for significant differences. Normal distribution of the data was confirmed using the Kolmogorov-Smirnov test (Field, 2005). The summated factor scores did not deviate significantly from a normal distribution, $D(65)=0.84$, $p=.200$; $D(51)=0.88$, $p=.200$, for both early and late respondents respectively. Independent sample t -tests for both groups against the three summated scales indicate no significant difference between the two groups for any of the factors at a 95% confidence interval: factor 1 $t(114)=-.025$; $p=.980$; factor 2 $t(114)=1.316$; $p=.191$; factor 3 $t(114)=.945$; $p=.347$.

5. Results

Table 2 presents the profiles of respondent's organisations. The sample is balanced in terms number of employees and the number of properties managed.

Table 2: Respondents' profiles

	Number	% of sample
<i>No. of employees</i>		
1-24	9	7.8%
25-249	35	30.2%
249-500	26	22.4%
501+	46	39.7%
<i>Properties managed</i>		
Less than 1,000	18	15.5%
1,000-10,000	44	37.9%
10,000+	54	46.6%

5.1 Operationalisation of sustainable procurement

To address research question one (how is sustainable procurement operationalised in the social housing sector), principal components factor analysis with Varimax rotation was used to identify parsimonious factors (see Table 3). The sample size of 116 is over the minimum recommended number (100) and the case-to-item ratio of 12:1 exceeds acceptable limits (5:1) (Hair, Black, Babin, Anderson and Tatham, 2006). Eigenvalues are over 1 (Kaiser, 1960), loadings are over ± 0.50 and communalities exceed .40 (Field, 2005). Bartlett's Test of Sphericity falls within the appropriate range yielding a value of 425.23 (df=45, $p=.000$) (Tabachnick and Fidell, 1996). Factors were named to represent the dimensions of the underlying variables (Hair et al., 2006). All items loaded on unique factors above the threshold levels and there were no cross loadings. The iterative analysis produced a solution of three factors comprising of four, three and three items respectively. Cronbach's alpha was used to test for overall scale validity and the resulting value of .83 demonstrates

excellent reliability for the 10-item sustainable procurement construct. Summated compound scores for each factor reduce the reliance on any single variable and minimise measurement error (Hair et al., 2006). The compound variables demonstrate good reliability through Cronbach alpha scores, as detailed in table 3 (Gliem and Gliem, 2003).

Table 3: Exploratory factor analysis

Factors, items, Cronbach scores	Communality	Factor Loadings		
		1	2	3
Factor 1: Direction $\alpha=.879$				
Has a sustainability policy	.737	.845		
Trains staff in sustainability	.720	.818		
Has a sustainability action plan	.710	.751		
Encourages its tenants to behave sustainably	.563	.562		
Factor 2: Assurance $\alpha=.753$				
Checks the sustainability credentials of the supply chain	.682		.793	
Assesses the life cycle impact of its products/service provision	.664		.750	
Encourages its suppliers to behave sustainably	.701		.747	
Factor 3: Localism $\alpha=.694$				
Purchases from small to medium sized suppliers	.766			.864
Purchases from local suppliers	.633			.773
Purchases from charities or social enterprises	.597			.597
Eigenvalues (post-rotation)		2.51	2.29	1.97
% of variance explained		25.14	22.89	19.70
Cumulative % of variance explained		25.14	48.03	67.73
Sample n = 116 Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .786				

Names (see table 3) were assigned to represent the factors' underlying dimensions: Factor 1 – Direction, Factor 2 – Assurance, and Factor 3 – Localism. The direction factor comprises foundational activities that build capability. Some of these activities are internally focused i.e. planning and policy setting, training staff, as well as externally focused tenant encouragement. The second factor, assurance, reflects the need to ensure compliance and is supply-side centric. The third factor, localism,

reflects the operationalised policies and demonstrates commitment to drive local economic benefit, contributing to social outcomes through using small, local and third sector suppliers.

5.2 *Level of sustainable procurement activity*

For the second research question (the level of sustainable procurement activity in the sector), mean scores for the three sustainable procurement factors demonstrate high- average levels of activity (see table 4). Rank orders of the factors show that localism demonstrates the highest level of activity, followed by direction, and thirdly assurance. Awards won requires a non-parametric Mann-Whitney U test, which is analogous to the t-test for nominal groupings. The results show no association between awards won and the level of sustainable procurement across the second and third factors: Assurance ($Z=-1.15$; $p=.251$) and Localism ($Z=-.75$; $p=.4530$). The first factor, Direction revealed a significant difference between HAs that had won awards and those that had not ($Z=-3.70$; $p=.000$). Detailed analysis of the means for the Direction factor shows that HAs who had won awards had a higher level of activity for Direction ($M=1.78$, $SD=.61$) compared to HAs who had not won awards ($M=2.37$, $SD=.86$) on a 1-5 scale where 1 is very high and 5 is very low. This suggests that while award winning HAs perform better around direction setting there is no statistical difference in performance around issues of assurance and localism. This is important because assurance and localism are arguably the operationalisation of the policies; thus to drive action and impact in their supply chains HAs need to go beyond policy setting.

Table 4: Rank ordered means scores

	Mean	Std.Dev.
Factor 3: Localism	2.06	.73
Factor 1: Direction	2.20	.83
Factor 2: Assurance	2.52	.80

n=116
Mean scores from 5-point scale: 1=very high, 2=high, 3=average, 4=low, 5=very low

The debates in the literature suggest a number of variables are significant in the development of sustainable procurement. A Kruskal-Wallis test (non-parametric alternative to ANOVA) was used as normal data distribution was violated. Means of key variables were tested against each of the three sustainable procurement factors to test for statistically significant difference at a confidence level of 95% ($0.05 > p$).

The variables, as shown in table 5 are: the number of properties, the number of employees (both representing size), the use of procurement consortia and regulatory pressures. Levene's test confirmed homogeneity of variance for the three factors, all being above the .05 significance figure.

Table 5: Kruskal-Wallis test results for sustainable procurement activity

Sustainable procurement factors			
Variables	Direction	Assurance	Localism
No. of properties	$\chi^2 (2, N=116)=0.64$, $p=.969$	$\chi^2 (2, N=116)=0.376$, $p=.829$	$\chi^2 (2, N=116)=1.70$, $p=.428$
No. of employees	$\chi^2 (3, N=116)=1.58$, $p=.665$	$\chi^2 (3, N=116)=2.43$, $p=.489$	$\chi^2 (3, N=116)=10.26$, $p=.016^*$
Use of procurement consortia	$\chi^2 (4, N=110)=7.34$, $p=.969$ $p=.019^*$	$\chi^2 (4, N=110)=4.68$, $p=.332$	$\chi^2 (4, N=110)=5.12$, $p=.276$
Regulatory pressures to change	$\chi^2 (4, N=114)=3.12$, $p=.537$	$\chi^2 (4, N=114)=2.13$, $p=.713$	$\chi^2 (4, N=114)=0.42$, $p=.981$

** denotes significant association at 95% confidence level*

The results show no significant differences between the level of sustainable procurement across all factors and the number of properties and the regulatory pressures to change. The number of HAs employees shows no significant difference by the first two factors (Direction, Assurance) but differences emerge for Localism. Analysis of the means shows smaller HAs score higher on localism, potentially explained as their low spend profiles are more likely to attract small local suppliers rather than national suppliers working on leveraged contracts. A significant difference is indicated for the extent to which HAs use procurement consortia (as a % of spend) and Direction. Analysis of the means shows that HAs with a higher use of consortia have better performance on sustainable procurement direction, suggesting that consortia provide methods for developing foundational activity around policy that HAs can use.

5.3 Attitudes towards sustainable procurement

Attitudinal data were analysed to address the third research question (the sector's dominant attitudes towards sustainable procurement) as shown in table 6.

Table 6: Sustainable procurement attitudes

	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Mean
Sustainability requires coordinated supply chain action	42	42	10	3	-	1.75
HAs should have greater corporate commitment to sustainability	43	35	11	9	1	1.88
The most valuable sustainability approaches come from knowledge sharing	28	52	17	1	1	1.93
I actively encourage others to commit to sustainability	15	60	16	6	1	2.17

I am well informed on the sustainability agenda	22	48	18	9	2	2.18
My organisation could be doing a lot more on sustainability	22	47	17	12	-	2.19
My knowledge is balanced across the TBL	19	54	16	6	3	2.20
HAs have an ethical duty to educate tenants on sustainability	19	52	17	7	3	2.20
My commitment to sustainability is increasing	18	49	24	6	2	2.23
The social housing sector sees value in sustainability	19	50	18	8	3	2.25
My knowledge provides me with the capacity to act	16	48	25	6	4	2.35
Tenants want us to be sustainable in our work	6	35	42	13	2	2.69
Tenants prioritise sustainability	3	7	52	28	8	3.30

n=116

*Mean scores from 5-point scale: 1=very high, 2=high, 3=average, 4=low, 5=very low
Figures may not total 100% due to rounding and missing responses*

In line with the Knowledge-Based-View (Grant, 1996), an emerging theme is the importance placed on sharing knowledge and collaboration to achieve sustainable procurement outcomes, with 84% of respondents strongly agreeing/agreeing that sustainability requires coordinated supply chain action. Although respondents reported high levels of agreement on statements related to their own personal knowledge and commitment, the role of the organisation and the social housing sector highlight institutional and field-level pressures in the sector that combine to drive attitudes towards sustainable procurement. The values-led nature of social housing is reflected in the response to the statement that HAs should have a greater corporate commitment to sustainability (78% of respondents strongly agree/agree), and 71% strongly agree/agree that HAs have an ethical duty to educate tenants on sustainability. Alongside high-level sectoral support and organisational commitment, 64% (strongly agree/agree) of respondents stated that their knowledge provides the

capacity to act on the sustainable procurement agenda. Taken together, these results suggest appropriate motivation and skill to drive sustainable procurement.

Interesting results emerge related to the respondents' perceptions of organisational performance. Table 4 illustrates high-average results across the three dimensions of sustainable procurement, yet the respondents recognise that their organisations could be doing a lot more on sustainability (69% strongly agree/agree), despite HAs apparent willingness and individuals' skill. This suggests two possible positions. Firstly, some other factor(s) is(are) preventing the potential of sustainable procurement from being maximised. Secondly, there is significant scope for sustainable procurement to impact currently untouched areas of spend.

Tenants are not perceived to be major drivers in the sustainable procurement agenda and the influence towards sustainability attitudes is driven by the HA. Despite relatively positive ratings relating to tenants wanting HAs to be sustainable, sustainable procurement is not seen as being prioritised by tenants, evidenced by the average-low mean score ($M=3.30$).

5.4 *The role of procurement consortia*

The final research question asks, what is the role of procurement consortia in sustainable procurement? Although no statistical differences are found from Hochberg GT2 multiple pair-wise comparisons ($p>0.5$) a consistent picture emerges across the sustainable procurement factors (see Table 7); HAs with higher usage of consortia have greater levels of sustainable procurement.

Table 7: Sustainable procurement and the use of procurement consortia

Procurement spend through consortia	Direction		Assurance		Localism	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
0%	2.59	1.20	2.67	.84	2.57	.99
1-30%	2.27	.79	2.56	.79	2.04	.71
31-60%	2.07	.73	2.54	.73	2.11	.76
61%+	1.73	.65	2.19	.86	1.93	.51

The means vary for key supply chain stakeholders perceived knowledge of sustainable procurement. Mean scores for all stakeholders are good-average (see Table 8), but the differences suggest that information is asymmetrically distributed throughout the network.

Table 8: Sustainable procurement knowledge

Levels of knowledge	Mean	Standard Deviation
Social housing procurement consortia	2.39	.934
My organisation	2.57	1.027
External suppliers	2.64	.951
Other contractors	2.74	.932
Social housing regulators	2.82	.844

Notes: N=115; Mean scores 1=very high, 5=very low

The distribution of knowledge across different groups presents an interesting finding, specifically in relation to where knowledge is perceived to be located. Social housing regulators attract the lowest score for perceived knowledge and procurement consortia attract the highest.

6. Discussion and conclusions

The delineation of the three parsimonious dimensions of sustainable procurement extends and enhances the explanatory power of prior sustainable procurement instruments. The complexity of integrating the diverse and temporal aspects of sustainable procurement is recognised as challenging (Arman, Zuo, Wilson, Zillante and Pullen, 2009; Meehan and Bryde, 2011), yet despite this complexity the extant scales treat it as a homogenised concept (Walker and Brammer, 2009). The results suggest that in practice sustainable procurement is heterogeneous, indicating a phased maturity model driven through development of direction setting, supplier-centric assurance, and local socially oriented supply. Interestingly, the three factors do not fall into the conceptually delineated aspects of the triple bottom line. This suggests that social housing organisations take holistic considerations of sustainable procurement adding support to the importance of connecting planet, people and profit in the sector to deliver HAs core values (Pullen, Arman, Zillante, Zuo, Chileshe and Wilson, 2010). A limitation of the study is that the research design provides a snapshot of activity, thus it does not sufficiently explain the temporal element of development. Future longitudinal studies across different countries, sectors and industries could track transitional mechanisms and identify sustainable procurement's preferred and future development to deliver improved outcomes, innovation or competitive advantage.

The results demonstrate a field-level maturity and collaborative intent to deliver on the sustainability agenda yet this is perceived as sub-optimal. This has a broader resonance for sustainable management in general – how much is achievable and how will we know when this is achieved? The role of performance measurement and how this is calibrated is an important area of future research, particularly for public

organisations facing extensive pressure and new forms of service delivery (Conway, Kiefer, Hartley and Briner, 2014). Public organisations tend to measure internal or sector-level performance conferring legitimacy from an institutional perspective through maintaining institutional norms (Suchman, 1995). The changing policy landscape however, requires market-aligned management metrics as public service providers compete with private organisations for work and coopetition grows (Peng et al., 2012). Implicit in the challenge is functional and sectoral maturity. For example, the results from this study are indicative of procurement in its infancy within individual HAs; thus, the ability to challenge and credibly assess sustainable procurement optimisation is low. An interesting stream of future coopetition research could centre on sector/industry maturity to assess changing motivations and outcomes from coopetitive models once the initial learning curves are achieved for individual organisations. Other public sector contexts that use consortia, have social missions and have opportunities to deliver benefit from sustainable procurement would make interesting areas for future study.

Regulation is seen as a driver for change (Ageron et al., 2012) yet fears of compliance create supplier engagement barriers limiting outcomes achieved. Regulators are perceived to have the lowest level of knowledge on sustainable procurement compared to other supply chain players. The regulators' network position affords them no direct access to suppliers, contractors or tenants constraining knowledge creation, an important factor for sustainable procurement in the sector. Network positions and regulation raise interesting research agendas and are of particular importance given the ideological shifts in conceptualisations of the state and collaborative working (Ashworth et al., 2013). The role of the supply chain

and network position contributes to an emerging body of research in the sustainable operations management field that links network position and access to information (Lo and Power, 2010; Lo, 2014). The results of this study centre on collaborative procurement consortia between HAs rather than supplier/customer, which augment the extant literature.

Recent studies have linked business strategies with sustainability drivers (Spence and Bourlakis, 2009; Hoejmose et al., 2013) yet these tend towards for-profit motivations. This study reflects the rise of third sector organisations and the results show that beyond traditional cost-leadership or differentiation motivations, HAs have a moral imperative to educate tenants on sustainability demonstrating that sustainable procurement stems from organisations' missions to positively impact the communities served. Yet, despite having a need for sustainable solutions (Hills, 2007), tenants do not prioritise sustainable procurement and their involvement adds complexity. This is a significant finding more broadly for the corporate social responsibility (CSR) agenda and the emerging body of research on the Knowledge-Based-View (Grant, 1996) and the importance of knowledge sharing (Blome et al., 2014; Meehan and Bryde, 2014). The assumption in the current body of knowledge is that the customer is a willing contributor. The results of this study highlight that this is an ideal rather than a reality. If tenants (or other key stakeholders) are unwilling collaborators, organisations may only look to their traditional, commercially-orientated network partners, e.g. suppliers and contractor, skewing the focus. Stakeholders impact the nature and content of collaboration and non-business relationships including tenants and communities may share knowledge, expertise and provide legitimacy (Crespin-Mazet and Dontenwill, 2012). Integrated,

collaborative strategies are important for sustainability and CSR. Efficiency-responsiveness strategies that do not engage with or embed stakeholder complexity, risk marginalising issues through abstracted universal approaches (Bondy and Starkey, 2014). This is a particular issue for consortia as there is a danger that they search for universal solutions to meet the diverse needs of members rather than community-specific solutions. The importance of localism as a distinct dimension of sustainable procurement creates a challenge for consortia models built on leverage at a regional/national levels, as this can conflict with localism.

Collaborations forming around knowledge bases are increasing (Batt and Purchase, 2004) emphasising the need to collaborate upstream, downstream and with wider network stakeholders (Chang, Chiang and Pai, 2012). The challenge is that the more a single organisation tries to control the network, the more innovation is stifled (Gadde, Huemer and Håkansson, 2003). The implicit suggestion from the procurement literature is that the network focus for sustainability is centred on upstream engagement to ensure the supply chain is acting sustainably and has not done damage or harm. We posit that true sustainable procurement must also look downstream to assess what good it delivers (not just avoiding harm). To do this organisations must embrace multiple stakeholder collaboration, as it is the users and beneficiaries of sustainable procurement impacts that will ultimately judge success, in hindsight, and at a considerable point in the future.

The role of procurement consortia in social housing networks adds to a growing body of knowledge on cooptation (Peng and Bourne, 2009; Peng et al., 2012; Ritala, 2012). Prior work in this area centres on mature markets where simultaneous

competition and cooperation with competitors is used to secure market positions, drive additional mutual value, or lower resource costs. This study differs as the social housing sector is relatively new and the motivations for cooperative working relate to procurement immaturity rather than defensive positioning. In support of this, the data shows a positive relationship between use of consortia and direction setting for sustainable procurement raising issues for the future development of procurement consortia beyond foundational activities.

Procurement consortia's role in sustainable procurement is based on their knowledge and ability to provide procurement maturity and skills to individual HAs whilst sharing overhead resource, thus supporting previous cooperative research (Ritala, 2012). Consortia require integrated supply chains to deliver efficiency benefits (Christensen, Germain and Birou, 2005; Mitra and Singhal, 2008), but an underpinning assumption is that a focal organisation leads the supply chain's direction owing to their power and position (Hall and Vredenburg, 2003).

Two issues arise here. First, the literature highlights moves away from linear assumptions of supply chains towards fluid and complex networks (Villena, Revilla and Choi, 2011) that comprise non-direct and fringe actors. The network approach makes analysing the interactions difficult as focal organisations cannot always be easily distinguished (Foerstl et al., 2010). Second, the network approach proposes network emergence rather than direction by a single organisation. While leadership plays an important role in any change effort, its importance is heightened in sustainability initiatives integrating the TBL and there is a requirement for broader, interdependent perspectives of strategy, planning, stakeholder engagement and

employee involvement (Cousins, Handfield, Lawson and Petersen, 2006). The lack of sole leadership shifts the dynamic from managing the network to being able to influence it. Networks have a diffused power structure that raise issues surrounding multiparty structures, position within the network and information sharing (DiMaggio and Powell, 1983). Regulatory bodies through policy can distort power and take decisions away from HAs. This can be balanced by procurement consortia, who given their membership size may have a powerful role in influencing the network and they hold the agency relationships with suppliers as the contracting body.

The lack of a sole authority can constrain complex, risky supply chains that have variable knowledge requirements (Passerini and Wu, 2008). Potential tension arises here between the ability to provide network leadership and the need for an emergent, diffused power structure to enable democratisation of diverse stakeholders. Leveraged procurement consortia can be pivotal in balancing these counter-dynamics and provide routes to create and share sustainable procurement knowledge in a network broker role (Lo, 2014). There is a need to consider how consortia influence HAs procurement practices to make them more mature in terms of sustainability and for HAs to provide a clear mandate to the consortia to help HAs on the road to maturity. There is a potential leadership vacuum in social housing networks in driving forward sustainable procurement practices, which consortia are ideally placed to fill.

Acknowledgements

We are grateful to Procurement for Housing for administering the questionnaire to their members.

References

- Adair, A., J. Berry, M. Haran, G. Lloyd and S. McGreal, 2009. The Global Financial Crisis: Impact on Property Markets in the UK and Ireland. Ulster, University of Ulster Real Estate Initiative Research Team.
- Ageron, B., A. Gunasekaran and A. Spalanzani, 2012. Sustainable supply management: An empirical study. *International Journal of Production Economics* 140(1): 168-182.
- Arman, M., J. Zuo, L. Wilson, G. Zillante and S. Pullen, 2009. Challenges of responding to sustainability with implications for affordable housing. *Ecological Economics* 68(12): 3034-3041.
- Arrowsmith, S. and R. Craven, 2013. Supplier litigation behaviour in the United Kingdom: A preliminary assessment based on perspectives of legal advisors. *Public Procurement: Global Revolution VI*, University of Nottingham.
- Ashworth, R., E. Ferlie, G. Hammerschmid, M. J. Moon and T. Reay, 2013. Theorizing Contemporary Public Management: International and Comparative Perspectives. *British Journal of Management* 24(S1): S1-S17.
- Batt, P. J. and S. Purchase, 2004. Managing collaboration within networks and relationships. *Industrial Marketing Management* 33(3): 169-174.
- Bergenwall, A. L., C. Chen and R. E. White, 2012. TPS's process design in American automotive plants and its effects on the triple bottom line and sustainability. *International Journal of Production Economics* 140(1): 374-384.
- Blome, C., A. Paulraj and K. Schuetz, 2014. Supply chain collaboration and sustainability: a profile deviation analysis. *International Journal of Operations & Production Management* 34(5): 639-663.
- Bondy, K. and K. Starkey, 2014. The dilemmas of internationalization: corporate social responsibility in the multinational corporation. *British Journal of Management* 25(1): 4-22.
- Brandenburger, A. and B. Nalebuff, 1996. *Co-opetition*. New York, Doubleday.
- Camarinha-Matos, L. M. and X. Boucher, 2012. Sustainable collaborative networks—case studies. *Production Planning & Control: The Management of Operations* 23(4): 237-239.
- Carter, C. R. and D. S. Rogers, 2008. A framework of sustainable supply chain management: moving toward new theory. *International journal of physical distribution & logistics management* 38(5): 360-387.
- Chang, C.-W., D. M. Chiang and F.-Y. Pai, 2012. Cooperative strategy in supply chain networks. *Industrial Marketing Management* 41(7): 1114-1124.
- Christensen, W. J., R. Germain and L. Birou, 2005. Build-to-order and just-in-time as predictors of applied supply chain knowledge and market performance. *Journal of operations management* 23(5): 470-481.
- Cohen, W. M. and D. A. Levinthal, 1990. Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly* 35(1): 128-152.
- Conway, N., T. Kiefer, J. Hartley and R. B. Briner, 2014. Doing More with Less? Employee Reactions to Psychological Contract Breach via Target Similarity or Spillover during Public Sector Organizational Change. *British Journal of Management in press*.
- Cooper, J. and K. Jones, 2009. Sustainability and social housing maintenance. Phase 2-interview results. Technical Report. IDCOP, Southampton, UK.
- Cousins, P. D., R. B. Handfield, B. Lawson and K. J. Petersen, 2006. Creating supply chain relational capital: The impact of formal and informal socialization processes. *Journal of operations management* 24(6): 851-863.

- Cowan, D. and K. Morgan, 2009. Trust, distrust and betrayal: a social housing case study. *The Modern Law Review* 72(2): 157-181.
- Crespin-Mazet, F. and E. Dontenwill, 2012. Sustainable procurement: Building legitimacy in the supply network. *Journal of Purchasing and Supply Management* 18(4): 207-217.
- Dam, L. and B. Petkova, 2014. The impact of environmental supply chain sustainability programs on shareholder wealth. *International Journal of Operations & Production Management* 34(5): 586-609.
- Darnall, N., I. Seol and J. Sarkis, 2009. Perceived stakeholder influences and organizations' use of environmental audits. *Accounting, Organizations and Society* 34(2): 170-187.
- Dayson, C., P. Lawless and I. Wilson, 2013. *The Economic Impact of Housing Organisations on the North*. Centre for Regional Economic and Social Research, Sheffield Hallam University
- Delmas, M., 2001. Stakeholders and competitive advantage: the case of ISO 14001. *Production and Operations Management* 10(3): 343-358.
- Delmas, M. and I. Montiel, 2009. Greening the supply chain: when is customer pressure effective? *Journal of Economics & Management Strategy* 18(1): 171-201.
- DiMaggio, P. J. and W. W. Powell, 1983. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review* 48(2): 147-160
- Directive 2004/18/EC (2004). Directive of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts. (2004/18/EC). *Official Journal of the European Union*: 114–240, article 126.
- Eesley, C. and M. J. Lenox, 2006. Firm responses to secondary stakeholder action. *Strategic management journal* 27(8): 765-781.
- Elkington, J., 1997. *Cannibals With Forks: The Triple Bottom Line of 21st Century Business*. Oxford, Capstone.
- Essig, M., 2000. Purchasing consortia as symbiotic relationships: developing the concept of 'consortium sourcing'. *European Journal of Purchasing & Supply Management* 6(1): 13-22.
- Field, A., 2005. *Discovering Statistics using SPSS for Windows*. London, Sage Publications.
- Foerstl, K., C. Reuter, E. Hartmann and C. Blome, 2010. Managing supplier sustainability risks in a dynamically changing environment—Sustainable supplier management in the chemical industry. *Journal of Purchasing and Supply Management* 16(2): 118-130.
- Gadde, L.-E., L. Huemer and H. Håkansson, 2003. Strategizing in industrial networks. *Industrial Marketing Management* 32(5): 357-364.
- Glavič, P. and R. Lukman, 2007. Review of sustainability terms and their definitions. *Journal of cleaner production* 15(18): 1875-1885.
- Gliem, J. A. and R. R. Gliem, 2003. Calculating, Interpreting and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, Ohio State University, Columbus, Ohio.
- Gnyawali, D. R. and R. Madhavan, 2001. Cooperative networks and competitive dynamics: A structural embeddedness perspective. *Academy of management review* 26(3): 431-445.

González-Benito, J. and Ó. González-Benito, 2005. Environmental proactivity and business performance: an empirical analysis. *Omega* 33(1): 1-15.

Grant, R. M., 1996. Toward a Knowledge - Based Theory of the firm. *Strategic management journal* 17(S2): 109-122.

Grekova, K., H. Bremmers, J. Trienekens, R. Kemp and S. Omta, 2013. Extending environmental management beyond the firm boundaries: An empirical study of Dutch food and beverage firms. *International Journal of Production Economics*.

Grimm, J. H., J. S. Hofstetter and J. Sarkis, 2013. Critical Factors for Sub-Supplier Management: A Sustainable Food Supply Chains Perspective. *International Journal of Production Economics*.

Hair, J. F., W. C. Black, B. J. Babin, R. E. Anderson and R. L. Tatham, 2006. *Multivariate Data Analysis*. New Jersey, Prentice Hall.

Hall, J. and H. Vredenburg, 2003. The challenges for innovating for sustainable development. *MIT Sloan Management Review* 45(1): 61-68.

Hassini, E., C. Surti and C. Searcy, 2012. A literature review and a case study of sustainable supply chains with a focus on metrics. *International Journal of Production Economics* 140(1): 69-82.

Hills, J., 2007. Ends and Means: The Future Roles of Social Housing, CASE Report 34. London, the London School of Economics and Political Science.

Hoejmose, S., S. Brammer and A. Millington, 2013. An empirical examination of the relationship between business strategy and socially responsible supply chain management. *International Journal of Operations & Production Management* 33(5): 589-621.

Homes & Communities Agency, 2012. The Regulatory Framework for Social Housing in England. available from: <http://www.homesandcommunities.co.uk/sites/default/files/our-work/regfwk-2012.pdf>.

Homes & Communities Agency, 2014. Homes and Communities Agency Corporate Plan 2014-18. London, HCA.

Homes and Communities Agency (2014). 2013 Global Accounts of Housing Providers. London, HCA.

Huq, F. A., M. Stevenson and M. Zorzini, 2014. Social sustainability in developing country suppliers: An exploratory study in the ready made garments industry of Bangladesh. *International Journal of Operations & Production Management* 34(5): 610-638.

Jenkins, H., 2006. Small business champions for corporate social responsibility. *Journal of Business Ethics* 67(3): 241-256.

Kaiser, H. F., 1960. The application of electronic computers to factor analysis. *Educational and Psychological Measurement* 20: 141-151.

Kan, C., 2014. The affordable housing challenge. *The Middle East*. <http://www.themiddleeastmagazine.com/news-detail.php?nid=30>; Accessed 3rd June 2014.

Kellaway, M. and H. Shanks, 2007. UK National Accounts Case law on classification of quasi-corporations. London, Office of National Statistics.

Klassen, R. D. and D. C. Whybark, 2007. Environmental Management in Operations: The Selection of Environmental Technologies. *Decision sciences* 30(3): 601-631.

Kolokotsa, D. and M. Santamouris, 2014. Energy poverty in Europe: Challenges for energy efficiency. *Information, Intelligence, Systems and Applications*, Chania, IISA.

Laffin, M., 2013. A new politics of governance or an old politics of central–local relations? Labour's reform of social housing tenancies in England. *Public Administration* 91(1): 195-210.

Levinthal, D. A. and M. Warglien, 1999. Landscape Design: Designing for Local Action in Complex Worlds. *Organization Science* 10(3, May-June): 342-357.

Lindner, J. R., T. H. Murphy and G. E. Briers, 2001. Handling nonresponse in social science research. *Journal of Agricultural Education* 42(4): 43-53.

Liu, D., H. Li, W. Wang and Y. Dong, 2012. Constructivism scenario evolutionary analysis of zero emission regional planning: A case of Qaidam Circular Economy Pilot Area in China. *International Journal of Production Economics* 140(1): 341-356.

Lo, S. M., 2014. Effects of supply chain position on the motivation and practices of firms going green. *International Journal of Operations & Production Management* 34(1): 93-114.

Lo, S. M. and D. Power, 2010. An empirical investigation of the relationship between product nature and supply chain strategy. *Supply Chain Management: An International Journal* 15(2): 139-153.

McCue, C. P. and J. T. Pitzer, 2000. Centralized vs. decentralized purchasing: Current trends in governmental procurement practices. *Journal of Public Budgeting, Accounting and Financial Management* 12: 400-420.

McKinsey & Co, 2013. Affordable Housing for All. World Bank Housing Finance Conference, Washington DC.

McLintock, M., 2011. Procurement in the Affordable Housing Sector; Report for the Scottish Government. Edinburgh, Turner & Townsend Consulting.

Meehan, J., 2013. How can social housing providers remove the barriers to business intelligence and commercially focused procurement? .Thinktank Series, Warrington, Procurement for Housing.

Meehan, J. and D. Bryde, 2011. Sustainable procurement practice. *Business Strategy and the Environment* 20(2): 94-106.

Meehan, J. and D. J. Bryde, 2014. Procuring sustainably in social housing: The role of social capital. *Journal of Purchasing and Supply Management* 20(2): 74-81.

Meehan, J. and G. H. Wright, 2011. Power priorities: A buyer–seller comparison of areas of influence. *Journal of Purchasing and Supply Management* 17(1): 32-41.

Mitra, S. and V. Singhal, 2008. Supply chain integration and shareholder value: Evidence from consortium based industry exchanges. *Journal of operations management* 26(1): 96-114.

Monk, S., C. Tang and C. Whitehead, 2010. What does the literature tell us about the social and economic impact of housing? Report to the Scottish Government: Communities Analytical Services. Edinburgh, Scottish Government, Social Research.

Nikolaeva, R. and M. Bicho, 2011. The role of institutional and reputational factors in the voluntary adoption of corporate social responsibility reporting standards. *Journal of the Academy of Marketing Science* 39(1): 136-157.

Nollet, J. and M. Beaulieu, 2003. The development of group purchasing: an empirical study in the healthcare sector. *Journal of Purchasing and Supply Management* 9(1): 3-10.

OGC, 2011. An Introduction to Public Procurement. London, Office of Government Commerce.

Passerini, K. and D. Wu, 2008. The new dimensions of collaboration: mega and intelligent communities, ICT and wellbeing. *Journal of Knowledge Management* 12(5): 79-90.

Pawson, H. and F. Sosenko, 2012. The Supply-Side Modernisation of Social Housing in England: Analysing Mechanics, Trends and Consequences. *Housing Studies* 27(6): 783-804.

Peng, T.-J. A. and M. Bourne, 2009. The Coexistence of Competition and Cooperation between Networks: Implications from Two Taiwanese Healthcare Networks*. *British Journal of Management* 20(3): 377-400.

Peng, T.-J. A., S. Pike, J. C.-H. Yang and G. Roos, 2012. Is Cooperation with Competitors a Good Idea? An Example in Practice. *British Journal of Management* 23(4): 532-560.

Preuss, L., 2009. Addressing sustainable development through public procurement: the case of local government. *Supply Chain Management: An International Journal* 14(3): 213-223.

Pullen, S., M. Arman, G. Zillante, J. Zuo, N. Chileshe and L. Wilson, 2010. Developing an assessment framework for affordable and sustainable housing. *Australasian Journal of Construction Economics and Building* 10(1/2): 48-64.

Reck, R. F. and B. G. Long, 1988. Purchasing: a competitive weapon. *Journal of Purchasing and Materials Management*, 24(3): 2-8.

Reeves, A., S. Taylor and P. Fleming, 2010. Modelling the potential to achieve deep carbon emission cuts in existing UK social housing: The case of Peabody. *Energy Policy* 38(8): 4241-4251.

Ritala, P., 2012. Coopetition Strategy – When is it Successful? Empirical Evidence on Innovation and Market Performance. *British Journal of Management* 23(3): 307-324.

Schiele, H., 2007. Supply-management maturity, cost savings and purchasing absorptive capacity: Testing the procurement–performance link. *Journal of Purchasing and Supply Management* 13(4): 274-293.

Seuring, S., 2004. Industrial ecology, life cycles, supply chains; differences and interrelations. *Business Strategy and the Environment* 13(5): 306-319.

Simpson, D. and R. Sroufe, 2014. Stakeholders, reward expectations and firms' use of the ISO14001 management standard. *International Journal of Operations & Production Management* 34(7): 1-1.

Smith, L. and W. Swan, 2012. Delivery of Retrofit at Scale: Developing a viable delivery model in social housing. *Retrofit 2012*, University of Salford.

Sneddon, C., R. Howarth and R. Norgaard, 2006. Sustainable development in a post-Brundtland world. *Ecological Economics* 57(2): 252-268.

Spence, L. and M. Bourlakis, 2009. The evolution from corporate social responsibility to supply chain responsibility: the case of waitrose. *Supply Chain Management: An International Journal* 14(4): 291-302.

Suchman, M. C., 1995. Managing Legitimacy: Strategic and Institutional Approaches. *The Academy of Management Review* 20(3): pp. 571-610.

Swan, W., L. Ruddock and L. Smith, 2013. Low carbon retrofit: attitudes and readiness within the social housing sector. *Engineering, Construction and Architectural Management* 20(5): 522-535.

Tabachnick, B. G. and L. S. Fidell, 1996. Using multivariate statistics. New York, Harper Collins.

Tan, K. S., M. D. Ahmed and D. Sundaram, 2010. Sustainable enterprise modelling and simulation in a warehousing context. *Business Process Management Journal* 16(5): 871-886.

Thøgersen, J., 2006. Media Attention and the Market for 'Green' Consumer Products. *Business Strategy and the Environment* 15: 145-156.

Trautmann, G., L. Bals and E. Hartmann, 2009. Global sourcing in integrated network structures: The case of hybrid purchasing organizations. *Journal of International Management* 15(2): 194-208.

United Nations General Assembly (1948). Universal Declaration of Human Rights. Resolution 217 UN Doc. A/64, available from: <http://www.un.org/en/documents/udhr/>.

Vachon, S. and R. D. Klassen, 2006. Extending green practices across the supply chain: the impact of upstream and downstream integration. *International Journal of Operations & Production Management* 26(7): 795-821.

van Bortel, G. and M. Elsinga, 2007. A Network Perspective on the Organization of Social Housing in the Netherlands: the Case of Urban Renewal in The Hague. *Housing, Theory & Society* 24(1): 32-48.

Varnäs, A., B. Balfors and C. Faith-Ell, 2009. Environmental consideration in procurement of construction contracts: current practice, problems and opportunities in green procurement in the Swedish construction industry. *Journal of cleaner production* 17(13): 1214-1222.

Villena, V. H., E. Revilla and T. Y. Choi, 2011. The dark side of buyer–supplier relationships: A social capital perspective. *Journal of operations management* 29(6): 561-576.

Walker, H. and S. Brammer, 2009. Sustainable procurement in the United Kingdom public sector. *Supply Chain Management: An International Journal* 14(2): 128-137.

Walker, H. and S. Brammer, 2012. The relationship between sustainable procurement and e-procurement in the public sector. *International Journal of Production Economics* 140(1): 256-268.

Walker, H., L. Di Sisto and D. McBain, 2008. Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management* 14(1): 69-85.

Walker, H. and N. Jones, 2012. Sustainable supply chain management across the UK private sector. *Supply Chain Management: An International Journal* 17(1): 15-28.

Walliner, A., N. B. Rajkovich and J. Forester, 2012. Exploring the Challenges of Environmental Planning & Green Design: cases from Europe and the USA. *Planning Theory & Practice* 13(1): 113-174.

Weiss, L. and E. Thurbon, 2006. The business of buying American: Public procurement as trade strategy in the USA. *Review of International Political Economy* 13(5): 701-724.

Wilcox, S., J. Perry and P. Williams, 2014. UK Housing Review: 2014 Briefing Paper. Coventry, Chartered Institute of Housing.

Yusuf, Y. Y., A. Gunasekaran, A. Musa, N. M. El-Berishy, T. Abubakar and H. M. Ambursa, 2013. The UK oil and gas supply chains: An empirical analysis of adoption of sustainable measures and performance outcomes. *International Journal of Production Economics* 146(2): 501-514.

Zhu, Q. and J. Sarkis, 2007. The moderating effects of institutional pressures on emergent green supply chain practices and performance. *International Journal of Production Research* 45(18-19): 4333-4355.