

# Investigating the Role of Sustainability in Contractor Selection and Evaluation

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## I Abstract

Contractor selection has long been dominated by lowest price considerations. Since the publication of the Latham Review in 1994 however, the idea of best value rather than best price has gained increasing popularity. Considerations, such as experience, quality of construction and ability of the contractor to complete a project within a given timeframe have arguably become as important as the budget.

Within the same timeframe as the above changes in contractor selection there has also been a wider cultural shift in the way we view our planet. The concept of climate change has emerged and become increasingly accepted. The word 'sustainability' has become a buzzword for the 21<sup>st</sup> century and can now be found on labels for foods, cars and clothes. In construction, there has been a rise in zero carbon buildings, BREEAM requirements, preference for local and responsible sourcing of labour and materials as well as the Considerate Constructors Scheme which has become increasingly important for maintaining a positive image of the industry. It is within this realm that the question emerged as to whether sustainability played a role in processes of contractor selection and, if so, to what degree sustainability was important to construction clients when awarding work.

A broad and varied research approach was taken to investigate the aims and objectives consisting of the analysis of pre-qualification questionnaires, client and bids submission team questionnaires and interview data. The research confirmed that sustainability played a considerable role in contractor selection but it emerged that different types of clients had very different ambitions regarding sustainability, all of which are discussed in more detail in the discussion of this report. A major finding also lies in the importance of reputation to customers and the role sustainability, particularly social spheres of it, plays in the forming of a company's reputation.

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### III Abbreviations

BREEAM	Building Research Establishment Environmental Assessment Method
CIB	Conseil International du Bâtiment" (in English this is: International Council for Building)
CCS	Considerate Constructors Scheme
COP21	Conference of the Parties 2015 in Paris
DREAM	Defence-Related Environmental Assessment Methodology
EPC	Energy Performance Certificate
GDP	Gross Domestic Product
HEFCE	Higher Education Funding Council for England
HEFE	Higher and Further Education
LCA	Life Cycle Analysis
LCC	Life Cycle Costing
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
PQQ	Pre-qualification questionnaire
UN	United Nations
WWF	World Wildlife Fund

## Contents

I Abstract.....	2
II Acknowledgements .....	3
III Abbreviations.....	4
1. Introduction .....	7
2. Literature Review .....	10
2.1 Sustainability.....	10
2.2 Sustainability in the Built Environment .....	11
2.3 Sustainable Construction Drivers and Barriers .....	13
2.4 Sustainable Construction in the UK - A Policy Perspective .....	15
2.5 Influences of Increasing Pro-Environmental Behaviour .....	17
2.6 Tendering and Contractor Selection.....	19
2.7 The role of sustainability in contractor selection .....	20
3. Research methods .....	23
3.1 Content Analysis .....	23
3.2 Online Questionnaires .....	25
3.3 Interviews .....	25
4.1 Focus on the Client .....	29

4.1.1 Private Sector .....	30
4.1.1.1 Defining What the Private Sector Client Should Want .....	31
4.1.1.2 Defining What the Private Sector Client Wants .....	32
4.1.2 Public Sector.....	34
4.1.2.1 Defining What the Public Sector Client Should Want.....	35
4.1.2.2 Defining What the Public Sector Client Wants.....	36
4.1.3 Higher and Further Education .....	38
4.1.3.1 Defining What the HEFE Client Should Want.....	39
4.1.3.2 Defining What the HEFE Client Wants .....	41
5. Sustainability as a Unique Selling Point.....	45
6. Conclusions and Recommendations .....	47
6.1 Areas of Future Research.....	49
7. References.....	51

## 1. Introduction

In the global construction context, the best value tender has become a widespread approach for contractor selection, as an alternative to other traditional awarding criteria such as the lowest price. But amongst a long list of other selection criteria sustainability is increasingly featured amongst tender questions. The introduction of the Social Value Act in January 2013 is undoubtedly linked to this and has perhaps acted as a catalyst for local authorities to enshrine social value principles in their procurement and planning policies (Cabinet Office, 2016).

Sustainability has been creeping up higher and higher on the public agenda since the Rio Earth Summit of 1992 and consequently the topic of climate change has become recognised as one of the world's most significant contemporary concerns (Myers, 2005). As a result, most European countries have started producing strategies for more sustainable construction practice. The reasons for greater integration of sustainability in the construction sector are twofold: firstly, due to the significant environmental and social impacts created by the industry, and secondly, and more importantly, because it has always lagged far behind other sectors (Myers, 2005).

In the UK, several government initiatives encouraging reform in the construction industry have been published. Publications such as the government's White Paper on sustainable construction have highlighted the need for the construction industry to change from its traditional fragmented processes towards a more client orientated approach, which embeds innovation, training and research (HM Government, 2007). Concern is expressed regarding the traditional nature of the industry and it is encouraged to modernise and adopt more sustainable approaches. The industry has been challenged to minimise the number of accidents on site, to reduce waste, to put an end to its high numbers of pollution incidents, to further integrate the supply-chain, to engage and liaise with all stakeholders ((HM Government, 2007). In summary, the challenge for the construction sector is to find a new vision where

social and environmental benefits go hand in hand with what has traditionally been considered the primary business driver: profit maximisation.

The importance of the construction industry in contributing to everyone's quality of life is significant as the industry not only shapes the appearance, nature and function of our towns and countryside, it also contributes to the formation of communities and has significant environmental impacts, with currently 50% of UK emissions being associated with the built environment (Department of Trade and Industry, 2002). It has therefore been argued that responsible construction firms should be encouraged to address the poor public image of the industry by trumpeting any new achievements, particularly due to the common perception of the industry as 'dirty, dangerous and old fashioned' (Department of Trade and Industry, 2002, p. 30).

In the public sector, the introduction of the Social Value Act in 2013 has had a major influence on the role of sustainability in the construction sector (Cabinet Office, 2016). The Social Value Act aims to transform the way money is spent on local public services by requiring the people in charge of putting in place public services to think about more than just how to design services, and who will provide them, but also what impact these services could have on local communities. In the built environment this means that contractors who wish to bid for public sector contracts must demonstrate how their projects can have positive impacts on the local communities in which they are building.

Responding to the ever-growing governmental focus on sustainability, more and more private sector clients now place higher values on sustainability and are increasingly interested in sustainable construction. The delivery of green buildings requires a very specific skill set and considerations of design, construction and operation and maintenance considerations are generally not encountered on this level in the procurement of conventional buildings. Therefore, the specification of very clear sustainability requirements to potential contractors is crucial in achieving sustainable project goals. However, many clients either do not explicitly specify sustainability requirements, nor do so in a prescriptive manner during the project procurement process.

## 1.1 Research Aims and Objectives

This research project investigates the UK's current procurement process used in specifying the sustainability requirements of the public, private and higher and further education sector clients in the UK construction market by means of a robust content analysis of pre-qualification questionnaires (PQQs) as well as a series of online questionnaires and in-depth interviews. The results of the content analysis indicate that the sustainability requirement is a significant dimension in the best-value evaluation of contractors confirming initial expectations. One of the more surprising findings of this research lies in the breadth of aspects of sustainability appealing to different client types as well as the emergence of a finer, less tangible contractor evaluation criterion: the human touch.

This study allows contractors to understand the specific sustainability ambitions of public sector, private sector and higher and further education clients which in turn will lead to a more tailored response to sustainability on behalf of the contractor and consequently, a more satisfied client.

The primary aim of this research project is to investigate the role sustainability plays in contractor appointments. To achieve this, the following objectives have been formulated:

- ▶ Identify the role of sustainability in contractor evaluation and selection and identify which sustainability components are of the greatest importance to clients and why.
- ▶ Explore discrepancies between what clients are perceived to consider and what they do consider in reality.
- ▶ Make recommendations on how principal contractors can form more successful working relationships with clients.

## 2. Literature Review

### 2.1 Sustainability

'Sustainable Development' is a concept that has gained increasing momentum and awareness throughout the past three decades (Myers, 2005). The phrase sustainable development was first coined to respond to a growing understanding of environmental issues and its wider socio-economic effects on a global scale (World Commission on Environment and Development, 1987). This improved understanding of the connection between socio-economic and environmental issues has helped to achieve an overall goal for the concept of Sustainable development, to ensure an improved quality of life not only for now but also for the future.

Though the term sustainable development represents an extremely broad range of issues the different definitions given for sustainable development tend to include a few reoccurring central points which are most successfully included in the Brundtland Report (World Commission on Environment and Development, 1987) which defines Sustainable Development as '*development that meets the needs of the present without comprising the ability of future generations to meet their own needs*'. This definition indicates that the environment and social issues are as paramount as economic issues, and suggests that human, natural, and economic systems are interdependent. It also involves dimensions of intergenerational justice, highlights the responsibility of the current world population for the wellbeing and future of millions of as yet unborn citizens, and involves the idea that present generation are borrowing the planet, its resources, and its environmental function and quality from future generations (Kibert, 2005).

The United Nations Framework Convention on Climate Change was set up in 1992 at the Rio Earth Summit and since then has worked towards combatting climate change on a global scale. In December 2015 the UN climate conference (COP21) in Paris ended with a historic outcome as 196 countries agreed on a deal to tackle global warming. The Paris Agreement has been seen as a major success, particularly as it took place eighteen years after the perceived failure of the last international treaty on climate change,

the Kyoto Protocol, which was ratified by less than 40 developed countries. This international agreement comes as a hopeful and relieving announcement and will take effect from 2020 onwards, when its predecessor, the Kyoto Protocol ends (Green Element, 2015).

In the agreement, governments have committed to cut greenhouse gas emissions to limit warming to 'well below' 2° Celsius in relation to pre-industrial levels by the end of the 21st century, with an additional ambition to limit warming to 1.5°C (Price Waterhouse Cooper, 2016). This target aims to improve on the current estimate that global greenhouse gas emissions will produce a 3 degree rise on average, compared to pre-industrial levels. For the second half of the century the agreement then aims for net zero emissions.

For the Paris Agreement to result in a successful outcome, the Agreement now needs to be ratified and, most importantly, implemented by all countries. This is where business will play a fundamental role. The implications of COP21 for the UK and the rest of the world are clear: emissions need to be curbed as soon as possible. However, recent UK government initiatives, including the removal of the Code for Sustainable Homes environmental assessment method and the Zero Carbon Standard, do not necessarily bode well for overall CO2 emissions reduction in the construction sector. This arguable lack of governmental leadership now puts an increased focus on the client: if sustainable development does happen in the construction industry it is first and foremost the client who will be able to drive this change by demanding greener construction practices from their contractors.

## 2.2 Sustainability in the Built Environment

The Oxford Dictionary defines construction as 'the action of building something' though in recent times the construction industry has a much broader reach. More recently, construction has been defined to encompass all who commission, produce, develop, plan, design, build, alter or maintain the built

environment, a definition which considers the overall reach of the construction industry including the multitude of stakeholders involved. This definition also allows for a temporal definition that goes beyond just standing for the time a project is on site, construction starts at the drawing board and is an ongoing process comprising of three main phases to construction: the pre-construction, construction, and post-construction phases.

it is not surprising that the construction industry has been made a priority for development towards a more sustainable future (House of Commons, 2015; Roodman and Lenssen, 1995). Buildings account for roughly one-sixth of the world's fresh water withdrawals, one-quarter of its wood harvest, two-fifths of its material and energy flows as well as approximately 6.5% of the annual GDP of the UK, and as much as 50% of the UK's total CO2 emissions

In its simplest form, sustainable construction can be examined as an application of sustainable development in the realm of construction. In 1994, the Conseil International du Batiment (CIB, or International Council for Building) defined sustainable construction as "...creating and operating a healthy built environment based on resources efficient and ecological principles" (Kibert, 2005). Sustainable construction is broadly taken to signify the responsibility of the construction industry for the efficient use of natural resources, minimisation of any negative impact on the environment as well as the satisfaction of human needs and improvement of the quality of life. This simple understanding though is not easily defined when the broad scope of Brundtland's definition of sustainability 'meeting the needs of others without comprising the ability of future generations to meet their own needs' is considered. The limitations of combining two such definitions are that the relationships between sustainability and the built environment are complex and inter-related.

The CIB formulated seven principles of sustainable construction which inform decision makers during each stage of the design and construction process persisting throughout the whole life cycle of a building which are (Kibert, 2005):

- ▶ reducing resource consumption
- ▶ reusing resources
- ▶ using recyclable resources
- ▶ protection nature
- ▶ eliminating toxics
- ▶ applying life-cycle costing
- ▶ emphasis on quality

To obtain optimal solutions to current difficult construction and infrastructure problems, it is vital to consider environmental technical, social, political and economic aspects, their synergies and the inevitable balances between them (Al-Yami & Price, 2006). Sustainability in this way symbolises solutions with regard to a whole system, with an entire combination of outcomes as expressed by a variety of comments and conclusions (Ferng & Price, 2005). A sustainable construction industry does not simply mean to continue its business and growth, but also needs to meet the principles of sustainable development, which mean it may need, in some cases, to stop growing or grow in different ways (Du Plessis, 2002).

### 2.3 Sustainable Construction Drivers and Barriers

According to the United States Green Building Council, Leadership in Energy and Environmental Design (USGBC), buildings in the USA constitute 36% of total energy use and 65% of electricity consumption, 30% of greenhouse gas emissions, 30% of waste production and 12% of drinkable water consumption (USGBC, 2003). The advantages of implementing sustainability principles into the briefing process are associated with three main aspects:

- ▶ environmental benefits shown in the improvement of air and water quality, minimisation of energy and water consumption and reduction of waste disposal
- ▶ economic benefits shown in the reduction of operating and maintenance costs, and increasing revenue (sale price or rent)
- ▶ and health and community benefits are enhancing occupant comfort and health and minimizing absenteeism, turnover rate and liabilities (Kats and Alevantis, 2003)

Moreover, achieving sustainable design will produce buildings with lower embodied energy and harmful emissions, using reusable, renewable, recyclable and repairable resources; and using water and energy more efficiently. It will increase the demand of practitioners and increase marketing and promotional opportunities associated with sustainable building (Ashe, 2003). Hayles (2004) stated that the adaptation of sustainable construction principles delivers better long-term value to the built environment and its occupants. Manoliadis and Tsolas (2006) outlined fifteen drivers for change to implement sustainable construction. These should stimulate stakeholders to adopt sustainable design in their building project at the briefing process. They are:

- ▶ energy conservation
- ▶ waste reduction
- ▶ indoor environmentally quality
- ▶ environmentally-friendly energy technologies
- ▶ resource conservation; incentive programmes
- ▶ performance-based on standards
- ▶ land use regulations and urban planning polices
- ▶ education and training; re-engineering the design process
- ▶ sustainable construction materials
- ▶ new cost metrics based on economic and ecological value systems

- ▶ new kinds of partnerships and project stakeholders
- ▶ product innovation and/or certification and recognition of commercial buildings as productivity assets

There are several potential barriers to the implementation of sustainable construction with the main one being perceived cost. The common perception about sustainable buildings appears to be that they cost more than ordinary buildings. They increase initial costs by an average of 2 to 7 per cent over ordinary building cost, and only some projects can recoup overall net costs in a short period. Decision makers rarely use whole life cycle costs to estimate reduced operating expenses (Castillo and Chung, 2005). These barriers can be overcome by shifting the thinking of stakeholders from cost to value and from short-term to long-term.

## 2.4 Sustainable Construction in the UK - A Policy Perspective

The British Government first recognised the requirement for sustainable construction in the publication *A Better Quality of Life: Strategy for Sustainable Development in the UK* (1999), then took a stronger stance and more focused approach towards the subject by publishing *Building a better quality of life – A Strategy for Sustainable Construction* (2000).

The main principles the Government sought to address through *Building a better quality of life – A Strategy for Sustainable Construction* (2000) were:

- ▶ improving quality of life and customer satisfaction
- ▶ enhance flexibility for any potential future changes
- ▶ create and support desirable natural environments
- ▶ maximise resource use

The government has continued to progress its approach towards sustainable construction through the publication of numerous white papers and strategies including *The Strategy for Sustainable Construction* (2008). This was developed as a joint industry and government initiative with intentions to help deliver the aims identified in the UK's *Sustainable Development Strategy* into the construction industry and the wider economy. Within *The Strategy for Sustainable Construction* sustainable design is said to ensure that even during the earliest stages of construction the main principles of sustainability, including resource efficiency, build materials, build techniques, impact upon the environment, adaptability, and the needs of the end user can also be incorporated into the entire lifecycle of a project. Another important aspect of sustainable design is its ability to integrate the building with its immediate surroundings, socially and environmentally, in essence creating an improved urban environment (Raynsford, 2000).

The UK planning system plays an integral role in delivering sustainable development and aims to help ensure that development takes place in economically, socially and environmentally sustainable ways. It also has a role to play in helping to cut carbon emissions, protect the natural environment and deliver energy security. Many local planning authorities have published planning guidance and documents that specifically address sustainable design and construction. In terms of scope these documents are often closely aligned with national assessment schemes such as BREEAM, (until recently Code for Sustainable Homes, LEED and DREAM), however significant variations exist between different authorities and many include different issues and targets.

At the project level, the so-called Merton rule which targets operational energy demand of buildings and the provision of renewable energy technologies has been adopted by many planning authorities (Merton Council, 2015). The legislation from the London Borough of Merton has now been widely adopted throughout councils in the UK. It prescribes that all new non-residential developments above a threshold of 1,000sqm will be expected to incorporate renewable energy production equipment to provide at least 10% of predicted energy requirements.

When considering planning and building regulations, it is evident that the construction sector is targeted as one of the major industries to adopt more sustainable working patterns. Reasons for the greater integration of sustainability in the construction sector are twofold: firstly, due to the significant environmental and social impacts created by the industry and, secondly and more importantly, because it has always lagged far behind other sectors (Myers, 2005). Whilst the sector has traditionally often been described as 'dirty, dangerous and old fashioned' (Fairclough, 2002, p. 30) a paradigm shift can now be noticed in which construction companies aim to increasingly care about the environmental performance of the buildings they build and leave positive legacies in the communities they work in. This is also encouraged by the Considerate Constructors Scheme which was set up in 1997 to improve the image of the construction industry and outlaw unsafe and untidy construction sites (Mackenzie et al., 2000).

## 2.5 Influences of Increasing Pro-Environmental Behaviour

Is this shift within the construction industry towards more sustainable development only due to more stringent and onerous regulations, or could it perhaps additionally or instead represent a wider shift in contemporary society towards pro-environmental behaviour on an individual level? In 1993, *Agenda 21* first set out the importance of 'thinking globally and acting locally' (Selman 1996; Selman and Parker, 1997). In the UK, succeeding governmental strategies for sustainable development have also stressed the significance of active engagement by all citizens in the environmental debate (DoE 1994; DETR 1999). This shift in attitudes towards citizen participation has been characterised as a rejection of the top-down policymaking approach: "*Sustainable development cannot be imposed from above. It will not take root unless people across the country are actively engaged.*" (DEFRA 2002, p.: 7)

As a result, a range of personalised environmental actions is now actively being promoted as a way of dealing with a range of local and global environmental problems. The scope of such activities is wide-

ranging, from recycling to travel choices. With unprecedented increases in sales of sustainable produce, be this through free-range eggs, hybrid vehicles or LED lighting, it becomes clear that the 'future is green'.

If pro-environmental behaviour happens on an individual level it seems logical that these individuals also incorporate those values in a professional sense, resulting in increasing amounts of work being awarded to contractors who share similar values. Sarkis et al. (2012) suggest that the overall success of a construction project highly depends on the compatibility of systems that need to work together. Subcontractors who share similar values, working cultures, communication and information sharing can be defined as compatible. Compatibility fosters an atmosphere of trust which may lead to increased performance, innovation and ultimately long term survival (Sarkis et al., 2012). Contractors can select the best subcontractors based on compatibility which may have been established through previous relationships, reputation, or other subjective characteristics.

Myers (2005) suggests that many larger construction companies within Europe are beginning to acknowledge sustainability and its importance. Myers argues that these companies recognise that a business is no longer judged solely on the economic value added by its activity; it is also judged on the social and environmental value they add to (or take from) local communities and environments. Corporate social responsibility (CSR) reports are used to inform stakeholders of a company's environmental, social and economic performance and are consequently often seen as a means of measuring a company's progress towards sustainability. However, for investors and consumers it can be difficult to differentiate between those companies who approach sustainability as a simply PR exercise and those who are genuinely committed. Peattie (in CSR 2004, p.13) suggests that a line needs to be drawn between those who 'green-wash' their products and those who actually 'walk the talk'.

## 2.6 Tendering and Contractor Selection

A thorough process of contractor selection is required for clients to get to know contractors and their sustainability experiences and ambitions. Tender evaluation and contractor selection continues to be an area of significant importance and interest to organisations responsible for delivering project outcomes.

Tendering took its early origin from communication between architect and builder prior to commencing a contract. By the end of the 18th century the architect's role was established as being the construction designer and leader of the project team, hence establishing traditional procurement (Holt et al., 1995). These early years played a leading role in the evolution of tendering practice, affecting both the architect (preparation of pre-contract documents/evaluation of tenders) and the builder (manner of estimating costs/time allowed/method of tender submission). The process was formalised further during the early 19th century which introduced the Bill of Quantities (BOQ), consequently becoming the means of providing a common basis upon which contractors could collate their bids (Skitmore, 1989). Pre-1950s construction contracts were typically traditionally procured and assigned via open tendering. However, since that time the industry has experienced significant changes in the way contracts are procured and managed.

In 1994, Sir Latham's construction review provided an in-depth analysis of procurement trends, specific failings of tendering practice and contractor selection were confirmed, as indicated by Holt et al. (1993). Latham confirmed that clients should base their choice of contractor on a value for money basis with proper weighting of selection criteria for skill, experience and previous performance, rather than accepting the lowest tender.

Occurring early in the project life cycle, tender evaluation is perhaps one of the most critical undertakings performed by clients, with its effectiveness directly linked to project success and the achievement of specified objectives (Alsugair, 1999; Holt et al., 1993). Judgments about contractors and their ability to deliver is complex, including high levels of ambiguity and uncertainty, competing stakeholder values and

complex relationships, as a result of multiple conflicting objectives (Hatush & Skitmore, 1997; Watt et al., 2009). Additional complications emerge in identifying suitable and relevant criteria and assigning appropriate weights. All of these are likely to vary as a function of many factors, least of which are the organisational objectives and experience of the evaluator (Watt et al., 2010).

Given the complexities and underlying issues surrounding contractor selection, and the variety of criteria available, how then do clients choose contractors and what is the relationship between the criteria used in an evaluation? Which criteria influence choice and is sustainability one of them?

Dempsey's (1978) study on vendor selection supported Dickson's (1966) earlier research investigating the purchasing behaviour of managers in selecting suppliers. Together, cost, quality and delivery performance were identified as the most important criteria used during the evaluation and selection process. A number of similar studies investigated the relative importance of service or product quality, performance in delivery and quality criteria, and others to select suppliers for the delivery of industrial equipment and services. Watt et al. (2010) argue that an actual choice of contractor requires evaluators to consider each contractor simultaneously as a function of all specified criteria and their assigned weightings.

## 2.7 The role of sustainability in contractor selection

Whilst a large body of academic literature has explored the broadening of contractor selection criteria in the built environment, research on the role sustainability might play in contractor selection, however, has been limited. There is still a significant gap in this research area though a recent paper by Sarkis et al (2012) did delve into the topic and found the importance of the construction industry with respect to economic, environmental and social sustainability perspectives. Sarkis et al (2012) introduced a number of decision factors and attributes that could be considered important within the construction industry's operations and appointments of contractors and sub-contractors. The factors include economic,

environmental and social factors, in line with the triple-bottom-line aspects of sustainability. It was found that typically decision models that have been applied to this area have focused primarily on the economic and business factors associated with the decisions, with the environmental parts of sustainability being identified as being of second most importance. The authors found that what literature and research lacks is a greater inclusion of social sustainability factors into the broader construction decision making environment.

It appears that, in today's business environment, solely complying with employers' requirements is no longer enough. Clients like to see their business partners going above and beyond compliance in order to demonstrate enhanced value for money. Social sustainability can be seen as a key way of achieving this and often feeds into a company's image or reputation. Engaging with the local communities and not adopting an approach centered round invisibility and 'minimal impact' but instead aiming to maximize the positive local impact are seen as examples of achieving the ethos of 'going above and beyond'.

Less physical, intangible assets, such as reputation, are increasingly important in determining the value of a company and its compatibility for working relationships and Robinson et al. (2008) suggest that corporate reputation is positively related to firm value. So, how can a company work on its reputation? There are clearly many ways of achieving an enhanced reputation but for the focus of this research the focus shall remain on sustainability and in this stakeholders increasingly expect companies to behave in an ethically, socially and environmentally responsible manner. Further, it is expected that companies communicate transparently about their actions leading in turn to a favourable reputation as a sustainable company (D'Amato et al., 2009).

Involvements in major corporate scandals (such as the European horse meat scandal, Volkswagen's diesel scandal or the BP oil spills) can have a considerable negative bearing on the reputation of a company and its supply chain. Czinkota et al (2014) suggest that a company's lack of response to the threat of climate change, too, can also be seen as a major threat to a company's reputation in an era where the words 'organic', 'sustainable' and 'ethical' are used everywhere. To avoid these incidents and

negative press, companies are recommended to better protect the consistency of their brands' values throughout their supply chain and to better adapt to their social context (Lopez, 2011).

In an industry where competition is fierce between principal contractors, being able to culturally align oneself as a company with the client's company is increasingly important. Barile (2006) suggests that the corporate system constantly looks for players with which to create and maintain lasting relations, through the development of, first, a state of consonance, and, then, of resonance. Consonance is a condition that is achieved when the relevant players (corporate and supply chain system) identify a common language and shared emotions/passions, while resonance marks a relational evolution in which the players create opportunities to reach common goals (Barile, 2006; Golinelli, 2010).

### 3. Research methods

To achieve the main aims and objectives, a broad research approach was employed with qualitative and quantitative methods combined in order to compensate for shortcomings and benefit from the advantages of both of them. Philip (1998) argues that employing a range of methodological strategies means that the researcher does not necessarily privilege a particular way of looking at the social world. According to Bryman (2004), each research method has distinctive characteristics which make the possibility of combining them especially attractive. The trustworthiness of the data was enhanced by the use of data triangulation (Bryman, 2004), combining qualitative in-depth semi-structured interviews, and the analysis of semi-quantitative/qualitative questionnaire data as well as the data gained from pre-qualification questionnaires. Erzberger and Kelle (2003, p. 460) describe data triangulation as playing each method off against the other in order to “reduce threats to internal and external validity”.

#### 3.1 Content Analysis

Content analysis accounted for a large proportion of the data used within this research project. Content analysis is an observational research methodology for studying the content of communications and can help reveal any emerging themes in unstructured data. The PQQ is a document in which clients define and convey project requirements to prospective contractors (Harris and MaCcaffer, 1995; Molenaar et al., 2000). For sustainable construction projects, clients need to include their sustainability requirements in the PQQs so that they can be addressed accordingly by interested contractors in the project proposals.

Similar to Xia et al. (2014), a rigorous content analysis of 20 PQQs (see table 1) was used to understand how British public and private sector clients define their sustainability requirements for green buildings.

Table 1 shows the types of projects reviewed through PQQs sorted by sector:

	Total PQQs	Project Focus	
		Private Sector	5
		Office	2
Public Sector	8	Education	5
		Leisure	3
Higher & Further Education	7	University	6
		College	1

Willmott Dixon’s twenty most recent PQQs were reviewed in relation to the following main subjects;

- ▶ Weightings given to sustainability sections of past tenders to assess the main drivers in contractor appointments
- ▶ The nature of the sustainability questions asked in PQQs
- ▶ The role of sustainability credentials (BREEAM, Carbon Standard etc.)

Though the PQQs were all related to projects which Willmott Dixon were asked to tender for, this does not create a bias as the PQQ documents sent out to different contractors would be identical (Al-Reshaïd & Kartam, 2005). For each proposal, the information of project size and location, time of release, BREEAM certification levels, statements of sustainability requirements, importance weightings of sustainability requirements and price proposal, contractor selection methods and client provided design proportions were recorded for further analysis. Once the data for these variables were collected, qualitative and quantitative analysis was used to investigate how clients define their sustainability requirements and explore the relationships between the different variables involved.

Unfortunately, inconsistencies in terms of data availability between PQQs meant that sometimes quantitative analysis of the PQQs proved difficult and it was therefore decided that to add more depth to this topic the results would have to be viewed in conjunction with the interview and questionnaire findings.

### 3.2 Online Questionnaires

Two online questionnaires were circulated to elaborate on the findings from the content analysis. The first survey was circulated to the bids submissions team within a major contractor and was aimed at developing a better understanding of how the staff who prepare PQQ responses view the topic of sustainability and its role in winning work. 24 bids submissions staff participated in the survey representing a 50% response rate.

The second survey was circulated to 60 past and present public, private and HEFE sector clients and project managers in order to better understand the importance of sustainability in awarding projects. With a response rate of 40%, the analysis of the 24 responses indicated that the self-selected aspects of sustainable development fell into six categories:

- ▶ Supporting the local community including local purchasing
- ▶ Sustainable use of natural resources
- ▶ Energy efficiency and life cycle considerations
- ▶ Innovative design and construction
- ▶ Considerate Constructors Scheme
- ▶ Cycling

### 3.3 Interviews

A series of interviews were conducted for this research in order to add qualitative data, and therefore depth, to the data collected via the PQQs and the surveys. The first set of interviews comprised of ten interviews with clients from the public, private and HEFE sector. The interviews focused on the client experience, starting from their first initial contact with Willmott Dixon leading all the way into the post-

construction phase. Questions included in the interviews looked at clients' reasons for choosing Willmott Dixon over other contractors, clients' ambitions before commencing the construction journey, particularly with regards to sustainability, and how these were realised throughout construction.

A second set of semi-structured interviews was conducted with bid managers and a community engagement manager of a major contractor. The content of these interviews primarily revolved around clients' approaches to sustainability and mostly echoed the findings from the content analysis and the client interviews.

Regarded as one of the most frequently used research methods in human geography, Longhurst (2009) describes in-depth, semi-structured interviews as conversations in which an interviewer attempts to obtain information from another person by asking questions. Although the interviewer uses a predetermined question catalogue, semi-structured interviews tend to unfold in a conversational manner, allowing the participant to explore issues, experiences and understandings of particular relevance to them (King & Horrocks, 2010). Interviews are also useful in determining what the issues are in a relatively unexplored area, which can then be of assistance in the production of surveys. Ultimately, in-depth, semi-structured interviews are seen as a useful tool for investigating complex behaviours, opinions and emotions, and for collecting a diversity of experiences as they offer sufficient time and space to explore issues thoroughly (Longhurst,2009).

## 4. Data Analysis

Back in 1994, the Latham Review 'Constructing the Team' made far reaching recommendations to help clients acquire the high quality projects for which they strive. The Latham Review underlines the need for thorough and systematic contractor selection since entrusting a project to a contractor is amongst the most important of all client decisions (Odusote, 1990; Russell et al., 1992; Holt et al., 1993). Sir Latham (1994) suggested that emphasis on the encouragement of lowest bid should be redirected towards other factors such as project performance or quality of completed product, which Sir Latham proposed would in turn result in increased client satisfaction.

According to Smith (1986), the fundamental rationale behind competitive tendering is free market competition, genuine competition should achieve best value for money for the client (Burrows, 1981). However, Sir Latham suggested that this has often been implemented to the extreme with some clients obligated to accept lowest bid regardless of the bidders' competencies (Latham, 1994).

In comparison to many other sectors of the economy, construction clients are said to be more prone to the adverse effects of this misdirected selection procedure in that they normally select the manufacturer of their product before they select their product (Holt et al., 1995). Therefore, once committed to purchase, project success determines the level of satisfaction achieved by them.

Traditional selection methods are arguably unable to predict a satisfactory project outcome as evidenced by an increasing number of clients utilising alternative procurement methods (Latham, 1994). Design and build, management contracting and construction management are increasingly prevalent, not least because these procurement methods apportion greater risk onto the contractor (Watkinson, 1992). Consequently, a client's financial exposure from choosing the wrong contractor is reduced but procurement form alone is no guarantee of project success (Brook, 1993).

The Institute of Building (1979) pointed out that shortcomings occurred in both the public and private sectors which resulted in clients struggling to achieve best value for money. Most of these issues

commenced before the contractor was appointed and many were made worse because the wrong contractor, or possibly the wrong method of employing him, was chosen (IoB, 1979).

According to the Latham Review (1994), clients' needs are of the greatest importance as they have the right to expect projects which meet their needs and aspirations fully (1994). Cost is obviously a major factor but a balance is desirable with project time and quality, to secure best all round value for money. There will always be a trade-off between time, cost and quality as the client tries to balance these variables, the importance attached to each having a dominant influence upon the contractor selection decision. Fellows (1988) found hierarchical classification of these criteria in respect of specific client groups. The public sector express concern over public accountability (i.e. cost limits and specification stipulations) whereas the private sector are more attentive to time - notably due to its impact upon profitability. Lastly, Fellows (1988) argued that clients' experience of construction will also influence their expectations of the industry.

To summarise, in striving to attain successful projects, selection must evaluate contractors in the context of their potential for achieving these pre-eminent client requirements—time, cost and quality. In addition to these, roughly a third of the 20 PQQs analysed for this research included sustainability requirements as a separate evaluation criterion. If evaluated separately, the weighting associated with sustainability issues is usually between 5 and 10%. Meanwhile, a much larger number of PQQs include sustainability requirements as the sub-factor(s) of other selection criteria, i.e. technical approach, past performance and experience, and qualification of design-builders. The sustainability requirements were most frequently mentioned in design criteria and project performance specifications. For those defining none of the specific sustainability factors and importance weightings for contractor selection, the sustainability requirements are normally covered in the description of project requirements and objectives. Most importantly, 100% of the PQQs analysed for this research covered sustainability in any of the aforementioned forms, clearly highlighting that sustainability is of importance to clients.

## 4.1 Focus on the Client

Sir Michael Latham (1994) stated that in the end ‘clients drive best practice’. It is the clients who possess the influence to drive change and transform this industry. Some clients are already realising the power they have in this but unfortunately this cannot be said for all sectors. The following sub-chapters separately examine the different types of client served by the construction industry, including the private sector, public sector and HEFE clients, as the type of client appears to lie in clear correlation to their sustainability ambitions. Each of the above mentioned client types will be discussed in more detail whilst also considering the often occurring discrepancies between what one would expect a particular client type to be interested in versus the actual client requirements as identified to bidders.

In the following sub-chapters trends will be presented for each client type to highlight the primary sustainability ambitions and interests. Table 2 provides a brief overview of these trends.

**Table 2:** Sustainability preference trends by sector

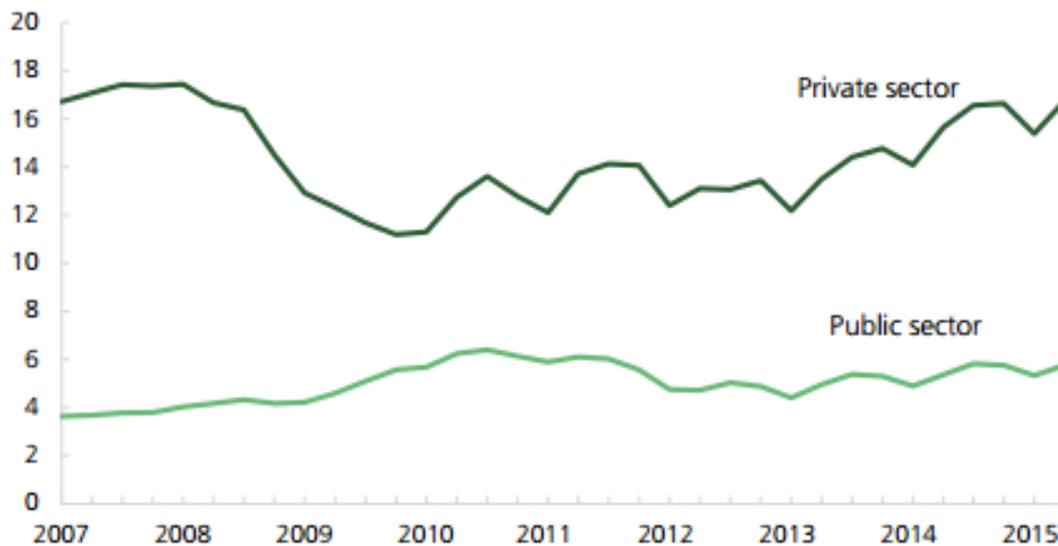
	Private Sector	Public Sector	HEFE
<b>Environmental</b>			
Waste minimisation	+	++	+++
Carbon reductions	+	++	+++
BREEAM	+++	++	+++
Material considerations	+	+	++
<b>Social</b>			
Community engagement	++	+++	++
Local labour	+	+++	+
Apprentices/work experience	+	+++	++
<b>Economic</b>			
Life Cycle Costing	+	+	+++
Local spend	+	+++	+

### 4.1.1 Private Sector

According to a briefing paper for the House of Commons, in 2015 the private sector has been amounting for 74% of all construction works in the UK equating to a spend of £16.8bn in comparison to public sector orders worth £5.8bn, as shown in Figure 1 (Rhodes, 2015).

**Figure 1: Construction sector output: Total (Rhodes, 2015)**

£ billions, current prices



Private sector clients express a preference as to what values they want from the firm as they typically pay for a service or a good. By paying, the customer imparts a justification for the firm to supply the product. In economists' terms, demand becomes effective demand. Consequently, customer demand provides the definitive signal to a private firm about what value it should be producing. The more people are willing to back up their choice with 'hard dollars', the more it makes sense for the firm to produce value (Alford, 2002). This means that private sector construction clients are likely to be driven by their staff's (if building is going to be owner-occupied) or their clients' (if the building is to be sold on or let out) demands.

#### 4.1.1.1 Defining What the Private Sector Client Should Want

For the private sector profit appears to be of the greatest importance. With regards to the effects this might have on sustainability aspirations there is a clear need to consider the diverse nature of the private sector, as alluded to in the previous section. On one hand, private sector clients include those who are commissioning a new building for their own use (owner occupiers). On the other hand, some private sector clients will require a new building in order to either sell it on or use it for the accommodation of tenants (resellers/landlords). The sustainability aspirations of these two different types of private sector clients would appear to be quite different.

Owner-occupiers are likely to place significant value on health and wellbeing factors, such as air quality, materials used within the building cycle provisions etc. Furthermore, it can be assumed that owner-occupiers are likely to be interested in life cycle costing as, throughout the life cycle of the building, the owner-occupier will be paying the utility and maintenance bills. For example, there is no point in procuring a flagship office headquarter only to discover five years later that it is too expensive to heat and maintain. Accurate life cycle costing allows a client to compare different options at design stage, analyse the cost and plan what future expenditure will be ten to 15 years ahead.

For the reseller/landlord client however, assumptions regarding sustainability aspirations are likely to be quite different with an increased focus on the marketing aspects of sustainability. In the private sector landlords are subject to market forces, which have dictated the need to incorporate green credentials in order to maximise letting potential and rents. In that sense, environmental benchmarking certifications, such as BREEAM, LEED or SKA, appear to be a logical expectation.

#### 4.1.1.2 Defining What the Private Sector Client Wants

All the different sectors analysed for this research the private sector certainly had the least focus on sustainability. With an average PQQ section weighting of 2-5%, the private sector appeared to attach the lowest weightings to sustainability questions in comparison with the public and HEFE sector. Due to the private sector's margin driven focus this is perhaps to be expected.

Sustainability related questions seemed to focus on requirements clients knew would be passed down from the local planning authorities rather than ambitions going 'above and beyond' compliance. One bid manager from a major contractor stated:

*"We do not see a terrible amount of altruism in the private sector. Community benefits etc. are certainly not high on the sector's priority list and do not drive decision making processes. If there is a commercial benefit in something then they'll consider it but even with that there seems to be a limit... life cycle costing for example is barely ever asked for, even though it would so much sense."*

In this, most sustainability questions asked for BREEAM related experience and sometimes experience in cutting carbon emissions (linked to building regulations and the Merton Rule in London boroughs). According to a bid submissions coordinator interviewed for this research public sector clients either do not seem to regard sustainability as being particularly important or appear to be asking questions just for the sake of asking questions, represented through a lack of coherence within the sustainability questions asked. This view was supported by the PQQ analysis which highlighted brief questions regarding the contractor's ability to achieve certain BREEAM ratings. The required BREEAM ratings almost always corresponded with planning conditions likely to be imposed by the local planning authorities and were not particularly ambitious, with a majority of PQQs asking for the ability to construct BREEAM Very Good buildings.

The second focus of the private sector appeared to lie in compliance with Section 106 agreements. Section 106 (S106) Agreements are legal agreements between Local Authorities and developers which are linked to planning permissions and can also be known as planning obligations.

Section 106 agreements are drafted when it is considered that a development will have significant impacts on the local area that cannot be moderated by means of conditions attached to a planning decision. For example, a new residential development has the potential to place additional pressure on the social, physical and economic infrastructure which already exists in a certain area. A Planning obligation will aim to balance the pressure created by the new development with improvements to the surrounding area ensuring that where possible the development would make a positive contribution to the local area and community.

The S106 will vary depending on the nature of the development and based on the needs of the District with most common obligations including:-

- ▶ Public Open Space
- ▶ Affordable Housing
- ▶ Education
- ▶ Highways
- ▶ Town centre improvements

A major contractor's community engagement manager commented on the nature of private sector clients saying:

*“What we see from the private sector is the bare minimum. If there is a 106 condition about apprentices then that's what they'll ask for... there's not a lot of 'added value' requested from these types of clients.*

*Unless we can do it for free.”*

Finally, it could be assumed that the industry within which the client works might have an impact on sustainability aspirations. With the limited research sample analysed for this research project this did not appear to be the case. By looking at mainly hotel and office clients there did not appear to be a clear correlation between the company's line of work and their sustainability ambitions. The only exception to this observation would be commercial work for third sector clients, with the World Wildlife Fund's recently built head quarter in Woking serving as a prime example. As the third sector is not technically speaking part of the private sector WWF's sustainability agenda will not be discussed in more detail throughout this research.

#### 4.1.2 Public Sector

As the UK government's first public sector priority spend area, the construction industry is a major focus for the public sector (Department for Environment, Food and Rural Affairs, 2006). The construction sector is a key part of the UK economy which represents some 6.5% of GDP (more if the whole-life contribution through planning, design, construction, maintenance, decommissioning and reuse, is taken into account) or £110bn per annum of expenditure (House of Commons, 2015). 40% of this construction expenditure is procured by the public sector, with central Government being the industry's biggest customer (House of Commons, 2015; Cabinet Office, 2011).

One role of the public sector client is that of the paying customer, just like that encountered by private sector firms. However, to further illustrate the role of the public sector clients and to highlight the differences between public and private sector clients, Alford (2002) employs a social exchange perspective. He uses the example of public transport commuters who directly exchange money for bus trips, they have a positive preference for the service at the price in question, and the transport authority seeks to maximise its clientele (and hence its fare revenues) within its cost constraints. However, the clients of public sector organisations are hardly ever, if at all, solely paying customers. Public transport

systems are typically subsidised by the public purse because they create public value, such a mitigation of traffic congestion and air pollution (Maddison et al, 1995). To the extent they are subsidised commuters, they receive part of the service without paying money directly. In fact, most public sector consumers do not pay money in return for the service, and consequently there is no economic exchange between the organisation and the client - for example, pupils at government schools (Scrivens, 1991). Consumers in this case are better described as beneficiaries who receive a service or benefit but give no money directly to the organisation in return. In such cases, the organisation cannot be said to be seeking to maximise sales. Instead, its concern is to ration its services, which are limited by budgetary resources, rather than to generate greater demand (Walsh, 1991).

In response to the call made at the World Summit on Sustainable Development in 2002 to 'promote public procurement policies that encourage development and diffusion of environmentally sound goods and services' the UK government in 2005 stated its goal to be amongst the leaders in Europe on sustainable procurement by 2009 (Department of Environment, Food and Rural Affairs, 2005). Sustainable procurement is procurement that is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance. As McCrudden (2004, p. 257) notes, sustainable procurement therefore places government in two roles by "participating in the market as purchaser and at the same time regulating it through the use of its purchasing power to advance conceptions of social justice".

#### 4.1.2.1 Defining What the Public Sector Client Should Want

Public procurement is guided by principles of transparency, accountability, and achieving value for money for citizens and taxpayers (Kelman, 2002). Public sector expenditure in general is substantial: government organisations across the world tend to spend between 8 per cent and 25 per cent of GDP on goods and services (Organisation for Economic Co-operation and Development, 2006); in the UK, public procurement expenditure is approximately £150 billion (Department of Environment, Food and Rural

Affairs, 2005). Government is often the single biggest customer within a country, and governments have the potential to use this purchasing power to influence the behaviour of other organisations. In particular, it has been noted that public procurement can be a lever to deliver broader government objectives, such as stimulating innovation in supply markets, using public money to support environmental or social objectives, and for supporting domestic markets (McCrudden, 2004). The nature and context of public sector purchasing differs from commercial practice. The public sector spends taxpayer's money, is subject to public review and needs to be transparent and accountable in its purchasing processes. Thus whilst buyers in government and the commercial sector might both be concerned with reducing cost and achieving value, public sector buyers have the additional task of achieving social, environmental (and other) benefits in their purchasing to fulfil the responsibilities of government to society. Some private firms also pursue socially responsible purchasing, but this is a choice rather than an obligation.

There is an argument that public sector clients should be giving higher priority to life cycle costs than capital costs, to ensure that public money is spent wisely. Higher costs at design and construction stages should be considered in the interests of achieving significant savings over a building's lifetime. Most in the public sector understand that lowest capital cost does not give best value for a construction project. The Treasury defines value for money as: "the optimum combination of whole-life cost and quality to meet the user's requirements" but in practice this has proved difficult for government clients to adopt because budgets for construction and operation are separate.

#### **4.1.2.2 Defining What the Public Sector Client Wants**

Throughout the research conducted for this research project, the public sector currently seems to primarily be focused on the social rather than the economic and environmental aspects of sustainability. Clients from the public sector appear to be particularly interested in supporting local communities by procuring goods and services from small and local suppliers, and by placing public contracts in a strategic way, goals such as social cohesion Thus the combat of long-term unemployment and the achievement of

acceptable standards of living can be fostered (Walker & Brammer, 2009). Localism appears to be at the heart of the public sector's sustainability ambitions with one client stating that *'investing money in a charity overseas is not much good for us, we have to deliver local benefits, local jobs and local legacies'*. Many other clients echoed this sentiment with 15 out of 18 (83%) stating that local social value was somewhat important, important or extremely important to their organisation.

Community engagement is very clearly at the centre of public sector clients' minds when it comes to sustainability, with a clear majority of PQQs analysed for this research project (90%) requiring the submission of an Employment Skills Plans and community engagement strategies.

It was suggested by a major contractor's community engagement manager that the public sector's focus on social sustainability could be linked with funding cuts:

*"We've seen a lot of (public sector) clients asking us to support a certain charity dealing with social exclusion or similar topics. Though I can't say that this is the definite reason I would assume that the root of questions like this lies in funding cuts. They're the kind of charities local councils want to work with but they don't have the money, so they ask contractors to deliver the benefits in their stead."*

Social sustainability appears to be at the forefront of the public sector's sustainability ambitions, yet many clients do not seem to believe that localism, community engagement and local labour are related to sustainability per se. When this apparent apathy is explored by reviewing comments made by public sector clients, it appears that, among other things, there is a lack of knowledge as to what constitutes sustainability and that, according to public sector clients, the term sustainability only refers to environmental sustainability. This is, amongst others, evidenced by the answer of one public sector client below when asked whether they were interested in sustainability when scoring principal contractors' PQQ responses:

*“Honestly, I don’t think we’re really bothered with sustainability, at least not in a way that it affects how we score contractors. The more important things here, apart from obvious things like cost and experience, are things like apprentices, community engagement, CCS scores... all of the social stuff really.”*

It can be seen that the public sector has a long way to go until sustainability can be seen as being fully understood. Implications for contractors bidding for public sector contracts appear clear: the simpler the terminology used within bids and the greater the focus on localism the more likely it is for sustainability messages to seep through.

### 4.1.3 Higher and Further Education

The size of the British higher education sector is staggering. A recent study by Universities UK (2015) found that at over £27 billion, the turnover of the higher education sector as a whole would put it in fourth place in the FTSE 350 on revenues alone – behind only Tesco (£63 billion), Vodafone (£38.3 billion) and SSE (£30.6 billion).

More than 40% of England’s university non-residential estate was built in the 1960s and 70s, an era associated with building issues related to heating, ventilation, and panel cladding systems. Coupled with a historic lack of investment in maintenance, this has left the UK university estate as a whole in significant need of repair or rebuild (AUDE, 2008). AUDE suggests that ‘a conservative estimate of the replacement cost of all 1960s buildings within English university institutions is circa £11bn’. Although there has clearly been some progress on addressing this problem since the report’s publication, the speed at which universities have been able to carry out development work has been constrained by recent cuts to national funding and by uncertainty around tuition fees, both of which have led to a degree of caution in procuring projects to update the estate.

Considerable investment is required to ensure the UK’s higher education estates are fit for purpose and able to support world-class teaching, learning and research. According to AUDE, capital expenditure on the higher education estate – excluding residential property – was £2 billion in 2012–13, a rise of 9% on

the previous year. To put this in context, this level of annual investment makes the university estate a bigger investment than Crossrail (AUDE, 2014).

The university estate matters; it is central to the operational effectiveness of the university, the experience of staff and students alike, and plays a critical role in ensuring that a university is able to meet the many demands placed on it. But, as in light of financial restructuring, the higher education sector adapts to a new and more competitive environment, the role and purpose of the estate as a potential competitive advantage has also increased (Alwani-Starr, 2014). Studies by AUDE (2014) suggest that a third of students have rejected an institution based on the facilities they observed, and 80% of students say that the quality of the estate influenced their decision on where to study. Consequently, University estate management staff have sought to maximise the outcomes of any investment into the university estate with sustainability now also being a key driver.

#### 4.1.3.1 Defining What the HEFE Client Should Want

Sustainability ambitions of the HEFE sector are assumed to be influenced by two key drivers:

- ▶ funding requirements
- ▶ competition to attract students

The Higher Education Funding Council for England (HEFCE) provides government funding to 129 universities and HE colleges and 186 directly funded FE colleges in England. This funding is a major contributor to the estate related costs of HEFE clients through new construction, refurbishment and modernisation works. HEFCE funding is often linked to a number of conditions, including HEFCE's Sustainable Development Framework which is underpinned by the Government's guiding principles for sustainable development and aims to achieve the following:

- ▶ living within environmental limits
- ▶ ensuring a strong, healthy and just society
- ▶ achieving a sustainable economy
- ▶ using sound science responsibly
- ▶ promoting good governance.

For HEFE institutions to thrive in this new funding environment, decision making needs to be based on maintaining excellence but at the same time controlling cost and maximising efficiency - and perhaps most importantly, on high levels of engagement with students. Students are, rightly, increasingly seen as partners in institutional decision making, and being responsive to their needs across many core areas of university activity is a priority for institutions. Recent studies by Universities UK have set out the ways in which universities have invested income from increased tuition fees, for example to deliver excellence in education and research and in enhancing the student experience (UUK, 2010; 2013; 2015).

The use of HEFE estates is constantly evolving and growing with students and staff increasingly expecting access to buildings for longer hours than before, as well as expecting better environments within them, such as cool temperatures in the summer and warm temperatures in the winter. Demand for access to electrical sockets for charging laptops and other electrical equipment continues to increase, reflecting a trend in virtual (and hence energy-intensive) teaching, research methods and facilities. This is especially true of research space, which is seen to be using unprecedented amounts of energy (AUDE, 2014).

Universities UK (2015) have found that the efforts of estate management teams to improve energy efficiency have in turn reduced the sector's carbon footprint, with a slight drop in carbon emissions per square metre since a peak in 2008–09. Without improvements to energy efficiency and space use, nearly 1.2 billion kg of additional carbon dioxide equivalent emissions would have been released (Unpublished

research by London Economics, cited in Universities UK (2015)). Given the increased energy demand across the period, this also highlights the considerable impact of investment in green technologies.

From placing environmental sustainability and energy efficiency as a central consideration in new build and renovation projects, to voltage optimisation in student halls and the replacement of fluorescent tube lighting with modern light-emitting diodes, the sector has been proactive and innovative in reducing its energy demands and carbon footprint (HEFCE, 2014). To support and encourage the range of green projects within universities, HEFCE has made over £60 million available over three rounds through its Revolving Green Fund for energy efficiency and carbon reduction projects. A 2014 evaluation of this fund found that supported projects are expected to result in lifetime savings of £281 million and will generate annual carbon savings of 103,000 tonnes, around 12% of the sector's 2020 carbon targets (Blue Alumni, 2014).

Given the above, the HEFE sector is expected to place significance on carbon and waste reductions, healthier environments and ambitious BREEAM ratings. It is envisaged that due to the academic expertise within the institutions themselves and funding sources such as HEFCE the approach to sustainability will be sophisticated, well-informed and diverse, appreciating the three-fold nature of the concept of sustainability.

#### 4.1.3.2 Defining What the HEFE Client Wants

Indeed, the requirements and expectations of the HEFE sector appeared to be most in line with perceived preferences. The sector is characterised by a well-educated and well-rounded approach to sustainability. Possibly due to the academic expertise available from within universities, the HEFE sector's approach to sustainability took into account the economic, social and environmental aspects of sustainability.

On the economic side, HEFE clients appeared to be mostly interested in life cycle costing with a clear and concise understanding of the value of investing into technologies and systems that are cost effective over

its whole life cycle. Due to the sector's changing financial landscape the HEFE client can often be characterised as an 'educated private client' meaning that financial dimensions and profit are still very much on their mind. However, though the sector is still focused on financial benefits the outlook is often broader and farther reaching than that of a standard private sector client meaning that life cycle arguments can resonate with this particular client type.

Environmentally speaking, the energy performance of buildings was key and very high up on HEFE clients' sustainability priorities, mirroring the findings from Universities UK. Energy Performance Certificate (EPC) A ratings were often mentioned within the PQQs and some clients even expressed the desire to achieve an ambitious Displayed Energy Certificate (DEC) rating. Waste management also featured frequently throughout the PQQs, as did material choices, with some clients stipulating that materials will have to be specified and sourced in line with the Red List of the Living Building Challenge.

BREEAM seemed to be a key environmental focus, too, with a large majority of the analysed PQQs including BREEAM requirements. BREEAM can be seen as one of the most popular vehicles for delivering 'greener' construction (Kubba, 2012), a notion which is echoed by the primary research carried out for this project. There appears to be a clear correlation between clients stipulating a certain BREEAM rating and local planning conditions frequently requiring a certain BREEAM rating. A university in central London for example is likely to mention BREEAM in their PQQs as they know that London Plan requirements will stipulate a specific BREEAM rating. However, upon further investigation it emerged that clients' BREEAM requirements do not only coincide with local planning conditions but also often reflect the client's desire to have a way to measure the sustainability of a building. The reason BREEAM is so important can be linked back to an inherent issue of the topic of sustainability itself - how does one measure it? Many clients expressed their concern over not being able to quantify sustainability and mentioned BREEAM as the preferred way of measuring and applying some sort of quantifiable measure. One respondent for example eluded to the fact that perceptions of sustainability vary widely, so having a quantifiable tool like BREEAM is really important, because:

*“to some people a sustainable building has a green roof, to others it is one that included lots of community engagement during construction, and to others again it’s a zero energy building. BREEAM really is the only way of saying ‘okay, this building is ‘Excellent’, this building is ‘Good’. It helps quantify things that are otherwise just down to peoples’ perceptions”.*

A key difference between HEFE and public sector clients with regards to BREEAM emerged regarding aspirations. Whilst public sector clients often only asked for the ‘bare minimum’ (ie. the rating likely required by the local planning authority, which often seems to be Very Good) HEFE clients were more ambitious and asked for Excellent and Outstanding ratings, often going above and beyond the likely planning conditions.

These different BREEAM preferences could perhaps also reflect the institutions’ different standpoints on what their buildings mean to them. For public sector clients the approach often seems to be of a very utilitarian nature, for example a new building is built to accommodate more pupils. On the other hand, universities often recognise the importance buildings hold to their student population. Particularly in the rise of increasing tuition fees many universities felt that they needed to show students ‘value for money’ to compete with other universities and investing in the infrastructure and architecture of their campus was seen as a way of achieving this. One university representative expands on the importance of their new building:

*“The design of the building is about aspiration and treating students as grown ups; it’s about the independence that education gives people. The students here are often young people who wouldn’t have a lot of options regarding where they study, and they are striving for something better.”*

Finally, HEFE clients also placed significance on social sustainability issues. Unlike the public sector, who appeared particularly keen in tackling social exclusion, the HEFE sector again focused on value for money for the student population. To compete with other HEFE institutions there is a large focus on providing their students with valuable work experience and access to good employers. Hence, work

experience opportunities and the willingness of contractors to participate in research projects were key foci. From the view of a contractor's community engagement manager this is exactly what differentiates the HEFE sector from the public sector:

*“Whilst the public sector cares about the socially excluded, ex-offenders, the disabled, the unemployed etc., universities have to think about how they can prevent their students from becoming socially excluded at some point. A university degree no longer guarantees a meaningful job after graduation, so for their alumni not to become unemployed and socially excluded, universities have an obligation to provide their students with a smooth path into employment... and indeed, work experience, sandwich years and dissertation research are key things they are asking us about these days.”*

It becomes very apparent that the private, public and HEFE sectors have very different sustainability priorities or, in some cases, sustainability might not be a priority at all. Expectations of a sector's sustainability preferences in some cases coincided with expectations and academic research, with the HEFE sector being a prime example. On the other end of the spectrum, however, the public and private sector still has a number of lessons to learn regarding the value of sustainability and how it can be of benefit to the sector. In the case of the private sector this was anticipated due to the key focus on profitability but in the case of the public sector came as a surprise particularly as whole life thinking would make a lot of financial sense in a sector with such limited resources.

## 5. Sustainability as a Unique Selling Point

The previous chapter has discussed some of the key trends on the different sector's sustainability drivers and ambitions. This chapter will look at some of the finer details which did not necessarily emerge from the PQQs but which were picked up throughout the review of the online surveys and client interviews.

Interestingly, throughout the interviews analysed for this research project, almost all clients or client representatives mentioned the idea of aligning of values regarding contractor selection processes. According to Schwartz (2012) values guide the selection or evaluation of actions, policies, people, and events. Humans decide what is good or bad, justified or illegitimate, worth doing or avoiding, based on possible consequences for their personal values. But the impact of values in everyday decisions is rarely conscious. Instead, values enter awareness when the actions one is considering have conflicting implications for different values one holds.

Organisations with governmental funding have their own sustainability and social value requirements and, in order to comply with these, the rest of the supply chain also has to comply, meaning that contractors with a strong sustainability and social value record are favourable in the selection process. According to Barile (2006) identifying a common language, shared emotions and passions as well as creating opportunities to reach common goals are all key contributors to successful business relationships. In line with this, apart from firm sustainability requirements (such as BREEAM ratings, waste targets etc.), many respondents also highlighted that they personally prefer working with organisations whose values align with their personal ones as they linked shared values with increased trust:

*“Knowing that you’re on the same wave length as your business partners is extremely important to me. It gives me a sense of trust. And you need a lot of trust if you give someone a multi-million pound budget.”*

Along with seeking contractors who share their own values, some clients also confessed to looking for the ‘human touch’ when selecting a contractor. Three clients noted that, although a strong corporate image

looks great on paper, one of the things they are particularly looking for in tender interviews is to see the human side of these organisation. Sustainability and social value are quoted as key ways of seeing this 'human touch', as one respondent put it:

*"These are exactly the kind of things that make you stand out, you know. When you go above and beyond and don't just give us a building but give our pupils memories and become part of their day-to-day lives, even if it's just for a year."*

## 6. Conclusions and Recommendations

This report has discussed the role of sustainability in processes of contractor evaluation in the British construction industry and established sustainability as an important decision making criterion. Clients from different sectors appeared to have different ambitions when it came to particular aspects of sustainability, an overview of which was provided in the previous chapters, but overall it was clear that sustainability, in some form or other, was of importance to all of Willmott Dixon's current and recent clients.

Though sustainability emerged as an important criterion to clients, a further major finding from this research was a considerable knowledge gap with regards to sustainability found in some clients. Clients' definitions of sustainability varied widely and sometimes included many contradictions, with clients on one hand stating that sustainability did not play a major role within contractor evaluation but on the other hand local spend, value for money and community engagement were major considerations. This clearly shows that the understanding of many clients of what sustainability is is often at its best ambiguous. For contractors this poses an opportunity as they can maximise the impact of their sustainability agenda simply by reformulating their communications to align with those of the client. Speaking the client's language might appear to be an easy recommendation to make but the research for this project has in fact identified language and communication as a major factor in the success of a project.

- ▶ *Recommendation: Listen carefully to clients when they mention or ask about particular aspects of sustainability (even if the word sustainability is not used) and employ an individually tailored approach to your response.*

A final key finding of this research lies in the concept of 'human touch', the idea of clients not only wanting contractors to tick a series of boxes but to add that human element to the client-contractor relationship. Clients want to know that the contractors understood their very own values and could align their corporate values with them. In this, working together and communicating, not just about business, but about the

'softer things' was seen as just as important as the 'hard facts', which in itself appears to be a perfect example of social sustainability and working in partnership to achieve common goals.

- ▶ *Recommendation: A corporate approach to communications is good, a personal approach is better! Show the client that their requirements, ambitions and values are clearly understood and align with your own and corporate values.*

This study ultimately highlighted that clients no longer want the construction industry to be seen as having 'minimal impact' and being invisible in the local community. Instead contractors are now expected to aim to maximise the positive impact they can have on the communities in which they work and to leave local legacies.

- ▶ *Recommendation: Don't be afraid to impact communities, aim to leave legacies. Use sustainability to communicate a caring reputation.*

This research project has established sustainability as a considerable criterion in contractor evaluation and selection processes and, in this, has fulfilled the primary research aim of better understanding the role of sustainability in said processes. In terms of progress against the individual research objectives, the following bullet points highlight findings regarding each objective:

- ▶ Identify the role of sustainability in contractor evaluation and selection, and identify which sustainability components are of the greatest importance to clients and why.
  - The content analysis, questionnaires and interviews have confirmed that sustainability plays a considerable role in processes of contractor evaluation and selection. Although sustainability is usually not seen as equally important as more traditional factors, such as quality, time and budget, the research for this project has confirmed that sustainability has emerged as a clear focus, with varying degrees of importance within different sectors.

- ▶ Explore discrepancies between what clients are perceived to consider and what they do consider in reality.
  - The data analysis chapter has outlined discrepancies between perceived and actual sustainability ambitions (particularly for the private and public sector) as well as highlighting a well-educated and informed approach to sustainability for the HEFE sector in which perceived and actual sustainability ambitions aligned well.
  
- ▶ Make recommendations on how principal contractors can form more successful working relationships with clients.
  - Recommendations have been made on the language contractors need to use when wanting to successfully communicate their sustainability strategy to clients. Further, it was suggested that the topic of sustainability is an ideal vehicle for communicating a contractor's 'human touch' which in turn enables an alignment of values between the client and contractor.

## 6.1 Areas of Future Research

This research project analysed primary and secondary data from the public, private and HEFE sector and has resulted in some valuable lessons for these sectors. It should be noted that the research is based on a relatively small research sample. Views and opinions expressed on one sector will therefore not be representative of the entire sector. The overall emerging trends from this research should be seen as just that - they are not necessarily representative of the public, private and HEFE sectors but instead reflect the views of certain individuals within certain institutions or companies.

Finally, the third sector has been omitted from this research due to a lack of comparable data. The one PQQ which was reviewed for this research was not included in the analysis due to the client's

environmental focus. As an environmental charity, it was thought that the views of this organization would not in any way be representative of the entire third sector.

Future research following on from this project could look into how clients' sustainability ambitions are realised (or not) following contractor appointments during the preconstruction and construction phases of a project. It would be interesting to investigate the concept of the 'value action gap' to understand if clients and contractors are prepared to 'walk the talk' and turn ambitions into actions.

## 7. References

- Alford, J., 2002. Defining the Client in the Public Sector: A Social-Exchange Perspective. *Public Administration Review* 62(3): pp. 337-346.
- Alsugair, A., 1999. Framework for evaluating bids of construction contractors. *Manag Eng* 15 (2): pp. 72–78.
- Alwani-Starr, G., 2014. The role and value of the HE estate. Efficiency Exchange. Online: <http://www.encyclopedia.ac.uk> (accessed 01 February 2016).
- Al-Yami, A.M., A.D.F. Price, 2006. A framework for implementing sustainable construction in building briefing project. In: Boyd, D (Ed) *Procs 22nd Annual ARCOM Conference*, 4-6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, pp. 327-337.
- Ashe, B et al., 2003. *Sustainability and the building code of Australia*.
- AUDE HE Estates Statistics Report, 2014. Cambridge: AUDE, pp.6–8.
- H. Banwell, 1964. The Placing and Management of Contracts for Building and Civil Engineering Works, H.M.S.O., London.
- Blue Alumni, 2014. Evaluation of Rounds 1 to 3 of HEFCE's Revolving Green Fund. Online <http://www.hefce.ac.uk> (accessed 01 February 2016).
- M. Brook, 1993. *Estimating and Tendering for Construction Work*. Butterworth-Heinemann. Oxford.
- Bryman, A., 2004. *Social Research Methods*. New York: Oxford University Press.
- Burrows, M., 1981. *Tendering in the building industry 1750&1850*. M.Phil. Thesis, Nottingham University, U.K.
- Cabinet Office, 2011. Government Construction Strategy May 2011. Online: <https://www.gov.uk> (accessed 01 February 2016).
- Cabinet Office, 2016. Social Value Act. Online: [www.gov.uk](http://www.gov.uk) (accessed 05 January 2016).
- CSR, 2004. Corporate Social Responsibility Magazine—a supplement of Sustain: Built Environment Matters, McClelland Publishing, Manchester.

- D'Amato, A., S. Henderson. S. Florence, 2009. Corporate Social Responsibility and Sustainable Business. A Guide to Leadership Tasks and Functions. Center for Creative Leadership. Online: [www.insights.ccl.org](http://www.insights.ccl.org) (accessed 06 January 2016).
- DEFRA, 2005. *Sustainable Development Strategy*, Department of Environment, Food and Rural Affairs, London.
- DEFRA, 2006. *Procuring Our Future*. Online: <https://www.gov.uk> (accessed 01 February 2016).
- Department of Trade and Industry, 2002. Rethinking construction innovation and research: the Fairclough report.
- Dempsey, W.A., 1978. Vendor selection and the buying process. *Ind Marketing Manag*, 7: pp. 257–267.
- Dickson, G.W., 1966. An analysis of supplier selection systems and decisions. *Purchas*, 2: pp. 5–17.
- Du Plessis, C., 2002. *Agenda 21 for Sustainable Construction in Developing Countries*. Pretoria, South Africa: The CSIR Building and Construction Technology.
- Erzberger, C., U. Kelle, 2003. Making inferences in mixed methods: the rules of integration. In A. Tashakkori, C. Teddlie (eds.) *Handbook of Mixed Methods in Social and Behavioral Research*, Thousand Oaks CA, Sage.
- Fellows, R., 1988. *Escalation management*. Ph.D. thesis, University of Reading, U.K.
- Ferng, J., A.D.F., Price, 2005. An exploration of the synergies between Six Sigma, total quality management, lean construction and sustainable construction. *International Journal of Six Sigma and Competitive Advantage* 1(2): pp. 167-187.
- Hale. D.R., P.P. Shrestha, G.E. Gibson, G.C. Migliaccio, 2009. Empirical comparison of design/build and design/bid/build project delivery methods. *Journal of Construction Engineering and Management ASCE* 135(7): pp. 579-587.
- Hall, M., D. Purchase, 2006. Building or Bodging? Attitudes to Sustainability in UK Public Sector Housing Construction Development. *Sustainable Development* 14: pp. 205–218.
- Harris, F., R. Mccaffer, 1995. *Modern Construction Management*. BSP Professional Books, Oxford.
- Hatush, M. Skitmore, 1997. Criteria for contractor selection. *Constr Manag Econ* 15 (1): pp. 19–38.

- Hayles, C., 2004/ The Role of Value Management in the Construction of Sustainable Communities, *The Value Manager*, The Hong Kong Institute of Value Management pp: 15-19.
- HEFCE, 2014. *Sustainable development in higher education: HEFCE's role to date and a framework for its future actions*. Online: <http://www.hefce.ac.uk> (accessed 01 February 2016).
- Hill, R.C. and Bowen, P.A., 1997. Sustainable construction: principles and a framework for attainment. *Construction Management and Economics* 15(3): pp. 223-239.
- HM Government, 2007. Planning for a Sustainable Future. White Paper. Online: [www.gov.uk](http://www.gov.uk) (accessed 01 February 2016).
- House of Commons, 2015. Construction industry: statistics and policy. Briefing Paper. Online: <http://researchbriefings.files.parliament.uk/documents/SN01432/SN01432.pdf> (accessed 01 February 2016).
- G.D. Holt, P.O. Olomolaiye, F.C. Harris, 1993. Tendering practice-exploring alternatives. Faculty of Building Journal, Nottingham Autumn, pp. 28.-30.
- G.D. Holt., P.O. Olomolaiye, F.C. Harris, 1993. A conceptual alternative to current tendering practice. Building Research & Information. *The International Journal of Research, Development & Demonstration*. 21(3): pp. 167-172.
- G.D. Holt, P.O. Olomolaiye, F.C. Harris, 1994. Factors influencing UK construction clients choice of contractor. *Built Environment*, 29 (2): pp. 241–248
- Green Element, 2015. COP21 results in Paris Agreement: What does it mean? Online: [www.greenelement.co.uk/](http://www.greenelement.co.uk/) (accessed 04 January 2016).
- I.O.B., 1979. *Contractor Selection- A Guide to Good Practice*. Institute of Building occasional paper No. 34. Institute of Building, Ascot.
- Kelman, S., 2002. *Remaking Federal Procurement*. The John F. Kennedy School of Government Visions of Governance in the 21st Century. Working Paper No. 3.
- Kibert, C. J., 2005. *Sustainable construction: green building design and delivery*. Hoboken, New Jersey: John Wiley and Sons, Inc.

- Konchar, M., V. Sanvido, 1998. Comparison of U.S project delivery systems. *Journal of Construction Engineering and Management ASCE*, 124(6): pp. 435-444.
- Korkmaz, S., D. Riley, M. Horman, 2010. Piloting evaluation metrics for sustainable high performance building project delivery. *Journal of Construction Engineering and Management ACE*, 136 (8): pp. 877-885.
- Korkmaz, S., L. Swarup, M. Horman, D. Riley, K. Molenaar, N. Sobin, D. Gransberg, 2010. *Influence of Project Delivery Methods on Achieving Sustainable High Performance Buildings- Report on Case Studies*. The Charles Pankow Foundation.
- Lamb, C., 1987. Public Sector Marketing is Different. *Business Horizons* 30(4): 56-60.
- Latham, M., 1994. *Constructing The Team. Joint Government/Industry review of procurement and contractual arrangements in the U.K. construction industry*. Final report, H.M.S.O., London.
- MacKenzie, S., A.R. Kilpatrick, A. Akintoye, 2000. UK construction skills shortage response strategies and an analysis of industry perceptions. *Construction Management and Economics* 18(7): pp. 853-862
- Maddison, D., D. Pearce, O. Johansson, E. Calthorp, T. Litman, E. Verhoef, 1995. *The True Costs of Road Transport*. London: Earthscan.
- McClave, J., Benson, P.G. and Sincich, T., 2010. *Statistics for Business and Economics*. 11th ed. Prentice Hall.
- McCrudden, C., 2004. Using public procurement to achieve social outcomes. *Natural Resources Forum*, Vol. 28 No. 4, pp. 257-67.
- Merton Council, 2015. The Merton Rule. Online: [www.merton.gov.uk](http://www.merton.gov.uk) (accessed 01 February 2016).
- Mohsini, R., C. Davidson, 1986. *Procurement organisation design and building team performance-a study of inter firm conflict*. Conscil International du Batiment Proceedings 8.
- Molenaar, K.R., Vanegas, J.A., and Martinez, H., 2000. *Appropriate risk allocation in design-build request for proposals (RFPs)*. ASCE proceeding of construction congress VI: *Building together for a better tomorrow in an increasingly complex world*: 1083-1092, ASCE Publication.

- Molenaar, K., Sobin, N., Gransberg, D., McCuen, T., Korkmaz, S., and Horman, M., 2009. *Sustainable, High Performance Projects and Project Delivery Methods: A State-of-Practice Report*. White Paper for the Design-Build Institute of America and the Charles Pankow Foundation.
- Molenaar, K.R., N., Sobin, E.I. Antillón, 2010. A Synthesis of Best-Value Procurement Practices for Sustainable Design-Build Projects in the Public Sector. *Journal of Green Building* 5 (4): pp. 148-157.
- Myers, D., 2005. A Review of Construction Companies' Attitudes to Sustainability. *Construction Management and Economics* 23: pp. 781-785.
- N.J.C.C., 1974. *Code of Tendering Procedure for Industrial Building Works*. National Joint Consultative Committee for Building, R.I.B.A.. London.
- N.J.C.C., 1982. *Code of Procedure for Two Stage Selective Tendering*. National Joint Consultative Committee for Building, R.I.B.A.. London.
- N.J.C.C., 1985. *Code of Procedure for Selective Tendering for Design and Build*. National Joint Consultative Committee for Building, R.I.B.A.. London.
- N.J.C.C., 1989. *Code of Procedure for Single Stage Selective Tendering*. National Joint Consultative Committee for Building, R.I.B.A.: London.
- N.J.C.C., 1989. *Code of Procedure for Letting and Management of Domestic Sub-Contract Works*. National Joint Consultative Committee for Building, R.I.B.A., London.
- N.J.C.C., 1991. *Code of Procedure for the Selection of a Management Contractor and Works Contractors*. National Joint Consultative Committee for Building, R.I.B.A., London.
- North American Industry Classification System, 2007. Small business size standards. Online: <http://www.sbaonline.sba.gov> (accessed 13 June 2015).
- Odusote, O., 1990. *An examination of the importance of resource considerations when contractors make project selection decisions*. M.Sc. Dissertation, University of Bath, U.K..
- Price Waterhouse Cooper, 2016. #Paris2015 and Beyond. Online: [www.pwc.co.uk](http://www.pwc.co.uk) (accessed 01 February, 2016).

- Raynsford, N., 2000. Sustainable construction: the Government's role, Proceedings of ICE, Vol. 138, Nov. 2000: pp.16-22.
- Rhodes, C., 2015. Briefing Paper: *Construction Industry: Statistics and policy*. House of Commons.
- Roodman, D.M., N. Lenssen, 1995. Worldwatch Paper #124: A Building Revolution: How Ecology and Health Concerns Are Transforming Construction. Online: [hwww.worldwatch.org/node/866](http://www.worldwatch.org/node/866) (accessed 04 January 2016).
- Russell, J., 1992. Decision models for analysis and evaluation of construction contractors. *Construction Management & Economics* 10.
- Russell, J., D. Hancher, M. Skibniewski, 1992. Contractor prequalification data for construction owners. *Construction Management & Economics* 10: pp. 111-135.
- Sarkis, J., L.M. Meade, A.R. Presley, 2012. Incorporating sustainability into contractor evaluation and team formation in the built environment. *Journal of Cleaner Production* 31: pp. 40-53.
- Scrivens, E., 1991. Is there a role for marketing in the public sector? *Public Money and Management* 11(2): pp. 17-23.
- Selman, P., 1996. Local Sustainability. *European Environment* 7 (4): p. 136, July/August.
- Selman, P., J. Parker, 1997. Working Towards Sustainable Communities in Canada. *The London Journal of Canadian Studies* 13.
- Skitmore, R., 1989. *Contract Bidding in Construction*. Longman, Essex.
- Smith, R., 1986. *Estimating and Tendering for Building Work*. Longman, Essex.
- USGB, 2003. *Why Build Green?* Online: [www.usgbc.org](http://www.usgbc.org) (accessed 01 February 2016).
- Universities UK, 2010. *Making it count: how universities are using income from variable fees*. Online: [www.universitiesuk.ac.uk](http://www.universitiesuk.ac.uk) (accessed 01 February 2016).
- Universities UK, 2013. *Where Student Fees Go*. Online: [www.universitiesuk.ac.uk](http://www.universitiesuk.ac.uk) (accessed 01 February 2016).
- Universities UK, 2015. Efficiency, Effectiveness and Value for Money. Online: [www.universitiesuk.ac.uk](http://www.universitiesuk.ac.uk) (accessed 01 February 2016).

- Walsh, K., 1991. Citizens and Consumers: Marketing and Public Sector Management. *Public Money and Management* 11(2): pp. 9-16.
- Walker, H., S. Brammer, 2009. Sustainable procurement in the United Kingdom public sector. *Supply Chain Management: An International Journal* 14(2): pp. 28 - 137.
- Watkinson, M., 1992. Procurement alternatives. *Faculty of Building Journal*. Nottingham Autumn Winter, pp: 5-6.
- Watt, D.J., B. Kayis, K. Willey, 2009. Identifying key factors in the evaluation of tenders for projects and services. *International Journal of Project Management* 27 (3): pp. 250–260
- World Summit on Sustainable Development, 2002. *Plan of Implementation of the World Summit on Sustainable Development*. United Nations, New York, NY.
- Xia, B, A.P.C Chan, J.F.Y. Yeung, 2009. Identification of key competences of design-builders in the construction market of the People's Republic of China (PRC). *Construction Management and Economics* 27(11): pp. 1141-1152.
- Xia B., M. Skitmore, J. Zuo, 2012. Evaluation of design-builder qualifications through the analysis of Requests for Qualifications (RFQs). *Journal of Management in Engineering ASCE* 28 (3): pp. 348-351.
- Xia, B., A.P.C. Chan, K. Molenaar, M. Skitmore, 2012. Determining the Appropriate Proportion of Owner-Provided Design in Design-Build Contracts: Content Analysis Approach. *Journal of Construction Engineering and Management ASCE* 138 (9): pp. 1017-1022.
- Xia B., A.P.C. Chan, J. Zuo, K. Molenaar, 2013. Analysis of selection criteria for design-builders through the analysis of request for proposals (RFPs). *Journal of Management in Engineering ASCE* 29 (1): pp. 19-24.
- World Commission on Environment and Development, 1987. Our Common Future.