Sustainability Evaluation in the PFI industry: Analysis of a questionnaire survey

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Abstract: This research is part of a PhD study which aims to develop a sustainability framework for the Private Finance Initiative (PFI) project and its practice. PFI as an effective procurement system has been broadly accepted by most governmental departments and local authorities in the UK. Because of the nature of PFI’s long-term contract and the Value for Money (VFM) principle, PFI seemed to be a good mechanism to deliver sustainability and provide massive benefits for both public and private sectors. However, in practice there is a lack of a recognised framework for integrating sustainability objectives in PFI schemes. As such it is necessary to evaluate sustainability performance in the current PFI industry.

The study was carried out as a nationwide questionnaire survey in the UK from March to May 2006. The results were collected by using a questionnaire with partly structured questions and one open question.

Based on the national survey, this paper analyses the results in three divisions: 1) the client’s attitudes and their experiences in sustainability; 2) sustainability performance level in four dimensions (social, environmental, economic and technical); and 3) the future development of PFI projects in terms of sustainability. Finally, it concludes that sustainability, as one of the key evaluation criteria, has been integrated into the PFI procurement process, and a national standard framework is urgently needed to assist the key stakeholders make decisions about sustainability.

Key words: PFI, Public Procurement, Survey, Sustainable Development

1. Introduction

Sustainable development takes account of the past, the present and the future as a whole system and gives equal emphasis to human, social and economic development and protecting the natural environment system. Every state or regional area government has a vast responsibility to lead and fight in this revolution storm. Their behaviour has a major impact on their citizens and on the future development of their counties or areas. In the UK, since the first sustainable development strategy was published in 1999 (DEFRA), sustainability has become a basis of state policy for the central government. This strategy requests that every level of government not only sets up policies or regulations, but also aims to be a leader by example in this field. In the following strategies (NAO, 2005 and HM Treasury, 2005, 2006), it was approved that public procurement was an effective and powerful tool for governments to achieve their goals. Therefore, the private finance initiative (PFI), as a modern dynamic model, has much potential to deliver sustainable development in public estates, and could be
a good public example to demonstrate the benefits of sustainable development. The nature of the PFI contract and its widespread use could provide the scope for the government to stimulate sustainable development in practice. Conversely, adopting sustainable development principles could offer many benefits for PFI projects; reduce whole life cost and add value to the estate (Zhou and Lowe, 2004).

However, there is a gap between commitment and implementation in practice (Zhou and Lowe, 2004 and NAO, 2005). As such it is necessary to evaluate sustainability performance in the current PFI industry. The study was carried out as a nationwide questionnaire survey with partly structured questions and one open question. Based on the national survey, this paper analyses the results in three sections: 1) the client’s attitudes and their experience in sustainability; 2) sustainability performance level in four dimensions (social, environmental, economic and technical); and 3) the future development of PFI projects in terms of sustainability. Finally, it concludes that sustainability, as one of the key evaluation criteria, has been integrated into the PFI procurement process, and a national standard framework is urgently needed to assist the key stakeholders to improve their understanding of the principles of sustainable development and its implementation in practice.

2. Sustainable Development and UK Approaches

2.1 Definition of Sustainable Development

In 1987, *Our Common Future* (the Brundtland Report) was published by the World Commission on Environment and Development. This report presented a very popular definition of sustainable development:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

This definition places human beings at the centre and sets out the two fundamental principles of intergenerational and intra-generational equity, and contains the two “key concepts” of needs and limits. Clearly, the Brundtland Report is the most significant milestone of sustainable development. It rejects the crude anti-growth arguments of the 1970s, asserting that “Growth has no set limit in terms of population or resource use beyond which lies ecological disaster” (WCED, 1987, p45), and also shapes the priority of the physical environment remedially within civil society via economic growth and social equity, giving a long-term view of human development.

2.2 UK Approaches

In the UK, the government has defined sustainable development as “ensuring a better quality of life for everyone, now and for generations to come” (UK Government, 1998). In this context, “quality of life” reflects an increase in per capita real incomes, better health and education, improved quality of natural and built environment, and more social stability. In November 2001, an interdepartmental Sustainable Procurement Group (SPG) was established to look at the scope for improving the way in which sustainable development considerations are incorporated into purchasing. In 2003 the UK government announced that all central
government departments must apply the minimum environmental standard in new contracts when purchasing certain types of product, which cover aspects such as energy efficiency, recycled content and biodegradability. Moreover, the UK has set a significant goal for sustainable public procurement. This is reflected in the following statement by Sir Neville Simms: “our new goal is to be recognised as amongst the leaders in sustainable procurement across EU member states by 2009” (HM Government, 2005). Furthermore, the government appointed in spring 2005 a business-led Sustainable Procurement Task Force to deliver a national action plan for sustainable procurement across the public sector by April 2006. Government targets force central departments, local authorities and the construction industry (GCCP, 2000) to face the sustainability challenge and to seek an effective mechanism to deliver sustainable development.

2.3 Construction Industry’s Responses

In Britain, sustainable development is a critical issue for the construction sector. On one hand, the construction industry is one of the pillars of the national economy (8% of GDP). On the other hand, it has a massive impact on the national environment and resource use. DETR (2000) states that construction sites and demolition produce 72 million tonnes of waste each year, representing 17% of the UK’s total waste burden. Commercial waste from construction adds up to 30 million tonnes, a further 7% of the UK total. Poor design and site management leads to 10 million tonnes of non-used materials each year that are delivered to vacant sites (Crossely, 2002). Consequently, the government published a series of policies to request that the construction industry implements sustainable construction principles in current and future projects. The key policy document, Building a better Quality of Life: a Strategy for more Sustainable Construction, was published in April 2000 (DETR, 2000). This strategy focuses on the significant contribution of the construction industry in the UK, and also presents 10 action points in order to achieve more sustainable construction:

- The re-use of built assets
- Design for minimum waste
- The aim of lean construction
- Minimising energy in construction
- Minimising energy in use
- Avoiding pollution
- Preserving and enhancing bio-diversity
- The conservation of water resources
- The respect of people and their local environment
- Target setting

In 2000, the Sustainability Action Group of the Government Construction Clients’ Panel produced its action plan, Achieving Sustainability in Construction Procurement. This document summarises the actions of various governmental departments and agencies who are commissioned to construction projects, including Highways Agency, NHS Estates, the Environment Agency, English Heritage, Defence Estate and the Office of Government Commerce. Furthermore, the sustainable construction task group published a research paper which establishes the relationship between sustainable construction and business. This paper concludes that senior executives of construction organisations should pay attention to the
growing influence of sustainable construction on business, and recommends that they integrate a sustainability agenda into their business strategies.

3. Private Finance Initiative (PFI) and Sustainability

3.1 The Context of PFI

The origins and development of PFI in the UK have been successfully reviewed in a number of articles (Allen, 2001; The Scottish Parliament, 2001; Allen et al., 2002). It was politically born in 1992 with the Labour party, and formally introduced in 1997. The International Project Finance Association (2002) defined PFI as:

“The procurement of public services and assets by government and local authorities where the private sector is responsible for the design, construction, finance and operation of an asset or service for a specified period of time after which it is transferred back into the public sector. The public sector purchases the services from the private sector and pays a fee based on specified output criteria and usage. The private sector consortium uses the fee to repay loans taken out to finance the construction or refurbishment of the asset/service.”

PFI has two major principles: value for money (VFM) and risk transfer. The first principle, VFM, requires that project costs be used efficiently and safely. The private sector is required to deliver the project under budget (agreed in the consortium) and to provide a good quality of performance. The second major principle of PFI is the transfer of risk from the public to the private sector, where the private sector is best placed to manage that risk (Grimsey and Graham, 1997).

Up until March 2006, 747 projects had been signed as PFI contracts, amounting to a total capital investment of over £47.56 billion. Almost every central government department and local authority is now using PFI contracts. They include most types of public estates, for example, roads, prisons, hospitals, schools and office buildings, etc. Furthermore, £26 billion of PFI investment across 200 projects is currently in the pipeline to close by 2010 (HM Treasury, 2006). This investment is expected to deliver significant new or refurbished public infrastructure over the next few years, including over 60 health facilities and 104 schools.

3.2 The Advantages of PFI to Deliver Sustainability

PFI can offer real scope to promote sustainable construction (Addis and Talbot, 2001; Hill and Collin, 2004; Logan and Mills, 2003). It incorporates whole-life costing, as opposed to lowest initial price, and should encourage a more sustainable approach. The transfer of risks such as energy consumption to the private sector may provide an incentive for investment in more efficient energy usage. PFI clients generally specify outputs rather than input. Clients can use this opportunity to specify a required sustainability performance (e.g. energy usage per year) rather than specifying the use of low energy equipment or facades. It is then the contractor’s responsibility to find the most cost-effective way of delivering the performance-level demand. Furthermore, the long-term and integrated nature of PFI contracts offers incentives for the contractors to consider the synergies between the design of an asset and its
ultimate operating cost (OGC, 2002). Table 1 outlines the benefits of implementing sustainability into PFI projects.

Furthermore, PFI is one of the most important tools for the UK government to achieve their objectives to provide world-class public service to present and future generations. For example, PFI is making an important contribution to the government's aim of bringing all social housing into a decent condition by 2010, and in the provision of additional social rented homes.

Table 1: Benefits of implementing sustainability into PFI projects

<table>
<thead>
<tr>
<th>Public sector</th>
<th>Private sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Best value for money</td>
<td>• Better client understanding</td>
</tr>
<tr>
<td>• Good publicity</td>
<td>• Sustainable construction experience</td>
</tr>
<tr>
<td>• Achieve government target</td>
<td>• Reduce whole life costing</td>
</tr>
<tr>
<td>• Protect local environment</td>
<td>• Greater competitive advantages</td>
</tr>
<tr>
<td>• Improve productivity</td>
<td>• Reduce energy bills</td>
</tr>
<tr>
<td>• Better quality of service</td>
<td>• Opportunities for innovation</td>
</tr>
<tr>
<td>• Add value to the estate</td>
<td></td>
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</tbody>
</table>

3.3 Sustainability-Related Issues in PFI projects

Regarding the principles of sustainable construction (Kibert, 1994; Hill and Bowen, 1997; CIB 1999), the sustainable issues of PFI projects could be divided into four dimensions: social, environmental, economic and technical.

- Social sustainability highlights improvements in the quality of human life and human living environment, which includes health and safety issues and community aspects, etc.
- Economic sustainability includes the use of full-cost accounting methods and real-cost pricing to set prices and tariffs for goods and services and achieve more efficient use of resources.
- Environmental sustainability includes the notion that sustainable construction needs to protect the natural environment rather than pollute it, encourages the use of renewable resources, and reduces the use of water, energy, materials and land in each stage of a project.
- Technical sustainability requires high performance, durability, quality and mixed use of a building.

Table 2 illustrate these issues within a theoretical framework, which would be tested in the questionnaire survey.
4. Survey and Data Analysis

4.1 Questionnaire Survey

A questionnaire was developed to ascertain the sustainability performance level in existing PFI projects. The survey was undertaken by sending an email or letter to the PFI projects’ client organisation or project directors. Recipients were given three weeks to complete the questionnaire. The questionnaire included a catalogue of 23 questions, divided into four sections:

<table>
<thead>
<tr>
<th>Social issues</th>
<th>Environmental issues</th>
<th>Economic issues</th>
<th>Technology issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and safety</td>
<td>Construction energy consumption</td>
<td>Capital cost</td>
<td>Green materials</td>
</tr>
<tr>
<td>Public image</td>
<td>Operation energy consumption</td>
<td>Whole life costing</td>
<td>3 Rs in material use: reduce, recycle and reuse</td>
</tr>
<tr>
<td>Care of end users</td>
<td>Water use</td>
<td>Low maintenance cost</td>
<td>Natural ventilation</td>
</tr>
<tr>
<td>Equity</td>
<td>Land use</td>
<td>Extra investment in sustainability</td>
<td>Grey water collection</td>
</tr>
<tr>
<td>Education aspect</td>
<td>Eco-landscape</td>
<td>Financial incentives for sustainability</td>
<td>Photovoltaic system</td>
</tr>
<tr>
<td>Ethical issues</td>
<td>Construction waste</td>
<td>Support local/national economic growth</td>
<td>Building intelligent system</td>
</tr>
<tr>
<td></td>
<td>Noise</td>
<td>Bio-diversity</td>
<td>Transport</td>
</tr>
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- Section A: the background information about the project (e.g. project name, type, year, capital value, main contractor and location);
- Section B: a number of questions about the client or participant’s attitudes and experiences related to sustainability concerns;
- Section C: asking the participant to weight sustainable indicators in four dimensions (social, economic, environmental and technology);
- Section D: addressing questions associated with future application of sustainability principles in the project.

The survey was conducted from March to May 2006 among UK PFI schemes. A total of 480 questionnaires were sent out by post or email; 80 responded, and 65 were useful responses. This response rate is 13.5%.
4.2 Data Analysis

Because this survey is designed to evaluate the individual PFI projects’ sustainability performance level, most of the respondents are project directors (26%) or project managers (40%), and other clients or their representatives constitute 12%. Only 1 facility manager, 1 contract manager and 1 operational manager answered this questionnaire. Other professionals (e.g. designer, quantity surveyor or engineer) did not commit to this survey due to the lack of overview experience of the whole project. Although this is a national survey, most of the responses are from England (56 of 65); another 8 responses are from Wales, and only 1 response is from Scotland. None is from North Ireland. There are three main types of projects in the survey – 28 education projects, 25 healthcare projects and 5 transport schemes – and the rest include libraries, office buildings, housing and leisure centres. The detailed survey results are shown in Figures 1–7.

Figure 1: Sustainability strategy/policy in client’s organisation

Figure 1 shows that 64 respondents answered this question, and 1 omitted it. The distribution of the answer demonstrates that 53 participants agree that there is a sustainability strategy or policy in their client organisation, while 11 are without a sustainability strategy or policy. This demonstrates that since the UK government national strategy was published in 1999, most central department or regional governments have their own strategy or related environmental and sustainable policies or guidance.
Figure 2: Has the client clearly stated any sustainability requirement in their bidding documents?

Figure 2 shows that 63 people answered this question: 50 participants agreed that they have integrating sustainability in their bidding documents, and the remaining 11 projects did not use sustainability as one of the criteria in their bidding stage. This demonstrates that sustainable development was not a new issue in the PFI procurement process. Sustainability has become integrated into the bidding document as one of evaluation criteria to select the prefer bidder.

In section three of the questionnaire, the participants need to weight the different issues in four sectors, as indicated in Table 2.

Figure 3: Sustainability performance level in social factors

The statistical results show that 63 people answered this section, and 2 omitted an answer. Figure 3 compares the results of each sub-issue’s mean. Both ‘Health and safety’ and ‘Care of end users’ are seen as the most important issues in the social sector. The lowest is the education aspect of the sustainable PFI project. The average rate of the mean is over 3.
In the environmental section, energy consumption in operation has the highest rate of 4.08, while the energy consumption in construction stage has the lowest rate of 2.81.

In this section, both capital cost and whole life costing are the most important factors to influence key stakeholders’ decision making. Their means are both higher than 4.50 (capital cost is 4.59 and whole life costing is 4.60). The least considered issue is extra investment. This is because of the nature of PFI projects, whose financial situation is based on the private sector’s investment, so their aim is to use the lowest investment to gain maximum profit. So,
there is no opportunity to obtain extra investment if there is no visible and immediate financial return.

![Sustainability performance level in technology factors](image.png)

Figure 6: Sustainability performance level in technology factors

In this section, all response rates are lower than the other three sections: there is no sub-issue rate higher than 4. The response rates show that the most frequent use of technology is natural ventilation, with a mean of 3.89. The popularity of natural ventilation is because it can reduce the capital cost of the project and lower the technique skills requested. The lowest rate of use in PFI projects is of photovoltaic systems, with a mean of 2.19. The main reason for this is the high cost of photovoltaic systems.

![Future development in sustainable PFI projects](image.png)

Figure 7: Future development in sustainable PFI projects

Figure 7 illustrates the future development of sustainability in PFI projects. The survey results show that sustainability is still not a critical issue in PFI projects, although they are all important. The average rate of these three main issues is higher than the medium rate of 3. The most important issue is to request an environmental assessment for the project, for example using BREEAM or Eco-Home, etc. PFI project clients are also still interested in the
sustainability framework and the decision-making tool to help them make better sustainability decisions.

![Direct business benefit of sustainability](image)

Figure 8: Direct business benefit of sustainability

Although the most survey responses agreed that implementing sustainability principles could bring direct business benefits for them, many considered that these benefits would not appear in the short term. Many responses considered that sustainability could help to reduce their energy bill, promote good publicity, lower maintenance costs, and offer competitive benefits for PFI firms. However, because sustainability is not in the centre of a PFI project, it would need to be emphasised.

5. Conclusion

The research has indicated that PFI, as one of the major public procurements, is the key for the government to demonstrate their commitment to sustainability and promoting a good mechanism to deliver sustainability in practice. It is necessary to evaluate the existing sustainability performance in PFI industry. For this reason, a survey has been conducted.

The results of the survey of sustainability performance of PFI projects in the UK have been reported. Twenty-three questions have been asked, and a theoretical framework has been tested. The survey responses show that sustainability performance has positive results in the UK PFI industry. Over half of the responses agreed that their client has their own sustainability strategy or policies, and has committed to sustainable issues in their PFI process. Social and economic impacts have been considered to be two major factors to take into account for their project in terms of sustainability. The survey responses approve that a practical framework and decision-making tools are necessary and useful for PFI project directors/managers to develop a better understanding of sustainable development and to assist in their daily procurement process.

The ongoing research work on sustainable PFI will follow with a number of in-depth interviews, case studies and focus group studies to establish a practical framework for PFI projects, and a decision-making tool designed to help key stakeholders (both public sector and private sector) to drive the PFI industry towards sustainable development.
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