

# INCORPORATING SUSTAINABLE CONSTRUCTION INTO PFI PROJECTS: AN ANALYSIS OF FINANCIAL INCENTIVES AND ASSOCIATED RISKS

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There is a common assumption that the public procurement system, the Private Finance Initiative (PFI), is a good mechanism to deliver sustainable construction. In principle, PFI creates a long-term partnership between clients and the supply chain, takes account of environmental and social performance, and genuinely considers the whole life cost against the lowest capital cost. However, in practice there are a number of barriers to incorporating increased sustainability into PFI projects. One of the most significant obstacles is the lack of awareness of financial incentives. Few PFI clients and stakeholders are aware of the government's tax incentive, while the fear of higher risks and private finance interest rates force main contractors to complete the project as quickly as possible rather than to consider any long-term benefits derived from sustainability. The lack of the interest in sustainable construction from bankers and insurance companies again forces the PFI consortia itself to hold the higher financial risks for any extra investment linked to sustainable innovation. This paper is based, in part, on the results of a national questionnaire survey, which investigated the level of integration of sustainable construction into PFI projects. It analyses why sustainability is a dilemma for the PFI consortia, and investigates the risks associated with incorporating sustainable construction methods into PFI projects. Finally, it recommends that central government should encourage the PFI sector to learn more about possible tax saving linked to sustainability, and for the financial institutions to provide additional support for sustainable construction.

Keywords: Sustainable construction, Private Finance Initiative (PFI), Financial Incentive, Tax Saving, and Risk Allocation

## INTRODUCTION

The pursuit of sustainable development brings the built environment and construction industry into sharp relief. The Habitat II Agenda stresses the fact that the construction industry is a major contributor to socio-economic development in most countries (CIB, 1999). In the UK, sustainable construction is a critical and emerging issue. The government recently published a series of policy documents to encourage the construction industry to introduce the principles of sustainable construction into current and future projects (DETR, 2000, DTI, 2001,2003, GCCP, 2000 and the

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Sustainable Construction Task Group, 2002, 2003). Public discussion and academic research, following the agenda set by the British government, has largely focussed on an action plan for the whole building industry and at the individual project level (for example, Addis and Talbot, 2001 and Bartholomew, 2002). However, because of the complexity of sustainability, the fragmentation of the construction industry, and also the fear of increased risk and capital cost, the demand for and the level of implementation of sustainable construction in practice are still low (Zhou and Lowe, 2003a). Therefore, as government legislation and regulatory systems always lag behind reality and the lack of a market value, sustainable construction is only seen as being applicable to 'pioneer' projects and not, therefore, applied to mainstream projects.

The British government, as a major client of the construction industry, has a responsibility to lead this revolution. One significant tool is the use of the public procurement approach to influence the supply chain to achieve greener buildings. Compared with the traditional procurement system, the Private Finance Initiative is seen as a better mechanism to deliver sustainable construction (Zhou and Lowe 2003b). Currently, this initiative forms one of the key elements of the UK government's strategy to deliver a modern, better quality public services and to reduce public investment by increasing private sector investment. Furthermore, in principle PFI creates a long-term partnership between the public and private sectors, takes environmental and social performance into account and seriously considers whole life costs against the lowest capital cost. However, according to Horsley et al (2003), there are some characteristics common to many PFI projects, which may constrain building energy performance. They consider the first barrier is the payment mechanism, which offsets any increase in capital cost. Secondly, the risk transfer system forces the private sector to use the safest construction and operating process, thereby, rejecting many opportunities to be innovative. It is necessary, therefore, to identify potential benefits and risks when incorporating sustainable construction into PFI projects. Consequently, the financial incentives and extra risk evaluation has been seen as the two main factors that have influenced the implementation of a sustainable methodology into the PFI procurement system.

This paper evaluates the potential financial incentives and perceived environmental and application risks in sustainable PFI projects. Furthermore, based on a recent national questionnaire survey, it analyses why sustainability is a dilemma for PFI consortia in practice.

## **RESEARCH OBJECTIVES AND METHODOLOGY**

The research which underpins this paper is part of a doctoral study entitled "The economic solution: investigating the stakeholders' business benefits from integrating sustainable construction into PFI projects". It began in October 2002 and is due to be completed in September 2005. The objective of this research is to investigate the relationship between sustainable construction and PFI projects and to establish the business benefits what would motivate the key stakeholders (decision-makers) to demand more sustainable construction. The methodology is typified as a multi-method research project. It consists of a literature review, a pilot study, and a main questionnaire survey and case study research. The completed literature review is divided into three parts, a) the principles and concepts of sustainable construction, b) PFI procurement and systems, and c) the relationship between procurement system and sustainability. The second stage: design of the main questionnaire and the pilot

study was completed in December 2003. The postal questionnaire survey started in January 2004 and will be finished by the end of June 2004. Questionnaires were distributed to a sample of 500 construction industry professions and academics, to date 130 completed questionnaires have been received.

The objectives of the research are to:

1. Evaluate the financial structure and payment mechanisms of the PFI procurement system;
2. Identify the baseline of existing financial incentives, which have an impact on the supply of sustainable construction;
3. Analyse those environmental and application risks of sustainable PFI projects during a long-term contract; and
4. Establish the current level of understanding of the fiscal incentives and additional risks in the context of the UK construction industry.

## **PFI AND ITS FINANCIAL STRUCTURE**

The Private Finance Initiative began in 1992. Since 1997, following its first review by Bates, the use of the Private Finance Initiative is accelerating. Up to April 2003, about 570 projects have been signed, comprising a total capital investment of over £52 billion. Private-financed capital expenditure is now about 15% of all publicly sponsored gross capital spends each year. PFI fundamentally changes the government's procurement procedure for capital expenditure from the provision of an asset to the provision of a high quality service. It has been applied by both central government and local authorities, in a range of projects, which including road, bridge, prisons, school, etc (Zhou and Lowe, 2003c).

There are much literatures concerning PFI (for example, PFP, 1995, Merna and Dubey, 1998, Merna and Owen, 1998, Allen, 2001, and Allen *et al*, 2002). The following describes its financial structure and payment mechanism.

PFI contracts are made between the public sector and a "special purpose vehicle" (SPV), which brings together a group of private sector companies, often including a construction company, a facilities manager and a financier. Financing is typically composed of 90% debt, and 10% equity provided by the member companies (Spackman, 2002). Bank finance is most common, especially for smaller projects, often for terms as long as 25 years. According to Shaoul's research finding (In Press), project approval depends upon two financial criteria: Value for Money (VFM) must be demonstrated and the scheme must be affordable to both the Trust and the purchasers; both are central to the financial appraisal process. VFM requires that project costs be used efficiently and safely. The private sector is required to delivered the project under budget (agreed by the consortium) and to provide a good quality of performance. However, while VFM is substantiated by the use of discounted cash flow techniques, affordability is less clearly defined and operationalised as a decision rule. In some conditions, affordability depends on the payment mechanism. The revenue of a PFI project is divided into two parts. Firstly, there is an availability fee for the capital element or rental charge and secondly, a service charges for the facilities management. These charges are linked to performance, thereby, providing an incentive to the SPV (Froud, 2003)

In brief, private financing has produced better-defined contracts, better contract management, and design innovation. At the strategic level, it broadens the horizons of public procurement, and effectively commits construction contractors to long-term contracts (Spackman, 2002). The contract, based on the whole life costing and performance related rewards, provides a possibility for technology innovation and long-term sustainable facility management (Logan and Mills, 2003, and OGC, 2002). However, there are some limitations inherent in the PFI financial system. Firstly, the complexity of PFI contracts and its financial system increase professional fees and VFM may lead to the rejection of possible increases in capital investment. Also, the payment mechanism depends on the discounted cash flow, where financial institutions only consider short-term benefits rather than long-term considerations (CIRIA, 2003).

## **FINANCIAL INCENTIVES FOR SUSTAINABLE CONSTRUCTION**

Private investors do not have the social and natural environment as their primary concern; rather their main aim is to make an acceptable return on their investment on behalf of their shareholders (Pearce, 2004). If society requires these investments to meet some sustainability objectives, then society must be prepared to pay the private sector for costs it otherwise has no incentive to meet (Pearce, 2004). Because of these limitations inherent within the PFI financial system, the fiscal incentive to the private sector is seen as the biggest potential stimulant to encourage the private sector to adopt of sustainable methodologies.

The UK government has also begun to introduce various environmental instruments intended to influence the market, for example:

- The Landfill Tax (1996) is influencing waste management practices by encouraging greater diversion of waste from landfill sites. The cost of disposing of construction and demolition waste to landfill can be minimised through more efficient construction and the innovative re-use and recycling of materials.
- The Climate Change Levy on business use of energy was introduced in April 2001.
- The Aggregate Levy introduced in April 2002 to reflect the environmental cost of aggregate quarrying and to encourage the demand for and supply of alternative materials, such as mineral waste and recycled construction and demolition waste. (Addis and Talbot, 2001)

Although UK government has, introduced the concept of environmental taxation (e.g. Climate Change levy, Aggregates Levy and Landfill tax), its fiscal measures have recently concentrated on rewarding good behaviour rather than taxing bad behaviour (the carrot v the stick argument). Furthermore, WWF- UK (2002) has outlined a number of potential incentives for sustainable homes, they are:

1. Stamp duty relief on the first sale of sustainable homes and rebates on the stamp duty paid on the land on which sustainable homes are built or premises which have been converted into sustainable homes.
2. A reduced VAT rate of 5% on accredited suppliers
3. Abolition of the zero VAT rate on the construction of new building for residential use; to be replaced with a reduced VAT rate (5%) conditional upon achieving a

sustainability rating. New residential build that does not achieve the sustainability ratings would be taxed at 17.5% per cent

4. Capital allowance for expenditure on the conversion of premises into 'sustainable' residential dwellings for the rental market

## **EXTRA RISKS OF SUSTAINABLE PFI PROJECTS**

PFI was not originally devised as a policy for managing risk (though it is now being discussed in this prototypical way), however risk has emerged as the key feature that legitimates the shift in public services management to PFI. The concept of risk is important in the demonstration of value for money and in determining the balance sheet treatment of infrastructure assets (Froud, 2003). Thus, all the risks associated with design, construction, finance, maintenance and operation of the scheme over the life of the project must be identified. Probabilities of their occurrence must be assigned and financial values attributed to their outcome so that the amount of risk to be transferred to the private sector can be included in the public sector comparator (Shaoul, In Press). For instance, 'Partnerships for Prosperity' outlines seven groups of risk: design and construction; commissioning and operating; demand (or volume/usage); residual value; technology and obsolescence; regulation (including taxation and planning permission), and project financing (Treasury taskforce, 1997).

Private sector finance of sustainable development, therefore, will not occur unless the context for investment is one in which the risks associated with the investment are acceptable, that is, where markets are liberalised, political governance is secure and democratic, and structural adjustment is occurring. (Pearce, 2004)

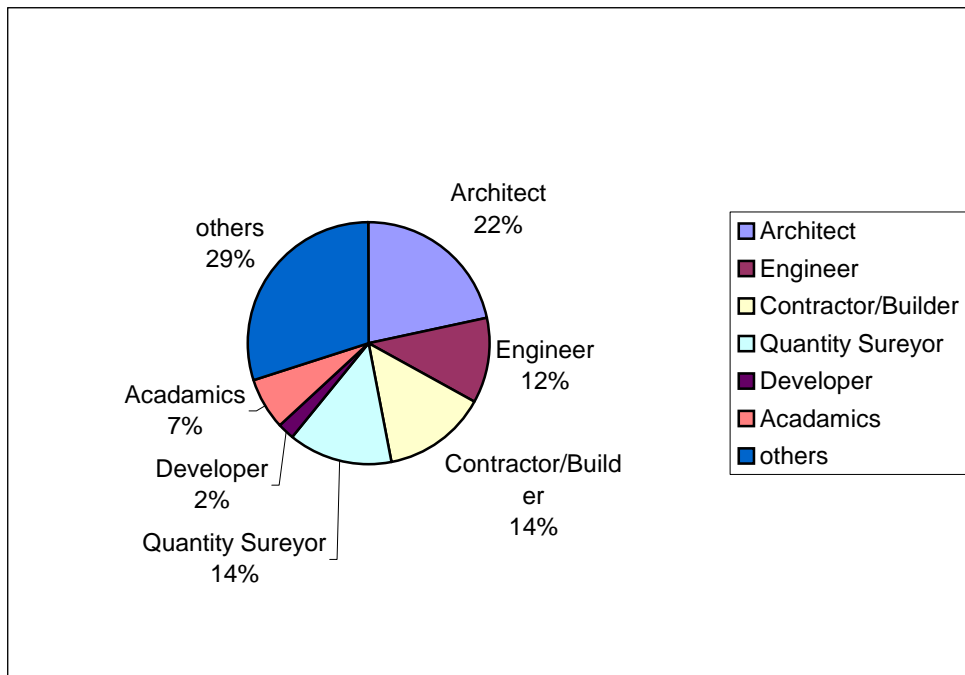
Because of the natural characteristics and long term period of PFI contracts, a number of environmental risks should be seriously considered in PFI projects: flood risk, climate change, etc. New technologies offer substantial benefits, but are seldom risk-free. Moreover, these risks are not always obvious at the time of introduction of a new technology. Companies will not finance new technologies if they are unsure that their investment will be protected (WBCSD, 2004). Furthermore, a number of barriers should be considered when integrating sustainable construction into PFI. These include:

1. Lack of reliable information on environmentally-preferable products;
2. Perceived higher professional fees
3. Whole life costing is not applied in practice
4. Perceived higher capital costs
5. Perceived higher commercial risk
6. Lack of investor/banker's interest

## **RESEARCH FINDINGS AND ANALYSIS**

In order to investigate the current level of sustainable construction within the UK built environment and the opportunities to integrate sustainability into PFI projects, a questionnaire entitled "Integrating sustainable construction into PFI procurement systems" has been designed. Of the 500 questionnaires sent out nationally to architects, engineers, contractors/builders, quantity surveyors, developers, academics, and others (see the figure 1), 130 were completed and returned. This represents a

response rate of 26%. The questionnaire was split into two sections, the first relates to the current level of sustainable construction; the second concerns the integration of sustainable construction into PFI.



**Figure 1:** The respondents' professional background

The respondents were asked to rate the economic benefits of sustainable construction, in terms of whether sustainable construction would increase tax savings. The results show (Table 2), that more than 43.8% of the respondents are unaware of this fiscal incentive. Further, 17.7% of the respondents disagreed, while less than 10% strongly agreed with the statement.

**Table 2:** Economic benefits - increase tax saving

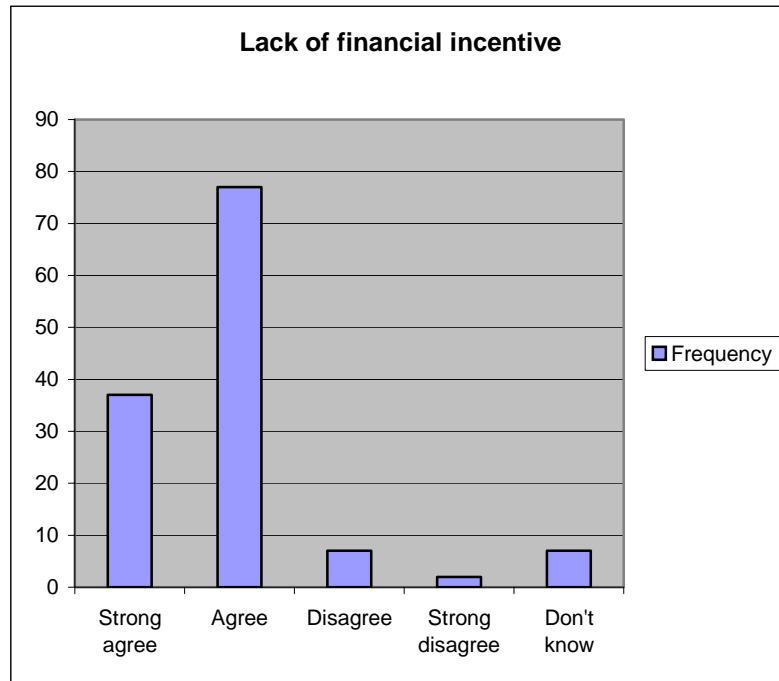
		Frequency	Percent
0.0	No answer	5	3.8
1.0	Strong agree	11	8.5
2.0	Agree	34	26.2
3.0	Disagree	23	17.7
4.0	Don't know	57	43.8
	Total	130	100.0

Table 3 and figure 2 indicate that most respondents considered the lack of financial incentives to be a significant barrier to the introduction of sustainable construction. 37 respondents strongly agreed, 77 agreed and only 9 respondents disagreed and strong disagreed with the statement.

**Table 3.** Lack of Financial Incentives

		Frequency	Percent
1,0	Strong agree	37	28.5

2.0	Agree	77	59.2
3.0	Disagree	7	5.4
4.0	Strong disagree	2	1.5
5.0	Don't know	7	5.4
	Total	130	100.0



**Figure2.** Lack of Financial Incentive

Table 4 shows that more than 50% of the respondents strongly agreed that integrating sustainable construction into PFI procurement is very important and necessary. Only 5 respondents considered it to be unimportant.

**Table 4.** The importance to integrate sustainable construction into PFI

		Frequency	Percent
0.0	No answer	16	12.3
1.0	Very important	67	51.5
2.0	Important	41	31.5
3.0	Unimportant	4	3.1
4.0	Very unimportant	1	.8
5.0	Don't Know	1	.8
	Total	130	100.0

Table 5 shows that nearly 50% of the respondents considered that that whole life costing to be utilized in PFI projects; however, more than 30% of the respondents were unaware of whether or not whole life costing used in PFI projects.

**TABLE 5.** WHOLE LIFE COSTING USED IN PFI

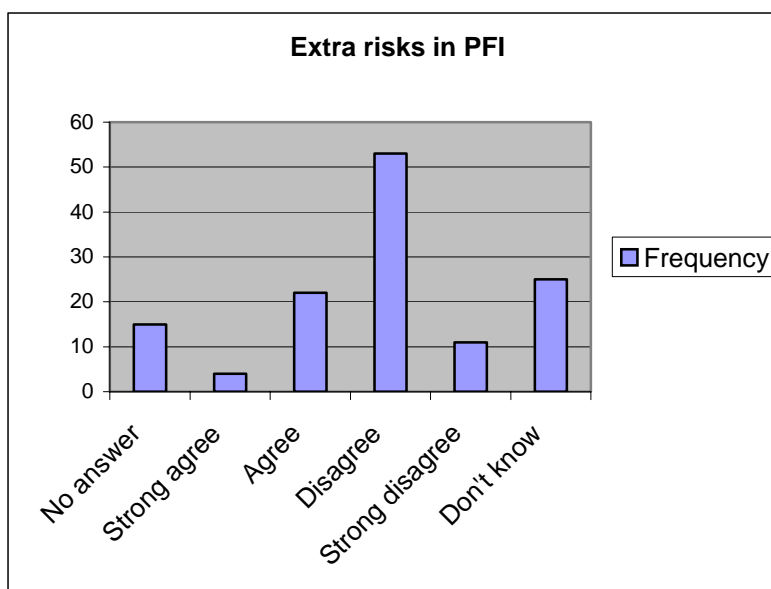
		Frequency	Percent
0.0	No answer	14	10.8

1.0	Strong agree	19	14.6
2.0	Agree	37	28.5
3.0	Disagree	14	10.8
4.0	Strong disagree	7	5.4
5.0	Don't know	39	30.0
	Total	130	100.0

Table 6 and figure 3 show the result of a question that asked the respondents to consider whether the integration of sustainable construction into PFI projects would result in addition risk. Most respondents disagreed with this statement or didn't know whether sustainable construction would result in extra risks. One respondent commented that sustainability requires a change in the way people think, and that if planning took place early enough then all risks could be avoided or better managed.

**Table 6.** Extra risks in PFI

		Frequency	Percent
0.0	No answer	15	11.5
1.0	Strong agree	4	3.1
2.0	Agree	22	16.9
3.0	Disagree	53	40.8
4.0	Strong disagree	11	8.5
5.0	Don't know	25	19.2
	Total	130	100.0



**Figure 3.** Extra risks in PFI

## CONCLUSION AND FURTHER RESEARCH

Construction industry professionals have increasingly accepted the importance of sustainable construction, while both the UK government and industry has instigated a number of initiatives to encourage the introduction of sustainable construction. However, due to the of a market value and the complexity of sustainable



methodologies and technologies, the implementation of sustainable construction into the UK building industry is still relatively insignificant.

The government as the major client of the construction industry has the responsibility to lead innovation in sustainable construction. On the other side, sustainable performance is critical to the introduction and distribution of PFI procurement systems. To stimulate this kind of integration, both the provision of a financial incentive and managing the associated risks is the key.

Research found that there is still limited knowledge of whole life costing within the PFI market and that most respondents considered that the government should increase financial incentives to stimulate the introduction of sustainable construction within PFI projects. As financial (and fiscal) barriers are commonly identified as being amongst the most important barrier, fiscal incentives can be an important tool for developing sustainable property. Further, the incorporation of risk management has become inextricably linked with the wider issues of sustainable development.

Further research is recommended to investigate the application of current financial instruments and whole life costing on individual PFI projects and using the case study to establish the potential benefits of PFI projects in practice.

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