

## **The Code for Sustainable Homes: what are the innovation challenges?**

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### **Abstract:**

The UK government has set timescales for the house building industry to significantly increase the number of new homes built and to improve the sustainability performance of these as defined by the Code for Sustainable Homes (CfSH). These dual requirements are generating a range of demands that require a corresponding range of innovative solutions. There is considerable uncertainty within the house building sector on the focus, scope and intrinsic risk of these innovation challenges. There is an urgent need, therefore, for this uncertainty to be transparent and calibrated. This will enable house builders to channel and optimise their innovations to meet government targets whilst developing new sources of competitive advantage. This paper sets out and substantiates a theoretical framework developed from the relevant literature that identifies and links the issues that house builders need to consider if they are to deliver against the dual requirements of sustainability and increased quantity. The questions generated by this theoretical framework are informing ongoing case study research on sustainable housing and innovation being carried out by the Salford Centre for Research and Innovation in the Built Environment, and the methodology for this work will be described.

### **Keywords:**

Innovation, sustainability, UK house building

### **1 Introduction**

The focus on sustainable housing is part of a broader international agenda to reduce the impact of climate change and, in so doing, move towards a more carbon-neutral global economy. The United Kingdom (UK) government has published a range of policy initiatives to address the issues. These include the Code for Sustainable Homes (DCLG, 2008) (CfSH) as a focus for the house building industry to achieve a high level of sustainability for new homes. The industry will need to develop and deliver a flow of successful innovation in order to achieve the dual goals of meeting the objectives of this policy and sustaining competitiveness.

This paper puts forward a diagnostic model that aims to structure the investigation of the significant challenges for house building supply chains that stem explicitly from

the implications for the scale and speed of innovation needed to achieve the higher levels of the CfSH ratings within the government's timescales.

An ongoing case study into the construction of 52 homes for a housing association client by a major housing developer, which will test the model proposed and map the processes of innovation needed to deliver these homes, is described along with the research methodology.

## **2 UK housing context**

Sexton and Barrett (2003) define the factors that are critical to firms' successful innovation and these include a considered awareness of the external or "given" environment. This is the business context that firms are influenced by, but which they cannot influence themselves. The current "given environment" for house builders is driven by government policy on three specific issues, summarised by the Department for Communities and Local Government (DCLG, 2007) that, in turn, are responses to broader global and national circumstances. These represent the defining framework within which the house building industry now needs to operate.

**Volume.** Three million new homes are needed by 2020 (bringing housing stock to c.25 million in England). This will be achieved by building increasing volumes of homes every year, rising to 240,000 a year by 2016. (DCLG, 2007: 6)

**Quality.** The sustainability of new houses is a key element of the policy commitment to build well-designed homes for mixed communities with good local infrastructures to support them. (DCLG, 2007: 8)

**Price.** The average house costs over 8 times the average salary and by 2011, 70,000 new homes a year will be "affordable", for either rent or purchase. (DCLG, 2007: 9)

These three are expressed as parallel policy objectives in government documents and can be summarised as more, better and cheaper housing. However, as well as satisfying national and local government requirements, housing developers, operating in market conditions, also need to manage viable and profitable businesses and there is a tension that underpins the two of the three key policy objectives of "better" (quality) and "cheaper" (price). Based on data in the government's policy statement (DCLG, 2007:22) it has been estimated that the construction of a low carbon, sustainable home may add 30% to the average building cost and £25,000 to the price for buyers (Miller 2007).

The policy objective of volume is compromised by the capacity of the sector, for example in the 12 months to June 2008, 161,000 new homes were completed in England (DCLG, Aug 2008: 2), far below the 240,000 annual target set by the government. Capacity is further reduced by the downturn in the economic climate in late 2008. The urgent need for the industry to develop and apply appropriate innovation to satisfy the apparently conflicting drivers of policy and business is clear, and requires timely academic support in order to clarify and calibrate the implicit challenges.

As a “given environment” for the house building industry, all three policy objectives need to be addressed as new (or recent) drivers that will generate, or at least accelerate, a flow of innovation to meet the government’s targets of more, cheaper and more sustainable homes. At the same time, developers continue to work within the framework of existing regulations such as Building Regulations, the central and local government requirements that regulate all house building projects, and any parameters that are relevant to individual projects.

### **3 The Code for Sustainable Homes**

The policy objective of better quality housing includes the Code for Sustainable Homes (DCLG, 2008). The CfSH has been introduced in England by the government to address the need for new homes to be “sustainable”. “Sustainability” is variously identified in the Code, though not specifically defined, as a minimisation of CO2 emissions, reduction of other environmental impacts of house building and an improvement of overall well-being & quality of life (DCLG, 2008: 2). The Code is a mandatory single national standard that rates “the whole home” against a range of nine “sustainability” criteria to give an overall 1 to 6 rating, where 6 is “highly sustainable”. The requirements of the nine categories of the CfSH (energy and CO2 emissions, water, materials, surface water run-off, waste, pollution, health and well-being, management, and ecology) add extra design requirements for the house building industry.

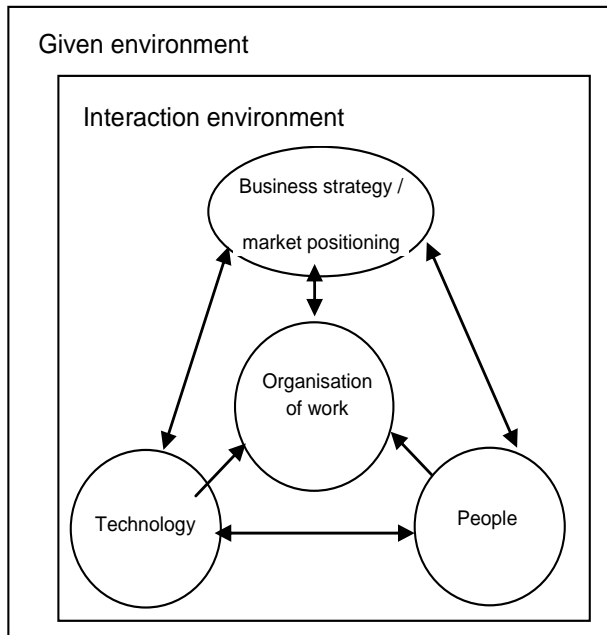
### **4 The innovation gap**

A definition for innovation that is appropriate for this research, reflecting a concept of a number of firms innovating on a project basis to meet the urgent challenges of high level CfSH housing is based on key government sources. The UK government’s aim is for the construction industry to “enhance [its] capacity to innovate and increase the sustainability of both the construction process and its resultant assets” (BERR, 2008: 44). The Economic and Social Research Council define innovation as “the successful introduction of new services, products, processes, business models and ways of working” (ESRC, 2008: 2) and the Department for Business Enterprise and Regulatory Reform stretch this to specify “the successful exploitation of new ideas” (BERR, [www.gov.uk/dius/innovation/](http://www.gov.uk/dius/innovation/)). These reflect the breadth and application of innovation that will be needed to meet the challenges of house building at higher CfSH levels. An amalgamation of the key elements of these definitions encompasses the successful application of a flow of significant and effective innovation, for projects which meet the criteria for higher-level CfSH housing, and which represent a sustainable business asset. Within the CfSH the challenge for innovation is implicit in, for example, the requirement for a 100% reduction in CO2 emissions for all new homes by 2016, with staged reductions of 25% by 2010 and 44% by 2013 (DCLG, 2007: 65), based on improvements on Building Regulations Part L 2006. However, there are several examples of small-scale private housing developments that demonstrate various elements of sustainability (for example the Living i development by Persimmon Homes, [www.living-i.co.uk](http://www.living-i.co.uk)). Developers have also been building and renovating homes for the social housing sector to the standards defined by the EcoHomes environmental performance standard since its launch in 2000, where meeting the highest level of “Very Good” is a forerunner of, though does not equate to, CfSH level 3 (HC, 2007: 10). Appropriate innovation has been developed and applied in the construction of these homes and would indicate that, if innovation to achieve CfSH level 4 or higher is a process, then this process has already begun.

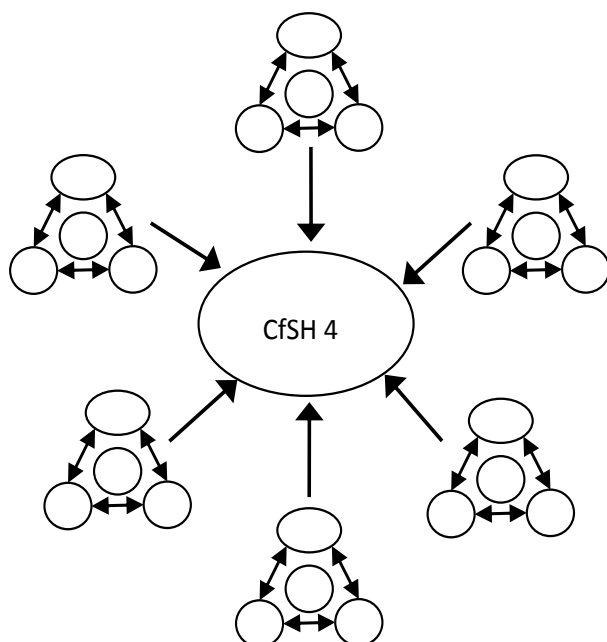
## 5 Diagnostic model

Sexton and Barrett (2003: 627) developed a model to clarify the business components that are necessary for successful innovation. It included the central organisation of work as a focus for the three-way relationship between technology, human resources and business strategy (see Figure 1)

Figure 1. Organisational factors of innovation model.



This has been multiplied to provide a diagnostic model for the case study (see Figure 2). The model shows Sexton and Barrett's triangle of the organisational factors of innovation multiplied for a constellation of firms sharing a common purpose of the successful delivery of CfSH4 housing. Each firm has its own perspective of the project and will organise its people and technology in line with business strategy to develop and adopt successful innovation to meet their part of the project. At the same time, firms need to continue to compete, and sustain competitive advantage, within their own specialist markets.



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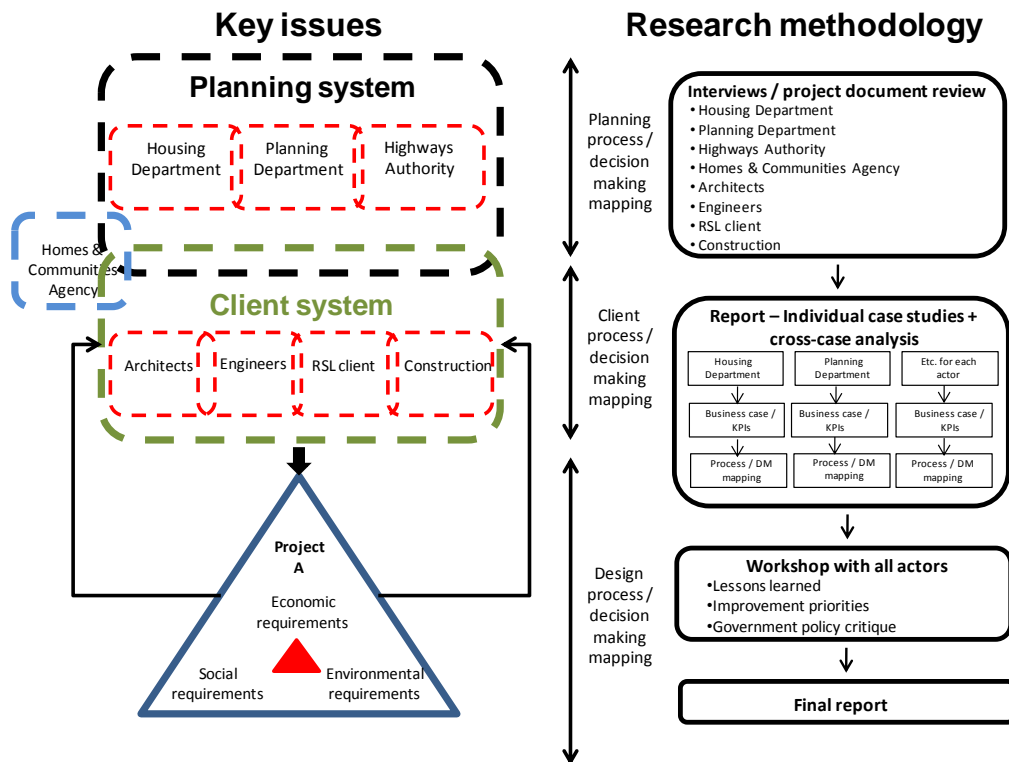
Figure 2. Project-based organisational factors of innovation

## **6 Research Methodology**

The case study, which is in its early stages, centres on a housing development of 52 CfSH4 homes. Figure 3 summarises the issues and methodology of the study, showing the progress of the development project through a series of decision-making processes by the organisations involved in planning, designing and delivering the 52 homes. The diagnostic model at Figure 2 illustrates the balance needed for a successful outcome, and the case study will include an examination of the effects of any inherent or unplanned weaknesses either in the links within organisations' individual "triangle" or in the focus on the project objective of CfSH4 homes.

A series of semi-structured interviews with members of staff from the designer, developer, client, engineer, local authority housing and planning departments, the regional Housing Corporation and the Highways Agency will explore perceptions and perspectives on achieving CfSH4 homes, supported by a review of project documentation. Interviews are scheduled to take place during November and December 2008, with subsequent analysis during early 2009. Transcripts will identify business cases, performance indicators and measures of success, and the process and decisionmaking maps for the construction project. Cross-case analysis of the reports will identify shared and unique perspectives on the processes and systems currently in place that support or create barriers to the innovations needed to successfully deliver CfSH4 homes. This will inform a debate of the issues and challenges of the innovation needed to achieve CfSH4, identify any priorities for improvement in existing systems and processes and finally discuss an evidence-based critique of the CfSH as a government policy.

Figure 3. Case study - key issues and research methodology.



## 7 Conclusion and further research

This paper has outlined the innovation gap implied for the house building industry by the Code for Sustainable Homes. It proposed a model to show the project-based organisational factors of innovation and introduced an ongoing case study that will include the use of the model to diagnose the innovation challenges in the construction of housing to CfSH4. The case study research findings and conclusions will be reported in a paper and presentation to the 2010 International Post Graduate Conference.

## 8 Acknowledgement

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