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EXPLORING THE REGULATIVE DRIVERS AND BARRIERS FOR LOW IMPACT BUILDING MATERIALS IN THE UK

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ABSTRACT

This paper used online questionnaire, interview, and case study data to explore the regulative forces applied to the adoption of low impact building materials in the UK. It was discovered that there are few regulative barriers to their adoption, but there are issues with the conservative nature of UK construction, warranty and insurance, the valuation of sustainable buildings, perceived and real extra costs, and the interpretation of the Building Regulations. There is the need for clear and specific legislative drivers to entry for these materials and greater awareness and education of the construction industry that support the increasing market demand for green buildings and LIBM. The most important change needed is the reassessment of the valuation of green housing.

INTRODUCTION

Low impact building materials (LIBM) are those that have a low negative environmental impact and a potentially high positive social and economic impact. LIBM can range from materials that modestly improve on typical practice (e.g. concrete with cement replacement) to 'deep green' materials such as straw bale, rammed earth, and bamboo.

In line with EU and UK directives to reduce carbon emissions as well as the new era of sustainable architecture, the UK construction industry is reducing its carbon footprint. Currently, this is being achieved through changes to the construction process as well as changes to the delivery of buildings and in building design. With these measures, and as we move towards a zero carbon energy supply from nuclear and renewables, the importance of the embodied carbon of our construction materials will increase. This will call for the increased use of local materials from renewable (crop or earth based) or recycled sources (LIBM).

The term 'regulative' has been defined as 'to control or direct according to rule, principle, or law; to adjust to a particular specification or requirement' and so covers planning and building regulations, as well as warranty, insurance, and aspirational building assessments such as Code for Sustainable Homes (CSH) and British Research Establishment Environmental Assessment Method (BREEAM).

METHOD

This project was undertaken as ‘practitioners’ research’ with the aim to strike a balance between academia and industry; implementing rigour and respectability to the research whilst keeping the topic and findings relevant and credible. Data were collected using a questionnaire that had 81 responses, six semi-structured interviews with industry experts, and chain-referral data sampling of secondary sources. This data was coded using NVivo and processed using a qualitative techniques based on grounded theory (Corbin and Strauss 2008). Previous literature and quotes from the data have been integrated into the discussion to support the findings.

DISCUSSION

Conservative vs. Innovative

The UK construction industry is viewed as “*conservative*” and regulations need to be more “*bullish*” to promote the use of LIBM. This is in keeping with the literature as Derwick and Miozzo (2002) and Pitt et al. (2009) believe steady increases in legislative penalties and economic incentives are needed to promote sustainable buildings, creating a ‘level playing field’ between sustainable and non-sustainable buildings. Williams and Dair (2007) found that where policies and regulations were clear and enforceable, sustainable objectives are largely met. This suggests that designers want a ‘tick-box’ exercise to increase the use of LIBM as it is simpler to monitor and enforce; a prescriptive set of regulations. This also suggests that regulation is being viewed as a means of getting the construction industry to change; to artificially stimulate the market into creating low energy housing and offices. This is very different from how the Building Regulations currently stand as a functional performance standard. They “*are written for innovation... we try to say ‘yes’ first, and... try and meet that minimum standard*”. The National House Building Council (NHBC) building standards are similar as there are only five technical requirements and “*everything else is either a performance standard or guidance*.” Building regulations currently do not achieve their aim, as the construction industry is too conservative for them i.e. as they are not prescriptive, the construction industry doesn’t have the drivers it needs to change its attitude. This disconnect between what needs to change; the construction becoming more innovative, or the regulations becoming more prescriptive, needs to be tackled if LIBM are to be used more in the UK.

Value of Green Buildings

Commercial buildings have added value if they are ‘green’ due to reputational benefits, fulfillment of CSR mandates and increased employee productivity (Nelson and Rakau 2010 cited by RICS 2011). These benefits have been recognised by commercial developers and so asking them for BREEAM Very Good certification “*has become just completely straightforward, like default industry standard*”.

However with house building, “*the resistance to change is much greater*” as there is a “*cultural difference*” between commercial developers and volume house builders. Further investigation suggests that this is down to how the market is perceived; “*house builders think that buyers are conservative*” and so provide for that market, making it “*self reinforcing*”. There is also “*more awareness of running costs in commercial buildings, so [if] people are looking for office space, for example, then they will look quite carefully at what their energy*

bills are". Yet with increasing fuel prices and fuel poverty in the UK, there is an increasing demand for sustainable housing with low running costs. Climate works (2011) found that "*homes which are smaller, with very much lower running costs, can be particularly desirable*". Also the rise of green consumerism could make LIBM more attractive than standard building products.

Much of a house's value is still on "*traditional indicators such as the number of bedrooms, bathrooms, built-form.*" and although developers "*ought to be able to get a premium for this house if [they] put solar panels on the roof*", it is not usually the case. This is a very important point that needs addressing. There are many house builders within the UK and with the demand for low cost housing, developers tend to compete on cost alone. If developers were reimbursed for extra costs they incur from additional work and altering their supply chain to produce greener housing, there is more of an incentive for developers to implement these improvements.

Perceived and Real Extra Costs

Understandably green buildings tend to have extra capital costs due to extra insulation, lack of economies of scale with LIBM etc. However the extent of these extra costs is very difficult to determine. Bristol's policy on achieving Code for Sustainable Homes Level 6 housing by 2016 underwent a consultation written up by Climate works (2011) as developers believed it to be too onerous and costly to achieve. The report stated that the developers were not necessarily concerned with "*the principle of the fact that higher performance standards would mean extra cost*", but more that there was an "*uncertainty about what these costs might be, how to achieve the required standards, the difficulties of amending existing design and procurement processes, and how to sell higher performance buildings to customers.*" These concerns call for greater education and guidance for the developers on how to achieve these standards, and for specific and clear legislative drivers for LIBM.

Warranty and Insurance

Building Regulations and NHBC Building Standards may be written for innovation, but their accountability ends when the building is completed. Warranty and insurance consider the long-term performance of a building material and in the case of LIBM the main issue is durability. Conventional materials have proved their reliability over time through empirical data from field performance. This leaves LIBM in a dilemma; field performance data are difficult to collect as few projects use these materials, and only a few projects use LIBM because there concerns with the reliability of these materials due to the lack of data. In the absence of field data, third party assessments on the performance of a particular materials or products are accepted. Testing would not be accepted, as "*tests in isolation don't give us the whole picture*". These assessments under are expensive, and as many LIBM companies are smaller start-ups, undergoing this assessment is a large financial ask. As third party assessment isn't necessary for Building Regulations this issue isn't a critical barrier for the use of LIBM, however third party certification would increase the market available.

Interpretation of Building Regulations

Tir-y-Gafel, an eco village in Pembrokeshire developed by the Lammas Low Impact Living Initiative, became involved in a dispute with Pembrokeshire County Council over Building Regulations. This development follows the 'deep green' philosophy, which calls for such a large departure from mainstream house design that the interpretation of these occupants of



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'adequate', 'reasonable' or 'appropriate' within the Building Regulations is very different from those of the mainstream population, including most building inspectors. This included sourcing fresh water from a nearby spring, sourcing hot water from heating it up on a wood stove, skylights made from recycled cellophane, and breathable wall construction.

All charges have been dropped by Pembrokeshire County Council (PCC) as it was their interpretation of the regulations, of what is 'adequate', 'reasonable' or 'appropriate', that was the issue, not the regulations themselves (PCC 2011 cited by Dale and Saville 2011). This issue of mainstream interpretation of the Building regulations is a key one, as those with a 'deep green' mentality will have a different interpretation of what are acceptable living conditions.

CONCLUSIONS

In conclusion, there are few regulative barriers to the adoption of LIBM, but there are issues with the conservative nature of the UK building industry, warranty and insurance, the valuation of sustainable buildings, perceived and real extra costs, and the interpretation of the Building Regulations. There is the need for clear and specific legislative drivers to entry for these materials and greater awareness and education of the construction industry that support the increasing market demand for green buildings and LIBM. The most important change needed is the reassessment of the valuation of green housing. Through appropriate valuation, developers would then be able to recuperate the extra costs needed to alter their supply chain and install benefits such as micro generation and breathable wall constructions. This will also allow housing developers to compete on criteria other than cost, prompting best practice. An increase in scope would lead to the investigation of the valuation of green housing; interviewing estate agents, house buyers, house builders, and mortgage companies.

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