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Improving the sustainability of the Built Environment: The role of legislation, guidance, assessment and ambition.

In a previous paper submitted for PLEA 2008 in Dublin (495: Driving change in the UK built environment: A review of the impacts of zero carbon buildings policy in the UK) the authors discussed the effectiveness of centrally-mandated legislation in driving carbon emissions reductions in the built environment focusing on the UK Government's drive for 'zero carbon' new-build. The paper concluded that, while the current policy agenda is overly prescriptive and too focused on an extreme target (zero carbon) for a small sector of the market (with 'new-build' only predicted to account for around 30% of the UK Built Environment by 2050), the basic principles could be used to create opportunities to drive much greater change. Having discussed in detail the current regulatory framework in the UK in the 2008 paper, including the barriers and opportunities for substantial performance improvements, the authors briefly review the conclusions and move on to discuss the relationships between compulsory, regulated standards, and voluntary design guides and assessment tools and their relative abilities to deliver controlled change in a complex environment.

'Sustainable Development' is cast as the guided change of a complex system toward an undefined goal involving multiple, and often competing objectives. As such 'performance' or 'progress' cannot be represented as merely an assemblage of component parts. The sustainability of the built environment (even at the level of individual buildings) depends on the interaction between a number of component elements that are not always tradable and as such, would seem to suggest that all decisions need to be made on a case-by-case basis. However, in practice, this is completely impracticable and so proxies are required. The suitability of several different approaches to measuring sustainability is reviewed. Legal minimum elemental standards for construction, Cost Benefit Analysis (CBA), Life-Cycle Assessment (LCA) and Multi-Criteria Decisions Analysis (MCDA) are among the most common approaches and the appropriateness of each is discussed, drawing on existing work and case studies to support the arguments.

Taking a step back from the detail of each individual piece of legislation or assessment framework the authors ask whether it is appropriate to judge individual buildings in isolation from their context and explore more broadly the need for:

- Rigour in ensuring that the buildings constructed under each scheme are of sufficient 'quality';
- Uniformity/predictability in so much as a level playing-field is required for effective market competition, and;
- Freedom to innovate and achieve the 'step change' that we are constantly reminded is required of us.

Furthermore the need to encompass both qualitative and quantitative measures in any definition of 'quality', and the desirability/practicality of setting a definitive 'end point' or definition of 'green building' or 'sustainability' are discussed.

The paper moves on to briefly review the history of voluntary sustainability rating tools around the world and then focuses on the UK, USA and Australia in more detail. The UK, USA and Australian construction industries have been among the early-adopters of sustainable development ideals and have all fostered successful voluntary sustainability rating schemes (BREEAM, LEED and Green Star) or Building Environmental Assessment Tools (BEATs). The authors examine the relationships between the various voluntary rating schemes in use and the relevant compulsory national standards. Existing work evaluating the effectiveness of established BEATs is critically reviewed, including a number of attempts to directly compare different BEATs, and a list of key attributes is proposed.

As the final layer of complexity, the paper examines the role of the occupant in achieving strict performance targets and the problems of asking designers, with little or no control of the occupation or operation of the building, to include energy-uses that are beyond their remit to control. Indeed, the ability to realistically control demand in any way is questioned, and technologies for Demand Side Management (DSM) such as Dynamic Demand (DD) and intelligent load management are discussed briefly.

The importance of in-use monitoring and feedback is discussed and mechanisms for capturing this information are suggested in order to try to ensure that all standards, whether compulsory or voluntary, are based in reality and remain relevant as technologies, practices, attitudes and indeed the physical climate itself begin to change.

As well as looking at the traditional 'hard science' aspects of environmental performance of buildings, the paper raises the issue of whether additional 'soft' benefits can be derived by greater transparency and wider stakeholder engagement. This raises once again the issue of engaging a non-technical audience in a very technical area and whether the need to include qualitative judgements in the decision-making process removes the basis for a true scientific approach.

The paper concludes with the hypothesis that sufficient change cannot be appropriately managed within such a complex system by relying on disparate and simplistic methodologies and the authors make recommendations for establishing effective relationships between the compulsory and voluntary standards as well as identifying a key role for in-use feedback and pro-active occupant management as part of a holistic approach to effecting change. The recommendations are viewed both in terms of a national context and how they might be operable from a policy point of view, and in terms of an individual project context.