APPG for EBE Inquiry into Sustainable Construction and the Green Deal – Call for Evidence

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Firstly the UK Government should be commended for its forward thinking in setting ambitious carbon emission targets, supported by legislation and policies for both domestic and non-domestic new builds and refurbishments.

As a global company, IES has a clear perspective on the UK's widely acknowledged role as the leader in sustainable construction[1], in particular through its use of building performance modelling for quantifiable assessment of buildings. The UK should aim to protect this position, especially as green building has now become a long-term business opportunity: worldwide revenue from zero energy buildings is expected to grow to almost $690 billion by 2020 and then $1.3 trillion by 2035[2].

A performance based approach to regulation and rating systems was pioneered by the UK, and is increasingly being adopted around the world – notably in Singapore BCA Green Mark regulations, LEED in the US, DGNB in Germany, NABERS in Australia and the UK based BREEAM rating scheme.

While the construction Industry is without doubt suffering in the recession, the economic opportunities presented by sustainability offers significant hope. Globally 51% of construction firms plan for more than 60% of their work to be green by 2015, up from 28% in 2012. 35% of firms cite client demand as the biggest driver of growth, while 33% say they're simply reacting to the market. 30% said that green building meant lower operating costs, and another 30% mentioned a brand advantage through being associated with sustainability[3].

However, we strongly feel that this issue is not just about how the industry is playing its part in meeting these targets, but how the Government consults with industry, and especially how it utilises the experts it has on its doorstep.

The commercial use of building performance analysis software and techniques was born here in the UK, yet there has been limited early consultation with the industry regarding performance related methodology and software tool development. Consequently, important elements have become fixed before feedback has been sought.

To move forward to zero-carbon targets we must ensure that compliance methodologies are robust. We have serious concerns that while SAP and SBEM are adequate at a simple level, they are not a suitable basis on which to build more stringent and complex policies. There is a tendency for the methodology to become ever more convoluted as it attempts to keep pace with evolving technologies. The danger is then that, through its limitations, the Government's free compliance software hinders, rather than facilitates, the introduction of new CleanTech solutions.

Currently we see compliance taking a different route to that of best practice high-performance, low-energy building design. Many of our customers prefer the dynamic simulation (DSM) route over SBEM, and already run two different versions of their building model – one to prove compliance and

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[1] A new study has predicted a bright future for green building, and said that the UK is at the forefront of a global, sustainable shift in the construction industry. The study paints the UK as second only to Singapore globally in terms of innovation in sustainable construction, with 65% of British companies planning some form of green renovation project in the next three years. The global average is 50%.
http://blueandgreentomorrow.com/2012/11/15/study-paints-uk-as-a-leader-in-green-building/

[2] Pike Research Zero Energy Buildings January 2012
http://www.pikeresearch.com/research/zero-energy-buildings

[3] McGraw Hill Construction *SmartMarket* Research Study November 2012
http://analyticsstore.construction.com/index.php/2012-world-green-building-trends-key-facts.html

the other to achieve the best high-performance low-energy building design[4]. This duplication of effort is wasteful of both money and the creative talents of designers. A way must be found to achieve convergence between compliance and ratings procedures and best design methodologies. For example, there is currently no DSM route for dwellings, yet as we drive ever closer to zero carbon targets the need for increased detail is paramount as a recent feasibility study we did for CIC Start showed; SAP underestimated the renewable PV area required for zero carbon by around 60%[5]

High-performance design, including energy efficiency, is becoming as fundamental a design service as meeting basic programmatic, budgetary, and life-safety needs. A deliberately multidisciplinary approach to building performance – including energy performance – coordinated and managed by the architect, should be embedded into every project team's workflow. It should engage energy modelling directly with design generation, thus informing major design decisions and providing continuous feedback[6].

Furthermore, advanced performance analysis modelling can be linked to BIM to deliver cross-disciplinary integration of the design team with sustainability at the heart, rather than an afterthought[7]. We see that legislation should support and encourage this best practice approach where possible.

Recent changes to the NCM methodology have largely been driven through without the close involvement of the software industry, in contrast to the more open collaboration seen in earlier years. The proposal to introduce high fees for software validation has put further distance between the Government and the industry. As one of only two companies to deliver widely used dynamic simulation (DSM) tools for compliance, IES has provided much constructive input to the development and improvement of assessment procedures (including SBEM), but recent changes in the Government's stance have hampered this collaboration. We would welcome a return to a closer working relationship acknowledging the vital role played by the industry.

We are concerned at the proposed procedures for Green Deal, to the extent that at present we are not planning to develop a DSM implementation. One of our major concerns is around the robustness of the proposed calculation procedure, which incorporates a number of questionable adjustment factors. Uncertainties in the way the building is operated and the vagaries of the weather, which both have to be extrapolated over a period of up to 25 years (and in the case of the weather are subject to variations in microclimate) make the calculation of investment return very challenging – particularly since to judge a scheme's viability the estimated saving must be reduced by the combined fees of up to four professional partners. If inaccuracies in the calculation mean the achieved net outcome moves the wrong side of zero (which we suspect might often be the case) then the property is likely to be saddled with a debt for a lengthy period and a net loss will be incurred on the investment. This represents a risk to both the owner/occupier and the finance provider.

Green Deal debts will impact the property market, since buyers are likely to demand that a Green Deal debt is paid off before a purchase proceeds. This effect will be exacerbated if early repayments incur penalties. Consumer confidence may further be eroded by a suspicion of less than complete independence between the professional partners involved in the deal.

A more general concern is that building energy calculation procedures sharing a common methodology have been placed under the responsibility of different Government departments: the DECC manages the Green Deal, the DCLG manages compliance and EPCs, while DEFRA manages SAP.

The Government needs to look towards the future and set legislation based on performance-related energy targets that are able to fit with evolving best working practices which utilise integrated, holistic design, with ICT aids such as advanced energy modelling and BIM – practices which are already being proposed by industry as the way towards true zero carbon buildings and communities.

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[4] http://www.cibsejournal.com/archive/2012-07/bad-by-design

[5] CIC Start Feasibility Study: Assessment and Application of Zero Carbon Building in Scotland http://www.cicstart.org/content/home/1,1,278/FS08AssessmentandApplicationofZeroCarbonBuildinginScotland.html

[6] http://www.aia.org/practicing/AIAB094452

[7] http://www.youtube.com/watch?v=cAUICDyQOfs&feature=share&list=UUjCPI969e4Hb11RSgzlHf4Q

Technology is joining up: Community Generation, Smart Cities, Smart Grids, Smart Buildings and ICT are all converging. A virtual 3D performance model of a building can evolve and adapt to ensure that optimal operation is achieved at all stages as a building profile changes during its lifecycle. In the future these models could communicate within a network.

Our own 10 year vision provides a sophisticated and integrated 3D analysis concept within a smart city environment. It follows building design from conception, through rating and regulation compliance, on into construction, commissioning, operation, and refurbishment/decommissioning. Linking individual building operation into integrated smart cities and communities; in this way enormous benefits can be gained throughout the whole design and subsequent operational process.

Integrated across the entire life of a building this type of performance analysis concept delivers a technology platform through which built environment stakeholders can quantify, optimise and verify sustainable results.

We believe that the application of Virtual Building technology from design, through construction/commissioning on into operation and renovation/adaptation offers a 3D platform upon which Smart Building and City principles can be analysed, assessed and improved. At design stage a virtual simulation prediction is modelled, while once built real-life operational data is used to refine and optimise performance.

Consequently, we believe that it is vital for the Government to look beyond the individual building level and start to consider compliance within the context of neighbourhoods and cities. In order to reach zero-carbon, buildings are increasingly being integrated with other local aspects; renewables, district energy systems and electric vehicles for example. In fact, the E2BA states demand side reduction and steps towards a higher scale level of energy efficiency (i.e. district level, fully integrating decentralised energy generation and renewable energy sources) as one of its three main identified priorities[8].

In addition, there also needs to be more of a focus on the very real issue of operational performance – as-built operation not matching predictions through poor controls, commissioning etc. There is an urgent need for links to be made between design and operation to ensure that compliance at the design stage is followed through by operational controls. ICT plays a dominant role in such performance monitoring and management[9].

Consequently, ICT based compliance requirements issued by the Government should aim to integrate and be interoperable within this emerging ICT aided design, construction, operation and smart community network.

About IES:

The application of building performance simulation on new-build and refurbishment projects facilitates a greatly improved integrated and sustainable design process. Before IES began to develop this technology such tools remained in the hands of academics and were too complex to use commercially. Over the last 15 years, IES has successfully brought to the global market its software suite, otherwise known as the Virtual Environment (VE). The company has attained a unique position. Its technological solutions, consulting expertise and investment in research has ensured that, as the need for energy efficient buildings, communities and cities continues to grow, IES is consistently at the cutting edge of those building science developments. Our vision is to transform analysis technology use, dramatically reducing the carbon emissions produced by the built environment, and optimise the use of energy and other resources. IES commits over 30% of expenditure to Research & Development, participating actively in collaborative funding projects; including UK Technology Strategy Board (TSB) and European FP7 projects.

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[8] E2BA Research and Innovation Roadmap towards Horizon 2020 cites http://www.ectp.org/enewsportal/index.php?option=com_content&view=article&id=698:e2ba-opens-a-consultation-on-the-new-e2b-roadmap-draft&catid=72:consultations&Itemid=61

[9] E2BC Research and Innovation Roadmap towards Horizon 2020 cites http://www.ectp.org/enewsportal/index.php?option=com_content&view=article&id=698:e2ba-opens-a-consultation-on-the-new-e2b-roadmap-draft&catid=72:consultations&Itemid=61

APPG for EBE Inquiry into Sustainable Construction and the Green Deal – Call for Evidence.

The All Party Parliamentary Committee for Excellence in the Built Environment is launching a far reaching inquiry into sustainable construction and the Green Deal, and it is calling on firms, organisations and individuals in the sector to submit evidence on best practice, challenges and barriers.

Buildings account for nearly 50% of all carbon dioxide emissions and reducing the carbon footprint of our new and existing buildings is vital if the UK is to reach its ambitious carbon reduction targets. In the last five years the UK government and the EU has introduced a raft of legislation to further these aims. This includes the code for sustainable homes, more stringent building regulations and the Green Deal - the instrument intended to kick start a revolution in retrofitting.

But is the industry playing its part? Is sustainability suffering in the recession? What more can be done to promote green construction in public and private sector building projects? We would like feedback on the spectrum of green construction and policies. These include:

- *Evidence of best practice of sustainable construction in the built environment - and how this could be repeated?*
- *Barriers to sustainable construction - what is holding the industry back and how could this be improved?*
- *Progress on sustainable homes - too much too fast?*
- *The Green Deal - is the policy the right one? What can be done to ensure take up?*

The closing date for evidence submissions is 30 November 2012.

The APPG for EBE Commission of Inquiry comprises of members of both Houses of Parliament, senior members of the construction professions and key influencers and decision makers in other aspects of society.

The Commission will hold sessions in January to March 2013 to invite selected organisations to present oral evidence in support of their submissions.

This will be the Committee's second report. It recently published A better deal for public building which set out a number of measures for improving construction procurement, including adopting the 2012 Construction Commitments on all public building projects over £100m.

The findings of the Inquiry will be published before the parliamentary recess in early summer 2013.

Sir Tony Baldry chairman of the APPG for EBE said "The Group has been very pleased with the outcome of the Commission's first Inquiry and is keen to press on with an annual commitment to investigate matters of great public importance in relation to the creation and maintenance of our built environment. The contribution of the built environment to climate change is immense and if the UK government is to meet its challenging targets for reducing carbon emissions then much has to be done to take carbon out of the construction and use of our buildings and facilities. So, we are looking for the best ideas in Green Construction – including how we can get the best out of the Green Deal – and invite evidence from clients and the industry to demonstrate the innovations that are already taking place or planned".

The Construction Industry Council acts as Secretariat to the Group.

To make a submission or for further information please contact APPGInquiry@cic.org.uk or Graham Watts on 020 7399 7402.