

SBEM AND THE GOVERNMENT'S RACE TO THE BOTTOM



Dynamic simulation modelling is being sidelined by the government's insistence that designers use SBEM to prove compliance with key regulations and codes, says **Andrew Cooper**

BRE – the Building Research Establishment – says the simplified building energy model (SBEM) and its interface, iSBEM, are compliance tools, not design tools. This statement can be extended to include any thermal-modelling software interfacing with SBEM. However, I think SBEM has become a strategic design tool embedded in the design process, a purpose for which it was never intended.

This has been amplified by the Department for Communities and Local Government's (DCLG's) requirement to tie dynamic simulation modelling (DSM) results to those of SBEM – with a tolerance of just 5 Asset Rating points – in an effort to get consistency across energy performance certificates (EPCs) and Building Regulations.

RIP DSM?

Design teams have, to date, been able to rely on the more detailed, accurate and expansive engineering capabilities of DSM. For compliance purposes, DSM is tied to the National Calculation Method (NCM), but it can take into

consideration shading from structures and vegetation; it allows engineers to undertake detailed analysis of the effect of sunlight and air-flow patterns for natural ventilation strategies; and it can model ventilation with enhanced thermal coupling to the structure and automatic blind control. It does not rely on monthly average calculations and is, therefore, a more accurate assessment of a building's design.

Most buildings are built speculatively by developers, who pay architects and engineers to design and construct properties that can be sold or leased. Buildings are designed to pass Building Regulations and – if the output of DSM is to be tied to SBEM – SBEM will increasingly be used on projects for which DSM is more suitable. After all, if design and performance optimisation were truly primary drivers for new-build properties and major refurbishments, the difference between predicted and operational energy consumption would not be so pronounced.

SBEM can be used to prepare energy statements, which are required for planning applications; it is the default

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tool for compliance with Building Regulations; and is used to help calculate BREEAM ratings. While it may not be suitable for HVAC sizing and engineering detail, the choice of system will be determined by SBEM and its modelled performance, not by predicted operational performance. Design and engineering solutions will first have to work in SBEM, and then operationally. To quote Chris Twinn, of Twinn Sustainability Innovation, from *CIBSE Journal* April 2014: 'Game Boy has taken over SBEM.'

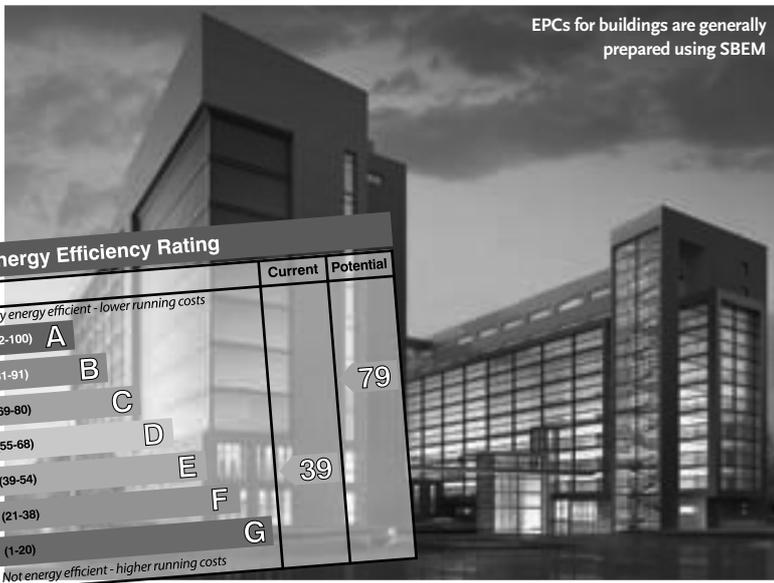
SBEM relentlessly marches on

The UK is legally bound to reduce its carbon emissions by 80% by 2050. Most of the buildings that will be standing then are already built, so meeting this target will mean reducing the energy consumption and CO₂ emissions of the existing built estate. The Energy Act 2011 legislates for minimum energy efficiency standards by 1 April 2018, and the Department of Energy & Climate Change (DECC) has stated that properties with F- or G-rated EPCs cannot then be let until a due process has been undertaken.

This means the influence of SBEM as a design tool will be extended to heavily influence the design of major refurbishments. This is because EPCs are generally prepared using SBEM. Compliance with legislation will be determined by the financial feasibility of energy conservation measures, which will be calculated using the Green Deal tool – a variation of SBEM.

EPCs determine the level of feed-in tariff, which affects viability – and, therefore, inclusion – in design. A Green Deal assessment is proposed, by DECC, as a route to compliance with the Energy Savings Opportunity Scheme for large UK organisations, a use for which it is wholly inappropriate. Now, if that's not a design tool, I'm not sure what is.

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