

**The
vote**

With Phil Jones of the CIBSE Energy Performance Group as the chairman of the debate, it turned into a lively evening with the audience participating almost as much as the speakers.

Before the debate, the audience were against the motion with less than one third believing that engineers should become legally responsible.

The issues were passionately delivered and a range of interesting ideas voiced. Those for the motion failed to swing the vote in their favour but did narrow the gap. There was consensus that energy performance of buildings has to improve and energy designers are well qualified to ensure this.

The ideas described below are distilled from those expressed by the debating team. Ideas are arranged under headings for clarity. Speakers are encouraged to take a strong stand to support their case and individuals are not necessarily 'true believers' in their own arguments

The case for

"Building designers should become legally responsible for energy performance in use".

Speakers:

Max Fordham, Partner, Max Fordham and Partners

Edward Spall, Commercial Manager, DMS Controls

Brian Mark, Director Fulcrum Consulting

Carbon emissions

- With nearly half of a developed society's carbon emissions coming from buildings it is clear that energy efficient designs are of paramount importance.

Present day design

- Traditionally designers are artists and not held responsible for their work provided they work in a conscientious way. Energy use is too important to allow artistry to be an excuse for failures of building performance.
- The emphasis to ensure that systems are operational are on the contractor not the professional team.
- Under present work scopes/fee structures, responsibility and accountability of consultants is reducing. There is little resource to pay for monitoring systems or the time for analysis to feed back into more accurate energy use predictions. The lack of performance monitoring feeding back to designers means that future designs are "improved on" without a true understanding of potential flaws.

- Design culture provides a service, designers seek to minimise forced long term contractual responsibility
- The accuracy of predictions is not viewed as “a sue-able event” and there is therefore a poor performance record of innovative designs in reducing CO2 emissions compared to initial claims by designers.
- The result is that real progress in energy-use reduction is held back.

Why should the designers take on the responsibility?

- The designers are the initiators of a building and are the only group of people who can take responsibility for the energy use.
- During design all the important decisions have to be taken and then the designers must take authority over the construction process so that the building will operate as designed. It is no good leaving the construction team to guess how the building is to be made.
- The energy designer is the only professional with the expertise to understand the importance of...
 - Construction detailing
 - What's built matches thermal model inputs
 - How it's used matches thermal model inputs
 - Building services design
 - Commissioning
 - Maintenance
 - User education and incentivisation to change engrained lifestyle behaviour patterns
 - Facilities management
 - Risk management of suppliers performance claims

Barriers

- The actual scope of works required of an energy designer to secure a robustly predictable actual energy use is long/complex/difficult to define and requires “fee” levels beyond most development capital cost plans
- Designers are culturally disposed to provide a duty of care and don't like the “slight” of forced contractual responsibility
- Any change is likely to involve a contractual liability for whole life performance and this will involve banks in some way
- The occupants of a building have to be taught how to use the building to meet its design
- Collective understanding of the complexities of such agreements – What is long term?
- Establishment of externalities and control of variables
- Control of assets

Advantages to the construction industry

- By placing the responsibility onto the designers it will become necessary for them to give themselves authority to discharge the duty of delivering energy efficient constructions.

- Long term acceptance of responsibility will encourage overall commitment and will help improve professionalism across the industry
- The designers will have to make realistic predictions and then over-see that they are fulfilled. The days of over optimistic promises which have little hope of working will be over.
- It will mean joined-up thinking with collective long term working agreements
- It will lead to improvements in training for all concerned
- There will be greater clarity regarding the supply of goods and services in relation to energy performance
- End users will be taught how to use the building to meet its designed energy targets

How it could be done

A possible performance related contractual offer from an energy designer could take the form of a much reduced fee at design and construction phase with the majority of the fee from actual monitored performance over a stated number of years. In the contract there will be non-performance financial penalties

If you call this PFI we all say we are experienced in the procurement system in marketing blurb yet we won't apply it ourselves to performance related fees. To fund a wider scope for designers, banks will be involved, yet banks are always involved in any calculation done on whole-life costing.

This debate is about a Principle. The energy designers are the best qualified to ensure energy performance in buildings. They are in a position to increase their scope of works and plug all the gaps with a tightening up of the legal responsibilities. Details will need to be developed but the potential advantages are too great to be dismissed.

The case against

"Building designers should become legally responsible for energy performance in use".

Speakers:

Bill Bordass, The Useable Buildings Trust

Kathrine Holden, Engineer Arup

Andy Ford, Director Fulcrum Consulting

Carbon emissions

There is no doubt that there is a need for improved energy performance in buildings but the responsibility should not be with the designer. All involved with the building process must be involved.

Present day design

- Despite building regulation improvements changing u-values from 1 in 1978 down to 0.25 in 2006 there is still a progressive increase in energy consumption.

With 300,000 new homes per annum and 3.6 million required by 2016, it is difficult to see how a 60% reduction in energy consumption by 2050 could be achieved

- The type of things that go amiss between design and construction, vary from poor installation of insulation in buildings to equipment failure. The designer draws the detail but if the construction is a design and build package contract the designer has nothing to do with installation or value decisions that can greatly affect performance.
- There are occupier issues. –An example is a recent award winning office construction of 15rooms with 450 computers- During a 2-week vacation, all computers were left on thus negating any energy saving through design. Occupiers also have a predilection to leave lights on even though there is adequate day-lighting. The designers cannot be made responsible
- There is a credibility gap developing between the emissions of carbon dioxide estimated by the designer and actual emissions. This is particularly so with electrical usage

Why designers should not take on the responsibility?

- The design team cannot maintain sustainability objectives as the team expands to the plot developers, the project managers, the contractors, the suppliers and the installers. At all levels verifiable targets are set and value judgements are made that are inevitably out of the control of the designers.
- After the construction of the building, the occupant lifestyle choices become dominant. Space heating and hot water can be modified by the designer but not cooking, lights and appliances
- There is very little incentive on individuals to behave responsibly and even less if the engineers have to take on responsibility
- Its just not likely to work however desirable.

How it could be done

- Designers to improve the way they inform clients giving full energy options
- Ensure compliance with part L by providing a report on thermal bridging, air-tightness and air leakage testing of ductwork which could be arranged by the architect
- Provide a report on inspection and commissioning which could be arranged by the contractor
- Use the national calculation method on as-built information to re-check that the submission has been built as designed.
- Provide a building log-book much like the current O&Ms. CIBSE give guidance on this (TM31). This could be done by the contractor
- Installers need to provide energy performance certificates. There is also a need to install equipment to allow energy to be suitably measured.
- To provide all of the above there is a need to ensure that there is an adequate well informed workforce

- All of the above would ensure design intents are properly realised with proper commissioning and would enable facilities management staff to operate the buildings more efficiently.
- Provide suitable metering to allow the estimated annual fuel consumption to be accounted for. This will empower the user to adapt lifestyle accordingly.
- Ensure that building inspections are carried out in an independent manner by qualified and/or accredited experts
- Prepare property portfolios to respond to market changes

Designers play an important part but so do developers, builders, tenants and users. Designers cannot be responsible for the whole energy performance in use. There needs to be a whole range of education and incentives as well as legislation.

Questions and interesting ideas from the audience

Engineers as policemen

- Energy designers have to be policemen and look at whole-life cost.
- Policemen operate in the system, they don't direct the system- they can't fix when things go wrong

No authority

- Engineers don't have authority to take on the extended responsibility –They have no understanding of the occupants
- Many engineers would be happy to take on responsibility for cladding etc but it can't be done in practise. There is a need for facilities managers to be used more in the design
- Designers not paid to snag properly

Experience in Europe

In Germany there is a system of 'performance contracting'. They bind energy performance to the working agreement. This leads to collective responsibility and often means increased performance saving money and energy as a resource.

Liable to whom?

- Would this be common law? –Would defaulting designers go to prison?
- PFI make contractors responsible for profit but not for CO2
- Need to apportion risk and mitigate risk when financing a building project. –Difficult to do if there is a legally responsible position.
- How can errors be prevented without someone taking responsibility? There must be an incentive.
- Sharing responsibility may be necessary but there is a need for a legal requirement.

The user should be responsible

- The users should be fully responsible. Increased council tax for increased resource use
- Too late if its down to the users Energy predictions are taken from a position of knowledge so it should be down to the designer

Changing the scope of works- Going quickly, slowly.

- Everybody has to learn together. Facilities managers have to come in early on a project. They have to be able to state what it is possible for them to manage.

- Need facilities managers to be engineers so why not make engineers into facilities managers?
- Monitoring the occupied building after construction forces the design consultants to learn.
- Need a holistic record of performance of buildings. Need to measure windows, floors, finishes and ensure these systems are measured. How? Thermal imaging
- A system of fees being related to performance. –Not getting money if the building doesn't perform
- If engineers were better qualified it would lead to higher efficiencies.
- Need a 'post completion services' business –M&E engineers don't return to buildings
- Need better monitoring of contractors
- Energy is not in the control of engineers-all they do is what the client wants.

Too many sticks . where are the carrots?

We have a system with lots of sticks and very few carrots. – Can't buildings have royalties so the designer can profit from a high performing building?- something like 10% of energy savings