

## THE EDGE Symposium

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*What is the role of architects, engineers and clients in developing a sustainable approach to the use of energy in buildings?*

Thinking about this question I am gripped by contradictory emotions.

I am delighted that since my attention was caught by low energy design in 1972 (the year in which the RIBA devoted its then annual conference to the environment) the idea of "green" design has established itself. A readily applicable body of knowledge has developed, a number of designers have made their names with architecturally satisfying buildings which enshrine low energy principles and governments in this country and across the EU have devoted substantial financial resources to the promotion of these ideas. In 1975 Robert & Brenda Vale wrote a book on the autonomous house and hardly anybody noticed -- in 1995 they built it and almost everybody saw it. Sir Michael Hopkins, Lord Rogers, Sir Norman Foster and many others have adopted low-energy principles as an important element in the development and promotion of their designs.

At the same time I am disconsolate. A drive (and how many people really get about any other way) for any distance across our country reveals that energy conservation thinking has had little impact on our lives. The mainstream of building practice has flowed on almost unaffected. It is true that fabric insulation standards for housing have ratcheted up a few notches -- but if we were serious about meeting the targets for CO2 emissions that the Government has set, all new homes should be insulated to the highest practical standard ("superinsulated"). At best we can say that energy consumption in buildings is not rising or is perhaps falling slightly.

What has gone wrong? It's not as if low energy design does not work. Those who live and work in well-designed low energy buildings are happy -- at the very least no less happy than those in "gas guzzlers" and usually happier because designers of low energy buildings usually take a great deal of care over comfort. Energy consciousness does not prevent talented designers from creating good buildings. It doesn't cost more. A well considered low energy design is no more expensive to build than a standard energy wasting design. In housing for example spending more on insulation can result in savings on the heating plant. In commercial and industrial buildings expensive air conditioning plant can be "designed out" by carefully shaping the overall form of the building to allow for natural cross ventilation and daylighting. Too often those commissioning buildings think only in terms of capital cost. A low energy design will cost substantially less over its whole life time -- especially if account is taken of likely rises in energy prices over coming decades.

The environmental movement (of which those who advocate low energy building are clearly a part) simply has not persuaded the rest of society that it is right about climate

change and the need to act now to drastically reduce carbon dioxide emissions to prevent an environmental disaster in the next century. The threat is just not frightening enough for people to change their daily behaviour -- or the way they commission, and use buildings. It is hard enough to persuade teenagers that smoking may kill them in thirty years -- how much harder to explain to a middle-aged developer his grandchildren will be threatened by the, as yet undefined, effects of global warming -- unless he spends more on fees to achieve greater energy efficiency in his new shopping centre?

"Green design" has something of the social status of vegetarian cooking -- an article of faith at the Centre for Alternative Technology; a fashionable option at the River Cafe; available, if you can stand the smell of fat, at the Little Chef; and a token, limp-crust-ed gesture where the real men eat in the site canteen.

In the market place of both money and ideas Green just hasn't made it. In economic terms the social costs have not been internalised, the polluter does not pay: the future (possibly catastrophically high) costs of climate change are not included in the electricity bill or the price of petrol at the pump.

Clients don't demand that architects and engineers achieve the highest standards of energy performance -- unless key individuals have a personal commitment or they have been persuaded that a green profile will help them compete in the market place. Energy is simply not expensive enough to make a difference to decision making -- except, perhaps, in the best run businesses where costs are examined very closely. I suspect that those are also the businesses that locate themselves to minimise their costs and maximise market share -- on the edge of town where there is plenty of cheap ex-agricultural land for parking. A dramatic example is one I see everyday, the MOD Procurement Executive: 6,500 people located on the north edge of Bristol in a complex of buildings which makes some plausible claims to energy consciousness but most employees get to work by car and are isolated in a bureaucratic ghetto all day. The MOD may be more serious about energy costs than most clients because it is building as an owner- occupier in contrast to the majority of those who initiate building projects in the commercial sector who are acting as developers and look no further than the buyer or lessee.

Professionals don't offer low energy solutions unless they are asked for them (or have picked up clues that clients want them). In the mainstream architects and engineers see low-energy solutions as risky. Even if they believe that it will cost no more to build and much less to run (in truth, they are rarely fully convinced) they know that it will cost more to design. They simply can't afford to go the "extra mile" that serious low energy design requires now that their clients have got used to paying cut price fees. In a professional world ruled by aggressive fee competition voluntary, risky innovation is not an option for most small, medium and even large practices.

Most building design practice is driven by repeating a successful formula -- even, or especially, at the level of the "great architect" this is true. That's why designs of John Soane and Will Allsop are instantly recognisable. In the world of day-to-day graft this is equally true. Clients go back to teams who have built on time and on budget. They

are satisfied if there is not too much hassle from the planning authority and the building control officer -- the last thing they want is something that is new and untried (even if illustrated in a Best Practice brochure) --especially something that may turn off customers or not be instantly lettable (like old fashioned sounding "natural ventilation" rather the cool and marketable "air conditioning")

Equally, in the world of architectural ideas, low energy is not that interesting. As a form-giving proposition energy consciousness will never punch at the same weight as neo-functionalism or deconstruction. The Architectural Review (the internationally acknowledged flagship journal of architectural design) struggles to find enough sexy images of "green buildings" to fill an issue every eighteen months or so. And of course it never can be the inspiration of a rich and fulfilling architecture -- energy efficiency is a characteristic of "building well" not the foundations of an architectural theory.

### **What, then, can architects engineers and clients do to bring about change?**

Professionals could try to act more "professionally", that is put the long term interests of others (the future users of buildings who will pay higher energy costs and the residents of the planet who will be affected by climate change) before their own short term interests. This is easy to say but very difficult to do in a market dominated economy where the health of a business can be seriously damaged by taking on the extra work necessary to produce a successful low energy building at the same fee level as others are offering the "normal service". It is especially difficult to do in a litigious environment in which rational people play safe to minimise the risk of a claim. Moreover most clients don't want you to take care of their long term interests -- they just want you to be on site by January and finished 24 weeks later. ("Oh alright then, we will go for extra insulation and condensing boilers if it doesn't, cost any more.")

Obviously professionals should ensure that they are up to date in their knowledge and skills in the field of energy design. Easier said than done. This is a challenge for the CPD system (and the new theme of Life Long Learning). There is plenty of material for those who want to run courses in this field and a number of good courses available but until the demand from clients is stronger there is little incentive for busy designers to seek training in a new field.

Professional bodies have a role to play:

They can encourage members to act in environmentally responsible ways -- but they are ultimately limited by their status as voluntary organisations and can only do what their membership agrees to. The opinions of members of the professional institutes are probably not greatly different from those of the public at large. They are probably just as unimpressed by the warnings of climate change and as unconvinced of the need for decisive action as most other people seem to be.

A coherent program of action for sustainable energy use must involve the professional institutions putting environmental concerns at the centre of their activities -- responsible use of energy should not be seen just as the "special interest" of a minority of members but as a fundamental part of good practice.

It must also be the role of professional bodies as learned societies to explain clearly to government how targets for carbon dioxide emissions can be achieved through active lobbying of ministers and officials. Perhaps equally important is for the institutions to open a dialogue with the public -- taking direct responsibility for raising public awareness of both the possibility of climate change and the contribution to be made by low energy design (targeting decision makers in politics and industry as well as school children and young people?).

The institutions must ensure that no new members can gain entry to the professions without a good understanding of energy performance of buildings. In the case of architects this must mean more than the right number of technical modules in the course guide -- energy must be a genuine consideration in design project work.

Professionals and their institutes will object that these things are already being done. I suggest that while some action is happening in all these areas there is huge scope for improvement -- but it is perfectly clear that however much the professions do (individually and collectively) they cannot have a *decisive* effect. The full commitment of design professionals is an essential condition for achieving sustainability in building energy use, but is in no way sufficient to ensure that sustainability is actually achieved.

Even concerted action in all these areas set out above cannot overcome the power of market forces. There has to be radical change in public attitudes, government policy and regulatory regimes if carbon dioxide emission targets are to be met. The recent election of an energetic new government is the best chance in twenty years for the achievement of real change. But ministers they will need to be much more decisive than they have so far indicated.

Although the CO<sub>2</sub> reduction targets announced by the Prime Minister can be seen as a bold commitment in comparison with the positions of other developed countries the target is relatively modest in the light of the of reductions which the UN has suggested will be necessary in the first half of the next century if the worst effects of climate change are to be avoided.

The contribution of new construction to the building stock is small (rarely exceeding 1.5%pa). Furthermore a significant proportion of new building including most new housing is additional to the building stock and so represents additional energy use and resource depletion. It is essential that the highest possible standards are attained in those new buildings as soon as possible to make the maximum contribution to the overall target. Buildings completed during the next ten years are likely to still be in use at the end of the next century by which time energy standards could be significantly more stringent.

It is possible (if unlikely) that 10% of the existing building stock will be replaced by new buildings by the year 2010. Even if all those buildings used half the energy of the current average the total saving could only be 5% of the total energy consumption of the building stock.

It must be clear then that improving the energy efficiency of the existing building stock

is be central to policies which aim at substantial reductions CO2 emissions. The government should consider mandating energy standards in all refurbishment work (for example when expending the funds recently announced for improvements to school buildings). A major program of improvement of existing housing could reap significant CO2 benefits and at the same time improve comfort standards and provide many jobs.

Most of the policies pursued by the last government relied on encouragement: for example EDAS (which is coming to the end of its planned funding), BREEAM and the Best Practice Programme. And while they have had some impact in raising consciousness the behaviour of the majority of developers and professionals remains unaffected. It must, therefore, be time for the government to raise mandatory standards.

In the domestic sector this could most effectively done by raising the insulation standards contained in the Building Regulations (which would impact primarily on new building work). In the case of non-domestic building the setting of mandatory energy targets should be considered.

It is hard to imagine real improvement in energy efficiency without substantial rises in energy prices. In a situation where supplies are good, as in the UK, this will not happen through the market mechanism. Especially as the main thrust in recent years through privatisation and the introduction of competition governed by a rigorous regulatory regime has had the effect of continuing and substantial price reductions. The arguments for progressive increases in tax on energy with a parallel programme of targeted investment in energy saving measures are compelling. But it is unlikely to appeal to any government, however idealistic and dynamic, which wants a second term.

The real challenge is raising awareness across the whole of society of the dangers that will be faced by the next few generations to a level at which people will accept the need for radical changes now.

I don't think it will happen. There might be some improvements in the next few years but I will be surprised if the 20% target is reached. If the worst predictions of climatic change are to be avoided in the next century there seem to me to be two reasons for optimism

First the scientists might be wrong -- climate change may not happen or the consequences may not be all that bad.

Second there will be a series of political or economic "pre-shocks" in the next decade which will push up the price of energy and force change through the market.

### **Points for a Political Programme**

As I noted at the outset I feel contradictory emotions. If I express a well founded scepticism I also have more optimistic moments when I convince myself that our society is capable of taking a long term view and can, through the political process

make changes that will fulfil this nation's contribution to a worldwide programme to head off the danger of climate change.

The following are six points to form the basis of a national policy to raise the energy performance of our building stock which could be instituted during the new government's first term

- 1 Raise UK domestic insulation and airtightness standards to the level of best practice in countries with similar climatic conditions.
- 2 Introduce a system of compulsory universal domestic energy rating -- in which every dwelling must have a certificate which is provided to the new occupant at the time of sale or letting.
- 3 Introduce a "carbon tax" to be levied on all energy sales (with appropriate tax breaks for those on low incomes) the proceeds of which are spent on a national programme of improving energy standards of the existing housing stock. Negotiate with other member states of the EU a change in the VAT regime to allow for the zero rating of energy saving products and equipment.
- 4 Introduce a system of energy targets for non-domestic buildings -- linked to the development control process (this could also provide a mechanism for the upgrading of existing buildings at the time of alterations)
- 5 Recast the regulatory regimes for the energy utilities to make energy conservation rather than energy price their main target.
- 6 Launch a concerted national campaign to raise public consciousness, particularly focused on primary & secondary education.

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