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Climate Change Imperatives, fads and fashions

Rob Shoard BEng (Hons), MPhil, MBA

Hoare Lea Consulting Engineers

200 – 208 Tottenham Court Road, London W1T 7PL
www.hoarelea.com

Summary

This paper provides a review of attempts to promote sustainable building development by means of legislation and persuasion. Commencing with a brief survey of the problem; a consideration of current legislation and good practice design guides; and concluding with possible future initiatives.

In particular mention is made of the 2003 Energy White Paper, Climate Change Levy, Enhanced Capital Allowances, Building Regulation Requirements, new Lighting Code for Offices, Building Research Establishment Environmental Assessment Method for performance classification, Carbon Trading Scheme, the British Council for Offices BCO 2000 Guide specification for current best practice, and the EU Directive for Performance of Buildings.

The object is to highlight the moral, ethical and empirical considerations implicit in the drive to achieve sustainable building development through climate change initiatives. Including the social responsibility of the design team and its individuals; application of modern technology; and the structure of the construction industry together with the responsibility of investment capitalists and other stakeholders.

Introduction

There appears to be confusion regarding attitudes to climate change. In particular, there is doubt concerning the seriousness of the situation and the steps necessary to counteract the threat. The result is that fads and fashions are not easily discerned from genuine intent. This paper reviews some of the recent climate change initiatives and considers their impact on the building industry.

Climate change

There can be no doubt that climate change is a fact. This is confirmed by The Met Office Hadley Centre for Climate Prediction and Research [1] and the Royal Commission on Environmental Pollution [2], where it is noted that CO² in the atmosphere has doubled since 1800; nine of the hottest years on record have occurred in the period since 1990; the polar ice caps are melting; sea levels are rising (1mm per year for the last 100 years); global weather patterns are destabilised; the incidence of skin cancer is increasing; and the delicate ecosystem in which we exist is being changed – possibly beyond repair. We depend on our atmosphere and its low carbon content to support life and this distinguishes our planet from other planets (unable to function in the same way as earth because of high levels of carbon in their atmospheres). We are facing a man-made disaster.

Energy crisis

Climate change is affected by the consumption of fossil fuels consequently the world we pass to the next generation could be polluted beyond repair and lack irreplaceable resources. This should be of major concern. However, while public health considerations have promoted legislation in the past, it is the practical necessity of retaining access to cheap energy, rather than environmental concern, that has provided the main drive for action on energy issues. Energy supply acts as an engine for economic growth and control of energy supplies are of prime concern for world politics. It was the 1970's energy crisis that provided the paradigm

shift influencing public awareness of energy matters. Now the latest statistics show that the UK will become a net importer of gas by 2005 and a net importer of oil by 2010 [3].

Means of reducing atmospheric pollution

The major cause of atmospheric pollution results from energy production and consumption together with the failure of vegetation to balance the eco-system. To restore balance action is needed and in the case of energy consumption it is transport and buildings that dominate present consumption patterns. Also as new build accounts for only 1% of the UK annual building stock emphasis must be placed on the upgrading of buildings already in use.

Politics

The 2003 White Paper, “Our Energy Future – Creating a Low Carbon Economy” [3] has the objective of putting, “energy at the heart of Government.” An agency is to be set up to promote Britain as the world leader for hydrogen fuel utilisation; the main form of renewables is to be wind power; energy efficiency is to be encouraged; and standards improved. The policy is carrot and stick; with a fight for “hearts and minds” backed by the force of cost penalties and legislation. The socialist government has found a cause.

Legislation and persuasion

To illustrate efforts to influence public opinion and promote effective action on energy issues consider the implications of the following measures.

□ Climate Change Levy [4]

This new tax, applicable from April 2001, applies to industry, commerce and the public sector. It adds 0.15pence/kWh to the cost of gas and coal and 0.43 pence/kWh for electricity. The extra cost is applied before VAT so that VAT is charged on the levy.

□ **New Enhanced Capital Allowances [5]**

Businesses in the private sector can claim 100% capital allowance for energy saving investments in qualifying technologies. This means the full cost of the investment is deductible in arriving at corporation or income tax bills. Qualifying technologies include:

- combined heat and power generation plant
- boilers
- pipe insulation materials and thermal screens
- refrigeration
- motors
- variable speed drives
- lighting.

□ **New Part L of the Building Regulations [6]**

The new Part L is concerned with the conservation of fuel and power in buildings and introduces:

- increased standards of insulation
- improved building air-tightness standards
- new performance standards for avoidance of solar overheating
- a requirement for energy metering
- the need for energy efficient heating
- energy efficient air conditioning
- energy efficient lighting systems
- procedure for calculation of a building's responsibility for carbon emission to atmosphere

- the use of a building log book
- testing and commissioning provision.

□ **New Lighting Guide LG3: 2001 for Offices [7]**

LG3 is the latest edition of a design guide that balances function against efficiency.

□ **BREEAM 2002 for Offices [8]**

Building Research Establishment Environmental Assessment Method (BREEAM) does not concern itself with legislation or standard good practice. It provides a certificated label to be used as a negotiating tool that can be displayed in buildings for the information of stakeholders. Each building is rated pass, good, very good, or excellent, according to compliance with the building's internal and external environmental performance. However, BREEAM is concerned with more than just energy consumption as it includes a number of environmental and sustainability measures such as the provision of storage facilities for those wanting to cycle to work.

□ **Emissions Trading Scheme [9]**

£200M of government money is available for companies that reduce the atmospheric pollution from their buildings. It is a voluntary scheme where targets are set for companies taking part. Those reaching the target qualify for a bonus payment. However, if they exceed their target they can sell their excess in a market administered by the Emissions Trading Authority but if they fail to reach their target they can purchase the improved performance of another seller.

□ **BCO Guide [10]**

The British Council for Offices “BCO Guide 2000” provides a guide to construction specifications for offices. It reflects the growing awareness of environmental issues and represents current best practice. The guide is concerned with:

- the need for sustainable buildings
- increased roles of the occupier and end users to influence the design brief
- the need to maximise office staff productivity
- the need to create a new mindset for the construction industry in terms of costs in use, construction time and quality

□ **EU Legislation**

At present construction industries in EU member countries concentrate on compliance with local and national requirements. However, the obvious trend is towards a common EU standard with the need for local industries to compete across national borders.

□ **European Directive on the Energy Performance of Buildings [11]**

The EU directive is accepted by the UK and is to be passed into law by 2005 and become operative by 2008. The requirement is that buildings over 1000m² should have an energy performance label available for public and tenant scrutiny and that boilers and airconditioning systems should be subject to annual inspection.

Effectiveness of climate change initiatives

- (i) The White Paper is strong on aspirations but not as effective in clarifying the details of how its aims are to be achieved, although an implementation plan is to be provided in 2004. Building Regulation revisions are to be brought forward to 2005 and this provides

an opportunity for the industry to influence policy. There is also a promise that the UK Carbon Trading Scheme will be extended to cover the EU in 2005.

- (ii) The Carbon Trading Scheme currently applies to a limited number of large organisations such as, Shell and Barclays Bank. The main aim of the £215M funding seems to be to provide experience of a market that could be extended to worldwide operation, which if effective would help promote policy from local to national and international levels - this is necessary if climate change initiatives are to be successful.
- (iii) Enhanced Capital Allowances help to promote energy efficient measures, although the take-up rate is disappointing and there are anomalies in the range of projects included in the scheme.
- (iv) Strengthening the Building Regulations is an effective means of improving standards. As with all laws, policing the requirements must be effective and those affected by the restrictions must feel the regulations are fair. Calculating new L2 requirements is complex and bureaucratic and buildings do not always fit the benchmark categories. Another problem is that requirements must be all encompassing and yet specific to particular buildings.
- (v) BREEAM assessment provides publicity and education but overall it is ineffective in forcing a more environmentally friendly approach (due to the lack of financial and legislative support).
- (vi) Guides to good practice support good design but tend to be viewed as acceptable rather than minimum standards.
- (vii) The EU Directive for the Performance of Buildings with its labelling of buildings and inspections is worthwhile but until implementation is proven there must be reservations regarding effectiveness. The aims of the directive are laudable but member states have discretion for interpretation and implementation and it could be a decade or more before the requirements are effective. Hopefully the directive will cover all buildings, irrespective of size and use (including both new and existing stock).

(viii) The Climate Change Levy raises public awareness but it is doubtful if increasing the marginal cost of fuel affects the rate of consumption. This is because fuel constitutes as little as 1% of business costs and decision-makers prefer to occupy their scarce resources making profits in their own specialist areas of expertise. Presumably the levy is introduced so that energy costs reflect some of the true social costs of energy consumption. This is known as the principle of the “polluter pays”. However, a weakness in the policy is the lack of proof that increasing fuel prices has any effect on: transport use, tourism, or building energy consumption. Behaviour in these cases is price-inelastic with marginal price increases incidental to life-style choices.

Naming and Shaming

Labelling places a value on performance and creates a league table ranking for each building. The labelling is similar to that for domestic white goods.

The need to operate within an enlightened capitalist system

It is the profit motive that drives industry and climate change initiatives must operate within this system. An interesting aspect of the EU Directive is that it attempts to use the labelling of buildings as a means of influencing market forces. It is realised that developers base their decisions on short-term profit considerations. However, it is hoped that performance labelling will influence market valuation and force letting agents to alter their property appraisal. At present letting agents place high priority on airconditioning and low priority on energy efficiency. The market is currently distorted and needs to be re-orientated towards a quantitative and qualitative appreciation of performance.

Trouble free building

The general public wants trouble free operation from buildings (in the same way as for all consumer products) with first costs rather than costs-in-use dominating product choice.

However, they will comply with the law but are not interested in the science and technology of climate change policy (as this is the responsibility of experts whose function is to be society's professional watchdogs).

Feedback

At present building design and construction tend to be divorced from operation and there is little real experience in-use to influence design. It is even suggested that if architects had to live in their own buildings then buildings would be different. The hope is that performance labelling could provide feedback to close the design loop and improve accountability.

Sustainable development

Sustainable development does not have to be a confliction in terms as it is possible to have sustainability and development at the same time. Unfortunately, development is usually taken as being economic development and wealth creation. And yet when income exceeds subsistence the quality of life becomes an issue. This is why the future of retailing is not cheap produce but expensive malls. Economic development is possible with freedom from pollution and does not have to compromise our future.

Cost of the climate change initiatives

According to the White Paper the cost of the climate change policy is in excess of £1.3bn per year, which divided by the number of households in the UK gives a figure of approximately £50 per year per household. It could be argued that this is small compared with the multi-billion costs of nuclear submarines and the cost of fighting wars with countries thought to possess weapons of mass destruction. At least in the case of climate change the weapon of mass destruction is clear to see.

Bureaucratic burden

A problem when introducing policy that interferes with free market forces is the cost and procrastination involved in administering the system. Thus the climate change policy should be simple, free of form filling, cheap, easy to monitor and without the opportunity for corruption.

Political economy

Theoretically the extra cost to the construction industry as a result of climate change policies should not affect the price of buildings. This is because as shown by David Ricardo (one of the pillars of our capitalist society), the price of buildings is determined by the strength of demand rather than the cost of provision. Therefore, it is possible to achieve better standards at no extra cost to the consumer (although there is a reduction in supplier's profits). David Beckham's wages provide an illustration of the way price of a scarce resource is determined by demand.

Support for the climate change policy

The UK government seems committed to a policy designed to lower the rate of atmospheric pollution and it is interesting to note that despite the restrictions imposed by the initiatives, and their cost, there has been almost no dissent or criticism of the policy. Having said this, it is true that many people would do things differently and many would increase the severity of the action.

Future policy

The public seem to accept the need for a climate change policy and the impetus provided by the present initiatives should not be lost. Therefore, the intention should be to strengthen present legislation and render it more effective. Energy consumption is concentrated in

existing buildings of all sizes and descriptions, and there must be a search for means to enforce energy economy in these areas.

Social responsibility

We, as building professionals, have responsibility to society and it is not always easy to compromise this responsibility with the needs of business ethics. However, we must do what we can, which means looking further than acceptance of the lowest tender and advising clients of the need for social and life-cycle costing to take the place of short-term expediency. Also, where clients are attracted to the latest “must have” fashion, such as airconditioning or photovoltaics, we have a responsibility to point out that these things have their place but not as expensive appendages with little real utility.

Individual responsibility

We cannot rely on government for our social responsibility as each individual should act with due regard to communal well-being. So do I enjoy an energy-dependant life-style, airborne tourism, use public transport or have a bike? You guess. It is always easier to see the faults in others than in oneself.

Effect on the building industry

The climate change initiatives introduce a change to industry requirements and provide both a challenge and an opportunity. Climate change, computers and global market competition provide changed circumstances where success is measured by the ability to adapt. It is not easy to see the requirements of the future but change is the means by which a competitive market provides improved performance.

Image of the industry

The core of traditional design practice could be lost to software and outsourcing. Therefore, the industry must throw off its craft beginnings and pass to a more professional role with lifelong learning approaches and methods that embrace computer literacy.

Conclusion

We are damaging our delicate life-support system with climatic destabilisation and the mistakes we are making could cost the earth. Successful sustainability means getting more for less, with buildings that are energy efficient and have performance levels befitting the 21st century.

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