

**Notes: “Truth or Dare?” – Low Carbon Building
Edge Debate 43 – 20th April 2011**

Chair:

Liz Peace, British Property Federation,

The BPF has a longstanding interest in the refurbishment of existing buildings. But everyone says they want to achieve low carbon - so why don't they. There is masses of information, but too much of it is the wrong sort. What is needed:

- Technology if it is appropriate
- Landlord - tenant issues to be resolved
- A map that leads from A to B

The technology is there but do we know how to use it?

Is the only way to get over barriers is to tax building owner/users and make them pay?

Energy bills will drive resource consumption.

Speakers:

Will Ray, Carbon Trust:

Carbon Trust support for the edge and its stress on interdisciplinarity

Truth or dare? Like a teenage game working out what the truth is

UK is a leader in the Low Carbon space internationally.

Tightening of the Building Regulations – is this reducing consumption?

Do the McKinsey's cost curves reflect this?

Carbon Trust looked at 9 buildings for refurbishment – across section to types – seeking a low (or lower) carbon outcome. Tracked from design through to operation – and data DECC – 19 projects with capital funding for micro-generation solutions. Whole building low carbon solutions that aimed to get well below Part L. Needed to seek out low carbon refurbishment.

Evidence collated:

- commentary
- management team
- delivered carbon savings
- building modelling (refurb and operation)
- EPC for new build

Operation and design – what did we learn? Hard evidence on which to base future policy decisions

Evidence, working with EPC modelling, showed that management delivered carbon savings.

Kevin Couling, AECOM:

There is a performance gap between predicted and actual performance. Why, what are the implications and how can we understand the gap?

Definition of a low carbon building for the study: A building that, in use, uses a lot less carbon than the benchmark. The result would be low energy bills etc. The evidence is presented in graphs of five buildings.

Measures/metrics of evidence include: Part L SBEM/EPC/BREEAM. But these are flawed! Compliance modelling software is inaccurate in predicting actual performance.

Designs we produce do not deliver the performance we expect – based on small sample of 19 buildings (which may not be a statistically fair sample).

CIBSE TM31 logbooks were not in evidence – are we engaged? (Need to fill in Section II on metering and prediction of consumption.)

Should design for simple operation

Clients
Designers } don't know what they are doing
Contractors }

And all have a lack of engagement with the outcomes.

There is a long list Implications for Clients?

Designers design for compliance not performance, therefore

- slow progress – if any
- need to up our game to deliver performance goals

Intervention:

#1: When you make calculations there is a factor of six between the energy demand from essentially similar buildings. Therefore there are lots and lots of variables.

Part L is not representative of real life. The designs we procure do not deliver the performance.

Are logbooks being completed? Only two people in room admitted to having seen one.

Section 11 of CIBSE TM31 logbook has no requirement for designers to predict in-use energy use. Are buildings too complex?

Contractors have a lack of understanding of the intent of design. Therefore there is a need for the design team to clearly convey intent.

Commissioning is rushed, The design team does not remain adequately engaged following practical completion.

Designers have the most to answer for. They design for compliance rather than for performance. Part L is not a measure of performance.

Conclusion is that progress too slow and we need to up game.

Will Ray, Carbon Trust:

The performance data is available on the buildings studied for anyone who wants to work with it. There was no consistent energy outcome. There were good performing ground source heat pumps and badly performing ground source heat pumps.

There was only a small sample of refurbished buildings available. 10-20% energy savings were achieved with light refurbishment and 20-50% energy savings with heavy refurbishment - but activity changes associated with refurbishments can (and did) increase energy use

Two buildings in the sample (a pub and a leisure centre) increased energy use following the refurbishment.

Example: Elizabeth II Court in Winchester by Bennetts Associates.

The building was stripped back to its concrete frame. The results, including the impact of rationalising the building estate, were that the emissions were reduced from 70 kgCO₂/m² to 44 kgCO₂/m² - a productivity gain that is good but not great, although the results are from within the tuning period of the building.

We asked whether it was possible to work with the standard refurbishment cycle within the life of buildings or additional interventions required?

Example: John Lewis department store, Oxford Street

12% CO₂ savings were achieved on a like for like (m²) basis. The reductions came from replacing equipment, including cooking appliances and boilers. But with an increased floor area there was a 22% overall increase. The refurbishment was carried out to achieve the additional floor area - not energy savings.

Are CO₂ reductions adequately integrated into corporate strategies?

Trinity of measures can make or break projects: Good control systems / good metering and monitoring / good commissioning and handover.

How to regulate or incentivise proper implementation of good controls, commissioning etc.

How do we best use data?

The Carbon Trust is producing 12 different reports from the study on separate sectors. (www.carbontrust.co.uk/emerging-technologies/current-focus-areas/buildings/pages/buildings.aspx). 3 are on line at the moment. They include case studies and lessons learned. The data is being loaded onto Carbon Buzz. The residential data has been given to the EST and Zero Carbon Hub and is available for analysis.

David Adams, Zero Carbon Hub & Willmott Dixon:

Has read the reports in draft. They are a good introduction to the issue and generally helpful. The studies are good examples of what is happening. But the information has been known for a long time. What designers and contractors are doing is entirely rational. So what is going to change status quo?

With energy becoming more expensive and more highly taxed the importance of accurate predictions is growing and those doing BREEAM studies and not getting the outcomes predicted will ask the reasons why.

It will be down to clients being more demanding. There are people reducing energy requirements but still only in a very niche way. If clients are spending so much, then why are they not asking for more?

In a world with less money, what is going to be cut? Now more than ever it is essential to brief for what is most important - 'an unexpressed desire can only be met by luck'.

There is a performance gap in the housing sector of between 3 and 10 times. The ZCH has set a level at 14 kgCO₂/m² but it may be missed by more than 10 kgCO₂/m². Built performance needs to be actually measured post-construction. Compliance tools should only be a guide for performance. There should be no testing required in the field.

Debate:

- #2: Clients are frequently and imprecisely referred to in the studies. What is meant? Frequent and inaccurate use of the word "client" - The demand side is weakly represented in the research described?
- #3: Studies are mostly of owner occupied projects focused on user/occupants - although this is not typical
- #4: Who exactly is the client in a Developer/Investor situation?
- #3 Different grades of client
- #5: There are issues around legislation. It is unfathomable for experts in the industry let alone clients. There is a need to challenge the quality of legislation and make it simpler and a more scientific process
Clients (real ones) do not know what they want – perhaps we need a legislative approach, but need to make it simple based on process and science
- #6: Compliance tools are used in order to avoid prescription, but the evidence shows we have to change that culture. We need calculations that are much more reliable and we need better predictive tools (to avoid being sued for lack of performance).
- #7: Does this problem only relate to buildings or does it apply to all products. If so the real problem will be the response of the market
- #4 cf cars and mpg

- #8: It is incumbent on designers to engage with how buildings will be used. If performance gap is so great then it is more fundamental. More trust will be placed in the gap than in the performance.
- #9: Compliance is a barrier to what we are trying to do. Scrap the idea of compliance – should we just get on and do it?
- #1: Everything building simply needs to be zero carbon. That is the aim. We can try to achieve it even if we can't always get there. A straightforward target will deal with distrust in our business.
- #3: This will be a difficult conversation with clients. They did not want zero carbon. The emerging thinking is not to throw out compliance targets, but we also need to present clients with truthful information and explain there side of the bargain to reduce CO₂.
“Yes - You have got an A-rated EPC but
- #10: Compliance is getting in the way. In contracting it is all about compliance - extras do not get you the job.
- #5: Compliance
 - I. Carbon is a problem – we don't understand it. Revert to low-energy focus, which we can measure.
 - II. Operation – integration of liabilities to deliver under “performance management” contracts

Carbon should be further down the line. People have to want “it”.

Who can help? Clients are faced with a wall of data/people

- #8: Organisations are beginning to offer performance management contracts (eg. Daikin)
 - #4: Client companies are deeply suspicious of their agenda as these companies are selling something as well
 - #11: As a developer we go to occupiers with the proposal that we co-operate on energy efficiency. It is part of our offer. The reason why we can give a truthful picture of performance is that we have agreed on behaviour
- We do our best on design but is up to occupiers:
- Leases contain an obligation to collaborate (in energy performance)
 - Its not rocket science

Focus on carbon management – rather than refurbishment

- #3: There are also problems with metering and other deliverables.
- #8: Where things are paid for they should work. We need to make sure what we are delivering works.

Who is the building operator – they have a big impact:

Personal experience:

- 3 buildings for University of East Anglia – commissioned and operated successfully
 - Frustratingly – 3 others with same client – not performing
- #12: Buildings that work have active clients, eg. UEA, who accepted responsibility for making buildings work without the design teams further involvement. The critical issue is building managers.
 - #8: The design, as delivered, has to be at right level for those going to run it
 - #3: A long-term interest is the performance of the building is critical. An ESCO/owner occupier/developer will look after their long-term interest

- #13: Stern reminded us of the market failure in this area. The developer who offers fantastic low-carbon performance is not rewarded. More regulations are required to help the situation
- #7: Look at the example of Qatar. There is an incentive of planning gain if zero CO2 is achieved
- #14: There is a systematic problem: Government has trusted the construction industry to deliver - but that is not what the construction industry does. Government has lost its skill as a client. As ever the rule must be 'keep it simple - do it well'. You have got to have people who want to do it. There is a lack of a centre of gravity in decision-making. The tide has changed and many more people are interested - where is the centre of gravity in the Big Society.
- #15: The people with the budget and who run projects on behalf of the clients are just working as client representatives with a set budget. Things are now even tighter. The issue is how to get buy-in.
Schools programme – pressure from budget holders to make poor decisions regarding performance focus.
- #11: The industry is all those people who don't give a shit.
- #16: Sustainability offers the best value
- #10: If the drive is towards the lowest cost then low carbon will be jettisoned. It is absurd to be buying buildings on the outturn cost only. Need to change that equation and to start to offer energy managed centrally.
- #17: Though buildings are being made more efficient they still end up using more energy is the truth, because they are being used more. We have come a long way in the last ten years and in some cases we are delivering. But are we forgetting why carbon is an issue.
Need to achieve value rather than cost. Need to achieve social and environmental value. People have to want low carbon for it to work. People can enjoy working in a low-carbon building. Got to make people fall in love with the low-carbon life.
- #18: Just how great is the want? Everybody needs to want together. Low carbon outcomes are not cheap - it requires good people to manage buildings to achieve it. DECC as a client badly wanted it for their building and achieved 65% down from a few years ago.
- #19: Domestic sector: Have reduced energy use by 82% and also capped use by charging more over a certain cap.
- #15: The charging system for energy is bonkers
- #1: The economics currently supports burning coal to support our rich western lifestyles. Got to understand that it's carbon that makes our wealth. Therefore it is almost always better to burn more. Putting up the cost of energy would only result in inflation. Carbon has to be rationed.
CRC has not been mentioned. Companies now care about their carbon ranking, not about how much they are using in real terms. Similarly the motor industry cares about whether their products are the cleanest. O2 have an initiative called Think Big. (see www.o2thinkbig.co.uk).
- #10: Each 1p increase in fuel cost costs my company £30,000. There has been no reduction in fuel use over 10 years.
- #3: There is a lot of innovation to be had from the market. A lot of projects with low energy not even on the radar. Supermarkets show how you can extract value from raw data.

Chair Summary:

Enthusiastic people here, but great apathy out there. Is it people's pockets that really matters, or human aspiration or other drivers. We need to find people who can make a difference. Are the innumerable consultants, contractors and property managers key? We need to build up property managers. Or is it a combination of a lot of different things?

- How do we get people to really care about carbon?
- Where do the (low) carbon leaders come from?
- Where are the property managers in all this? They can make a difference to generate low (zero) carbon future.

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