

Carbon Literacy¹ and the Built Environment - Closing the Performance Gap

The built environment is responsible for around 47% of all UK carbon emissions, and the construction industry is well placed to influence and improve this figure². To a large extent it is often more accurate to say that it is the *people* in these buildings who are responsible for those emissions. However, the buildings themselves are also an issue.

There is a growing body of evidence that many, possibly even most of our new and refurbished buildings in the UK are not performing anything like as well as they should, especially low energy buildings³. The correct regulations are followed, the energy calculations are double checked, and the certificates are in place. But over time we sadly discover that the building often remains too cold or too hot, too draughty, too dark, or too damp.

So a two-pronged approach is needed if we are to get the maximum reduction in the level of carbon emissions associated with the built environment. First, the behaviour of people within buildings (the occupiers) often needs to change. Second, the performance gap of the buildings themselves needs to be closed⁴. The recent development of *Soft Landings* is one response to this gap, and especially helps new occupiers understand and control their buildings better. Building Information Modelling (BIM) also has a role to play.

The various professions within the built environment sector span a very wide range of knowledge, skill and experience. It is tempting, but wrong, to try and pin the responsibility for any building's carbon emissions on any one professional group of people. For example, the client may insist on large glass doors and hot air blowers in the lobby. The architect may decide on the orientation of the new building, and design a north-facing glass wall which will affect the building's emissions for years to come. Equally an M&E engineer (mechanical and electrical) may specify air conditioning, and a sub-contractor may unknowingly drill through the air seal membrane to fit a new cable run. The building regulations have been complied with, every expert has behaved correctly, but the accumulation of decisions and their implementation will, sadly too often, add up to making a poorly-performing building. **Better carbon literacy (CL) can solve this underperformance problem, especially when the approach taken is collaborative.**

The benefits of collaborative working between the professions involved in the built environment were thoroughly identified 20 years ago in the Latham Report (timeline summarised in Appendix 1). These collaborative working benefits flow from breaking down the professional silos, and help us all in achieving better economic, social and environmental outcomes. Examples include reducing waste, improving recycling and reuse, saving costs, achieving completion on time and on budget, and increasing the social value of the building such as having a higher number of apprenticeships.

A particular example of facilitating this collaborative working was in RENEW Northwest, which included a project to encourage pan-professional CPD (continuing professional development). This CPD initiative was endorsed by the following 16 professional institutes and similar bodies in the region, recognising the value to us all in sharing the marketing, content and delivery of training,

¹ <http://www.manchestercarbonliteracy.com/wp-content/uploads/2012/10/Carbon-Literacy-in-a-single-side.pdf>

² https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31737/10-1316-estimating-co2-emissions-supporting-low-carbon-igt-report.pdf

³ http://www.designingbuildings.co.uk/wiki/Performance_gap_in_low_energy_housing

⁴ <http://www.carbontrust.com/media/81361/ctg047-closing-the-gap-low-carbon-building-design.pdf>

working towards mutual recognition wherever possible. This was entirely voluntary and represented a forward thinking approach across the region and across the sectors, The RENEW Northwest programme ended somewhat abruptly in 2008 but the groundwork and goodwill for shared CPD has remained evident as a legacy.

The professional institutes and similar bodies who signed the pan-professional CPD on 27 September 2007 are:

1. ABE - Association of Building Engineers
2. CCI - Centre for Construction Innovation
3. CIAT - Chartered Institute of Architectural Technologists
4. CIC - Construction Industry Council
5. CIOB - Chartered Institute of Building
6. CIH - Chartered Institute of Housing
7. ICE - Institute of Civil Engineers
8. IED - Institution of Economic Development
9. IHT - Institute of Highways and Transportation
10. IStructE - Institute of Structural Engineers
11. LI - Landscape Institute
12. RIBA - Royal Institute of British Architects
13. RICS - Royal Institution of Chartered Surveyors
14. RTPI - Royal Town Planning Institute
15. UDG - Urban Design Group
16. UoS - University of Salford

* * *

Equally, the region's Centre for Construction Innovation (CCI NW), now rather reduced in scale, followed through regionally on many of national recommendations produced in the years following the first calls for more collaborative working. As with the pan-professional CPD project, CCI has helped to support within the region a culture of collaborative working. It is well documented how hard the economic crisis of 2007 onwards impacted particularly badly on the construction industry, and it is a credit to many of the firms in the region that they not only survived the recession but also continued to invest their time and resources in collaborative working when the pressure on them was intense to make short-term savings on any costs. The collapse of public sector infrastructure programmes from 2010 was an additional pressure.

There is an increasing trend now towards looking at the fundamentals of a building first, before adding 'green technologies' to solve problems - the *fabric first* approach. This fits with the findings of the *Passivhaus* movement with a focus on very highly insulated buildings, some requiring no heating system at all. In this method, there can be enough heat for a home captured just from cooking, washing, and from the electrical appliances.

However, in term of the low carbon agenda within the built environment there have been a few recent setbacks. The definition⁵ of a *zero carbon home* was set, roughly, to exclude cooking and 'plug in' appliances within the home even though we know that there is still a growth in energy consumption from the increasing range of devices. The voluntary *Code for Sustainable Homes* will soon no longer be in use⁶. The BREEAM standard remains available, however this is wider in scope than low carbon and allows for other offsetting factors to be used.

⁵ <http://www.zerocarbonhub.org/zero-carbon-policy/zero-carbon-policy>

⁶ <http://www.bbc.com/news/uk-politics-25014867>

Nevertheless, there are CL opportunities to be realised. A good example of the resource benefits of collaborative working is the reduction in *reworking* that can follow. Reworking is the classic example of total waste.

At the micro level, for example, we might have to pull down a wall that has just been built because the insulation was fitted wrongly around the buried pipework. A waste of materials, lost days or weeks, and costing extra money. The industry can choose to play the blame game (the architect's drawings were unclear, the contractor's parts were incorrect, the client changed their mind, etc) but the industry thankfully often chooses to learn rather than to blame.

And at the macro level, for example, we can consider the slum clearance of Hulme in the 1960s, replacing the old terraced housing with new concrete deck-access system-built flats in crescent shapes. This whole neighbourhood rebuilding was a massive professional failure, leading to the demolition of these flats - *reworking* - and their replacement with a holistic approach towards building a sustainable community which became the benchmark for urban regeneration in the UK. Not that everything was perfect, but still a willingness to talk, share and learn was a massive improvement.

How might this working culture be usefully taken forward?

There is a useful role at the city, conurbation and regional levels for a CL network to frame, encourage and enable the built environment professions to continue to work together on a common agenda around low carbon developments. While currently the resource base for such enabling work is much diminished, nevertheless there is sufficient basis for some joint working within existing resources, as well as preparing the way for future growth.

This CL training within the built environment could be focused in four mutually-supportive and equal ways, as follows, and not in any order of importance:

First, at the *organisational* level, whether within a private sector company, public sector organisation or department such as Planning, or third sector voluntary and community groups. This is already the location for much CL training.

Second, at the *project level* there are proven benefits in collaborative workshops especially at the early stages before the big decisions are 'set in stone'. CL project workshops would involve and engage all the organisations involved in the delivery of the project, all professional groups, and all staff. A 'project' here can range from a building up to an area-based regeneration programme.

Third, at the *professional level* it makes sense to hold carbon literacy workshops to tackle knotty problems. Just as one example, it is almost impossible currently for an architect to design a safe hospital without specifying air conditioning. The temperatures within the building must not be too cold in the rooms with windows (wards) nor too hot in the rooms without windows (operating theatres). A CL workshop of architects might well solve this puzzle.

Fourth, at the *pan-professional level* there are proven benefits in having mixed audiences for CL. The cross-learning within the workshop adds an extra dimension, where for example the planner learns solutions from the experiences of an engineer, who in turn gains knowledge from the interior designer.

It is noteworthy that these four arrangements of CL workshops are mutually supportive, all feeding into better outcomes on the ground, producing higher-performing new and refurbished buildings and in a context of regenerating neighbourhoods as sustainable communities.

A point of context is that in the 20 years between the mid 1980s to the start of the economic crisis in 2007 it was generally understood that effective regeneration programmes required cross-party political support. This was because some of the interventions may need to take a decade or even a generation to fully take effect. This is not to say that everything was 'sorted' in those decades. For example, the *Decent Homes* programme was too focused on the visual - new kitchens and bathrooms. It did not improve the systemic energy performance issues of social housing nor address fuel poverty, and very probably increasing the sector's carbon emissions as an unintended result.

However the cross-party support mentioned above is now less evident, and certain useful and ordinary phrases have unfortunately become associated with political moments, thus not to be used or spoken thereafter. For example, *development corporations*, then *sustainable communities*, then *regions*, and now *local*. If CL collaborative working can help rebuild support in effective long-term regeneration, and thus in creating sustainable communities, this is to be welcomed.

Next Steps

It is recommended that the 16 signatory professional institutes and similar bodies above, and others if interested, be invited to meet up again and consider proposals for pan-professional CPD in CL. It may be appropriate to ask a leading figure in regeneration and the built environment to convene the first meeting.

The recommended minimum involvement for each signatory organisation would be to promote the one-day CL workshop method to all their membership, however there would also be a strong welcome for any proposed additional initiatives which aimed to take CL training further.

The commitment to publicising and supporting CL could be shown as a Memorandum of Understanding, signed at the first meeting with images available to be used for publicity purposes.

TB. 12 May 2014.

Appendix 1 -

Timeline of Recent Collaborative Working and Skills in the Built Environment

1994

Latham Report: *Constructing the Team*, examines systemic failures in previous construction projects, and gain widespread support in industry and government.

http://en.wikipedia.org/wiki/Latham_Report

1997

Rogers Report: the Urban Task Force chaired by Lord (Richard) Rogers, *Towards an Urban Renaissance*. Calls for a further work on skills and innovation development for regeneration (Executive Summary, page 14) which becomes the Egan Report.

<http://www.eukn.org/dsresource?objectid=143299> (Executive Summary)

1998

Egan Report: *Rethinking Construction*, was produced by a task group led by Sir John Egan recommends integrated processes and teams.

http://www.constructingexcellence.org.uk/pdf/rethinking%20construction/rethinking_construction_report.pdf

1999

CCI (Centre for Construction Innovation) is established on Portland Street, Manchester, co-located with the RIBA Bookshop and the CUBE Gallery with a training and seminar suite, under the auspices of the School of the Built Environment at the University of Salford.

www.ccinw.com

2002

NWDA (Northwest Regional Development Agency) starts the RENEW project in collaboration with the Government Office North West, both giving some in-house staff support to produce a programme of training events for practitioners. Collaboration grows further with the regional office of RIBA (Royal Institute of British Architects).

2004

Egan Skills Review: Sir John Egan chairs the Skills Task Group and reports on the need for better generic and team-working skills in regeneration. Task Group membership includes Sir Howard Bernstein.

<http://www.architecture.com/Files/RIBAHoldings/PolicyAndInternationalRelations/Policy/PublicAffairs/EganReviewOfSkills.pdf> (Report)

and

<http://www.cles.org.uk/wp-content/uploads/2011/01/LW73-Regen-Skills.pdf> (Commentary)

2005

Lord Rogers reports on the results of the Urban Task Force's recommendations, six years on. *Towards a Strong Urban Renaissance*.

http://www.urbantaskforce.org/UTF_final_report.pdf

2005

NWDA recruits a staff team for the RENEW project, co-locating in the RIBA regional office in Liverpool with shared exhibition and seminar space. The project adopts the revised name of RENEW Northwest to avoid confusion with a housing market renewal programme in Staffordshire.

2006

The pan-professional CPD charter for the built environment is signed by 8, then 16 organisations in the following year.

<http://tonybaldwinson.files.wordpress.com/2014/04/renew-northwest-collected-works-2005-to-2008-9780957260610.pdf> (large file, summary on page 14)

and

<http://www.planningresource.co.uk/article/665603/meeting-minds?HAYILC=RELATED>

and

<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmcomloc/memo/planning/ucm3502.htm> (evidence given to Parliament on skills for planners)

2008

NWDA ends funding of the RENEW Northwest project.

Was: www.renew.co.uk

2009 to 2012

CCI runs the North West Construction Knowledge Hub with funding from ERDF (the European Regional Development Fund), BRE (Buildings Research Establishment), Urban Vision, and the universities of Central Lancashire, Liverpool and Salford. The focus of this £4m project was to support SMEs in the construction industry through the recession by helping them innovate. The strap line was: *less carbon, less waste, more jobs*. Over 200 construction jobs in SMEs were safeguarded and over 40 new SME jobs were supported.

http://www.ccinw.com/uploads/documents/nwckh/north_west_construction_knowledge_hub_final_evaluation_2012.pdf

2013

CCI and CUBE Gallery scale back with reduced resources, supported by University of Salford staff on campus.