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CAMBRIDGE RETROFIT: MOBILISING A COMMUNITY

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Abstract: Energy efficiency represents a win-win for the environment and energy bill payers. With older or inefficient buildings representing a large proportion of UK building stock, it will be impossible to raise levels of energy efficiency without retrofitting. However, with fragmented ownership and other challenges, this is a difficult task. Against this backdrop, the ambitious Cambridge Retrofit project aims to be "a landmark community-scale energy efficiency initiative to retrofit 65,000+ buildings over the next 30 years, helping make the Cambridge area the first to reach national carbon reduction targets". This essay, written by project director and Emeritus professor Douglas Crawford-Brown, provides insights into this inspiring and ambitious energy efficiency initiative.

Keywords: sustainable city, low carbon city, retrofit, energy efficiency, community engagement, coordination.

The tagline for Cambridge Retrofit makes a useful starting point for this piece: “a landmark community-scale energy efficiency initiative to retrofit 65,000+ buildings over the next 30 years, helping make the Cambridge area the first to reach national carbon reduction targets”. That is all well and good as a tagline, but how will this actually work?

Global policy recognises three arenas in which large changes are needed to limit the risks of climate change: (1) our energy system must be decarbonised to reduce emissions, (2) we must re-forest parts of the world to pull existing carbon out of the atmosphere and (3) we must greatly improve energy efficiency so we are no longer pumping energy into a sieve. The first two receive considerable attention both in policy and investment. Improving energy efficiency has

been a more difficult arena in which to act, in part because such projects involve many different actors with diverse interest, aims and resources. Efficiency projects also are much less 'news worthy' than the other two arenas. As just one example, the website of a large energy project such as the Severn Barrage Tidal Energy Project in the UK will receive a million or more hits per year, driven in part by the potential impact on birds (we British do love our birds). By contrast, an energy efficiency project, even one as large as Cambridge Retrofit, may receive a few tens of thousands of hits per year. Efficiency is unseen and so fails to draw much media interest.

And yet our homes, offices and schools are responsible for more than a third of energy consumed, and up to half of carbon dioxide produced. Those buildings in the UK are very low efficiency (the worst in the EU, not that this is a fair comparison after Brexit). They require draught proofing, much better insulation, boiler replacement etc. Each of these strategies is part of an effective programme of retrofit; each contributes to reducing energy use and cost; each reduces carbon dioxide emissions; each is technologically feasible and simple to carry out. And each increases the value and comfort of a property. So why are we not rushing to retrofit buildings, and encouraging our neighbours to do the same?

The answer lies not in technology but in mobilising people to act collectively. It lies not in focusing too much on creating supply, but in creating demand for those services. The assumption appears to be a bit Field of Dreams: if we build the supply, the demand will come. Reality has provided a harsh lesson in how far off this dream is to reality, driving many well-intentioned supply companies into restructuring or dissolution as they sit in their stalls and wait (and wait and wait) for the onrush of building owners demanding retrofits.

Cambridge Retrofit therefore focuses on several of these social challenges to mobilisation, the biggest challenge being mobilising the entire community to act as one. It is not primarily a government programme, but rather one championed by governments, businesses and property holders together. It focuses more on stimulating demand than on creating supply (although we do create supply as well, through our business members). It brings together property owners so they can procure the best deal through the economies of scale by aggregating their projects. It is built on the idea of collective action by everyone in the community so property holders, tenants, suppliers, financiers, policy makers, planners, innovators and educators are all working together to share the burdens and benefits of community-scale retrofits of the 65,000+ local buildings.

While the programme springs from the need of the nation to combat the risks of climate change through carbon reduction – made concrete in the 2008 Climate Change Act – the retrofit effort places no requirements on why people or organisations participate. A building owner may want to reduce their carbon footprint; an organisation may want to reduce their energy bills; a supplier may have a service to sell; an innovator may have a new low carbon invention ready for the market; a homeowner may want a more comfortable home; an asset manager may want a higher value property. All of these are valid reasons to participate. Our motto is "we are not

here to save your soul". We mean that what matters in the end is what is being accomplished in reducing energy and carbon in the building sector, not why. We won't judge your reason for joining; we will celebrate the fact of your joining.

Cambridge City Council's Guildhall (centre-top), a pilot project. Source: www.cambridgeretrofit.com

The programme takes place in four stages. In the first stage (2010-2013), research produced a map of the carbon emissions throughout the city, so we can understand the scale of the challenge. It shows that energy use in our buildings leads to between 4 and 5 tons of carbon dioxide per year per person, close to the national average. We collectively emit in the neighbourhood of 2 tons per person per year from commercial buildings, 1.5 tons per person per year from residential buildings and the remainder from government, university and college buildings. The percentages of our buildings that sit in conservation areas or that are listed is higher than average for the UK, but the barriers there are not insurmountable and local architects, council and English Heritage are leading the way in showing how such buildings can be retrofit. We are in many ways quite an average town, even if we don't always see ourselves that way.

In the second phase (2013-2014), we brought together all of the major actors in the community (property holders, suppliers, planners etc) and organised them into a network. This network is now coordinated through the innovative Open Debate system of Consense, found on the Cambridge Retrofit website (www.cambridgeretrofit.org).

In the third phase (2014-2016), we conducted pilot projects. Rather than launching on a grand scale (and potentially failing on a very large stage, as did the Green Deal), we went into a silent phase and selected pilot projects that differed by type of building, technology solution, finance and ownership chain. In the end, more than 800 buildings were completed, thanks in large part to the efforts of Cambridge City Council through their Action on Energy programme. We drew lessons from these projects: what finance packages work and which do not; what kinds of ownership chains are difficult and which are simple; which technologies prove cost effective and which do not?

And we are now in the final phase: delivery at scale across the entire community. This is where the wheels of Cambridge Retrofit touch the tarmac. This is where success will be found or lost. The pilot projects are some of the lower hanging fruit. They reached the 'early adopters' of the classic technology diffusion curve. The challenge is to draw in the 'late adopter', the 'laggard' and the outright 'recalcitrant'.

Cambridge University Library, another pilot project. Source: www.cambridgeretrofit.com.

As you can imagine, it is an immense effort. Retrofitting 65,000 buildings over 35 years requires several thousand buildings per year. Even the pilot phase reached fewer than 1,000 properties. The programme requires perhaps £1.5B of capital investment. That investment is available, but only if we go to investors such as pension funds with large bundles of thousands of properties. We do not yet have such bundles of fully committed, 'shovel ready' projects. And it requires quadrupling the size of the local workforce to deliver the retrofits, with a similar increase in amount of available supplies such as insulation and high efficiency windows. The workforce may be created through the new University Technical College, training 14-19 year olds in construction and retrofits (amongst other skills). Suppliers are slowing gearing up their materials. But it all begins with creating demands from property holders. We have the supply chain in place, an open stall to sell the services, and policies designed to stimulate demand. We are waiting patiently for the sound of footfalls in the corridor indicating the community has now been truly mobilised not just for talk but for action. We invite you to join, or to create a similar programme in your community, by visiting the Cambridge Retrofit website: www.cambridgeretrofit.org.

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