Theme : Regions and the Environment

Title : "Deconstructing 'eco-retrofit' in the housing sector, and assembling engagements"

Background

This paper draws on work in the East Midlands region to develop a deeper understanding of what is required to carry out successful 'eco-retrofit' in the housing sector. Central to this work has been understanding what constitutes the core tasks of 'retrofit' work – with a particular look at the skills required by these tasks and the capacities of the bodies to perform them - in order to make a meaningful contribution to national carbon efficiency and CO_2 reduction targets.

The call for more action and attention to be given to the performance of existing housing stock is still accompanied by significant uncertainty as to what actions will bring about the most sustainable changes to building performances, and how to demonstrate carbon and CO_2 reductions in practice. A recent assessment of housing 'retrofit' activity in the East Midlands[1] identified substantial property *improvements,* however little of this will contribute towards national efficiency targets outside of the Technology Strategy Board's half-dozen "Retrofit for the Future" pilots concluding during summer / autumn 2010.

A precise definition of 'eco-retrofit' is therefore needed to sharpen the focus of what is being considered here. The 'eco' sense is from taking an environmentally 'holistic' approach, understanding what demonstrable improvements to buildings can impact upon energy and water use and other waste treatment arrangements, and from interventions around buildings. The actual change that 'retrofit' implies suggests:

"the improvement of existing buildings through interventions, such as the introduction of new building materials and components not provided in the original construction, designed to reduce consumption of key resources like energy and water, and to reduce the overall impact of their carbon footprint and carbon emissions in a significant way."

This will be used to guide the following consideration of what kinds of skills and capacities will enable such improvement in resource 'consumption' to be achieved.

Identifying the core 'eco-retrofit' tasks

The above description gives a clear indication of what is core to 'eco-retrofit' work applied to the existing housing stock – namely using appropriate materials and other interventions to reduce resource consumption '...in a significant way'. The following set of fundamental tasks can then be deduced :

- setting a clear standard for the resource consumption to be reduced, able to act as a suitable basis for benchmarking how accurately such change is estimated initially, and then measured in practice;

[1] "Financial resources for housing 'retrofit' in the East Midlands" - *emda* / CIH, August 2010

- gathering detailed information on the stock to be the subject of 'retrofit' activity, and of its current performance on using energy, water, and associated waste-treatments, applying recognised analyses like Energy Performance Certificates as a common evaluative baseline;

- making a comprehensive assessment of the practical opportunities to reduce resource consumption in properties of a particular type or construction, and of the costs that each respective 'retrofit' procedure will involve;

- choosing the materials and other building components that will apply to carrying out a planned alteration to the existing performance of a given housing type in a particular location, along with the selection of one or more appropriate implementation process to carry out the subsequent 'retrofit' practice on that property type;

- carrying out the practical building works to apply the chosen materials and process(es) to the housing stock on-site, with sufficient accuracy and competency such that the projected resource efficiencies will be achieved;

- monitoring and evaluating the impact of the implemented interventions against the initial baseline of resource consumption, in order to demonstrate the actual changes achieved and the rate of resources required by adapted properties into the future.

Complementary 'eco-retrofit' skills

Complementary to the tasks noted above, is being able to develop and shape the planning and implementation of 'retrofit' works into a cogent programme of manageable activities – a 'planning' that requires a variety of competences and confidence to weld together different levels of both professional and artisan skills:

- *project design and development skills* : the background conception of a programme of works to properties requiring 'retrofit' improvements, thereafter leading to a detailed portrayal and timetabling of a series of tasks and their trigger points that will determine subsequent implementation;

- *financial planning skills* : assessing the costs of the programmed works, the likely source of the funding required, and any potential terms of repayment, and the requirements for liquidity to be available at the different times that various costs are being incurred under the project programme **;**

- *project management expertise* : undertaking the detailed management or supervision of different aspects of the planned work programme, through initial conception stages and on to the on-site processes, taking responsibility for enabling each part of the project programme to proceed with minimum hindrance;

- *technical expertise* : the undertaking of actual physical works to elements of the building fabric, using knowledge gained from trade-based experience for how the existing properties can best be connected to new materials or other components, both to bring about the proposed efficiencies and to maintain the integrity of the existing construction.

Assembling actions to establish an 'eco-retrofit' impetus

The impetus to promote the most supportive conditions within which the above tasks and skills can develop will inevitably need a combination of the following kinds of inputs :

- the development of 'low carbon' partnerships to oversee 'retrofit' activities;
- developing appropriate and consistent policy and strategy positions;
- promoting appropriate project procurement and supply chain capacities;
- an ongoing 'knowledge transfer' about expertise and practice.

A few observations can be made on these points :

a) 'low carbon' partnerships

Current changes to public and private sector partnerships will see Regional Development Agencies replaced by 'local economic partnerships' (LEPs). LEPs are generally proposing sustainable work with 'new-build housing' issues, but there needs to be a broader recognition of stimulating low carbon savings in meeting the challenge posed by the existing stock across their economic areas.

b) local policy and strategy positions

Policies need to encapsulate how 'retrofit' activity will be addressed comprehensively across all tenures – local authorities should consider strategies for low carbon 'asset management' in all stock. National directives can help here, although it is crucial that practice examples are pertinent and 'replicable'. The TSB-funded 'pilots' are not of a scale that can be easily emulated; 'tariff' income-generation schemes will still have finite national resources, *and* could distract a focus on long-term fabric-based efficiencies.

c) procurement and supply chains

Local initiatives such as the 'Efficiency East Midlands' procurement partnership will be a powerful means of issuing commissions to stimulate competitive 'retrofit' services and the emergence of local specialist agencies. Stock holders need to prepare for the widest resource-consumption strategies (alongside a direct engagement across the utility sectors) – only a minimal number of regional social landlords have long-term plans of how to address carbon efficiency targets.

d) *knowledge transfer*

The University and FE sectors will be natural contributors to cross-industry 'Round Table' discussions and development groups – e.g. partners across Northamptonshire are collaborating on a 'Sustainable Development' approach, co-ordinated by University of Northampton. The input from independent bodies such as the Energy Savings Trust and the Green Building 'network' is also fundamental to sharing information on the latest 'good practice' and technology innovations.

Recommendations for future 'retrofit' engagements

The above focus on what constitutes 'eco-retrofit' tasks and skills generates a number of thoughts about key concerns :

- the need to agree a national 'standard' for how to assess and measure retrofit improvements to existing housing stock, relative to the performance of their type and make, to the interventions proposed and how this contributes towards national targets;

- that a significant amount of baseline 'evidence'-gathering is required to assess and catalogue current housing stock conditions and their resource consumptions;

- finding sufficient finance needs innovative decisions : rental incomes could be sequestered for contributions towards efficiency targets, if properties are used for those tenures; mortgage finance could be required to demand improvements for private sector properties, or other government-backed loans provided, repayable against future equity values;

- the 'skills' identified above under the consideration of necessary 'tasks' give clear indications for how local 'supply-chains' need a focus on the availability and production of fabric materials, components, and professional services;

- local procurement and commissioning agencies have a central role to stimulate markets for innovative products, such as volumetric-based 'total roof' replacements providing both retrofit improvements and additional internal space standards;

- the largest focus of national and local 'retrofit' initiatives remains upon energy-related issues : greater assessment of water-use and waste treatment performances is required [perhaps a 'water-performance certificate'?], along with proposals for dealing with changes to the water-retention capacities in existing residential areas.

Conclusion

This short paper has sought to highlight the core tasks and skills at the heart of carrying out 'eco-retrofit' improvements to existing housing. It has argued that the works carried will require a set of minimum dexterities to achieve the holistic efficiencies required by national carbon reduction targets. It is in this area that the 'eco-retrofit' imperative must be developed.

[1486 words] Paper to be presented by :

Dr. Martin Field, Regional Housing Advisor,
East Midlands Development Agency
e-mail : martinfield@emd.org.uk (work) / martin.field@uku.co.uk (home)

[All views are personal to the author.]