WHOLE HOUSE RETROFIT IN TEIGNBRIDGE

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Section 1. Introduction

The significance of Green-House Gas (**GHG**) emissions from heating our buildings, in terms of meeting our Paris commitments, is widely acknowledged. Many schemes, both government and community led, have been set up over the past 20 years to tackle this problem.

While we acknowledge the significant improvements, especially early on, that large-scale government schemes have had, there has been an equal degree of ineffectiveness in several schemes. At all levels of government, both the scale of the task and the priority given to this matter, means the rate of GHG reduction will remain inadequate without additional impetus.

There are two approaches:

- decarbonise the heat energy source by direct supply of low-carbon fuel (e.g. Biomass, Biomethane, Hydrogen, etc.) or electrification of heating (i.e. Heat Pumps or direct heat from electricity) using low-carbon electricity generation.
- reduce the heat energy load by eliminating waste (i.e. behavioural change) and minimise heat loss from buildings (i.e. better insulation & ventilation).

Both approaches are necessary, however, the first on its own will not be enough to reach the Paris objective. There is a significant body of evidence, and a slow realisation, that there is no simple solution to suit all circumstances. However, there is widespread agreement that reducing heat loss from buildings is a key element.

By their nature, central government schemes, need to be simple and standardised. Interestingly the latest government initiative appears to be limited to providing a modest financial incentive to specific housing retrofit measures. The initial experience of this scheme has not been that good, the government has already announced a reduction in the amount of subsidy available. Given the size of the challenge (UK has a poor housing stock in terms of its heat energy demand), this approach is unlikely to be effective. Like most previous subsidy schemes (e.g. FiT & RHI), this financial injection will be useful in stimulating short-term economic activity but may only result in modest emission reductions.

As a nation, the UK generally prizes home ownership. Both in terms of 'my home is my castle' but also in terms of 'a sound investment'. As a result, homeowners invest significantly in home-improvements, especially in the able-to-pay segment. This sector often also represents the higher GHG emitters, primarily because energy pricing is still low relative to incomes in that segment.

Climate Change is now accepted as a serious threat by a large percentage of the population, some of whom will also be part of the able-to-pay segment when it comes to home improvements. Although it is still the case that the vast majority of the population do not act to address their contribution to Climate Change, some do.

Those that have decided to act to improve their homes' energy performance and comfort are then faced with a plethora of technological solutions, deals and government incentives. More often than not, many are either disappointed that their actual emissions and running costs have not significantly improved or they do not measure the GHG emission reduction to find out. One of the most common concerns is 'can I trust the salesperson' followed by 'will the builder do a good job'.

This ACT initiative is initially targeted at the able-to-pay who want to reduce their GHG emissions but are concerned or not aware of the most appropriate/trusted supply-chain for them or the standards they could expect. The initiative is intended to identify local commercial organisations that have the expertise and quality of work, backed by relevant industry standards (e.g. EnerPHit or PAS2035), to deliver bespoke whole house retrofit solutions.

By identifying suitable customers, designers, architects, builders and material suppliers we hope to demonstrate that a sufficient market can be stimulated to become self-sustaining. This will of course

represent a small percentage of the retrofit needed, but it could be a model to deliver more ambitious initiatives such as the EnergiSprong or Carbon Coop models.

Section 2. Why should ACT be involved and how?

TDC currently does not have plans, or resources, to address this in a formal way. Housing Associations, while part of their ongoing remit, will develop their own specific supply-chain solutions which may in the longer-term be applicable to comparable building stock.

Teignbridge has a large number of older, poorly insulated[1], rural properties. ACT has provided a mapping of EPC ratings in Teignbridge. Although EPC assessments and recommendations suggest ~40% improvement measures, these tend to be generic or standardised around simpler piecemeal measures.

Increasingly these properties are owned by those wanting to undertake significant improvements and have the budgets to do this. Normally a piecemeal approach, based on little (if any) measurements or wholistic assessment, results in costly retrofits and inappropriate heating solutions.

ACT as an impartial community-based organisation, is ideally placed to bring the different parties together under a replicable scheme of effective retrofits. Learning from other organisations in the region, ACT could help develop a template scheme to help both homeowners and service providers avoid some of the less effective measures undertaken when retrofitting to reduce GHG emissions and improve comfort.

The initial model proposed is that adopted by the Carbon Coop. At its heart this has an assessment/design phase, similar to EnerPHit and PAS2035 processes. Most significantly, it uses local builders/crafts people with the appropriate experience to correctly implement the measures specified.

Section 3. Where we are and next steps

ACT has contacted other groups and service providers interested in progressing this initiative. Some groups are training to become PAS2035 assessors/coordinators with the view of offering a paid assessment service. Devon County Council (DCC) and other community groups are exploring ways of developing a Devon-wide retrofit offer. Some groups (TECs in Teignbridge) already offer an assessment process, app and tools to increase the level of understanding to its members so they may ask the right question when interacting with the existing supply chain.

We are investigating potential customers with a retrofit project and willing to work with ACT's Energy & Built Environment group to pilot some of the approaches already well understood. Trialling each of the stages of the process to identify appropriate supply chain providers should help highlight problems that may occur. Several such projects are likely to be needed before a Teignbridge-specific model is developed.

The one-off trials are aimed at evaluating each of the steps in the PAS2035, or similar, retrofit processes. We are also preparing a register of likely providers in the retrofit supply chain within the South West. This is likely to be in collaboration with other Community Energy groups as well as involvement from DCC. Existing 'entry level', so 'affordable', whole house retrofit assessment and design along the lines offered by Carbon Coop may provide an opportunity to get the ball rolling more quickly.

[1] Nearly 70% of Teignbridge's existing housing stock in 2019 had an EPC rating D and below.

Section 4. Process overview

Our aim is to provide a template process for commercial or not-for profit organisations to deliver. It is not currently ACT's remit to be directly involved, either on a paid or voluntary basis. Instead, ACT would suggest possible providers for the different stages in the overall process.

The template process described here is what ACT would assess providers on. It remains up to the user to verify if the services offered meet their requirements and to enter into a direct service/purchase contract with them. ACT does not take responsibility for any of the work undertaken or the list of suggested providers.

There are a number of organisations than can provide further lists of service providers for each of the stages, these include:

- Association for Environment Conscious Building (**AECB**)
- <list>

4.1 Engagement/Advice

Typically, this comes from promotions by commercial organisations. The internet offers a broad range of advice from generic to very detailed technical information. For most people it is difficult to understand the information available to make an informed decision, that is:

- what solution(s) best meet my requirements,
- do they represent value for money, and
- will they perform as expected.

Finding a trusted and knowledgeable source is challenging. While ACT is not set up to provide this, other organisations are. Some of these are free while others are fee or membership based. The following is a list of local sources for this advice:

<list>

4.2 Assessment

Without specific and detailed information, any advice can only be general. It is therefore essential to establish sufficient, thorough information. This should be done using a pre-defined electronic template which can be populated by the building owner/occupier or a professional assessor. This is more than the usual EPC assessment template but does not need to be as comprehensive and standardised as would be done for Passive House retrofit (EnerPHit). Alternatives such as those specified by PAS2035, Carbon Coop's Home Retrofit Planner or TECs' E-Pack could be used.

As a minimum, assessments must cover the following:

- Purpose, priorities and preferences of the building owner and/or occupier.
- Heat energy sources, amounts, patterns of use and occupier attitudes/behaviour/perception of heating/cooling, ventilation and humidity.
- Measurements of all elements of the building, or detailed building plans.
- Specification of every element of the building in terms of heat loss/gain, ventilation and heat capacity.
- The context and orientation of the building within its surroundings and how these may affect impact of local conditions such as degree-days, solar-gain, wind-chill, water/moisture ingress, etc.

It may not be possible or required to gather all the assessment data at the start. There will be a balance to be struck between the detail required and the price of getting this. The more the user can provide, the better informed they become and the less the assessment stage of the process is likely to cost them.

Additional targeted, possibly invasive, assessments may be needed at later stages in the retrofit process. Local providers of the initial assessment for whole house retrofit are:

<list>

4.3 Coordination

This is more of an ongoing stage throughout the process. It can be performed by any one of the providers of the different stages depending on the complexity and experience of the person performing the coordinating function.

The primary role requires the person to oversee all the stages are performed to the standard template selected. They should also be the impartial, trusted partner working with the owner/occupier to ensure that expectations are clearly defined and delivered. Typically the role will be performed by someone delivering one or more of the other stages in the process. So that an understanding of as many of the different aspects of retrofit are understood well enough to ensure the appropriate level of expertise is used.

Some local providers of this as a stand-alone service are:

<list>

4.4 Design/Specification

The initial data collected during the assessment will be analysed at this point. Depending on the scale of the project, the coordinator may decide to recommend additional specialists for some aspects of the building.

A whole house analysis, design and specification of the measures needed to achieve the stated objectives will be undertaken in this stage. This may require further visits to the building to obtain additional detailed information.

The proposed design and specification of the measures should be explained in sufficient details to the owner/occupier and in the sequence they are to be implemented, so that an informed decision can be taken. This should include sufficient specifications which can later be correctly used in the implementation and verification stages.

Typically, this stage would be performed by qualified architects, heating engineers or retrofit specialist designers. Some local provides include:

<list>

4.5 Implementation

Choosing the right installer is challenging as the supply-chain for retrofit to the standards ACT would expect, is only just starting. That is not to say there are not quality installers and materials suppliers that can deliver the designs specified.

The retrofit designer would normally supply recommendations for installers and materials, the following is a list of local providers that may be useful:

- AECB
- Mike Wye
- Green Register

4.6 Evaluation/Verification

Arguably the most important stage to ensuring a retrofit process that delivers on expectations. It is how trust in the retrofit supply-chain can be increased and maintained in the long-term.

This will not only be necessary on project completion, but also during the implementation stage. Verifiable evidence will need to be collected to demonstrate adherence to requirements. Ideally this should be part of any contractual agreement with a schedule of penalties should there be a shortfall.

Having kite-marks is useful, but does not replace contractual obligations based on measurable parameters of the service being delivered.

The stage can be performed by the retrofit coordinator, provided they are sufficiently qualified and independent. The building owner/occupier, given sufficient involvement, is usually the best arbiter of verification. There are few independent local providers, here are some:

<list>

Section 5. Proposition to Homeowners

The following is one of a number of commercial propositions being considered. The one described here is based on using the heat assessment elements of the TECs E-Pack.

The UK government has set a target for zero emissions by 2050 and identified that our homes currently account for circa 25% of UK emissions. Many, including ACT, are now calling for this date to be brought closer to 2030 in order to have a realistic chance of limiting global temperatures to well below $2^{O}C$.

With 80% of our homes estimated to still be in use for at least another 30 years, we want to help develop a plan that:

- Enhances your comfort & wellbeing;
- reduces ongoing maintenance;
- enhances your homes energy efficiency;
- reduces your environmental impact; and
- helps meet this target.

Over the next 30 years, many elements of your building will require maintenance and replacement. We want to ensure that when maintenance and renewal are considered there are no lost opportunities.

We propose to do this by engaging with you to help consider what solutions best meet your requirements, do they represent value for money and will they perform as expected.

We propose to do this by adopting a four-stage process.

1. Assessment
2. Design (a plan for your home)
3. Implementation
4. Operation

ASSESSMENT

We begin by asking you to complete as much as you can of our online TECs E-Pack. We will then arrange to visit your home to meet you (help with any of the more tricky questions) and discuss your priorities.

DESIGN

We then evaluate this information to develop a plan for your home, setting out the measures and sequences tailor made to your home to allow you to make informed decisions.

Depending on your home we may recommend additional study for some aspects of the building.

IMPLEMENTATION

We can help you to choose an installer. We seek to develop a list of installers and suppliers with the correct qualifications and experience.

OPERATION

The most important stage is to ensure the plan delivers on expectations. This is done through evaluation and verification. You are considered the best arbiter of this, however, we should like a visit once works are completed to assess the overall outcome.

The above process mirrors that set out in PAS 2035:2019 Retrofitting Dwellings for Improved Energy Efficiency- Specification and Guidance. This is a British Standard, set to soon become the standard for the retrofit of existing buildings.

The process is also similar to the EnerPHit, the PassiveHaus retrofit standard. The EnerPHit process includes calculations for energy saving and cost effectiveness. Cost effectiveness is planed and calculated over 30 years during which most building elements require maintenance/replacement.

The following are example processes for EnerPHit and PAS2035.