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Code for Sustainable Homes (CSH): Technical comments re levels 3 and 4 and the GHA's position

Though the Good Homes Alliance is very supportive of the attempt by Government to reduce Carbon Emissions and sees the Code for Sustainable Homes as an important part of this, the GHA also understands the problems of introducing new codes and that often problems only occur as a new code is tested. We are actively involved in identifying these problems and suggesting ways to address the problems to help ensure that the Code is upheld as a useful and trusted mechanism for achieving carbon reduction in new housing.

We have identified three major initial problems regarding meeting CSH levels 3 and 4:

Problem 1 – Electric vs gas heating:

In some cases, it is much easier to achieve CSH levels 3 and 4 by using electric on-peak heating, than by the more carbon efficient option of gas heating. It appears that it is actually not possible to make CSH level 4 with large amounts of insulation when using gas for heating and hot water. However by swapping to Electric on peak, despite the higher carbon emissions, we can make code level 4.

If we consider how to achieve level 3 with Electric on peak heating it becomes clear that the CO2 emissions will be worse than the building regulations base case for gas.

i.e. Developers can build a less insulated shell if they adopt Electric on peak heating to meet Code Level 3.

The reason for the problem lies with the Fuel factor used to calculate the TER, which was set (at 1.47) to allow electric heating to small flats to still pass the building regulations, *but* this was intended to be phased out (or converge to a value of 1) as time went on

Problem 2 – Large and small-scale buildings and efficient building forms

It is easier to achieve Building Regulations and CSH levels 1-4 if the building is bigger, and the building form is less efficient. Due to the % reduction scale, small and

efficient building forms are penalised, and developers are driven to increasing inefficiency of building form. Furthermore large houses in high value developments will meet high code levels more easily than smaller affordable developments. This runs against the desire to push the high code standards in social housing, and means that efficient affordable housing will require expensive and complex renewables to meet high code levels, whereas expensive inefficient housing will not.

Problem 3 – general code issues

The two problems listed above are in addition to the more general concerns we have about certain aspects of the code, particularly the target of autonomous zero carbon new homes, the timescale for changes, and the risks to building fabric and human health. These will be clarified in a future GHA briefing paper on the Code.

GHA Position

In order to address the first two urgent problems identified above, The Code for Sustainable Homes should

1. Treat all fuels equally (i.e. based on carbon emissions) for levels 3 and above.
2. Use absolute energy use figures measured in kWh/ m2/ year and absolute carbon emissions per year, measured in CO2/ m2/ year, possibly with some relation to occupation density.
3. Include a monitoring requirement for a fixed percentage of new homes, to test whether the designed performance is actually delivering the required CO2 savings.

The GHA is adopting as its code what is called **3 plus plus**. This refers to CSH level 3 as a basic code aim, but with two additional requirements:

- The first plus is the requirement for a fixed maximum Carbon target (CO2/m2/yr) and/or a fixed maximum Energy target (kWh/m2/yr) according to building type. These will ensure only the best solutions are chosen which will reduce energy and carbon in absolute terms.
- The second plus is the requirement to monitor homes post occupation for at least 2 years, to compare the designed with the actual performance.

The GHA is also developing further social requirements that will enhance the community and personal well being of occupants.