

UK Progress towards Nearly Zero Carbon Buildings

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Code for Sustainable Homes (CSH)

Voluntary Code

Introduced in 2006 (based on existing Ecohomes scheme)

- Defines six levels of performance
- Level 3 required for all Social Housing and English Partnership projects from 2008

Scope

- **Energy efficiency / CO2**
- Water efficiency
- Surface water management
- Site Waste Management
- Household Waste Management
- Use of Materials

CSH: Energy Requirements

Code Level	Improvement on 2006 regulations	Comment	Date to become regulation
1	10%	EST voluntary “good practice”	
2	18%		
3	25%	EST voluntary “best practice”	2010
4	44%	Close to PassivHaus	2013
5	100%	Zero carbon for heating, ventilation, cooling and lighting	2016 * (current policy)
6	100%	Zero carbon for all uses and appliances	2016 * (original policy)

** 2019 zero carbon for non-domestic buildings*

Implications

Level 3: (Now required)

- Technically straightforward
- Additional cost about 5%

Level 4: Proposed for 2013

- More demanding but feasible
- Additional cost about 10%?

Levels 5 and 6: 2016 (dwellings) and 2019 (other buildings)

- Technically demanding – needs on-site generation
- “At or beyond limit of UK house building industry”
- Cost??

On the ground

- Level 4 and 5: dwellings built by developers on BRE Innovation Park
 - Unoccupied demonstrators, many visitors; learning curve for developers
- Level 6: several hundred dwellings under construction on commercial “Carbon Challenge” sites



Some Example Solutions for “Zero Carbon” levels

Level 5

- High insulation levels
- Good air-tightness
- Mechanical ventilation with heat recovery
- Low energy lighting
- And one of
 - high efficiency gas heating or heat pump plus 25 m² PV
 - biomass community heating + 9 m² PV
 - biomass CHP + 3 m² PV

Level 6

- Low energy appliances
- Biomass boiler plus solar DHW plus 50 m² PV
- Typically needs community-level renewables

Constraints and the “Zero Carbon Hierarchy”

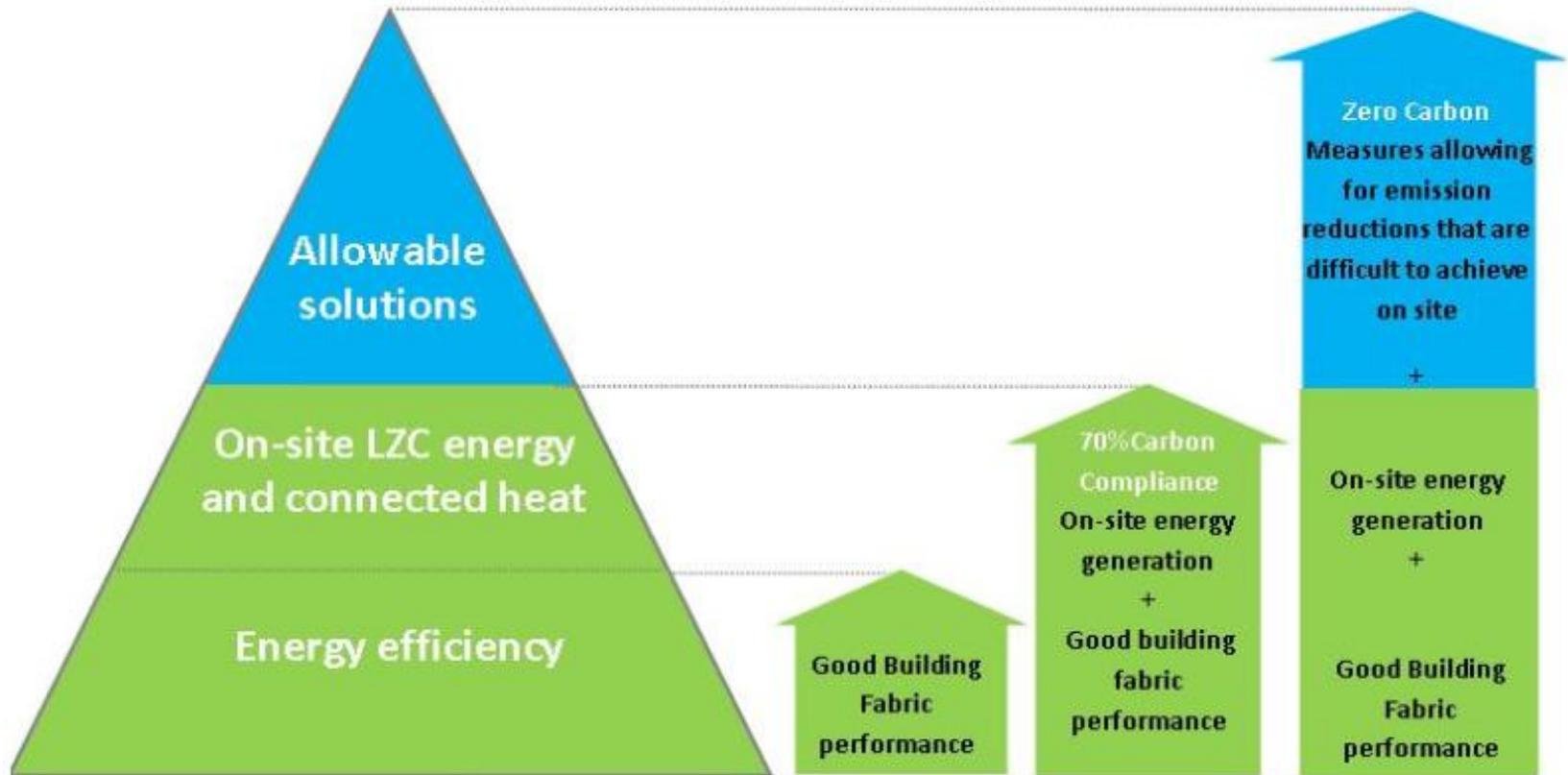
Analysis showed that levels 5 and 6

- Are physically impossible on some sites
 - Especially for commercial buildings
- Are expensive compared to other ways of reducing carbon emissions

So a “Hierarchy” has been developed:

- First, reduce fossil fuel demands by envelope and system measures
- Second, consider on-site renewable energy measures
- Offset remaining carbon emissions by “Allowable Solutions”
 - Carbon reductions off-site

The Zero Carbon Hierarchy



The Zero Carbon Hierarchy

Allowable Solutions: Principles and Expectations

- The **developer will make a payment** to an Allowable Solutions provider, who will take the responsibility for the solutions
 - Possibly payment to a central fund
- Per unit of carbon saved, allowable solutions must be **cheaper than on-site measures**
- Where possible, linked with **local projects** that would bring local benefits.
- For “level 6” they would provide 40% to 60% of carbon reduction
 - The percentage will be less for current, “level 5”, policy

Allowable Solutions: Possible Measures

Still under development:

- Possible project families:
 - On-site (but not duplicating Carbon Compliance measures)
 - Home electric vehicle charging, smart appliances....?
 - Near-site (within the Local Planning Authority area in which a specific development is built)
 - Retrofit to local buildings, low carbon street lighting....?
 - Off-site (outside the Local Planning Authority area in which a specific development is built).
 - Energy from waste plants, retrofit to other buildings...?

Some personal thoughts

– Pros

- Directs spending to cost-effective carbon savings opportunities
- Provides funding for carbon saving investment

– Cons

- Seems a complicated way of doing this
 - Effectively a levy on new buildings
- Reduces the incentive for technology development
 - (But should this be the role of building regulations anyway?)