The importance of clearly defining energy performance targets For the Built Environment

The ever-growing body of scientific evidence linking anthropogenic greenhouse gas (GHG) emissions to a marked rise in climate change makes it increasingly difficult to ignore the impact our actions have on the eco-systems upon which we ultimately rely upon. While the determination to address this issue has taken hold most strongly in the European Union, many nations around the world are now beginning to address their responsibilities.

Given that energy consumption in buildings can account for as much as 50% of all GHG emissions in some developed nations, the built environment represents a key intervention point. Recently, a plethora of initiatives have been launched in various countries around the world in order to drive reductions in the GHG emissions arising as a result of the energy consumed within buildings. Some of these initiatives have been 'bottom-up' industry-based initiatives, such as the US Green Building Council (USGBC), growing out of thought-leaders within the industry uniting to call for change: Others have been 'top-down' Government-mandated schemes, such as the UK Government's commitment to 'zero carbon' new homes from 2016. There has even been some limited success in brokering international commitments, such as the EU's Energy Performance of Buildings Directive (EU EPBD) which requires Member States to implement a series of initiatives aimed at improving the energy performance of buildings. However, there is little commonality between the various schemes, and even the EU EPBD allows Member States to interpret its requirements. The paper discusses how small differences in the wording of the requirements can lead to profound differences in the solutions delivered on the ground as a result. The paper also discussed the additional complexity encountered when multiple targets are set at different levels; both in terms of regional and national targets, but also in terms of what stage in building's life the targets are applied.

After demonstrating the importance of the built environment, in terms of striving to use less energy in general, but also in terms of helping to support the installation and maintenance of efficient, low-carbon energy infrastructure, the paper goes on to discuss the importance of carefully defining the targets to avoid adverse/unintended consequences.

In particular the paper discusses:

- The difference between 'energy', 'carbon' & 'carbon dioxide':
  A fundamental distinction that continues to perplex policy-makers is the difference between 'energy' and 'carbon dioxide'. Using examples from the recent swathe of UK building-related policies the paper demonstrates how outcomes can differ significantly depending on the precise wording of a design target and considers what impact these differences might have with respect to achieving the various over-arching targets in place both nationally and internationally.
- The interconnectedness of policies across the construction, property, energy & environmental sectors:
  Much of the recent drive to improve the performance of the built environment has focused on design standards, but increasingly people are realising that, contrary to the much touted Pareto principle, much of the impact of a building is decided in its operation. While energy efficient design will always be a crucial first step in securing a built environment it is just that, a first step. The paper discusses what other measures might be used; both in terms of policy interventions, and design and procurement methods in order to ensure that the efficient designs are operated effectively in order to maximise the return on investment. Again, examples from the UK are used to highlight the potential for both vicious and virtuous circles.

- Target audience.
  The paper discusses in more detail where responsibilities should lie for the eventual building performance i.e. should the building designer be asked to include occupant energy loads in their design calculations as, while occupant behaviour can have a profound effect on the energy performance of the building, in many situations there is little the design team can do influence this. The paper considers how different mechanisms/targets can be structured to engage specific audiences in an integrated manner to avoid the issues discussed in the previous section.

The UK, in response to the EU EPBD has embarked on an unprecedented drive to reduce national GHG emissions by signing up to ambitious, legally-binding targets such as 'zero carbon' buildings in order to achieve a wider goal of 80% reduction in national GHG emissions by 2050. While the journey so far has been anything but smooth, industry has responded strongly, working co-operatively through organizations such as the UK-GBC to help Government negotiate the barriers to achieving these ambitious targets. The lessons learned have been invaluable and should be communicated as broadly as possible in order to expedite global progress towards a more sustainable future. The paper draws on these UK precedents, relating them to international experience where possible; to demonstrate the importance of accurately defining energy performance targets for buildings intended to achieve specific outcomes. Getting these policies right first time and increasing their uptake globally has the potential to reduce the upfront investment required. Therefore this paper will be useful to authorities around in the world seeking to achieve a rapid increase in the energy performance of the built environment, and to practitioners seeking to make sense of a plethora of heterogeneous regulatory requirements and voluntary targets, or looking to adopt their own targets in the absence of a national movement.

Carbon Emissions from Buildings

Current timeline to Zero Carbon

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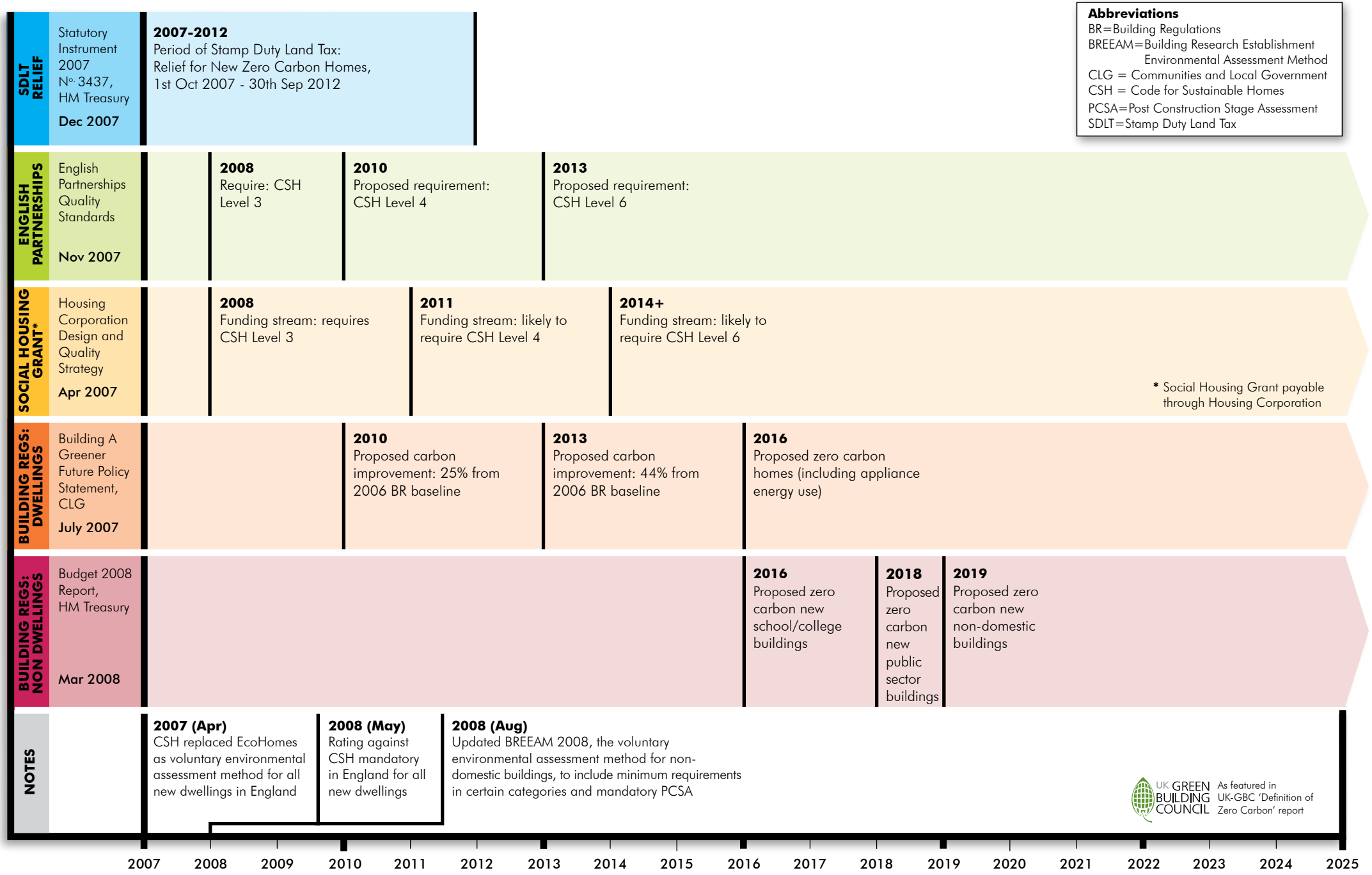
Abbreviations
BR=Building Regulations
BREEAM=Building Research Establishment Environmental Assessment Method
CLG = Communities and Local Government
CSH = Code for Sustainable Homes
PCSA=Post Construction Stage Assessment
SDLT=Stamp Duty Land Tax



UK GREEN BUILDING COUNCIL As featured in UK-GBC 'Definition of Zero Carbon' report

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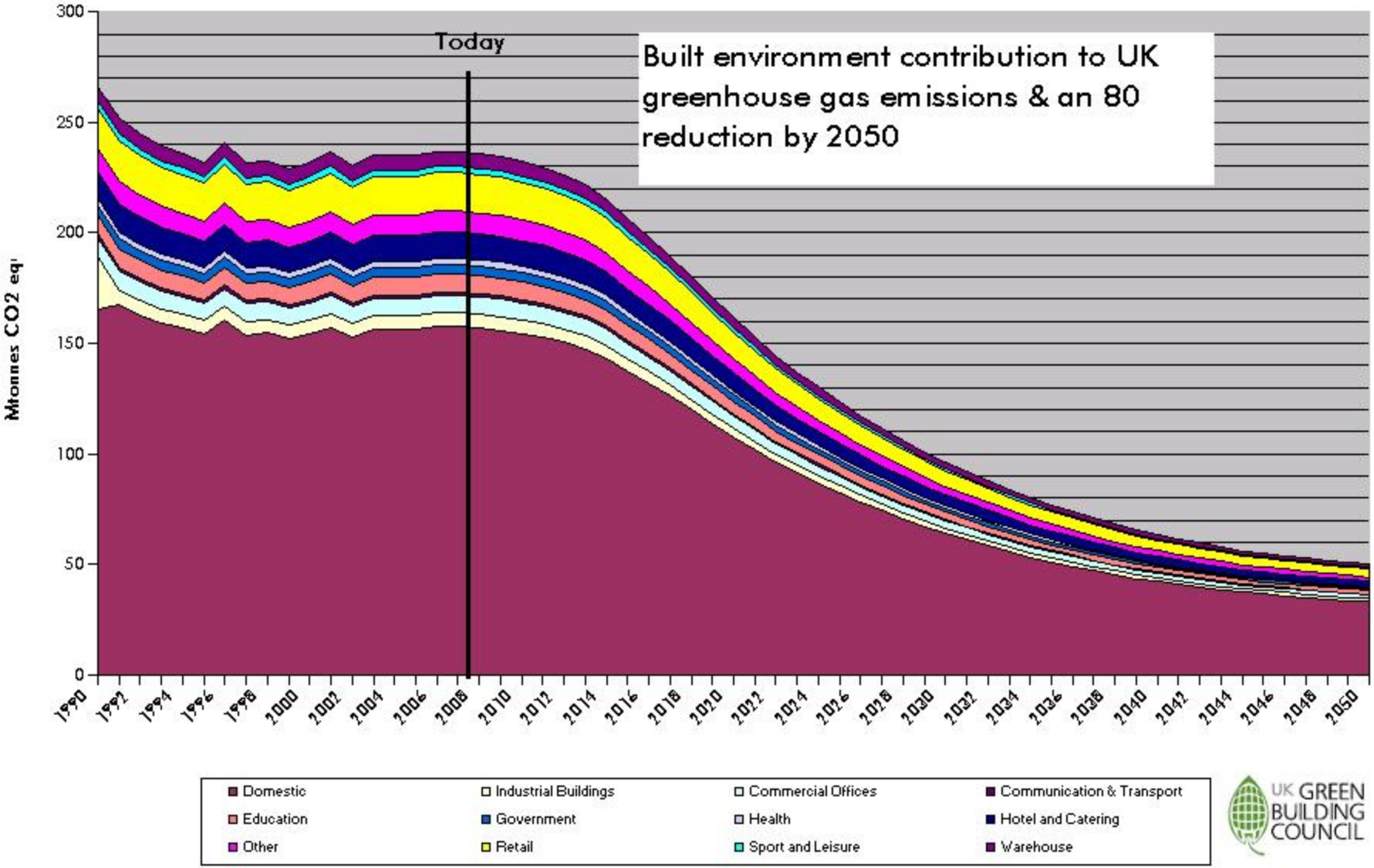

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