

2010 Part L and progression to zero carbon buildings

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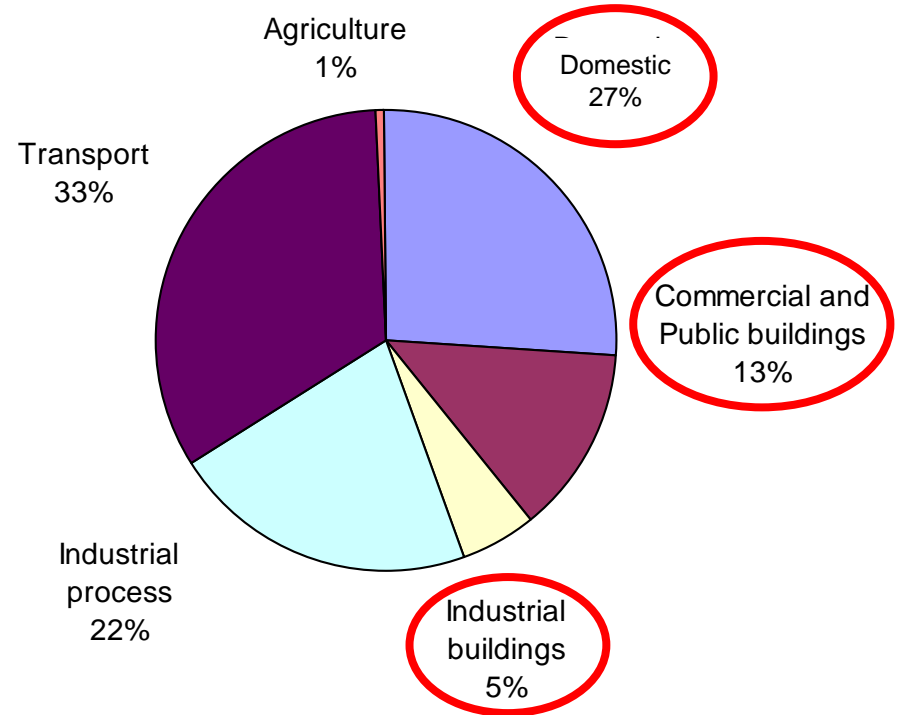
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- ▶ Buildings account for 45% of UK carbon emissions
- ▶ Also security of supply and fuel poverty issues
- ▶ Raising energy efficiency standards via Building Regulations is key
- ▶ Ensure health standards not compromised

In 2005, the UK emitted 550m tonnes of CO₂⁽¹⁾



(1) Source: Energy White Paper, 2007

10 years

Share of 2018-22 emissions savings

- Power and heavy industry 54%
- Homes and communities 13%
- Workplaces and jobs 9%
- Transport 19%
- Farming, land and waste 4%



2015
1.2m people could be working in the green sector
Low carbon economy could be worth £150m a year in UK and £4.3bn a year globally
The NHS expects to have reduced its carbon footprint by 10% compared to today

2016
All new schools proposed to be zero carbon (subject to consultation and confirmation)

2017
Climate Change Agreements extension to 2017 ends
Carbon Reduction Commitment first capped Phase ends. Cap for second Phase set

2018
New nuclear power stations could create or sustain up to 9000 jobs during the course of construction and operation (including supply chains)
Carbon Reduction Commitment second capped phase starts
Government ambition for all new public sector (non-domestic) buildings to be zero carbon (subject to further work)

2019
Government ambition for all new non-domestic buildings to be zero carbon from this date (subject to consultation and confirmation)

2020
Up to half a million additional jobs in the UK renewable energy sector, including supply chains
Central government departments (and wider public sector) will have cut their greenhouse gas emissions by 30% from 1999/00

2015

2016

2017

2018

2019

2020

Zero Carbon



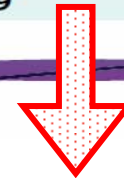
New Schools



New public buildings



New non-domestic buildings

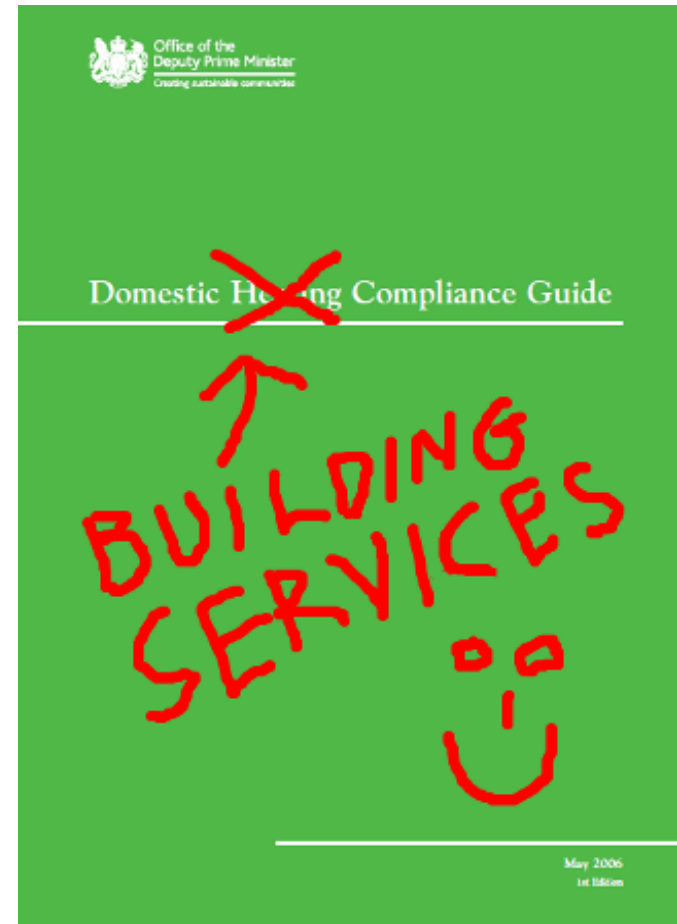


- ▶ **25% reduction in CO2 relative to 2006 Part L target.**
- ▶ **Reduce energy consumption as well as CO2 emissions**
- ▶ **Improvements in actual rather than predicted performance**
- ▶ **Another step on the journey towards zero carbon**

- ▶ An “Aggregate 25%” improvement for new build stock rather than per building
- ▶ 2010 notional building with no improvement factor based on relative cost effectiveness of making energy efficiency improvements for typical building components
- ▶ Takes into account the difficulties/opportunities of cost effectively improving performance in different types of building
- ▶ Some buildings deliver more than 25%, some less – optimised to deliver national target of 25% when applied across build mix
- ▶ Calculated using SBEM 2010 or approved Dynamic Simulation Models (DSMs)

Non-domestic building type	% of mix	CO ₂ reduction
Shallow plan (heated only)	1	22%
Shallow plan (Air conditioned)	1	40%
Deep plan (Air conditioned)	40	26%
Warehouse	33	34%
Hotel	6	16%
School	4	27%
Retail	12	21%
Supermarket	2	26%

- ▶ Domestic and non-domestic compliance guides set energy efficiency standards for building services
- ▶ Limit design flexibility for new build
- ▶ Standards raised compared with earlier editions of guides and updated in line with BS ENs
- ▶ Non-domestic guide has new sections on lighting and circulator pumps
- ▶ Include guidance on installation and commissioning



Notional building

2006

Wall: 0.35 W/m²K

Roof: 0.25 W/m²K

Glazing: 2.20 W/m²K

Air permeability:
10 m³/hour at 50Pa

2010

Wall: 0.26 W/m²K

Roof: 0.18 W/m²K

Glazing: 1.80 W/m²K

Air permeability:
5 m³/hour at 50Pa

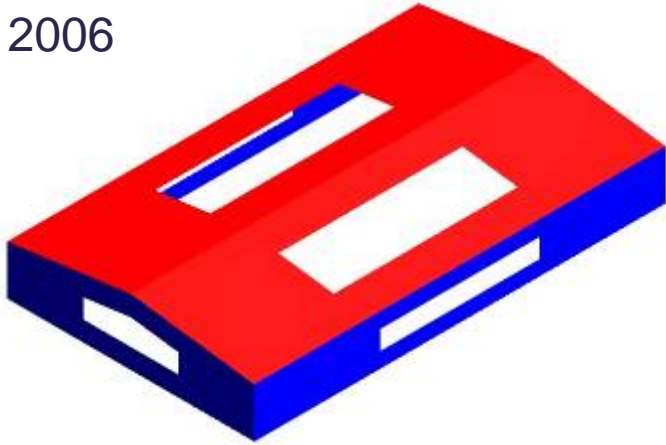
Notional building	
2006	2010
Natural gas <i>(unless Actual building does not have mains gas then it uses fuel oil)</i>	Uses the same fuel as the Actual building <i>(apart from heat pumps, heating fuel emission factor capped to fuel oil)</i>

More difficult to get compliance simply by using bio-fuels.

Notional building	
2006	2010
<p>Windows:</p> <ul style="list-style-type: none">• 40% in offices• 30% in residential• 15% in industrial <p>Rooflights : 20%</p> <p>Glazing based on low-e hard coat glass</p> <p>(g-value of ~0.72)</p>	<p>Side-lit activities get windows:</p> <p>Lesser of (40% of facade area OR 1.5m high × facade width)</p> <p>Roof-lit activities : 12% rooflights</p> <p>Glazing based on high performance soft coat glass</p> <p>(g-value of ~0.4)</p>

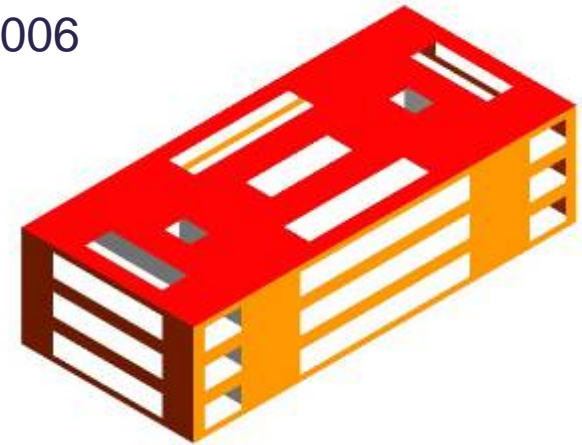
Industrial

2006

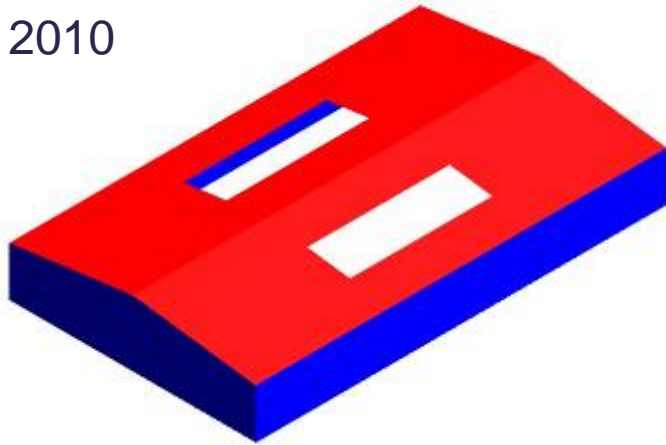


Office

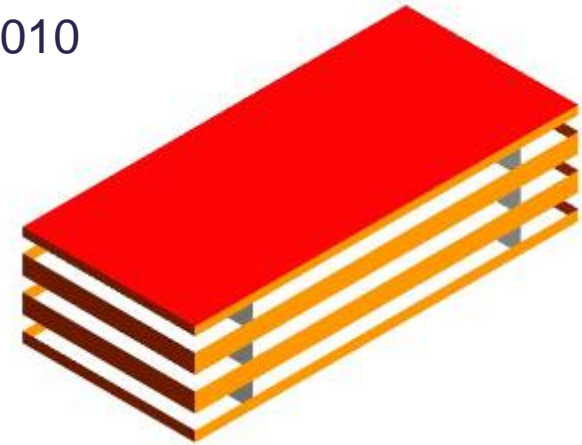
2006



2010



2010



Notional building

2006

2010

Space heating : 73% to 83%

Space heating : ~80%

Hot water : 45%

Hot water : 88% or 90%

Cooling : 1.67

Cooling : 3.60

Notional building

2006

Air handling unit : 2.0
(no heat recovery)

Fan coils : n/a

Zonal ventilation : 1.2

Zonal extract : 0.8

Local extract : 0.5

2010

Air handling unit : 1.8
(heat recovery at 70%)

Fan coils : 0.5

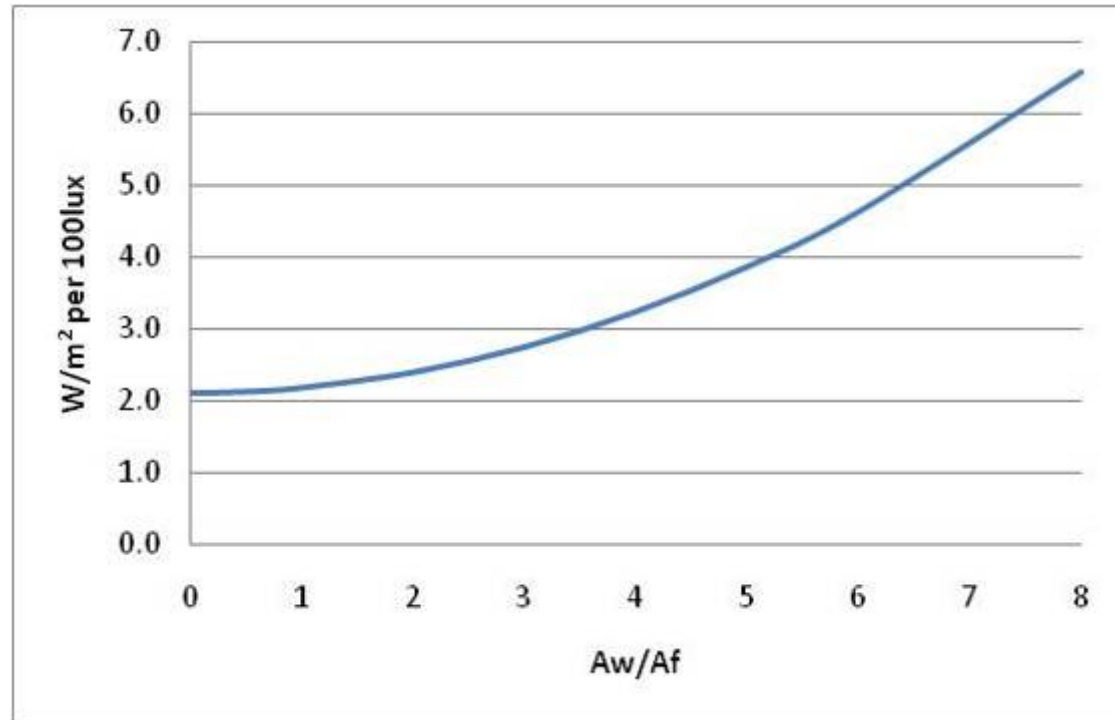
Zonal ventilation : 0.9

Zonal extract : 0.6

Local extract : 0.4

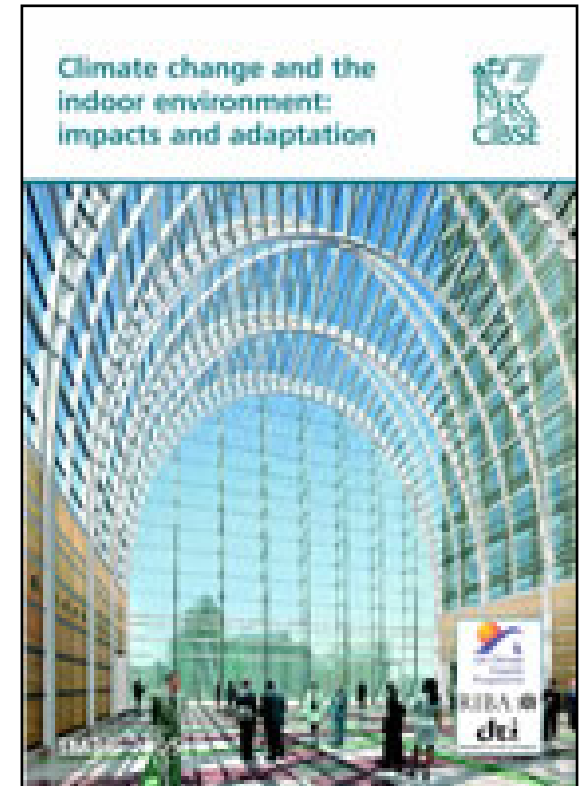
Notional building

2006	2010
Lighting: 3.75 or 5.20 W/m ² /100lux	Power density curve + photo electric dimming



Non-domestic

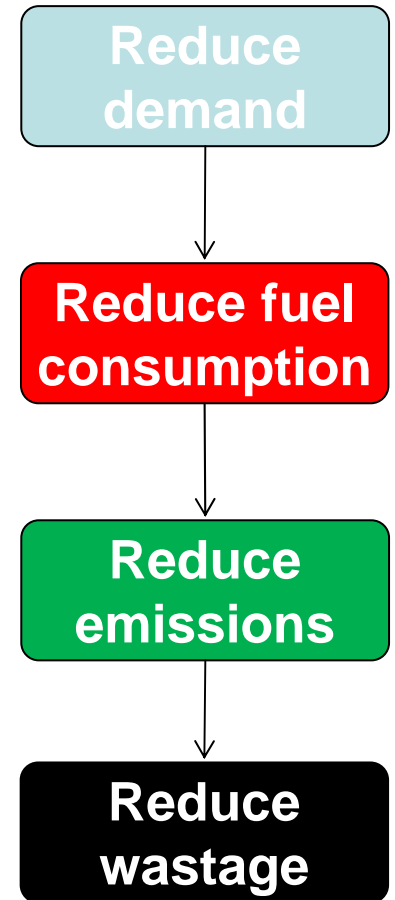
- ▶ New approach to limiting solar gains in non-domestic buildings.
- ▶ Limit on solar gain per unit area of façade, applies to both naturally ventilated and air conditioned spaces.
- ▶ Will require that good solar protection where highly glazed facades are proposed.



- ▶ Building Services Compliance Guides set minimum standards for new and replacement services in existing buildings
- ▶ More focused guidance for thermal elements and for consequential improvements for buildings over 1000m²
- ▶ Amended guidance is given where an extension is a conservatory or porch that is not exempt from the energy efficiency requirements.

- ▶ New requirement for CO2 emission rate calculations to be carried out before the start of building work on a new building along with a list of the specifications used in the calculations. This is in addition to the CO2 emission rate calculation required to be submitted after completion of the work.
- ▶ Option of adopting Accredited Construction Details (ACDs) with quality control system to claim higher performance
- ▶ Wider use of Competent Person Schemes
- ▶ More focused guidance for renovation work
- ▶ Training and dissemination

- ▶ **Passive component:** reduce energy demand
 - ▶ reduce heat loss and infiltration
 - ▶ optimise the solar gain re: facade design
- ▶ **Active component:**
 - ▶ high efficiency HVAC and lighting systems
 - ▶ property commissioned and controlled
- ▶ **CO2 reduction:**
 - ▶ mix of energy supplies and renewable sources that minimise carbon impact
- ▶ **Operating instructions and monitoring:**
 - ▶ enable building owners/occupiers to effectively manage their energy use



- ▶ Delivers around 2 million tonnes of carbon a year by 2020
- ▶ A flat improvement of 25% in the energy efficiency standards of every new home
- ▶ An aggregate improvement of 25% in the energy efficiency standards of all new non-domestic stock
- ▶ Measures to improve compliance
- ▶ Tightening of existing standards for some building services and elements



Part L – Conservation of fuel and power

- ▶ Approved Document L1A – new dwellings
- ▶ Approved Document L1B – existing dwellings
- ▶ Approved Document L2A – new non-domestic
- ▶ Approved Document L2B – existing non-domestic
- ▶ Domestic Building Services Compliance Guide
- ▶ Non-Domestic Building Services Compliance Guide

- ▶ www.2010ncm.bre.co.uk
 - ▶ SAP and SBEM
- ▶ www.planningportal.gov.uk/approveddocuments
 - ▶ Approved Documents
 - ▶ Building services compliance guides
 - ▶ Legislation

