Delivering Low Energy Homes

Rob Pannell
Managing Director
Zero Carbon Hub
Agenda

• The zero carbon ambition
• The zero carbon & low energy journey
• Where we are today
• Challenges to overcome
  – The Performance Gap
  – The challenges of Part L
• The importance of industry partnerships
The Zero Carbon Hub

Who we are and What we do
PURPOSE AND STRATEGIC OBJECTIVES

Facilitate the mainstream delivery of low and zero carbon homes working across the UK

- Provide leadership and create confidence
- Reduce risk
- Disseminate information
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Climate Change
The Future
THE EFFECTS OF CLIMATE CHANGE

Increase in the number of extremely warm days (2080s)

Winter: 6-12 days/year
Summer: 12-30 days/year

Source: Peter Stott, Hadley Centre
1998-2007 was the warmest decade on record.

2009 – 5th warmest globally and 14th warmest in the UK.

2012 Hottest day ever in Scotland and wettest June in the UK.

2013/4 was the wettest winter on record.
Government Policy

Zero Carbon 2016
The Journey to Zero Carbon

- Part L 2013 Update
- Housing Standards Consultation
- Allowable Solutions Consultation
The Zero Carbon Hierarchy

- **Energy efficiency**
- **On-site low/zero carbon energy (and connected heat)**
- **Allowable solutions**

**Zero Carbon =** Solutions addressing the carbon emission reductions that are difficult to achieve on site

- **Zero Carbon Hierarchy**
  - Building fabric performance: 95% Complete
  - Carbon Compliance = On-site heat and power generation: 75% Complete
  - On-site heat and power generation + Energy efficiency: 5% Complete
Fabric Energy Efficiency

Allowable Solutions

On-site LZC Heat and Power

Carbon Compliance: 10, 11 or 14* kgCO₂/m²/year

Zero carbon 2011 definition

Zero CARBON HOME V CODE 5 HOME

2016 Zero Carbon Home

Code 5 Home
CODE LEVEL 5 HOMES
THE ENERGY EFFICIENCY STANDARD

Building Fabric:
- U-values
- Thermal mass

Thermal Bridging

Air-permeability

Orientation, solar gains, Glazing proportion
ALLOWABLE SOLUTIONS

- Investment in offsite LZC (financial return)
- Offsite LZC electricity with direct physical connection
- Continue FABRIC FIRST & carbon compliance onsite
- Efficient appliances and controls
- Export LZC heat to existing stock
- Improve existing stock fabric
- Section 106 credit

2016 Allowable solutions

NEW RESIDENTIAL SOLUTIONS FROM
SAINT-GOBAIN
DEVELOPMENT LAYOUTS

**Site Conditions:**
- Access
- Location (regional weather)
- Ground conditions
- Flood risk
- Existing trees, water bodies etc.
- Local energy resource – source for biomass, wind
- Existing district heating network

**Planning:**
- Dwelling type mix/ density
- Built form considerations - roof pitch, building height etc.
- PV and solar panels
- Local Renewable targets

**Site Layout:**
- Dwelling types
- Design for solar technologies:
  - Orientation for solar technology
  - Roof pitch
  - Over-shading

What is the Energy Strategy?
JOURNEY TO ZERO CARBON

% of homes built

2006 Part L

2010 Part L

2013 Part L

Zero Carbon

2010 2013 2016 2020
KYOTO – WHO’S ON TARGET

Australia
New Zealand
Canada
Austria
Ireland
USA
Sweden
Russia
UK
France
Germany
Japan
Switzerland
Netherlands
Denmark

BEYOND TARGET
OFF TARGET
ON TARGET
-30
-20
-10
10
20
30

NEW RESIDENTIAL SOLUTIONS FROM SAINT-GOBAIN
Costs
COST OF ZERO CARBON HOMES

Current proposal: £5k

Revised proposal 2008/9: £20k per home

Original definition: £40k per home

Reduction on 2006 Part L:
- 2006 Part L: 25%
- 2010 Part L: 33%
- 2013 Part L: 70%
- 2016 Part L: 100%
- True Zero Carbon: ~150-200%

Allowable Solutions: Code 6
The Performance Gap
CLOSING THE PERFORMANCE GAP

- Carbon Compliance report 2011
- Recommendation 4a:
  
  From 2020 the test results distribution should demonstrate that at least 90% of all dwellings would meet or perform better than the designed energy / carbon performance.

- The journey: 2013 > 2016 > 2020
THE PERFORMANCE GAP

How do we close the Gap?
Work Group 0 - Cross-cutting group focused on process

Work Group 1

Work Group 2

Work Group 3

Work Group 4

Work Group 5

Industry Executive Committee

Steering Group

Cost Analysis

Reporting to government
UNDERSTANDING VENTILATION AND OVERHEATING

To regulate or not to regulate

That is the question!
SKILLS AND TRAINING FOR THE SME
HELPING THE CONSUMER

Do our customers like their Low Energy Homes?

Are they comfortable?

Are the controls easy to use?
Annual Household Energy Spend

<table>
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<tr>
<th>Type</th>
<th>Victorian (modern day improvements)</th>
<th>New Build (2006 regulations)</th>
<th>Future (2016 aspirations)</th>
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<td>4-bed Detached house</td>
<td>£2,379</td>
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<td>3-bed Semi-detached house</td>
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<td>1-bed Ground floor flat</td>
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The Future
Printed buildings using 3D printing technologies ???
THANK YOU

I’d love a new home
... Soon please !!