Wales Building Regulations 2013 Part L

New build homes

September 2012

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Options for reductions in CO_2 emissions

New homes CO_2 target

- National planning policy already exceeds Part L 2010
  - New homes to achieve Code Level 3 + 1 additional energy 'credit'
  - An 8% improvement of CO_2 emissions on Part L 2010
- 2015 carbon targets
  - The Welsh Government has previously stated its preference for a 40% reduction in CO_2 emissions compared to Part L 2010
  - Propose to phase its introduction to take effect in 2015
  - The consultation includes an alternative option of a 25% reduction in CO_2 compared to Part L 2010 (broadly equivalent of Code 4 - ENE1)
  - The intention is that for a 40% reduction, no further reduction in CO_2 emissions would be required on-site to meet a zero carbon policy

Expressing the CO_2 target: the problem

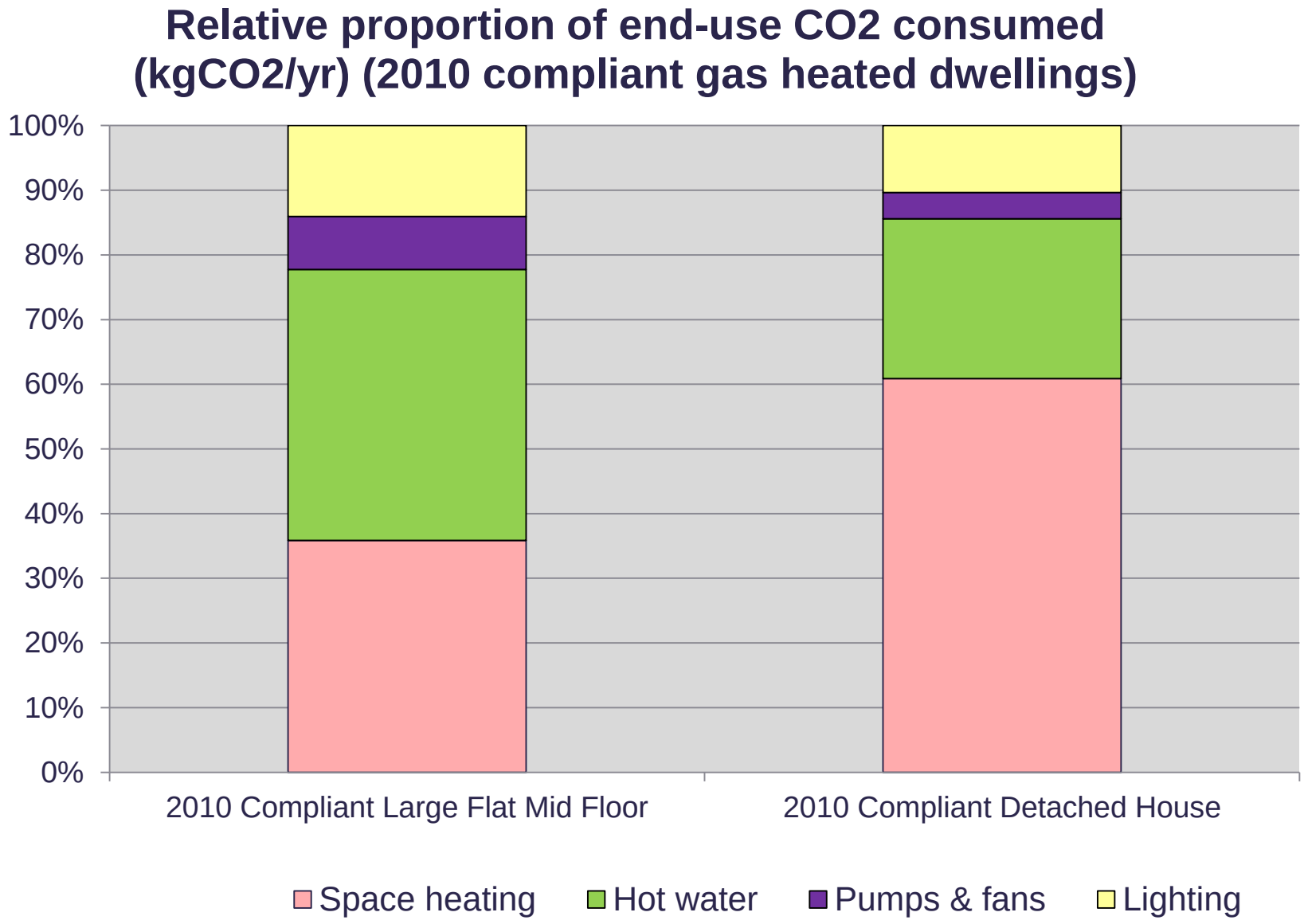
The current approach in Part L

- Currently compare emissions for actual building against a historic (2002) notional building with a fixed improvement factor.

- Continuing with this approach, CO_2 emissions for all dwellings would be 40% (25%) better than Part L 2010

Expressing the CO_2 target: the problem

- Two issues:
  1. **Disproportionate costs on dwelling types depending on their relative ease to meet the CO_2 target**


Relative proportion of end-use CO2 consumed (kgCO2/yr) (2010 compliant gas heated dwellings)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2010 Compliant Large Flat Mid Floor
2010 Compliant Detached House
Space heating
Hot water
Pumps & fans
Lighting

Expressing the CO_2 target: the problem

- Two issues:
  1. Disproportionate costs on dwelling types depending on their relative ease to meet the CO_2 target
  2. **The target does not indicate the compliant solution. Feedback is preference for a simpler, more elemental based, target.**

Expressing the CO_2 target: the solution – an 'elemental recipe'

- The carbon target for each dwelling is based on a common recipe of elemental specifications for
  - Fabric
  - Services
  - PV panels installed on the roof
- PV is used as a proxy for LZCs and is a practical and technically achievable solution in many cases
- Amount of PV is based on the foundation area
  - Approach preferred as simple to understand and apply
  - Alternative is to base on internal floor area with practical cap for taller buildings (harder for town houses/apartments, easier for bungalows)
- The recipe for 40% and 25% differs only by the amount of PV required

Ext. Walls (W/m²K)	0.15
Party Walls (W/m²K)	0
Floor (W/m²K)	0.15
Roof (W/m²K)	0.11
Windows (W/m²K)	1.4
Doors (W/m²K)	1.0
Airtightness (m³/hr.m²)	6.0
Thermal bridging (W/m²K)	ACDs
Ventilation type	Natural (with extract fans)
Low energy lighting	100%
Gas boiler	89% (SEDBUK)
PV (SW/S/SE; 30-45˚ incline; no overshading)	Foundation area (m^2) x 0.036kWp *(0.020kWp for 25% improvement)*

Expressing the CO_2 target: the solution – an 'elemental recipe'

Advantages

1. The recipe of elemental specifications is a compliant solution
   - This should particularly help the smaller developer
   - Alternative solutions are allowed which deliver at least the same carbon performance
2. The challenge is more equitable between different dwellings
   - All dwellings need to install similar elemental specifications.
   - The specifications have been selected such that on aggregate across the (predicted) dwelling mix, they should achieve the 40% (25%) improvement

Still need to do a SAP calculation

- In some cases, it may be necessary to deviate from the recipe
  - May not meet the conditions for the recipe (e.g. orientation, shading, window area)
  - Wish to adopt another solution (e.g. alternative LZC, incorporate shower waste water heat recovery, improve thermal bridging)
- However, even if the recipe is adopted, it is still necessary to undertake a SAP calculation both at design and as-built stage
  - Need to assess the overheating risk (Criterion 3)
  - As-built stage, will need an EPC

Proposed option for different fuel types

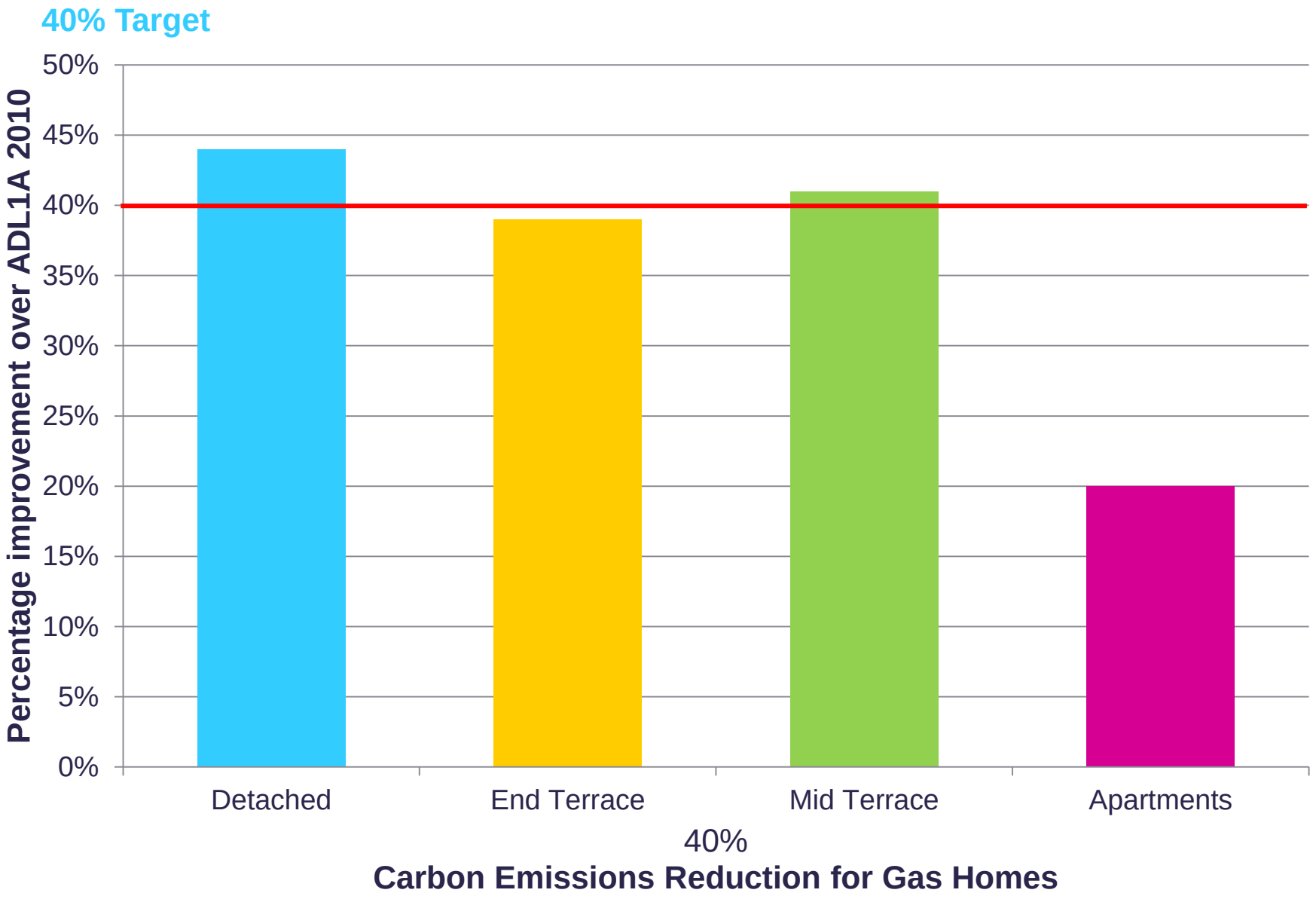
Current approach

- The fuel factor currently provides some relief in the carbon target for those who have to use more carbon intensive fuels than gas
  - Gas is not available
  - Gas is not the preferred option e.g. may be safety issues for high-rise apartment buildings

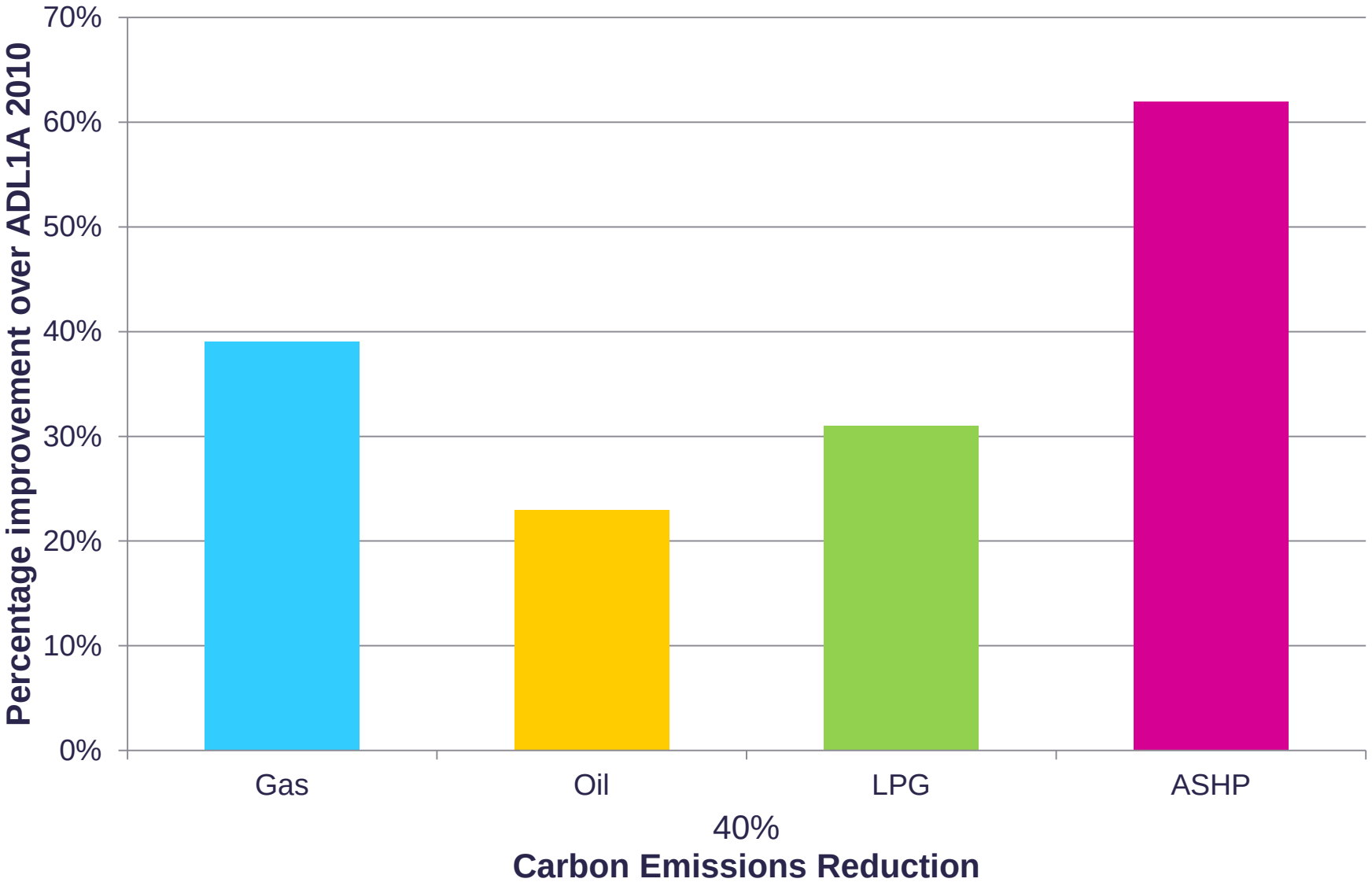
Proposed new approach

- The elemental specification is similar for all fuel types
  - The heating system efficiency is appropriate for the heating system type
  - For electrically heated homes, a heat pump has been specified with a COP that should provide CO_2 emissions similar to a gas boiler
  - For biofuels, as a very low carbon fuel, no PV is needed

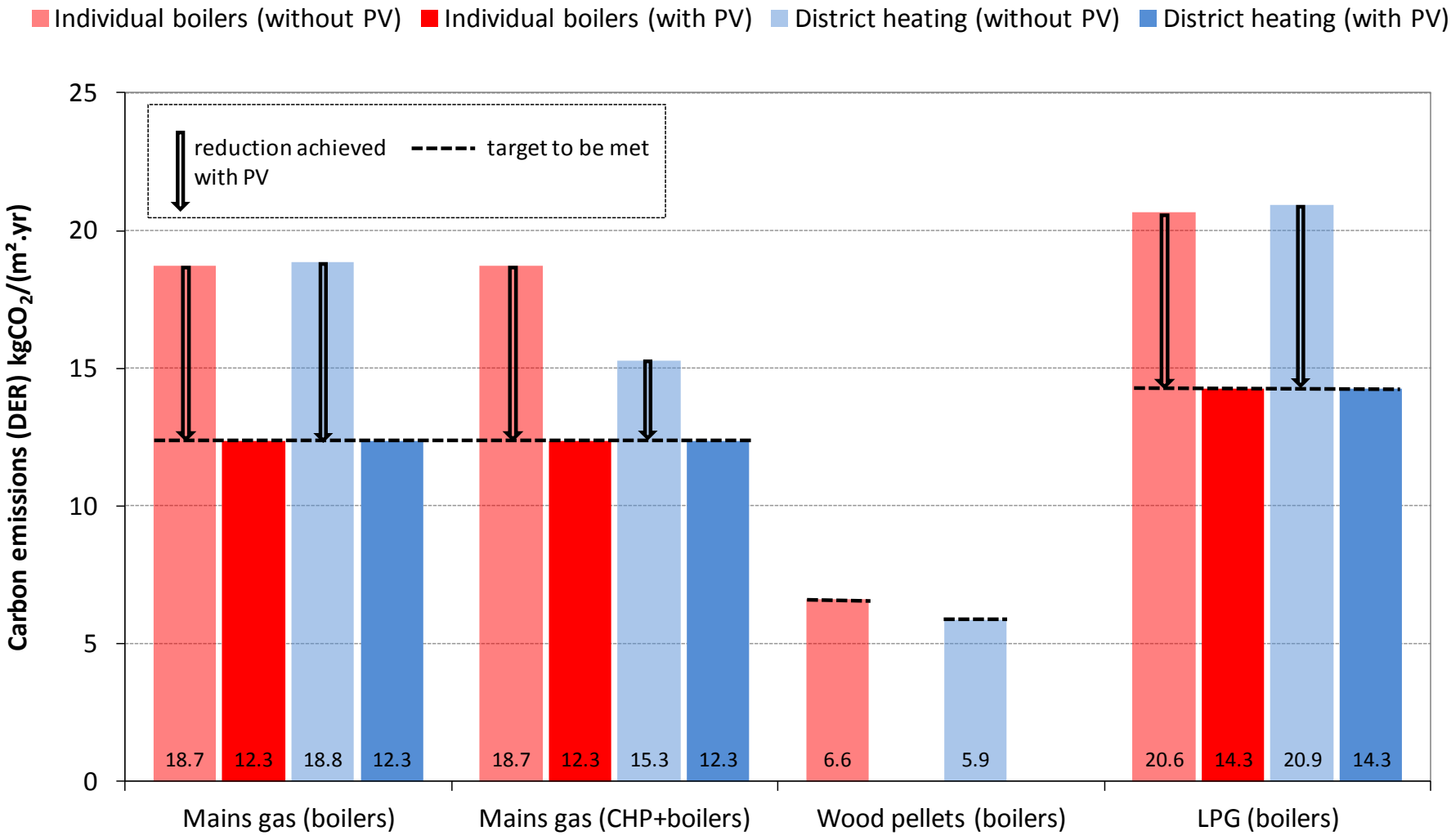
Wales Building Regulations 2013 Part L – consultation events



40% Target: End-terrace/Semi-detached



40% target – Community heating options



Capital costs for gas homes (above Planning Policy for Wales)

	Mid terrace house	End of terrace house	Detached house	4-storey apartment block	Average cost per dwelling
25% reduction	£2,000	£3,000	£5,100	£1,800	£3,300
	£26/m²	*£39/m²*	*£43/m²*	*£33/m²*	
40% reduction	£2,800	£3,900	£6,600	£2,300	£4,200
	£37/m²	*£51/m²*	*£56/m²*	*£42/m²*	

Overall net cost/benefit from IA (above Planning Policy for Wales)

- 25%: Net £95m cost
- 40%: Net £49m cost
- Overall net cost is less for 40% option, principally from lower energy use

Questions

Q1: Do you agree with the preference for a 40% CO_2 reduction from 2015?

Q2: Do you agree with the aggregate approach to target setting?

Q3: Do you agree with the approach of using an elemental recipe for target setting?

Q4: Do you agree with integrating the fuel factor into the recipes?

Q5: Are the recipes a sensible specification for achieving the CO_2 target?

Q6: Should the amount of PV be based on percentage of building foundation area or percentage of gross internal floor area with a cap?

Energy demand limits

Current approach to energy demand limits

- The CO_2 target is performance based and allows design flexibility.
  - Can choose not to follow the recipe but select alternative compliant solution that achieves the same CO_2 performance or better
- In selecting alternative solution, we also wish to minimise energy demand.
  - Part L looks to conserve energy and minimise CO_2 emissions
- Current approach in Part L is as follows
  - Specify limiting fabric standards in the AD to help control heat losses
  - Specify limiting service efficiencies in the Building Services Compliance Guide
- The fabric standards and service efficiencies are guidance
  - Reasonable provision in most normal cases
  - Alternative solutions can be allowed if Building Control approves

Proposed changes to energy demand limits

1. Introduction of mandatory limits for fabric performance

- Important to focus efforts on long-lived building fabric
- It helps future-proof the homes i.e. less likely to require more expensive retrofit upgrades later
- There is a risk that in stretching the fabric standards, having them as guidance only may not achieve the aim of a “fabric-first” approach
- Propose to make the limiting fabric parameters mandatory
- We propose not to implement the performance-based FEES methodology as proposed by UK Zero Carbon Hub at this time. Stakeholder feedback was for an elemental approach to target setting.

Proposed changes to energy demand limits

2. Make the limiting fabric standards more stringent

- These have been aligned with more stretching CO_2 targets
- Also looked to align with standards for existing properties (e.g. extensions)

Limiting fabric parameters	
Roof	0.15 W/m^2.K
Wall	0.21 W/m^2.K
Floor	0.18 W/m^2.K
Party wall	0.20 W/m^2.K
Windows, doors	1.60 W/m^2.K
Air permeability	10.0 m^3/h.m^2
Linear thermal transmittance	0.15 x exposed surface area (W/K)

Proposed changes to energy demand limits

3. Change to the Domestic Building Services Compliance Guide

- Still keep as guidance only
- We propose to adopt options in the England Part L 2013 consultation
  - Same Compliance Guide as England unless consultation response suggests significant Welsh specific issues that require a separate Guide
- The changes are intended to mainly:
  - Clarify and correct guidance in 2010 version
  - Raise product energy performance standards where practical and cost effective (limited improvements proposed)
  - Being performance standards and methods of specifying performance into line with European Directives and standards.

Questions

Q7: Do you agree that the limits on design flexibility ‘backstop’ values for fabric elements in new homes should be changed from reasonable provision to mandatory?

Q8: Do you agree with the changes in backstop values proposed?

Other changes

Criteria 3 changes: Limiting the effects of heat gains in the summer

- Criteria 3 focuses on minimising energy demand to control for overheating
- Text revised to stress that it is not just solar gains that need to be controlled during the summer period but also other heat gains
- As an example, it highlights the need to insulate circulation pipes for domestic hot water.
- For example: Feedback is that in apartment blocks, un-insulated pipes in communal areas can lead to overheating
- This guidance is already in the Domestic Building Services Compliance Guide but given greater prominence by inclusion in Approved Document as well

Criteria 4 changes: Quality of construction & commissioning

- Removal of the separate quality assured accredited construction detail approach for thermal bridging introduced in Part L 2010
- Separate presentation later on Compliance and Performance

Criteria 5 changes: Provision of information for energy efficient operation of the building

- Provides more details of what this information should contain
- Recommends a Quick Start Guide with information in easy to understand format
- Proposed content
  - Explanation of essential design principles and key features
  - Floor plans to show main heating and ventilation components
  - Explain how to operate, control and maintain building services and LZCs
  - Signpost other key information that should be provided in hard copy in a binder including appliance manuals, data to calculate DER/TER, EPC recommendation report
- A link to an example of a suitable Quick Start Guide is provided

Questions

Q9: Any other comments on the changes to ADL1A or the NCM?

Q10: Are the assumptions in the Impact Assessment fair and reasonable?

Q11: Is the Impact Assessment a fair and reasonable assessment of the potential costs and benefits of the options?

Summary

Main proposed changes

- 40% (25%) reduction in CO_2 emissions compared to Part L 2010
- CO_2 target expressed as simpler to understand fuel-based elemental recipes
- Fuel factors incorporated into the elemental recipes
- Mandatory limiting fabric standards
- Improvements in the limiting fabric and building service standards
- Highlighting the importance of limiting all heat gains in the summer
- A Quick Start Guide for homeowners

Where you can find more details in the consultation package

- Section one – The consultation proposals
  - Chapter 3.1: New homes
  - Chapter 3.3: Cumulative impact of policies (including viability of housing development for the options proposed)
  - Chapter 4: National planning policy review
  - Chapter 7: Future thinking (inc. zero carbon homes, climate change adaptation)
- Section two – Proposed changes to the Approved Documents
  - Proposed changes to Approved Document L1A
  - Proposed changes to the National Calculation Methodology
  - Proposed changes to the Domestic Building Services Compliance Guide
- Section three – The Regulatory Impact Assessment

ANY QUESTIONS?