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Part L 2013

HBF Technical Conference

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Wider Policy Landscape

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The Zero Carbon Story

- Budget 2013 confirmed Government commitment to Zero Carbon homes. Should not lose sight of this important commitment.
- Europe requires '**nearly zero energy**' buildings from 2019. This position is already set out in our Building Regulations.
- Part L 2013 is an important 'technical' step – strikes a balance between Zero Carbon and growth commitments
- Next steps to Zero Carbon consultation - thinking on 2016 step including design principles and options for **Allowable Solutions**
- **Housing Standards Review** (energy) is part of the approach

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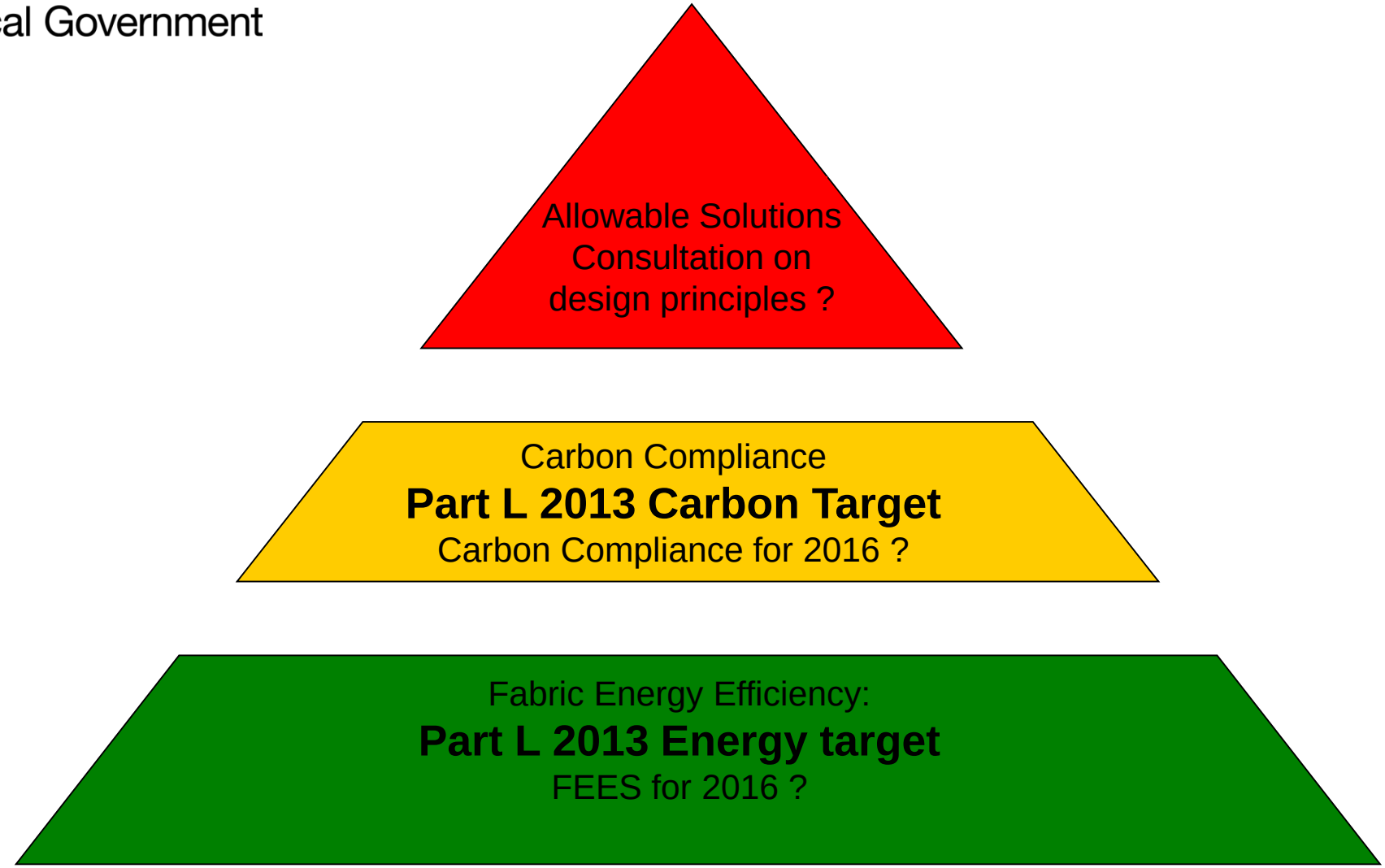
Zero Carbon Homes



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Zero Carbon Allowable Solutions

- **Consultation** on proposals for **'Allowable Solutions'** published in August and has just closed…
- Key principle is that Government prefers **choice for developers** if they are going to face a regulatory cost.
- What is a **solution** – on-site, off-site (retrofit), a central fund? Any others?
- What is the **future of Part L** alongside Allowable Solutions:
  - Should we push **on-site** measures further in 2016?
  - What does this mean for **fabric performance** and on-site **renewables**?

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Housing standards review

- **Consultation** published in August and has just closed ….
- Goes much further than just energy standards – access, water, security, space.
- On **energy** it proposes a **building regulations only** approach for new homes (Part L). Based on 2013 step and zero carbon policy.
- **Local role** in shaping how areas function including energy sources (traditional planning). **Central role** in ensuring national standards for minimum energy performance of homes.

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Part L 2013: Backdrop to Policy Decisions

Striking a balance between Green and Growth policy ambitions

Green:

- Meaningful step towards **Zero Carbon**
- **Climate Change Act**, contribution to **4th Carbon Budget**
- Reducing **energy costs** for consumers and business
- Improving **as-built** performance

Growth:

- **Spending Review 2010** commitment
- A **one-in, two-out** approach to regulation
- **Micro-business moratorium** until April 2014

…. and the **Red Tape Challenge** - call for simplification

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Part L 2013 Overview of Changes

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Part L 2013 : Final Policy

Ministerial Announcement 30 July 2013

New homes:

- c6% uplift to CO_2 targets, focus on fabric performance and affordability
- Notional building recipe (akin to full FEEs plus efficient services) but relaxed back for detached homes on basis of cost effectiveness and consistency of construction
- New mandatory energy target (akin to interim FEE)
- Retain fuel factor at current levels

New Homes As Built Performance:

- Not regulating for quality assurance at this stage – again helps to reduce overall regulatory burden

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Part L 2013: Final Policy

New non-domestic buildings:

- c9% aggregate uplift with elemental backstops
- Achievable through cost effective fabric and services in most building types, consistent with fabric focused approach for homes

Existing buildings:

- Government previously announced it will not be regulating for additional "consequential improvements" at this time
- No uplift to extension and window standards
- Strengthening of specific non-domestic services standards

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New Homes

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New Homes: Amended compliance steps

1. **Achieving the TER and the TFEE**

   DER ≤ TER and Dwelling Fabric Energy Efficiency (DFEE) ≤ Target Fabric Energy Efficiency (TFEE)

2. **Limits on design flexibility**

3. **Limiting the effects of heat gains in summer**

4. **Building Performance Consistent with DER**

   Quality of construction & commissioning

5. **Provisions for energy efficient operation of the dwelling**

   Providing information / O&M instructions

PS: take into account technical, environmental and economic feasibility of **high-efficiency alternative systems** before construction starts

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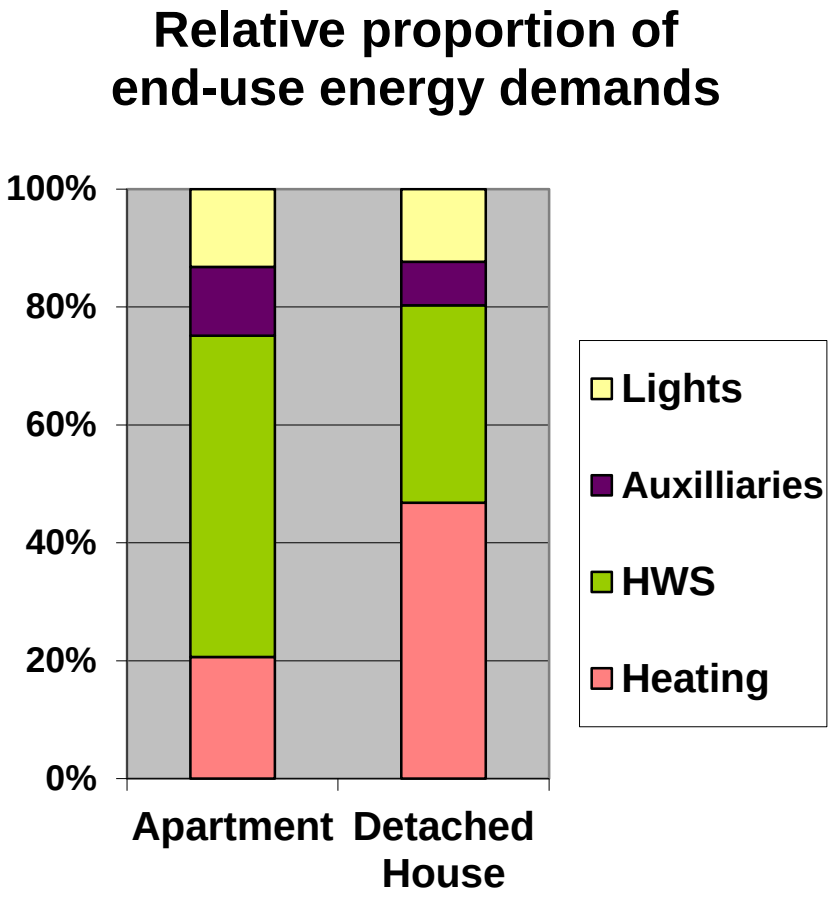
Criterion 1 changes: Calculating the TER

Traditionally, Part L1A has targeted the same percentage improvement against a historic 2002 performance standard across all dwelling types

However, the challenge in reducing CO_2 can vary significantly by building type

As proposed in the consultation, Part L 2013 introduces a concurrent standard that:

- Features a good level of fabric and service efficiencies
- Is common to all dwelling types



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Criterion 1 changes: Calculating the TER

- A number of respondents argued **hybrid** approach (relative CO_2 target with an absolute energy target) was too complex and suggested simplification.
- A relative and elemental approach has therefore been adopted.
- The 2013 standard uses an '**elemental recipe**' based on an up to date fabric and service specification with no improvement factor
  - recipe is itself a **compliant solution** (meets Criteria 1 and 2)
  - recipe is **not prescriptive** and more commonly will provide a reasonable starting point for a developer to select their own best solution
- This **TER** is based on a standard of fabric efficiency akin to full FEES so broadly consistent with the consultation and the journey to Zero Carbon
- The fabric specification for the detached house is eased to be consistent with other dwelling types.
- The impact is a 6% uplift in the **TER** on 2010 levels across the build mix

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Criterion 1 changes: Key features of elemental recipe

Orientation, over shading, sheltered sides.	Same as actual
Opening areas	Same as actual up to 25% of floor area
Ext. Walls (W/m²K)	**0.18**
Party Walls (W/m²K)	**0**
Floor (W/m²K)	**0.13**
Roof (W/m²K)	**0.13**
Windows (W/m²K)	**1.4**
Air tightness (m³/hr.m²)	**5.0**
Thermal bridging (W/m²K)	Calculated using the lengths of junctions in the actual dwelling and the psi values provided in App R (overall standard between ECDs and ACDs)
Ventilation type	Natural (with extract fans)
Gas boiler	89.5% (SEDBUK)

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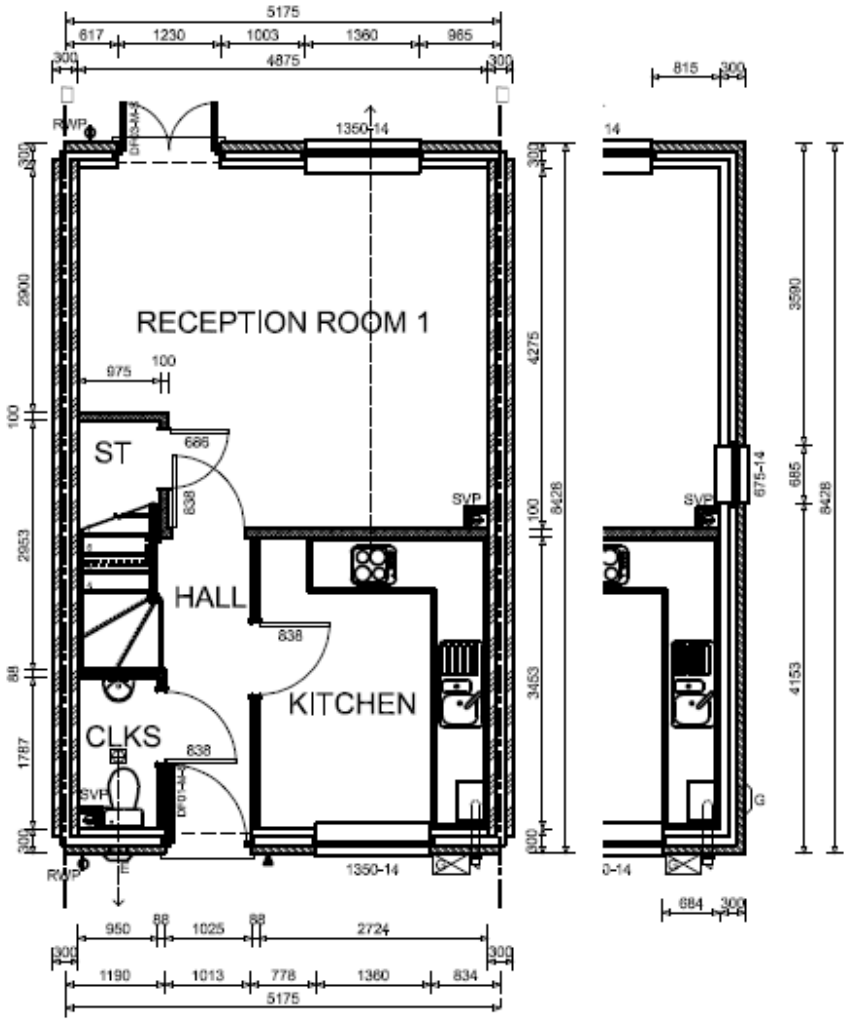
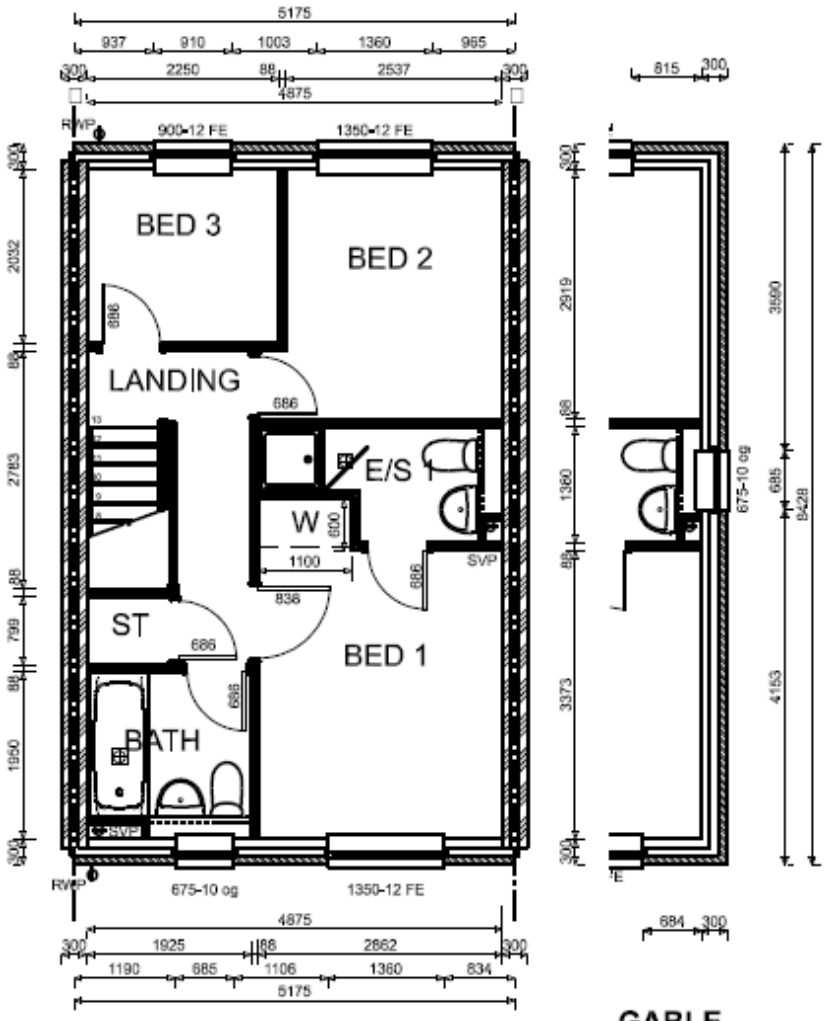
Criterion 1 changes: Calculating the TFEE

- Also as proposed in the consultation, Part L 2013 includes a **Target for Fabric Energy Efficiency (TFEE)** in addition to the **TER**
- A more relaxed **mandatory** target for fabric energy efficiency (**TFEE**) is introduced in Part L 2013 (set approx. at Interim FEES level)
- This is determined by calculating the Fabric Energy Efficiency level from the elemental recipe and increasing the kWh/m^2 energy demand by **15%**
- This more relaxed target:
  - provides **greater design flexibility**;
  - addresses consultee concerns that full FEES may not currently be achievable by all builders across the full range of home types.

Example routes to meet the TER and TFEE – End Terrace 76m²



GROUND FLOOR



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Example routes to meet the TER and TFEE — End Terrace 76m² - Elemental Recipe

	Appendix R	End Terrace	End Terrace
	Elemental Recipe		
Ext. Walls (W/m²K)	0.18		
Party Walls (W/m²K)	0		
Floor (W/m²K)	0.13		
Roof (W/m²K)	0.13		
Windows (W/m²K)	1.4		
Air tightness (m³/hr.m²)	5		
Gas boiler	89.5% (SEDBUK)		
Services			
TER ($kgCO_2/m^2.yr$)			
DER ($kgCO_2/m^2.yr$)	**18.72**		
TFEE ($kWh/m^2.yr$)			
DFEE ($kWh/m^2.yr$)	47.18		

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Example routes to meet the TER and TFEE — End Terrace 76m² - Calculation of TFEE and TER

	Appendix R	End Terrace	End Terrace
	Elemental Recipe		
Ext. Walls (W/m²K)	0.18		
Party Walls (W/m²K)	0		
Floor (W/m²K)	0.13		
Roof (W/m²K)	0.13		
Windows (W/m²K)	1.4		
Air tightness (m³/hr.m²)	5		
Gas boiler	89.5% (SEDBUK)		
Services			
TER ($kgCO_2/m^2.yr$)	**18.72**		
DER ($kgCO_2/m^2.yr$)	**18.72**		
TFEE ($kWh/m^2.yr$)	***47.18 * 1.15* = 54.26**		
DFEE ($kWh/m^2.yr$)	47.18		

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Example routes to meet the TER and TFEE– End Terrace 76m² – Relaxed fabric and WWHR

	Appendix R	End Terrace		
	Elemental Recipe	Triple Glazing		
Ext. Walls (W/m²K)	0.18	**0.22**		
Party Walls (W/m²K)	0	0		
Floor (W/m²K)	0.13	**0.16**		
Roof (W/m²K)	0.13	0.13		
Windows (W/m²K)	1.4	**0.9** (g=0.57)		
Air tightness (m³/hr.m²)	5	5		
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)		
Services		-		
TER ($kgCO_2/m^2.yr$)		**18.72**		
DER ($kgCO_2/m^2.yr$)		**18.68**		
TFEE ($kWh/m^2.yr$)		54.26		
DFEE ($kWh/m^2.yr$)		46.73		

Example routes to meet the TER and TFEE– End Terrace 76m² – Relaxed fabric and WWHR

	Appendix R	End Terrace	End Terrace	
	Elemental Recipe	Triple Glazing	Triple Glazing	
Ext. Walls (W/m²K)	0.18	**0.22**	0.21	
Party Walls (W/m²K)	0	0	0	
Floor (W/m²K)	0.13	**0.16**	0.14	
Roof (W/m²K)	0.13	0.13	0.13	
Windows (W/m²K)	1.4	**0.9** (g=0.57)	**0.9** (g=0.57)	
Air tightness (m³/hr.m²)	5	5	**6**	
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)	
Services		-	-	
TER ($kgCO_2/m^2.yr$)		**18.72**	**18.72**	
DER ($kgCO_2/m^2.yr$)		**18.68**	**18.69**	
TFEE ($kWh/m^2.yr$)		54.26	54.26	
DFEE ($kWh/m^2.yr$)		46.73	46.76	

Example routes to meet the TER and TFEE– End Terrace 76m² – Relaxed fabric and WWHR

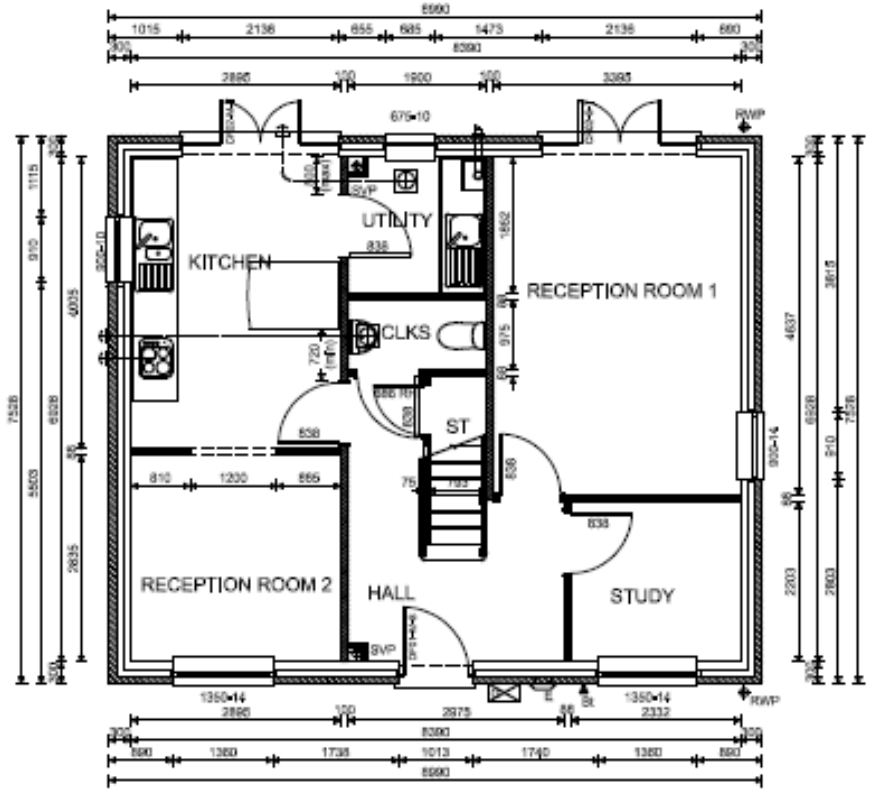
	Appendix R	End Terrace	End Terrace	End Terrace
	Elemental Recipe	Triple Glazing	Triple Glazing	Relaxed Fabric
Ext. Walls (W/m²K)	0.18	**0.22**	0.21	**0.26**
Party Walls (W/m²K)	0	0	0	0
Floor (W/m²K)	0.13	**0.16**	0.14	**0.19**
Roof (W/m²K)	0.13	0.13	0.13	**0.13**
Windows (W/m²K)	1.4	**0.9** (g=0.57)	**0.9** (g=0.57)	1.4
Air tightness (m³/hr.m²)	5	5	**6**	5
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)
Services		-	-	**WWHR**[1]
TER ($kgCO_2/m^2.yr$)		**18.72**	**18.72**	18.72
DER ($kgCO_2/m^2.yr$)		**18.68**	**18.69**	18.67
TFEE (kWh/m².yr)		54.26	54.26	**54.26**
DFEE (kWh/m².yr)		46.73	46.76	**54.20**

Example routes to meet the TER and TFEE– End Terrace 76m² – Relaxed fabric and WWHR

	Appendix R	End Terrace	End Terrace	End Terrace
	Elemental Recipe	Triple Glazing	Triple Glazing	Relaxed Fabric
Ext. Walls (W/m²K)	0.18	**0.22**	0.21	**0.26**
Party Walls (W/m²K)	0	0	0	0
Floor (W/m²K)	0.13	**0.16**	0.14	**0.19**
Roof (W/m²K)	0.13	0.13	0.13	**0.13**
Windows (W/m²K)	1.4	**0.9** (g=0.57)	**0.9** (g=0.57)	1.4
Air tightness (m³/hr.m²)	5	5	**6**	5
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)
Services				**WWHR**[1]
TER ($kgCO_2/m^2.yr$)				18.72
DER ($kgCO_2/m^2.yr$)				18.67
TFEE ($kWh/m^2.yr$)				**54.26**
DFEE ($kWh/m^2.yr$)		46.73	46.76	**54.20**

NB: Uses WWHR savings calculated from SAP2009, specification may vary with SAP2012 methodology for WWHR

Example routes to meet the TER and TFEE – Detached House 118m²



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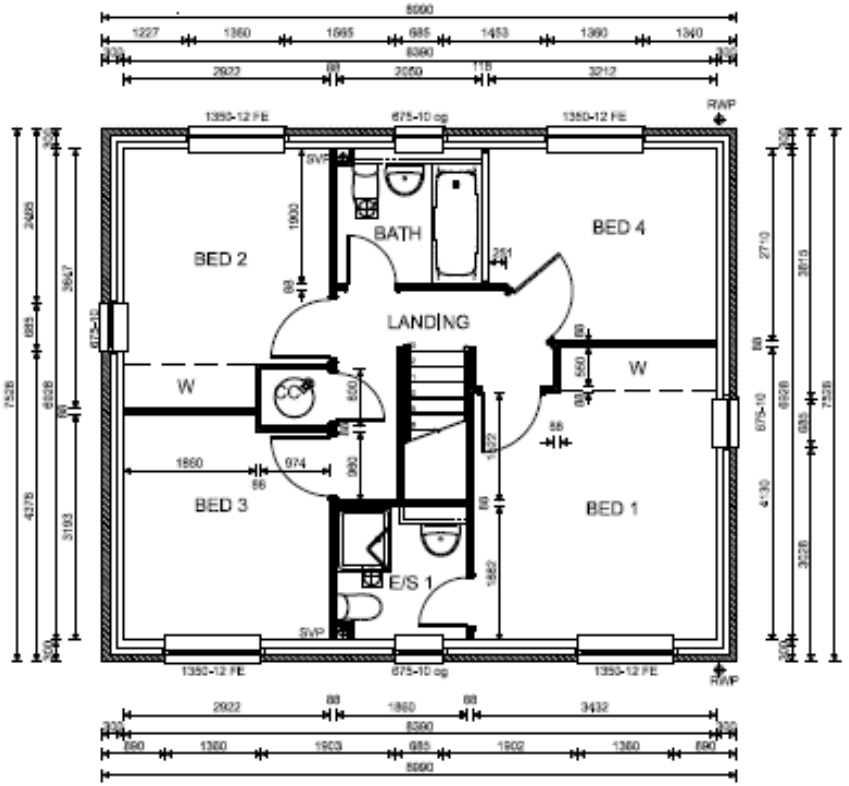

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Example routes to meet the TER and TFEE– Detached House 118m² - Relaxed fabric + PV

	Appendix R	Detached	
	Elemental Recipe	Relaxed Fabric + PV	
Ext. Walls (W/m²K)	0.18	**0.26**	
Party Walls (W/m²K)	0	0	
Floor (W/m²K)	0.13	**0.2**	
Roof (W/m²K)	0.13	**0.18**	
Windows (W/m²K)	1.4	1.4	
Air tightness (m³/hr.m²)	5	5	
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	
Services		**0.48 kWp PV** (too small)	
TER ($kgCO_2/m^2.yr$)		17.44	
DER ($kgCO_2/m^2.yr$)		17.44	
TFEE ($kWh/m^2.yr$)		**59.20**	
DFEE ($kWh/m^2.yr$)		**59.19**	AECOM

Example routes to meet the TER and TFEE– Detached House 118m² Relaxed fabric + SHW

	Appendix R	Detached	Detached
	Elemental Recipe	Relaxed Fabric + PV	Relaxed Fabric + SHW
Ext. Walls (W/m²K)	0.18	**0.26**	**0.26**
Party Walls (W/m²K)	0	0	0
Floor (W/m²K)	0.13	**0.2**	**0.2**
Roof (W/m²K)	0.13	**0.18**	**0.18**
Windows (W/m²K)	1.4	1.4	1.4
Air tightness (m³/hr.m²)	5	5	5
Gas boiler	89.5% (SEDBUK)	89.5% (SEDBUK)	89.5% (SEDBUK)
Services		**0.48 kWp PV**	**SHW**
TER ($kgCO_2/m^2.yr$)		17.44	17.44
DER ($kgCO_2/m^2.yr$)		17.44	<17.3
TFEE ($kWh/m^2.yr$)		**59.20**	**59.20**
DFEE ($kWh/m^2.yr$)		**59.19**	**59.19**

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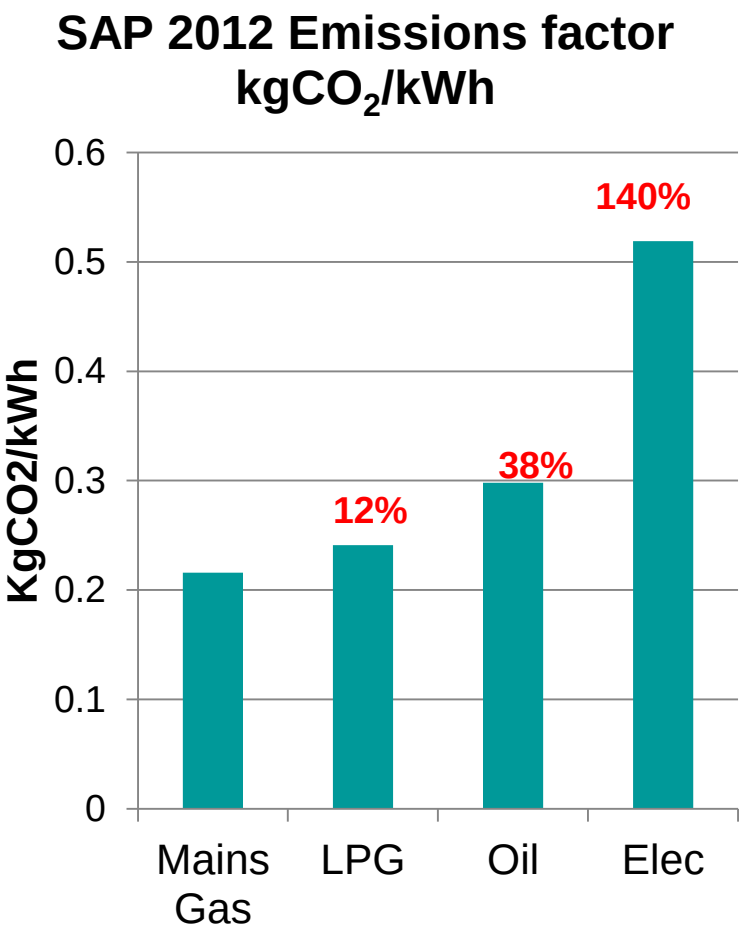
Criterion 1 changes: Fuel factor

- The fuel factor relaxes the carbon target (**TER**) for homes heated by a more carbon intensive fuel than gas
- Particularly helpful for
  - Off-gas grid homes
  - Electrically heated apartments
- With no fuel factor, these homes would need to meet the same TER as if using gas
- With a fuel factor, the TER is eased to reduce cost but still requires some additional measures compared to gas homes to reduce emissions
- **TFEE** limits the potential to relax fabric efficiency levels when introducing LZCs (biomass, heat pumps, PV) much more than previous reliance on elemental backstops.



% uplift in carbon intensity of fuel compared to mains gas

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Criteria 2 changes: Elemental backstops

- Keep fabric elemental backstops:
  - Achieving the **TFEE** standard could be very dependant on the high performance of one specific feature of fabric design
  - If this feature was to perform less well than expected, it would significantly impact on performance
- As very much a **backstop**, the elemental values are unchanged from Part L 2010
- Back stops for building services (domestic building services compliance guide)

Limiting Fabric Parameters	
Roof	0.20 W/m^2.K
Wall	0.30 W/m^2.K
Floor	0.25 W/m^2.K
Party Wall	0.20 W/m^2.K
Windows, Doors	2.0 W/m^2.K
Air permeability	10 m^3/hr.m^{-2}

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Criteria 2 changes: Building Services

- Domestic and non-domestic guides set energy performance standards for heating, ventilation, cooling and lighting services
- Referenced by Part L Approved Documents
- Standards are:
  - **backstop values** for construction of new buildings
  - **reasonable provision** for compliance with Part L when working on existing buildings
- New 2013 editions of guides will come into force on 6 April 2014
- Revisions based on input from two industry working groups and responses to 2012 Part L consultation

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Criteria 2 changes: Building Services

- Raise energy performance standards for products where industry say practical and cost-effective – **minimal changes**
- Bring standards into line with emerging European ecodesign and energy labelling regulations for products placed on market
- Harmonise standards throughout the UK
- Clarify and correct guidance in 2010 editions
- **But otherwise leave standards for work on existing dwellings unchanged**
- Also raise awareness of requirements of **other directives**, higher standards needed to qualify for **FITs, RHI, Green Deal** funding, etc

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

- Change in title stresses that it is not just **solar gains** that need to be controlled during the summer period
- It highlights the need to **insulate circulation pipes** for domestic hot water
- For example: feedback is that in apartment blocks, poorly insulated pipes in communal areas can contribute to overheating
- This guidance is already in the Domestic Building Services Compliance Guide

Note: The Government is investigating more widely the causes and impact of overheating in a changing climate and potential policy options

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Criteria 4 & 5: Changes

Criteria 4: Quality of construction & commissioning

- Removal of the separate quality assured accredited construction detail approach for thermal bridging introduced and disapplied in Part L 2010
- Priority item for the ZC Hub DvAB work programme

Criterion 5: Provision of information for energy efficient operation of the building

- Provides more details of what this information should contain including:
  - 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 including appliance manuals, EPC recommendation report

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Part L 2013: New homes as-built performance

- Not regulating for quality assurance at this stage – helps to reduce overall regulatory burden
- Need a better understanding of design vs built discrepancy
- Supporting **Zero Carbon Hub** led programme
- Interim report published July 2013 – thematic working groups - progress to date
- Final report due Spring 2014 to focus on evidence base and priority areas including construction joint details
- Mindful of industry's own **90% by 2020** target

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Impact Assessment

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Part L 2013: Cost & benefits to Business

2011 Prices	Improvement	EACB (£m)	EABB (£m)	**EANBB* (£m)**
New homes	6%	34	0	**-34**
New non-domestic buildings	9%	64	92	**29**
Existing non-dom buildings	See text	22	44	**22**
Total (including transition costs)	**Rounded**	**120**	**136**	**16**

*** Equivalent annual net benefit/(cost) to business**

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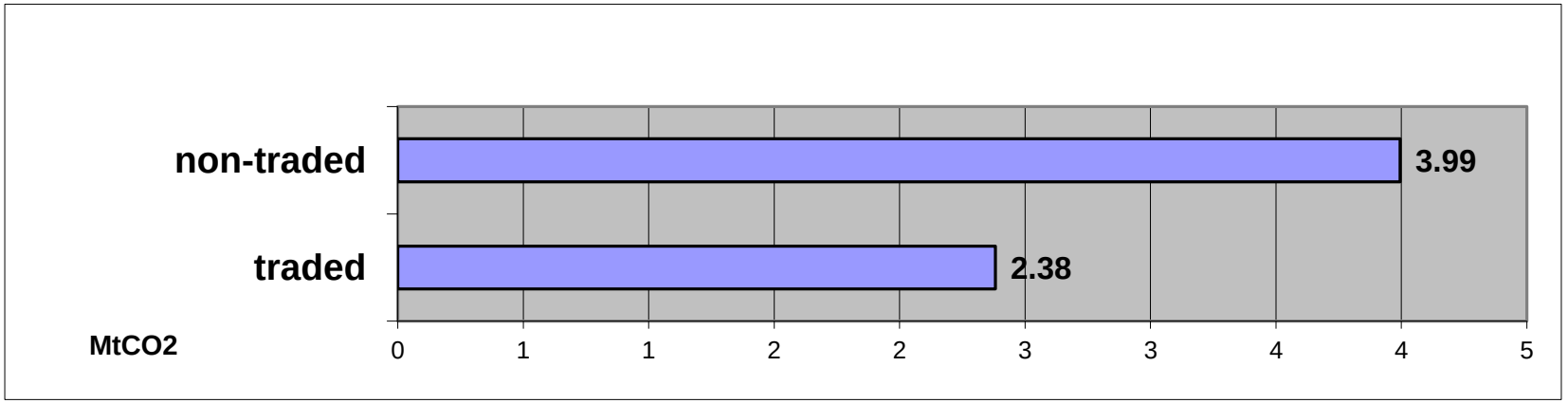
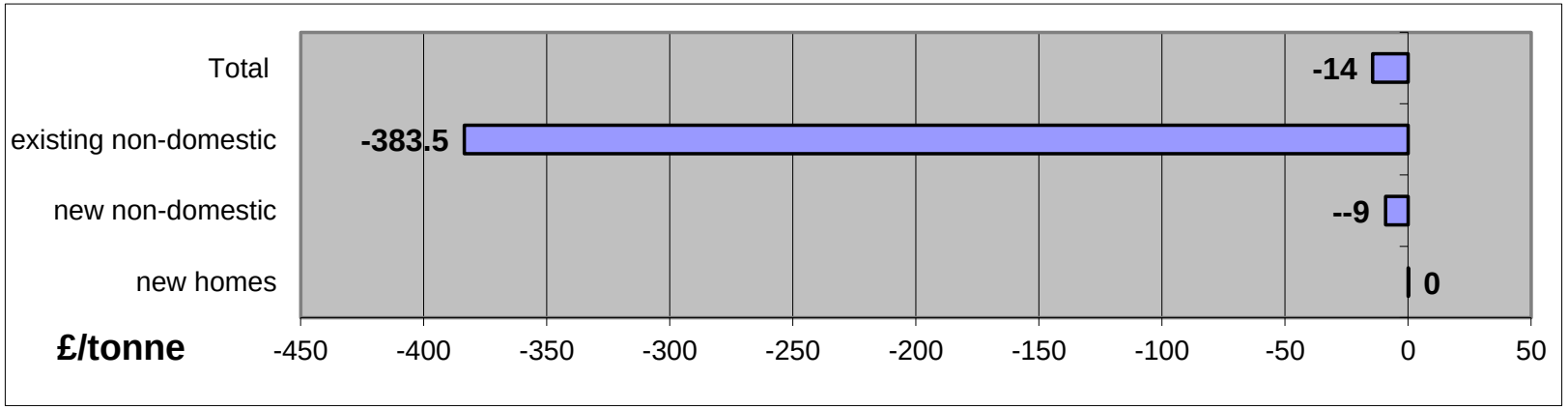
Carbon Savings



Cost Effectiveness



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Part L 2013: New Homes costs and sensitivities

% Cost increase	
Detached	1.20%
Semi-Detached	0.30%
Terraced	0.10%
Flat - gas	0.10%
Flat - electric	1.10%

Assumptions and Sensitivities

- Carbon and Energy Prices
- Proportion of detached homes
- Counterfactual for homes built
- Lower learning rates for solar pv and thermal bridging
- Lower compliance

End Terrace	Large builder	Small Builder	% difference
2010 Base Cost	80,000	95,610	20%
Estimated 2013 Increase	467	521	12%
2013 Total Cost	80,467	96,131	19%

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Next steps

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Part L 2013: Guidance and calculation tools

- New style ADL1A and ADL2A – single column tablet friendly – including summary of notional buildings and indexing
- Working with industry to develop pattern books e.g. similar to Part L 2010 "**Where to Start Guide**" and also a library of advanced construction joint details
- Amendments to 2010 versions of ADL1B and ADL2B – on points of clarification only
- New **Building Services Compliance Guides**
- Updated **SAP** to generate **TER** and **TFEE** – **temporary beta release** in advance of approved compliance software
- Updated **SBEM** to include new notional buildings etc. and introduction of formal **SBEM Appendix Q** framework

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Part L 2013: Next Steps

30 July 2013	Written Ministerial Statement (Final Policy)
8 Aug 2013	Regulations laid in parliament and Impact Assessment published
8 Oct 2013	Launch event – technical detail and demo of calculation tools
w/c 21 Oct 2013	On-line publication of Approved Documents and Compliance Guides
5 Nov 2013	Beta release of SAP & SBEM to reflect final policy in advance of approved compliance software
by 6 April 2014	Development of industry pattern books
6 April 2014	Regulations come into force including transitional provisions