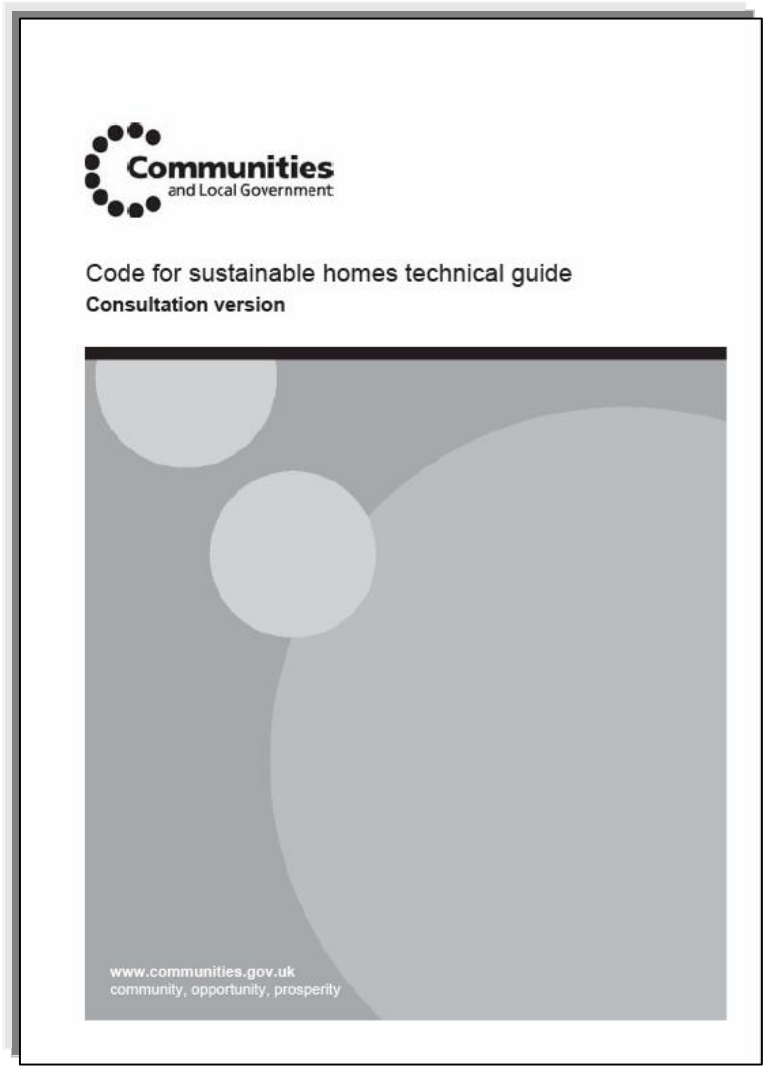
Code for Sustainable Homes -
New energy efficiency standards and metrics
EcoBuild 2010

Alan Yates – Technical Director, Sustainability

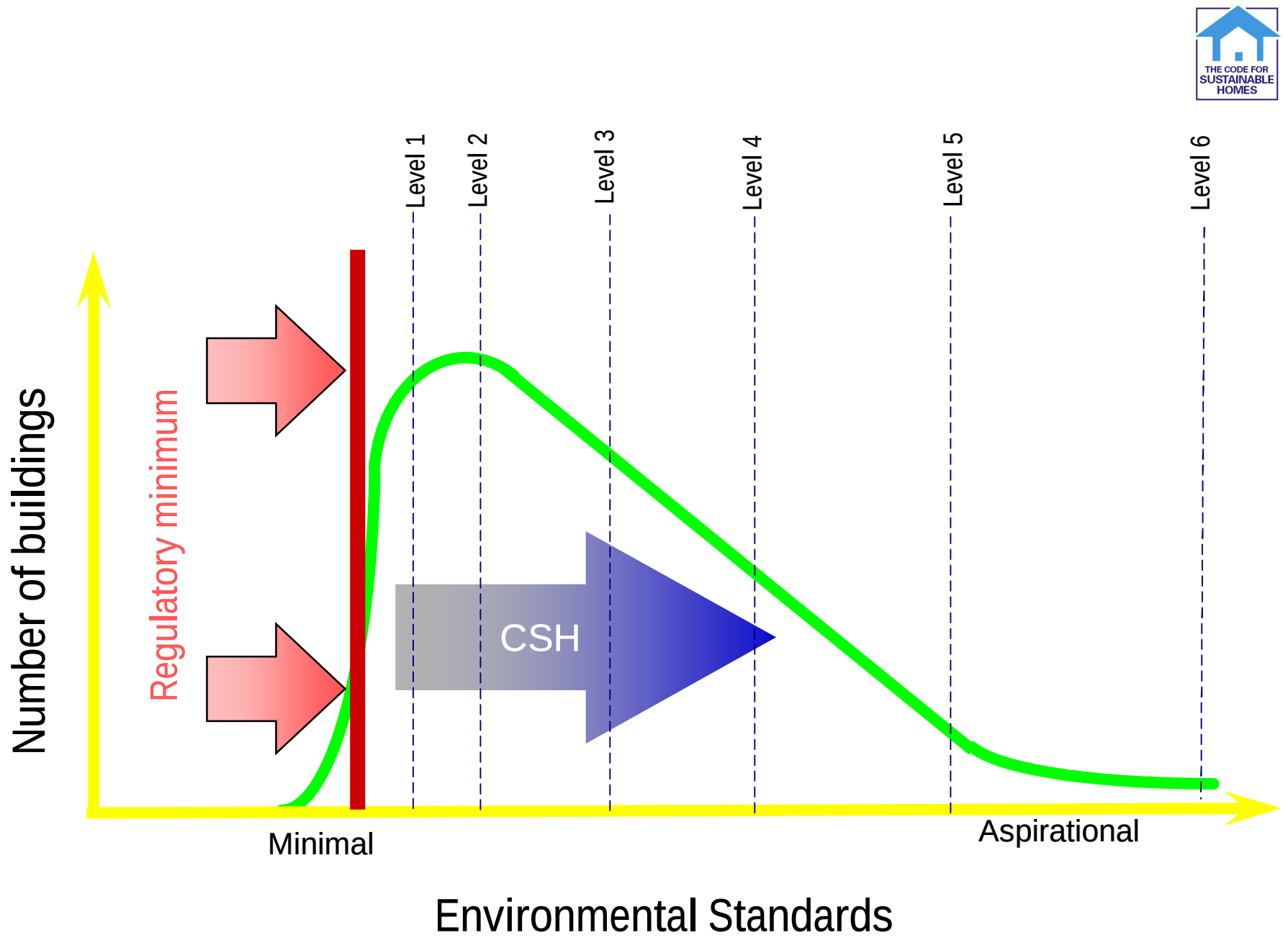


Technical Guide:

- Comprehensive draft
- Supports CLG's consultation document
- Illustrative of the proposed changes
- Subject to revision

Principles

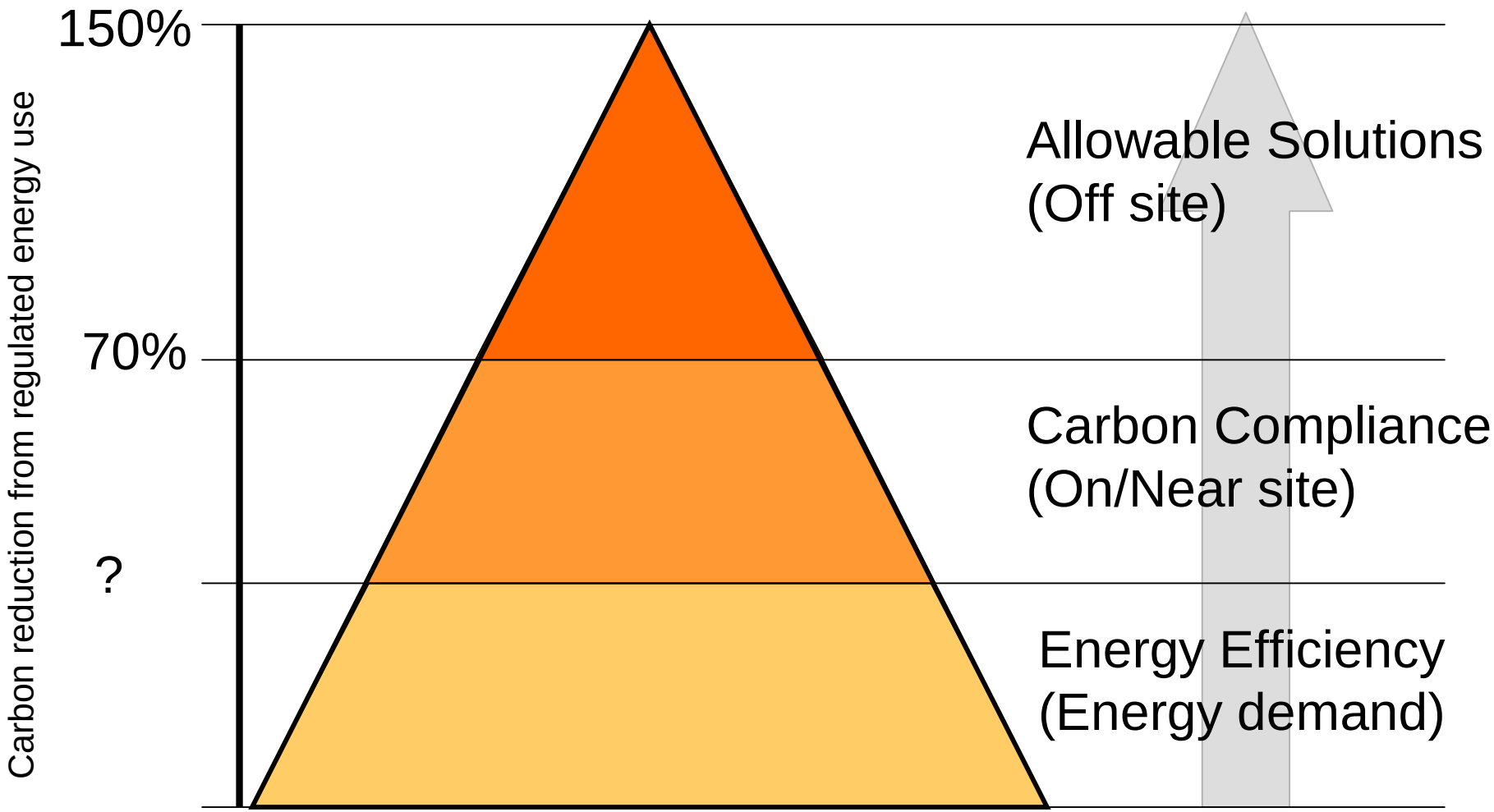
- Fit for Purpose
- Minimised environmental footprint:
  - Minimise Demands
  - Maximise Efficiencies
  - Minimise Impacts
- Robustness in Operation:
  - Recognises individual needs/tastes
  - Adaptable to future requirements/needs


THE CODE FOR SUSTAINABLE HOMES
Level 1
Level 2
Level 3
Level 4
Level 5
Level 6
Number of buildings
Regulatory minimum
CSH
Minimal
Aspirational
Environmental Standards

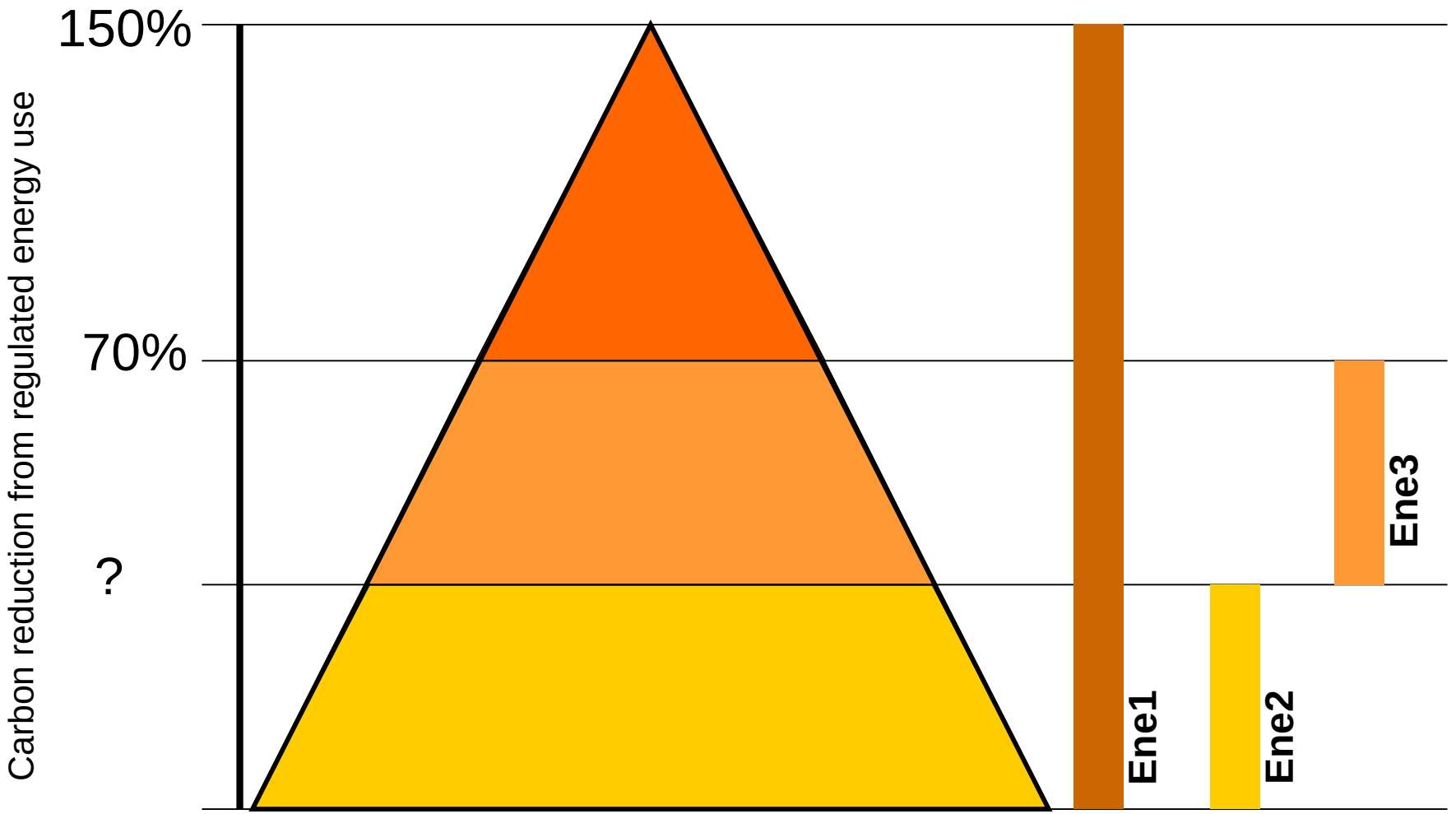
Principles

- Align with future of Part L/energy policy
  - Route to Zero Carbon Homes
  - Reflect phased implementation (2010/ 2013/2016)
  - Common nomenclature/metrics etc
- Ensure continuity with previous Code levels
- Promote innovation, skills and understanding in industry

Carbon Reduction Hierarchy



Carbon Reduction Hierarchy



Reallocation of credits

	2009 version		2010 version	
Ene 1	DER/TER (2006)	15 credits	DER/TER (2010)	10 credits
Ene 2	HLP	3 credits	Energy Efficiency Standard	7 credits

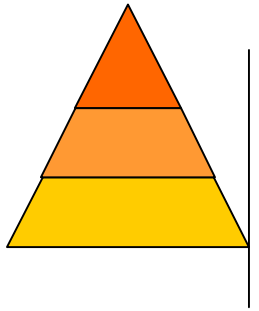
Other key changes

- The following changes are proposed:
  - Ene 2 – Building Fabric: *renamed*
  - Ene 3 – Internal lighting: *removed*
  - Ene 7 – Low or Zero Carbon Technologies: *renamed/renumbered as Ene 3*

Overall credit changes

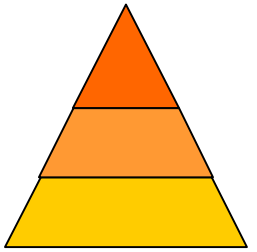
	May 2009 - Version 2		2010 (2009 consultation)	
Ene 1	**Dwelling Emission Rate**	**(15)**	**Dwelling Emission Rate**	**(10)**
Ene 2	**Building Fabric**	**(2)**	**Fabric Energy Efficiency**	**(7)**
Ene 3	**Internal Lighting**	**(2)**	**Renewable Technologies**	**(2)**
Ene 4	**Drying Space**	**(1)**	**Energy Labelled White Goods**	**(2)**
Ene 5	**Energy Labelled White Goods**	**(2)**	**Drying Space**	**(1)**
Ene 6	**External Lighting**	**(2)**	**External Lighting**	**(1)**
Ene 7	**LZC Technologies**	**(2)**	**Cycle Storage**	**(2)**
Ene 8	**Cycle Storage**	**(2)**	**Home Office**	**(1)**
Ene 9	**Home Office**	**(1)**	**Energy Display Devices**	**(3)**
Total	29 credits		29 credits	

Ene 1 – Dwelling Emission Rate



- Proposals are based on following assumptions:
  - Part L adopts the flat approach as set out in consultation
  - Part L achieves an equivalent standard to Code Level 3 (i.e. 25% improvement over 2006)
  - Changes to SAP calculations are not significant
  - DER/TER calculations assume 75% low energy lighting increasable to 100% voluntarily

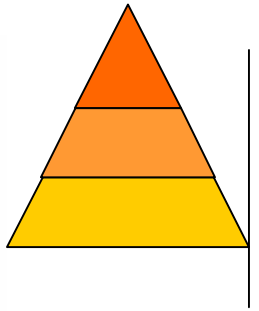
Ene 1 – Dwelling Emission Rate



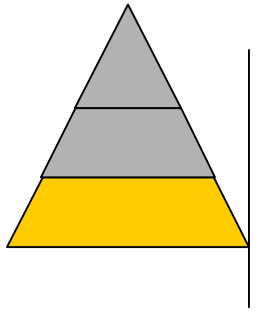
- Proposals:
  - Mandatory @ CL1, 2 and 3 –
    - *Part L compliance*
  - Mandatory @ CL4, 5 and 6
    - *Equivalent to previous standards*
  - Based on SAP 2010
  - Half credits introduced

Table 2: Proposed 2010 Ene 1 Credit Allocation

Mandatory levels	Current percentage improvement of DER over TER	Current Credits	Percentage improvement Of 2010 DER over 2006 TER	2010 Credits
Level 1	**≥10**	**1**	**25**	0
	≥14	2	25	0
Level 2	**≥18**	**3**	**25**	0
	≥22	4	25	0
Level 3	**≥25**	**5**	**25**	0
	≥31	6	≥31	1
			≥34	1.5
	≥37	7	≥37	2
Level 4	**≥44**	**8**	**≥44**	**3**
			≥48	3.5
	≥52	9	≥52	4
			≥56	4.5
	≥60	10	≥60	5
			≥65	5.5
	≥69	11	≥69	6
			≥74	6.5
	≥79	12	≥79	7
			≥84	7.5
	≥89	13	≥89	8
			≥94	**8.5**
Level 5	**≥100** regulated emissions	**14**	**≥100** (70% onsite + 30% allowable solutions)	**9**
Level 6	**'Zero Carbon Home'** – 100 % onsite (equivalent to 150% in total)	**15**	**"Zero Carbon Home"** – 70 per cent onsite + allowable solutions to reach zero carbon	**10**

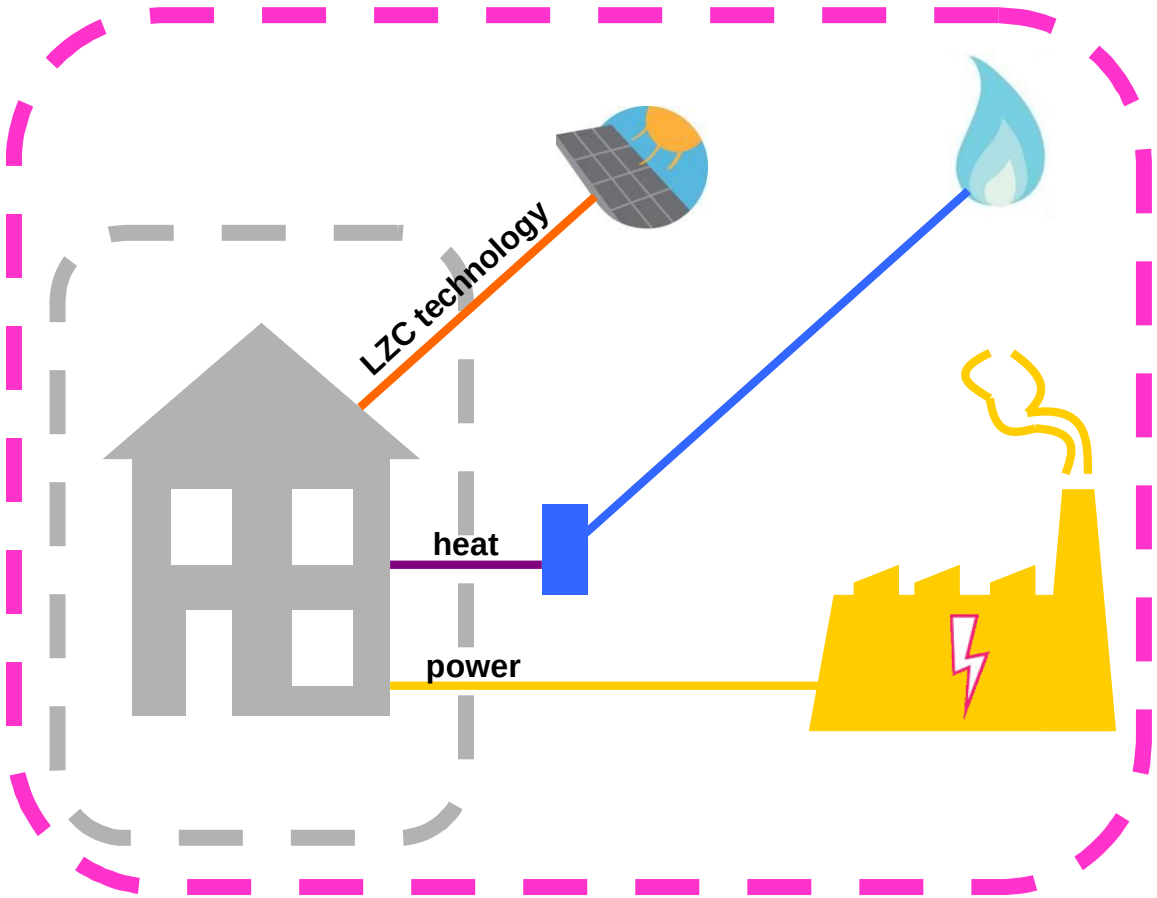


Ene 2 – Fabric Energy Efficiency



- Proposals:
  - Use proposed Energy Efficiency Standard in place of Heat Loss Parameter
  - Encourage movement towards higher inherent fabric standards
  - Set requirements at achievable and cost effective solutions

Scope of ‘Energy Efficiency’



Energy Efficiency Standard

- Building fabric U-values
- Thermal bridging
- Air permeability
- Thermal mass
- Solar, metabolic, lighting & appliance gains

Carbon Compliance Standard

- Heating / cooling appliances (boilers, etc)
- Mechanical ventilation
- Hot water
- Active controls
- Fixed lighting
- All LZC technologies

Metric for Energy Efficiency

- **kWh/m²/yr space heating & space cooling demand**
- Design standard ð **With design guidance**
  - Design Flexibility
  - Takes into account building form
  - Promotes innovation
  - Known level of performance
  - Known ‘currency’ internationally

Specifications Modelled

Current practice

Modified AECB Silver Standard

EST BPEE Standard = between Spec A & Spec B

Spec C but double glazed & air leakage = 3

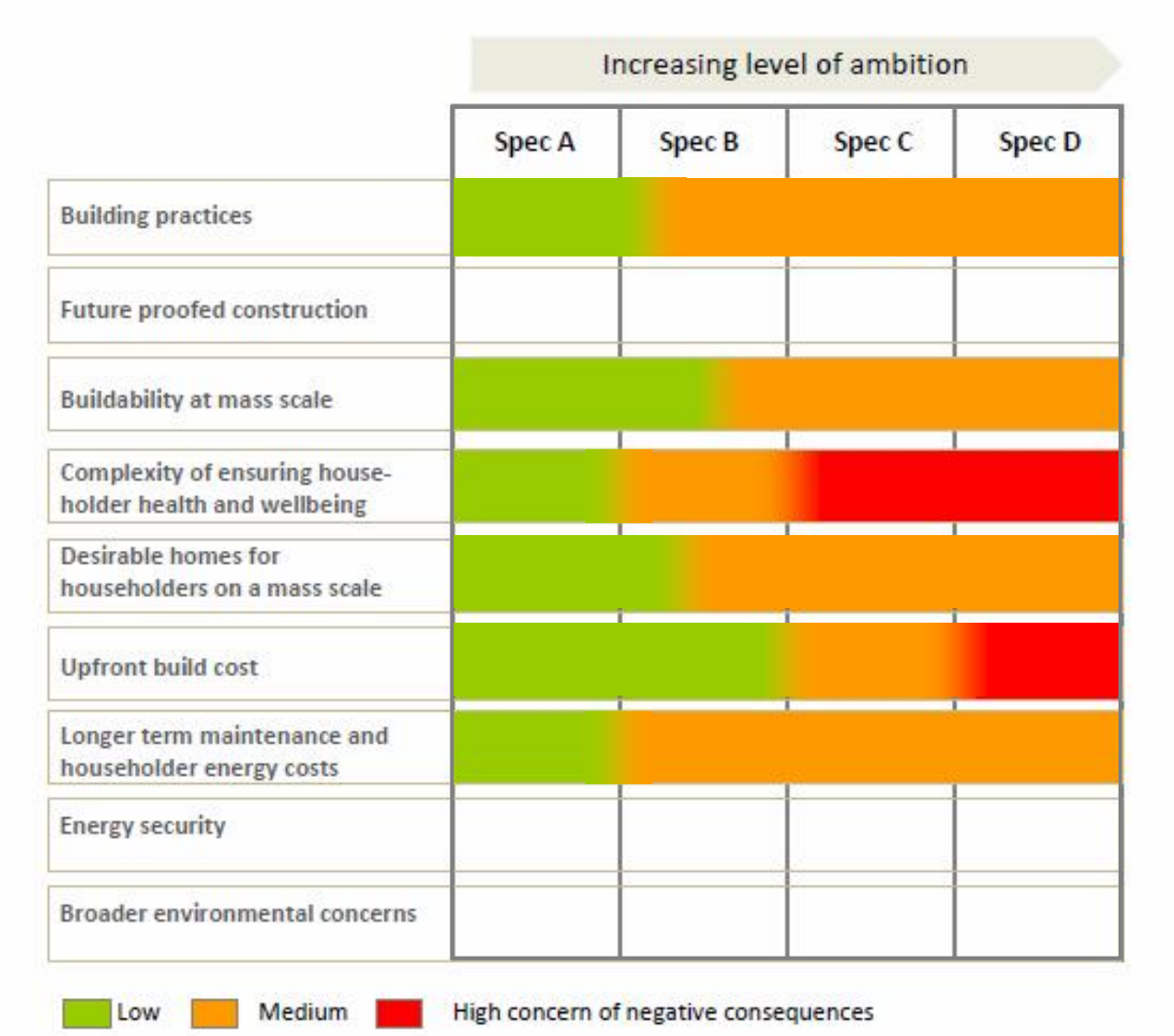
EST APEE Standard

PassivHaus equivalent

		Baseline	Spec A (NV)	Spec B (MVHR)	**Spec B (NV)**	Spec C- (MVHR)	Spec C- (NV)	Spec C (MVHR)	Spec C (NV)	Spec D (MVHR)
U-values (W/m²K)	**External Walls**	0.28	0.25	0.18	0.18	0.15	0.15	0.15	0.15	0.15 – 0.09
	Party Walls	0.5	0	0	0	0	0	0	0	0
	Floor	0.2	0.2	0.18	0.18	0.15	0.15	0.15	0.15	0.15 – 0.08
	Roof	0.16	0.15	0.13	0.13	0.11	0.11	0.11	0.11	0.10 – 0.06
	Windows	1.8 (double)	1.5 (double)	1.4 (double)	1.4 (double)	1.2 (double)	1.2 (double)	0.8 (triple)	0.8 (triple)	1.0 – 0.6 (triple)
	Doors	1.6	1.4	1.2	1.2	1	1	1	1	0.8
	Air leakage (m³/hr/m²)	7	5	3	3	3	3	1	3	1.26 – 0.41
	Thermal bridging (W/m²K)	0.08	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.04
	Ventilation	Natural (extract fans)	Natural (extract fans)	MVHR	Natural (extract fans)	MVHR	Natural (extract fans)	MVHR	Natural (extract fans)	MVHR

breglobal

Task Group Assessment



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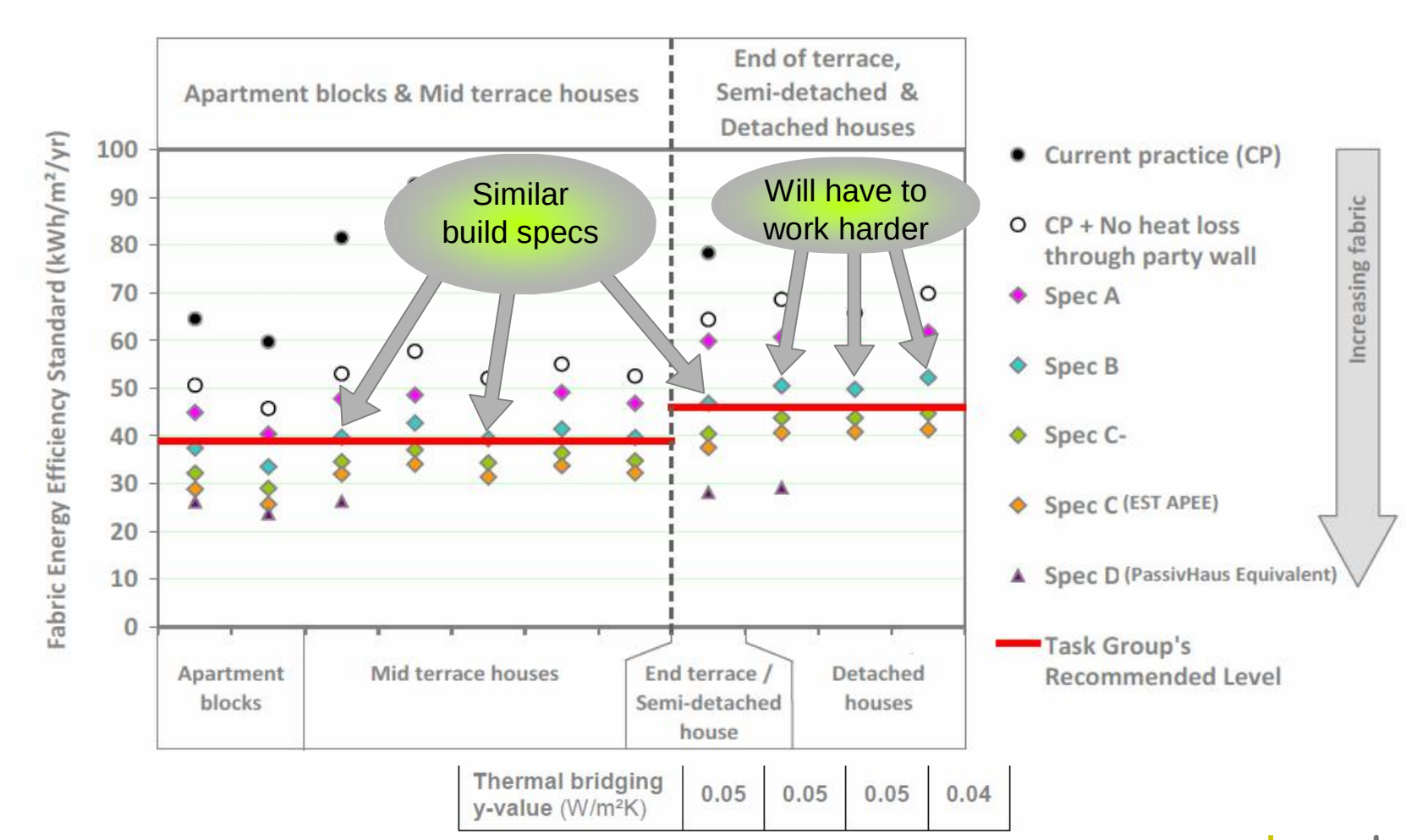
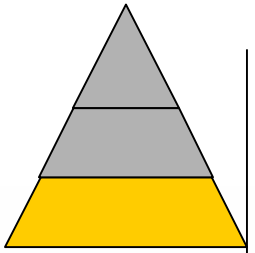
It is not a list of specs but……..

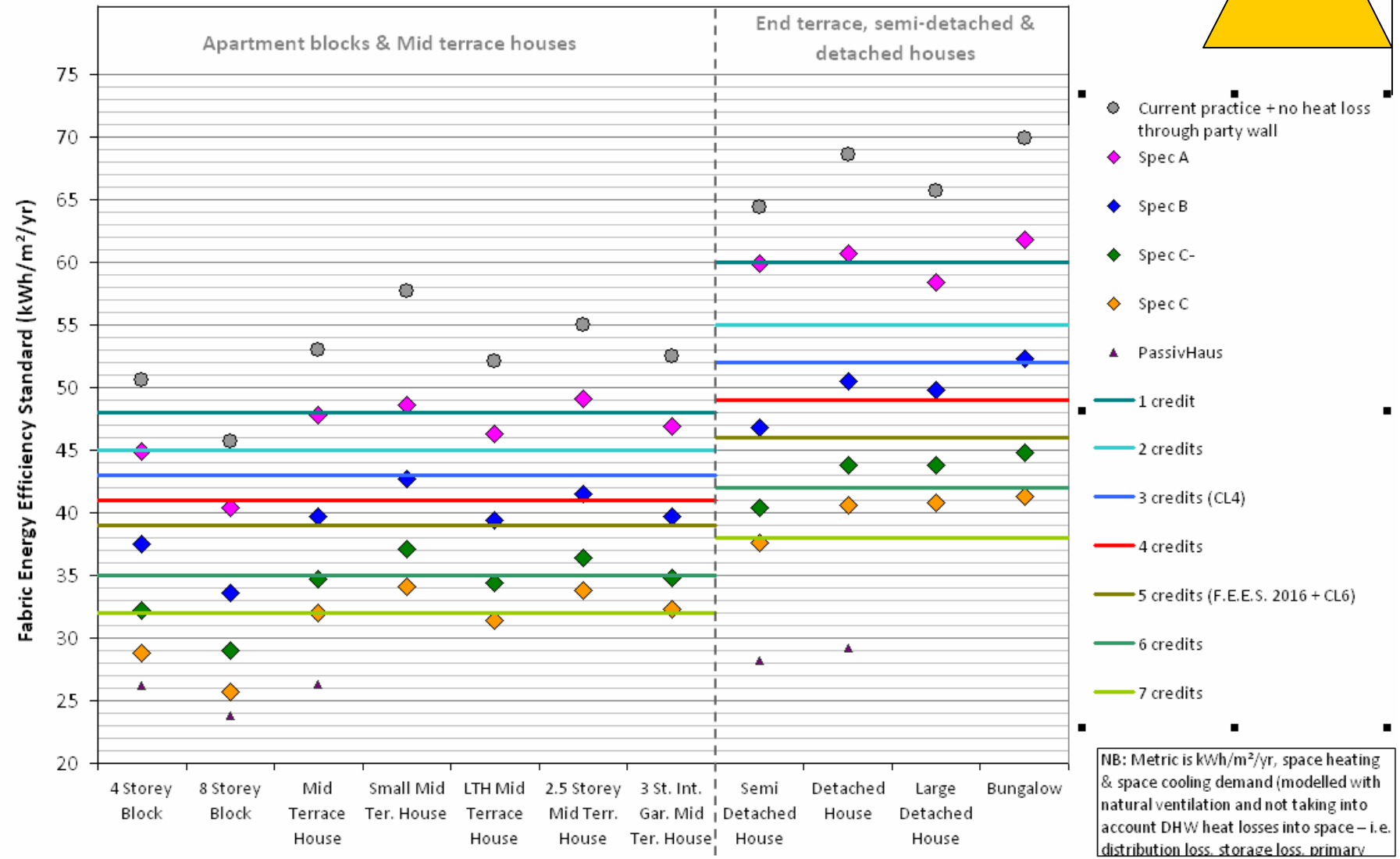


Recommendations summary

- **Performance not prescriptive**
  - Space heating and cooling only
  - No U-value lists or specific limits on elements – use kWh/m^2/yr
- **Two levels depending on dwelling type**
  - Objective being to allow similar construction challenges

Ene 2 – Fabric Energy Efficiency





Ene 2 – Fabric Energy Efficiency

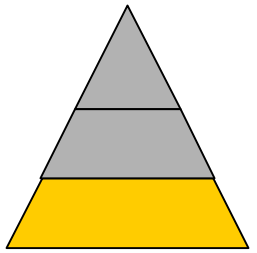
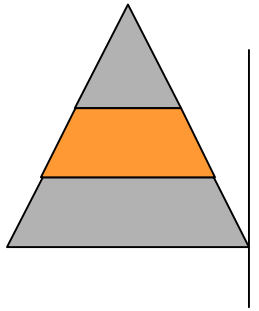


Table 1: Proposed Ene 2 – Fabric Energy Efficiency Assessment Criteria

Energy Demand (Space heating + cooling) kWh/m2/yr			
Apartments, Mid terrace	**End terrace, Semi detached, detached**	**Credits**	**Mandatory Requirements**
≤48	≤60	1	
≤45	≤55	2	
≤43	≤52	3	Level 4
≤41	≤49	4	
≤39	≤46	5	Level 5 & 6
≤35	≤42	6	
≤32	≤38	7	

Ene 3 – Renewable Technologies



- Issue renamed and numbered (was Ene 7 – Low or Zero Carbon Technologies)
- Definition of technologies amended. LCBP list replaced with:
  - EU Renewable Energy Directive definition of renewable technologies
  - Microgen Certification Scheme
  - CHP quality Assurance Scheme
- Feasibility Report removed

Ene 9 – Energy Display Devices

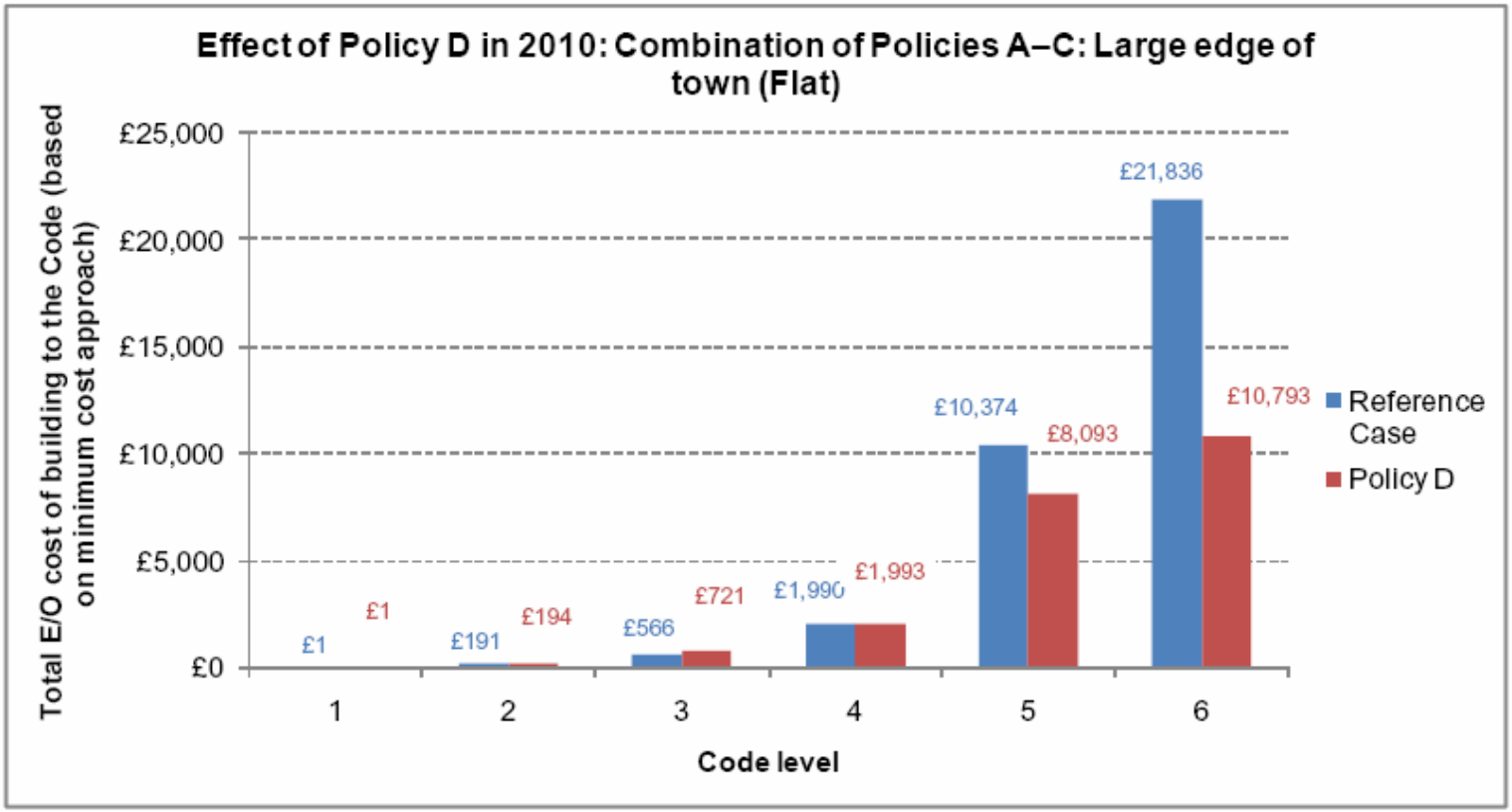
- New credit issue
  - 1 credit – provision of accessible device to monitor electricity OR primary heating fuel consumption
  - 2 credits – provision of accessible device to monitor electricity AND primary heating fuel consumption
  - 1 additional credit – Where the device provided is cable of recording data

Other changes proposed

- Lifetime Homes
- Site waste management plans
- Household waste
- Cycle storage
- Home office
- Scope of the Code

Cost of combined Energy amendments

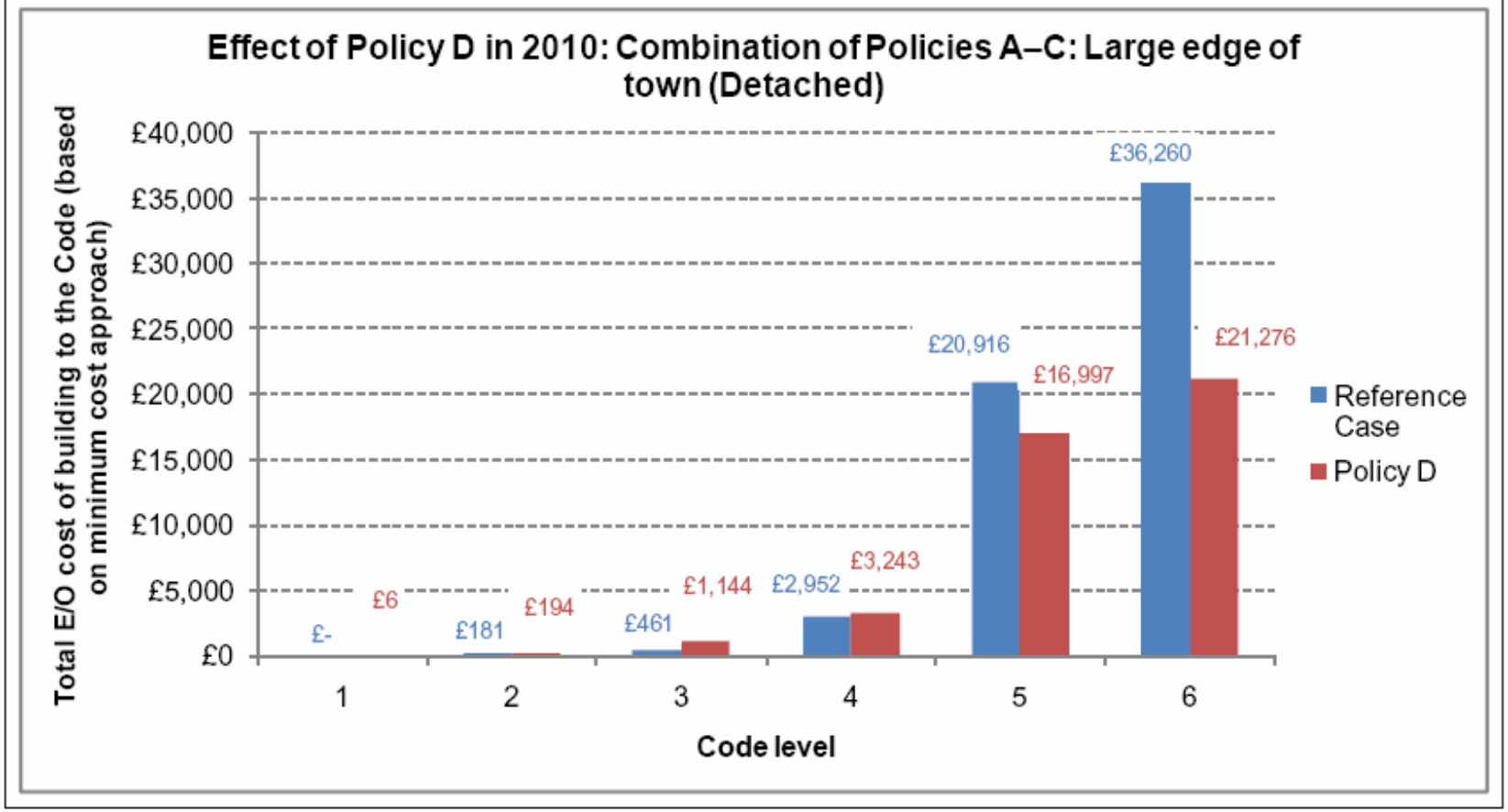
Figure 27: Effect of Policy D on E/O cost of building to the Code for a flat in a large edge of town development



Extract from 'Code for Sustainable Homes – Impact Assessment', CLG 2009

Cost of combined Energy amendments

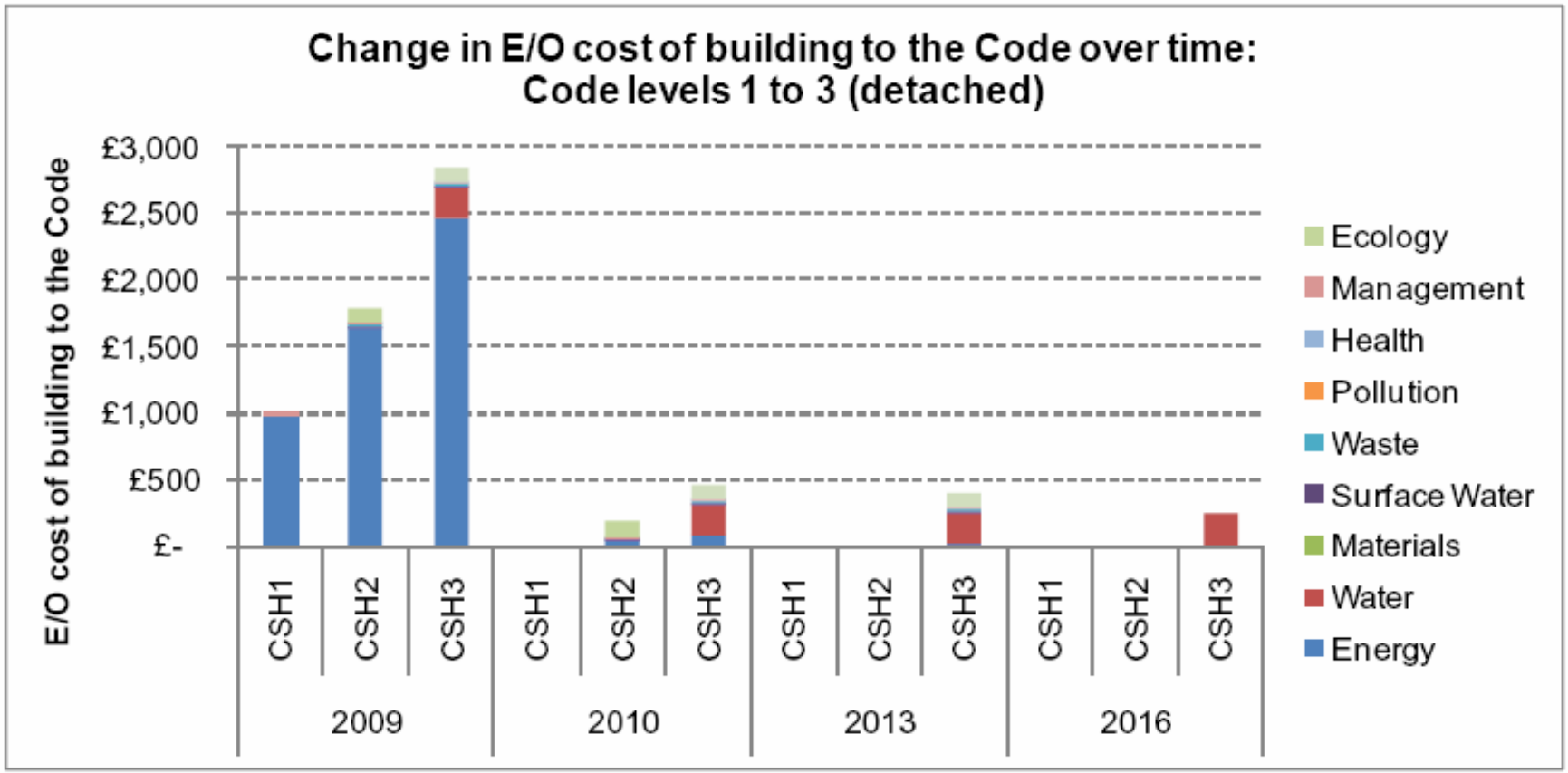
Figure 28: Effect of Policy D on E/O cost of building to the Code for a detached house in a large edge of town development



Extract from 'Code for Sustainable Homes – Impact Assessment', CLG 2009

Additional costs over future regulations

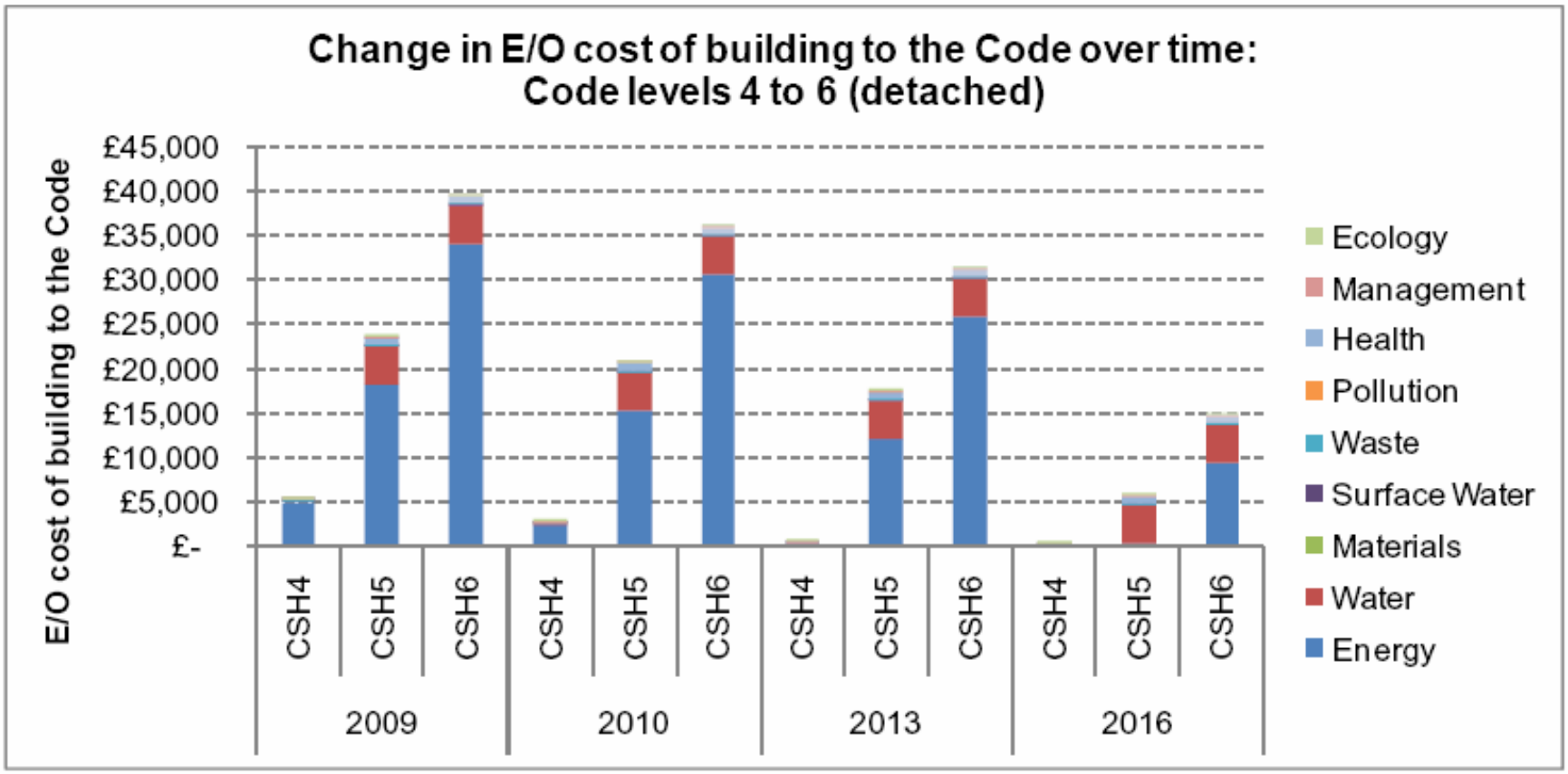
Figure 8: Effect of changing Part L on E/O cost of building to the Code for Code levels 1 to 3 (large urban development)



Extract from 'Code for Sustainable Homes – Impact Assessment', CLG 2009

Additional costs over future regulations

Figure 9: Effect of changing Part L on E/O cost of building to the Code for Code levels 4 to 6 (large urban development)



Extract from 'Code for Sustainable Homes – Impact Assessment', CLG 2009

Summary

- Proposed 2010 revisions:
  - In line with proposals for Part L
  - Recognise the 2016 carbon hierarchy
    - *First - Reduce demands*
    - *Second - Promote higher efficiency*
    - *Finally - Recognise offsite solutions*
  - Provide a clear roadmap to 2016

Thank you for listening

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