

## Report from WG1 Domestic Part L

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### Context

1. This report is from the Industry Working Group set up as part of the Part L 2013 review process and records the views of the industry as represented in the group. It was not intended that the group had to come to a consensus on all or any points. More the aim was to ensure that the diversity of views was accurately represented, thus allowing BRAC, DCLG officials and Ministers to make better informed policy decisions. Four meetings took place in May (2), June and July.
2. The policy context for new homes includes the deregulatory agenda (one in, one out and the pledge not to increase the overall regulatory burden on house builders over the current comprehensive spending review period), localism, and the growth agenda of which increasing housing provision is a part. The context also includes pledges for this to be the greenest government ever and the legally binding carbon targets within the Climate Change Act.
3. Achieving success in work on the viability tool for developments at plan level (house builders and local government led) is seen by the house builders as crucial. This would allow the balancing of many of the competing issues being driven by the complex policy context.
4. Because government has already committed to zero carbon new homes from 2016, it is crucial that government fully understands that any changes to Part L1 2013 are a step in the move to zero carbon from 2016 and not some isolated change. It is imperative that any changes in 2013 are designed to achieve the lowest net cost for 2013 and 2016 in total, rather than looking at the two changes in isolation and possibly ending up with higher costs overall. In terms of technical solutions for zero carbon homes, the Zero Carbon Hub has carried out extensive modelling to establish some ways in which house builders could meet the requirements. In addition a number of trade bodies have worked on further modelling for their particular sets of products including masonry and timber frame. (References to follow)
5. Establishing what the industry is actually using now for Part L 2010 is important but has been difficult; as yet very few homes are being built to this standard but just fewer than 25,000 homes have been built to Code Level 3 or above. Some data has been collected and this has allowed the group to broadly consider the scale of the change in technical specifications that would be needed to meet various possible options for Part L 2013.

## Summary

6. At this stage there is not a consensus on the best options for the standards in Part L 2013. However there are some areas in new homes where a majority view does exist. These are:
  - The need to improve the fabric first before adding renewables
  - The aggregate approach rather than flat approach for setting the level of improvement over Part L 2010
  - Absolute targets are favoured rather than percentage improvements although this is not an overwhelming majority
  - Everyone except electric heating, heat pump manufacturers and timber frame believe fuel factors should be removed, although some would do this via a gradual phase-out.
  - Logbooks are supported but there is scepticism on whether the benefits would be realised in reality
  - Generally there is a view that there is a performance gap but at this stage the need is to gather more evidence and improve practice. There is no support for introducing more compliance on-site testing.
7. The Passivhaus Trust/AECB has proposed that a new dwelling certified as meeting the Passivhaus requirements should be a 'deemed to satisfy' option for Part L1A 2013. There does not appear to be any opposition to this in the Working Group given that this would be a voluntary option.
8. Views on existing homes are more complex and varied and other than on consequential improvements, it is hard to see many areas of agreement.
9. Views on SAP are generally that improvements need to be made for 2013. Each sector had their particular areas of concern, and views gathered have been passed to DCLG and the SAP contractor. These views are in addition to those detailed in the substantive review carried out by the Zero Carbon Hub and published as Carbon Compliance for Tomorrow's New Homes (July 2010).

## Where are we now (2010)

10. In order to establish the options for changes in 2013 (which include no change), it is important to know what technical solutions are being used to meet Part L 2010. However, due to transitional arrangements in Part L 2010 there are very few Part L 2010 homes to look at. Around 25,000 Code Level 3 and above homes have been built but care has to be taken when looking at these because the Code for Sustainable Homes is not the same as Building Regulations. Credits for installing renewables under the Code and Merton Rule type policies may influence designers to specify less onerous fabric standards for instance.

11. The DCLG report for Code homes for 2011 Q1 gives the following certification numbers:

	Design stage	Post completion
Level 3	49,954	22,592
Level 4	6,732	1,873
Level 5	399	101
Level 6	292	31

12. In general, the Working Group has taken the participant's expectations of what will be the typical Part L 2010 specification and used these in the 2010 Baseline modelling work. More details on the individual views can be found in the members' feedback forms. Below is a summary:

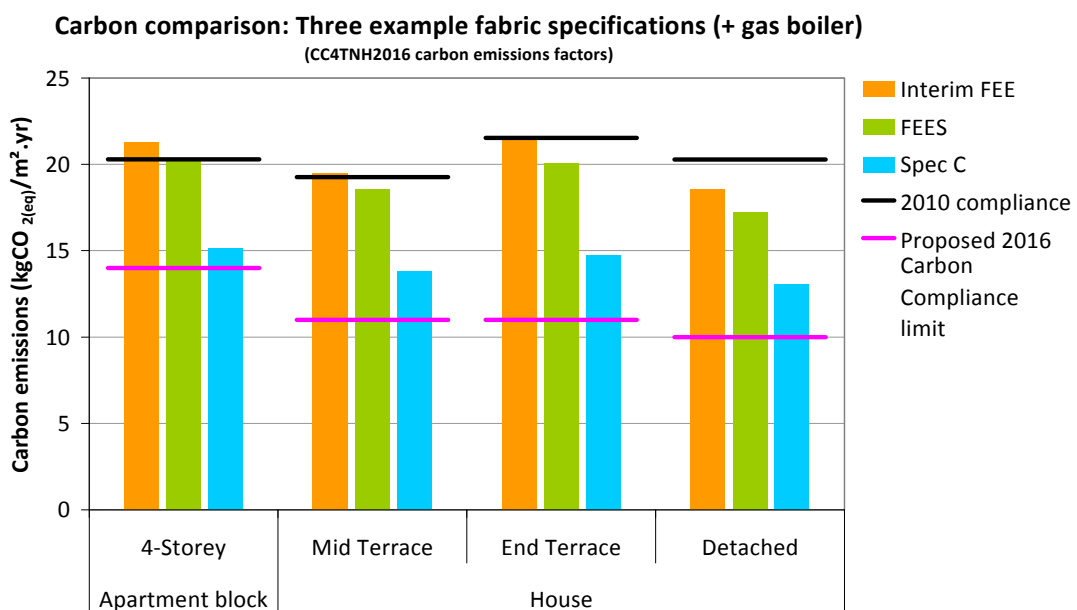
Walls:	A grouping around 0.2-0.26 with outliers down to 0.16 and up to 0.3
Roofs:	Larger builders down to 0.1 with most others below 0.13 but few up to 0.2
Floors:	Large range from 0.12 to 0.26. Beam and block tending to 0.14
Glazing:	Almost all double-glazed, coated, warm edge and argon filled. Range of g-values
Air tightness:	All in 5 to 8 range bar one outlier at 10
y-values:	All in 0.03 to 0.08 range except two outliers at 0.15

## What we will need in 2016

13. The Zero Carbon Hub has carried out extensive modelling work to establish the typical technical solutions needed to meet zero carbon (see <http://www.zerocarbonhub.org/definition.aspx?page=8> for details). It is clear that a very well performing fabric will be a key starting point, followed by the inclusion of low and zero carbon technologies.
14. The Fabric Energy Efficiency Standard (FEES) was proposed by a Zero Carbon Hub Task Group in November 2009, and has subsequently been adopted within the voluntary Code for Sustainable Homes. The metric is kWh/m<sup>2</sup>.yr space heating and cooling demand. The 2016 levels were recommended to be 39kWh/m<sup>2</sup>.yr for apartments and mid terrace properties, and 46kWh/m<sup>2</sup>.yr for end terrace, semi-detached and detached properties. An example FEES 2016 compliant specification for an end terrace house is as follows:
- |                |   |
|----------------|---|
| Walls:         | 0.18 W/m <sup>2</sup> K (Party wall @ zero) |
| Roofs:         | 0.13 W/m <sup>2</sup> K                     |
| Floors:        | 0.13 W/m <sup>2</sup> K                     |
| Glazing:       | 1.4 W/m <sup>2</sup> K                      |
| Air tightness: | 5 m <sup>3</sup> /hr.m <sup>2</sup>         |
| y-values:      | Use of ECDs                                 |
15. The Carbon Compliance levels for zero carbon homes were proposed by a Zero Carbon Hub Task Group in February 2011 to be as-built absolute limits (using 2016 CO<sub>2</sub> emission factors) of:
- 10 kgCO<sub>2(eq)</sub>/m<sup>2</sup>.yr for detached properties
  - 11 kgCO<sub>2(eq)</sub>/m<sup>2</sup>.yr for attached properties
  - 14 kgCO<sub>2(eq)</sub>/m<sup>2</sup>.yr for apartment blocks

## 2013 as a step to 2016

16. Unlike previous changes to Part L, there is a longer-term context for the 2013 change in that government has already set out the performance for Part L 2016 i.e. zero carbon with a Fabric Energy Efficiency Standard, a Carbon Compliance level and Allowable Solutions. Whilst much of this remain to be finalised (and formally consulted on and implemented) the possible technical solutions necessary for the homes in terms of fabric and onsite services are beginning to become clearer through Code homes and modelling. The Zero Carbon Hub and the various working groups have done much work in this area. In addition other groups including supplier trade associations have been modelling various solutions to see how their products would fit into a zero carbon home. Many of these organisations have publications showing that they can meet the challenge although some have expressed caution in the Working Group over the cost effectiveness of some solutions. (References to follow)
17. The Working Group is of the view that any changes to Part L 2013 must therefore be set in such a way as to make the transition to zero carbon as cost effective as possible. The nightmare scenario for all parties would be Part L 2013 driving technical and commercial solutions down a path that does not make the step to zero carbon from 2016 easier, in other words a technical or commercial cul de sac.
18. The house builder representative bodies (HBF, HBA and FMB) believe that there should be no change at all to the Part L requirements in 2013.
19. Amongst suppliers and other parties, there is a more nuanced debate about whether it is better to set performance requirements for Part L 2013 that mean some changes to both fabric (an interim FEES) and services this time and again in 2016, or whether it is better to set the 2016 fabric standards (FEES) for 2013 and not change the services until 2016. Whilst all parties agree that a policy that pushes fabric improvements first rather than renewables first is right, there is not agreement about how far these fabric improvements should go. It also has to be pointed out that setting the 2016 FEES standard as Part L 2013 with no other changes would typically result in carbon savings of around 4-15% over Part L 2010 for houses, and 0% for apartments (at some cost):



20. Supporters of the full FEES in 2013 argue that it will future proof the 2013-2016 cohort of homes, the industry only has to focus on one area of improvement at a time, that fabric is more difficult to get right and so needs to be started earlier. In addition the services side of the industry has argued that with the implementation of the Energy Using Products Directive from 2012 onwards it needs stability in the UK regulations at this time.
21. Supporters of the interim FEES approach (changes to both fabric and services in both 2013 and 2016) tend to focus on better cost-effectiveness of their approach, the state of the housing market and the need to minimise extra costs for house-builders in 2013.
22. Whichever approach is taken (no change, interim FEES or full FEES in 2013) it leads to the conclusion that the Impact Assessment should look at the costs and benefits for both the 2010/2013 change and the 2013/2016 change, and seek to get the best overall solution, whilst being aware of the impact at each change. It is also worth noting that due to transitional arrangements there is a lag of at least two to three years from any change in Part L to significant numbers of homes being built to the new standard. Recent extensions of planning consents from 3 to 5 years will possibly increase this lag. Concerns about 2013 costs for large house-builders should be viewed against the likely housing market in 2015-2016. The first sector that is caught by changes will be small and self-builders, although larger builders with small sites may also be caught earlier.

### ***Modelling work***

23. The group was presented with data from initial technical and financial modelling carried out by the Zero Carbon Hub and Cyril Sweett. This indicated the technical and commercial feasibility of various steps between 2010 and the zero carbon standard (quarter, half, and three-quarter points were investigated). Updated analysis provided by the Part L contractor was also presented at the group's final meeting. The full costs report is being presented by DCLG to BRAC and should be read in conjunction with this report.

### **Key points from the matrix for new build 2013**

24. The matrix (see separate report) sets out the key questions for the members of the working group and tabulates the responses.

### ***Level of Fabric Standards – no consensus***

25. The four options given were no change, an interim FEE level, full 2016 FEES and other. The house builders wanted no change. The insulation industry wanted full FEES or better (the Spec C from the Zero Carbon Hub modelling); roofing, heating, hot water, electrical, renewables and insulated concrete formwork also wanted full FEES; glazing and masonry supported an interim FEE whilst timber frame wanted Spec C. It would seem from the Working Group discussions that a few sectors are nervous about full FEES citing concerns over SAP and thermal bridging. Whether sorting these concerns would cause them to support full FEES is moot.

### ***Level of Carbon Compliance – no consensus***

26. Unsurprisingly views were mixed. A majority supported setting the carbon compliance half way between 2010 and 2016, but several major sectors disagreed. The house builders' view again was no change. Masonry wanted no more than 5-10% improvement from 2010. The renewables sector wanted the 2016 carbon compliance standard set for 2013.

**Improvement phrased as Flat or Aggregate – majority view**

27. All sectors other than timber frame wanted to see the improvements set as an aggregate improvement i.e. average over the whole stock, rather than a flat approach which would be the same level of improvement for all dwellings. As the house builders wanted no change in standards, they did not have a view on this.

**Target set as Absolute or Percentage Improvement – majority view**

28. Not as big a majority as the previous item, but a majority favoured absolute targets for carbon compliance. One sector in insulation would like a concurrent notional building, as in Part L2A.

**Fuel Factors – majority view**

29. It is worth noting how fuel factors are addressed in Part L1A 2010 - see Table 1 shown below.

Table 1 Fuel factor	
Heating fuel	Fuel factor <sup>1</sup>
Mains gas	1.00
LPG	1.10
Oil	1.17
B30K	1.00
Grid electricity for direct acting and storage systems	1.47
Grid electricity for heat pumps <sup>2</sup>	1.47
Solid mineral fuel <sup>3</sup>	1.28
Any fuel with a CO <sub>2</sub> emission factor less than that of mains gas	1.00
Solid multi-fuel <sup>3</sup>	1.00

**Notes:**

1. The fuel factors in Table 1 will be kept under review as progress is made towards the zero carbon target.
2. The fuel factor for electric heat pumps will be reviewed after the renewable heat incentive is introduced.
3. The specific fuel factor should be used for those appliances that can only burn the particular fuel. Where an appliance is classed as multi-fuel, the multi-fuel factor should be used except where the dwelling is in a Smoke Control Area. In such cases the solid mineral fuel figure should be used, unless the specific appliance type has been approved for use within Smoke Control Areas.

30. DCLG are required to review the heat pump Part L 2010 fuel factors once the Renewable Heat Incentive is in place, although it is not currently clear if RHI will be applicable to new homes. This should be addressed before Part L 2013 fuel factors are decided.
31. Notwithstanding the above, the majority of the members of the Working Group would be in favour of the removal of fuel factors (i.e. the TER should be the same no matter which fuel is used in the actual dwelling) although some would make this shift in two stages. The electric technologies, heat pump manufacturers and timber frame sectors would like to keep the fuel factors as present.
32. In the view of the heat pump industry, the original need for a fuel factor has changed little. They believe it is still necessary to avoid penalising electrically driven products since the policy decisions for decarbonising the grid have still not been taken. They see considerable uncertainty about projected CO<sub>2</sub> emissions levels as evidenced by the three levels used in the Hub analysis. HPA/FETA supports the publication of 15 year CO<sub>2</sub> projections by DECC, and would support a gradual reduction of the Fuel Factor if significant decarbonisation takes place or other support mechanisms are put in place. However, at present, neither of these conditions applies despite the planned introduction of schemes such as RHI.

**Dwelling logbooks - consensus**

33. All members agree that logbooks should be introduced but there are quite a few comments on the practicality and actual value in reality. It would appear that the issue for members is demonstrating value to the home occupant. If none or little can be demonstrated then logbooks would not seem to be useful.

### ***Dealing with Design versus as-built performance in 2013 – areas of consensus***

34. The working group accepts that homes may not perform as designed even before occupants are involved. There is a consensus that more evidence is required to establish the scale of the issue. Although some information is available (see Zero Carbon Hub report “Carbon Compliance for Tomorrow’s New Homes - A Review Of The Modelling Tool And Assumptions - Topic 4 Closing The Gap Between Designed And Built Performance” [http://www.zerocarbonhub.org/resourcefiles/TOPIC4\\_PINK\\_5August.pdf](http://www.zerocarbonhub.org/resourcefiles/TOPIC4_PINK_5August.pdf), robust data for all the different types of construction, builders and services does not exist. Therefore the aim for 2013 should be to enable or encourage the collection of such data through voluntary means. Only one insulation company suggested mandatory testing.
35. At this point the views of the group become more diverse. There is a view that SAP (for both fabric and services) and particularly the treatment of thermal bridging need to be revised so as to get better estimates of ‘as designed’ performance. A number of members support more on-site testing for fabric and services; others view improvements in processes as key. Competent Persons schemes are mentioned and also more enforcement from Building Control.
36. If voluntary testing and data collection is going to happen then some carrot is needed to encourage participation. At this stage there is no agreement on what that should or even could be. However, the Compliance and Performance Group and in particular a Performance Sub-group have been grappling with the issue of what might be implementable in 2013. None of this should be taken to imply support for changing the original timetable in the Hub’s Carbon Compliance report of at least 90% of homes by 2020 performing to the as designed levels. Rather it is an attempt to kick start voluntary data collection to help achieve the timetable and inform the 2016 regulations.
37. SAP issues are dealt with elsewhere including in the Hub reports and a separate paper from the Working Group as noted earlier in this report.

### **Existing homes and key points from the matrix for existing homes 2013**

38. In terms of broader policy context, the two major influences in this area are the recast Energy Performance of Buildings Directive that the UK has to implement, and the forthcoming Green Deal.
39. In the EPBD the trigger level for compulsory upgrading the energy performance of buildings is no longer the 1000m<sup>2</sup> floor area but is the following:
- A major renovation is defined as either where the total cost of renovation is higher than 25 per cent of the value of the building, excluding the value of the land upon which the building is situated, or where more than 25 per cent of the surface of the building envelope undergoes renovation.*
40. There is also a requirement that such upgrades shall be ‘cost optimal’. The UK government’s view in the EPBD consultation was that our standards would probably meet this requirement. However this will need to be checked given changes in both building costs and energy costs.
41. The responses from the working group on possible changes for Part L1B are shown in the matrix. The key points are summarised below.

**Performance requirements for 2013 – no consensus**

42. One of the house builder representatives, the insulation sector, roofing and renewables wanted the standards for extensions to be equivalent to new build or better. The masonry sector wanted no change from 2010 levels and the controls sector pointed out the lack of compliance in their area.
43. Regarding replacement glazing, there are 3 methods of demonstrating compliance with regulations for replacement windows – a Window Energy Rating (WER), a whole-window U value or a glass centre pane U value. The 2010 requirements are WER band C,  $U_w$  1.6 or centre pane U value 1.2 respectively. The industry would like to see all three methods of demonstrating compliance maintained.
44. The majority of trade association representatives in the industry support a move to WER band B in 2013 (with a commensurate improvement in U value). However, they acknowledge that a significant proportion of their “grass root” membership – generally SME window fabricators and installers – wish to see no change. The resistance to change is due to perceived extra costs for some products and a reluctance to continually change product specification.
45. It should be noted that different framing materials have different challenges in achieving improved U values and WER ratings. Retention of the centre-pane U-value option is necessary to enable slimline metal framed windows to continue to be used in like-for-like replacements. The industry consensus is that the existing limitations on the use of a centre-pane U-value set out in the 2010 Approved Documents L1B and L2B should not be extended beyond the present wording – but neither should they be further restricted, either by amendment to the AD or by DCLG Circular
46. One member specifically asked for party walls to become a controlled element so that existing party walls could be filled and hence improved. A number of trials have been undertaken on properties with party walls. Although these tests were performed on what might be regarded as new buildings the conditions of the party walls can be considered to be highly representative of the vast majority of party walls built since the introduction of Part E 2002, and reasonably representative of those built in the last 40 years. These trials have measured U-values in existing cavity party walls of at least 0.50 W/mK (Part L1A level) and that it is possible to reduce the U-value to zero by filling the cavity with mineral wool. The reports are:
  - Stamford Brook: 6 houses Masonry Effective U-value 0.6 W/m<sup>2</sup>K  
<http://www.leedsmet.ac.uk/as/cebe/projects/stamford/pdfs/del7coheating.pdf>
  - Elm Tree Mews: 1 house Timber Frame Effective U-value 0.4 W/m<sup>2</sup>K  
<http://www.leedsmet.ac.uk/as/cebe/projects/elmtree/index.htm>
  - Bradford: 2 houses Masonry, Effective U-value 0.6 W/m<sup>2</sup>K  
[http://www.leedsmet.ac.uk/as/cebe/projects/eurisol/eurisol\\_short\\_report\\_final.pdf](http://www.leedsmet.ac.uk/as/cebe/projects/eurisol/eurisol_short_report_final.pdf)
  - Sadberge: 2 houses Timber Frame Effective U-value 0.5 W/m<sup>2</sup>K  
[http://www.leedsmet.ac.uk/as/cebe/projects/eurisol/eurisol\\_timber\\_frame\\_report.pdf](http://www.leedsmet.ac.uk/as/cebe/projects/eurisol/eurisol_timber_frame_report.pdf)
47. Another member wanted encouragement for changing to lower carbon intensity fuels.

***Should consequential improvements be included – consensus***

48. All members agreed that some form of consequential improvements was needed, but there was a range of views on the detail. The glazing industry would limit improvements to the legal necessities from implementing the recast of the EPBD and the timber frame industry would limit it to the elements being worked on in the first place. The masonry industry did not want to introduce a cost penalty for homeowners who have chosen to spend money on home improvements.
49. There were a number of members wishing to see a clear link to the Green Deal as a method of financing such work as well as a way of getting property specific assessment and recommendations at the time the home owner was contemplating work on the dwelling. Upgrading controls of services was mentioned, as were changes to detailed issues on roofing.
50. One member suggested further exploration of the 'no net increase in emissions' for extensions idea.

***Fabric standards for new elements – majority view***

51. The insulation, timber frame, roofing and glazing sectors were in favour of updating the standards to fit in with Part L1A 2013 whereas the masonry industry did not believe changes were necessary. In any case they did not wish to see U-values for walls improved beyond 0.26.

***Fabric standards for retained thermal elements – not clear***

52. Some members wished to see upgrades, others did not but wanted a greater scope e.g. party walls. The flat roofing upgrade criteria needed to be changed to include overlaying on existing waterproofing as a trigger.

**Domestic Buildings Services Compliance Guide (DBSCG)**

53. Working group members were asked for their views on updates for the DBSCG. In general the view is that the guide needs to be made more consistent, and updated in view of EU Directives (especially ERPD). Some areas need updating and clarifying and the HHIC have set out a full list in their response that has general agreement in the services sectors.
54. The insulation sectors would like to see a greater application of insulation on hot and cold pipework as well as ductwork. The masonry sector would like continuous/quasi-continuous heating regimes as an option (see BS EN 13790).

**SAP**

55. The Zero Carbon Hub in their report Carbon Compliance for Tomorrow's New Homes (July 2010) recommended certain changes to SAP. A number of members of this group agree that these changes should be implemented for 2013.
56. There were many other specific requests for changes to SAP, relating to most areas including: occupancy patterns/behaviour; internal gains; the heating regime; ventilation; psi value calculations; overheating, thermal mass and decrement delay; cooling; secondary heating; lighting; hot water; appropriate services/technology combinations; communal heating; controls; Appendix Q. Details are shown in the SAP responses table which has been shared with DECC and the SAP contractor.

57. The heating and ventilation sectors requested that the Part L contractor investigate the application of controls to provide adequate indoor air quality, and how this might be rewarded.
58. The SAP software providers felt that the end-to-end process of a SAP assessment needs consideration. They cite consistency of data input and importantly the consistent use of conventions and the need for robust QA schemes. A suggestion is to QA 'design' calculations as well as 'as built' calculations to help this process. This would ensure that the work of Assessors is checked and corrected soon after SAP revisions go live, rather than a year or more later once dwellings are completed (see comments in document Part L 2013 update, WG1: Member feedback – SAP).
59. The Passivhaus Trust/ AECB proposed that Passivhaus compliant dwellings be given an optional 'deemed to satisfy' status under ADL1A. To support this they state that (i) Passivhaus performance is unquestionably in advance of any energy efficiency standard that might credibly be proposed for 2013, (ii) that it will normally also meet whatever carbon target is proposed without needing the use of renewable technologies, and (iii) that there is an independent Passivhaus certification scheme in operation in the UK, which operates in a competitive commercial market. They also recognise and accept the separate requirement to produce EPCs. There does not appear to be any disagreement in the Working Group for this proposal.
60. House builders cited the need for a credible scheme for thermal bridging details and the need for all areas of thermal bridging to be considered.

### ***Community Heating***

61. The guidance within the current Part L 2010 regarding the calculation and allocation of CO<sub>2</sub> emissions from communal energy systems is not consistent between ADL1A and ADL2A, which apart from being undesirable leads to potential issues on mixed-use sites where the network serves both domestic and non-domestic buildings. It is requested that the Part L contractor investigates this issue such that a consistent and logical approach can be taken.

### ***Continued dialogue***

62. It is requested that government continue the dialogue with industry regarding the changes for 2016 to make sure that any research/ investigatory work required has time to be carried out prior to the formal 2016 review, and to give industry confidence in the direction of travel and hence ensure deliverability. It was agreed that the chairman (as a non-executive director of the Hub) should start a dialogue with the Zero Carbon Hub on ways to set up a formal mechanism that would achieve this. In addition such a group should be proactive in developing industry views, together with robust and agreed data, in good time for the 2016 Part L review so that the issues with short timescales experienced with this review are not repeated.

John Tebbit, BRAC member: chair of WG1

Zero Carbon Hub: Secretariat