

## Proposals for amending Part L and implementing the EPBD - Collation of issues raised by consultees.

### Introduction

- 1 This document summarises the responses to the consultation exercise relating to the proposals for amending Part L of the Building Regulations and implementing the Energy Performance of Buildings Directive. 414 separate responses have been received. This document collates the comments made by respondents. The numeric analysis of the responses to the specific questions is reported separately (see appendix A).
- 2 A number of general points about the information presented here should be noted.
  - a) The collation of comments given in the body of text may present a message that is contrary to the balance of opinion indicated by the numeric analysis. Consultees tend to provide comments where they object to a proposal, and just tick the "Agree box" if they support the proposal. Consequently, both the comments and the numeric analysis have to be considered when assessing the responses.
  - b) The numeric analysis as given has no weighting factors applied, i.e. the response of a trade body or professional institution with several hundred members has been given no more weight than that of an individual member of the public. Although all comments are considered on their merits, special attention has been given to those being made by representative bodies.
  - c) It was clear from the responses that some organisations "played the numbers game" by encouraging several individuals to send in essentially the same response. This tends to distort the message coming from the numerical analysis, especially when trade bodies work hard to produce a single collective response from all their members (see point b)).
  - d) Consequently, the comments as given below are the main impetus for changes to be made to the consultation proposals, with the numeric analysis being used to gauge the popularity of key elements of the proposals.
  - e) It should also be noted that the same issue is often raised in response to different questions. Where this occurs, the point is not repeated under each question.
- 3 Because of the number and detail of the comments received, this paper does not aim to be exhaustive, but tries to capture the flavour of the responses and to highlight the key strategic issues. A separate working document has been prepared which summarises all the key points in bullet form. This records over 1,000 detailed points, which in some cases only provide pointers to individual responses where even more detailed technical comments were made.
- 4 As would be expected, the opinion on every issue was divided, and so this paper cannot represent all that wide body of opinion. It therefore summarises the balance of the opinions expressed, and brings out the strong points on both sides of the argument.
- 5 The analysis that follows has been subdivided according to the same sections and questions as used in the consultation response form.

### Overall Strategy

#### ***Q1 - Implementation into Law***

- 6 The consensus seems to be that the legislation covering the performance of buildings in use should all be covered within the same legislative procedures. This was particularly the case with respect to boiler and air-conditioning inspections, but to a lesser extent, in respect of building certification too. It was suggested that the appropriate legal framework would be best determined by the logistics of enforcement powers and where those powers rest. A dominant theme was that the key was the effectiveness of enforcement, and that perhaps the precise legislative vehicle was less critical.

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- 7 There was concern that the ongoing requirements would need to be looked at carefully in the light of the Landlord & Tenant Act, especially in relation to the respective duties and obligations for preparing energy certificates.
- 8 In respect of air conditioning systems, it was suggested that any arrangements should take cognisance of other related requirements (such as registers of cooling towers and regulations implementing the F-gas Directive).

**Q2 - Implementation time scales**

- 9 The general consensus was that a 5-year review period was the minimum interval that could be considered. However, many respondents pointed out that construction has to take into account the requirements of all parts to Schedule 1, and that therefore there was almost continuous change. This allows no stability in product manufacture. It was therefore suggested that there should be common review dates for those parts that have strong interactions (e.g. A, C, E, F, J and L), thereby allowing more time to develop consistent solutions. Another suggested approach to solving this problem was to develop "horizontal" ADs that covered all the functional requirements for a given type of building.
- 10 Another strong theme was that although 5-yearly reviews were sensible, that did not mean that change was essential every five years. Several respondents suggested that standards should be changed only every ten years, with the intervening review primarily concentrating on revisions to the supporting guidance, e.g. to accommodate new technologies etc.
- 11 The common plea from industry was for as much notification as possible about the future standards, so that product development and manufacturing capacity could be planned accordingly. It was also a strongly held view that new standards should be based on a clear understanding of the impact of the previous changes. In both of these respects, many respondents criticised the pace of the current review, especially given the fact that the calculation methods for assessing compliant designs are not yet available.
- 12 For these reasons, some respondents have suggested that the implementation of the revised energy performance standards be deferred, although recognising that the UK cannot defer implementing the Directive. As one respondent expressed it, it would be much better to have a good 2007 Part L than a rushed 2005 one.
- 13 Another common suggestion was to link the Part L performance standards to the Sustainable Building Code, whereby the SBC encapsulated the standards set out in the Future Thinking Paper (FTP), i.e. represented the standards anticipated for the next review. This would require Part L and the SBC to adopt the same methodology, and for this to be consistent across the UK. In this way, those who adopted the SBC would be developing the experience bank for the mainstream of the construction industry when the new standards became the minimum. It was also suggested that as well as signalling the 5-year forward look, attempts should be made to look 10-years ahead.
- 14 Another suggestion was that the forward planning for the next revision should begin now, and that the Industry Advisory Groups should be involved from the very beginning.

**Q3 - Structure of the Approved Documents**

- 15 There was general support for the split of the ADs into four parts, although some felt they should be four parts of one publication rather than separate publications. The main concern was that there was a need to better define which AD should apply in mixed-use developments, and in situations where non-domestic buildings contained residential accommodation similar to dwellings (e.g. nursing homes, hostels etc).
- 16 A number of instances were highlighted where confusion might exist over which ADs would apply. Examples include
- a) Relocating a portable building - is that a new building, or work on an existing building?
  - b) How to deal with community heating schemes, which might serve both dwellings and non-domestic buildings.
  - c) Where a new dwelling was created from a change of use of an existing building.
- 17 One concern over splitting the ADs was the possibility of inconsistencies between the guidance. The supply chain feel that it is essential that the basic product standards be the same irrespective

of which market they are selling in to, and so careful scrutiny of the ADs would be needed to ensure that such consistency was maintained.

**Q4 - Strategic nature of the ADs**

- 18 The broad approach taken in the draft ADs was generally supported, but a number of reservations were expressed about the status and availability of the second tier guidance documents. Some of the key comments were -
- a) It was suggested that the functional requirements were now in the ADs, with the practical guidance now being in the second tier documents. It was suggested that this might go beyond the powers in the Building Act.
  - b) A concern that if the documents did not appear in time, BCBs would be left with the responsibility to research the issue in order to discharge their statutory duties.
  - c) A concern that only major industry players could support the development of these second level documents, and that the content might therefore be biased towards the solutions and materials of those players. It was also suggested that the second tier documents might be more prescriptive than the ADs themselves. It was suggested that to satisfy these concerns, the second level documents would have to be peer reviewed in some way and approved by ODPM, with a clearly defined on-going monitoring and revision process being set in train. Some suggested that these publications should also have been part of the formal consultation.
  - d) Guidance relating to common issues should be consolidated into a single second level publication - e.g. there should not be a plethora of publications relating to heating, but one publication dealing with all the options.
  - e) The publications should all be easily and freely available, with many suggesting web downloads as the preferred delivery mechanism. Other responses pointed out that this would not be practical for some organisations who relied on income from selling publications to fund both the work needed to develop the content and the costs of production. It was suggested that one way around this problem might be for appropriate extracts to be made freely available, with the full document remaining a priced publication from the originators.
  - f) As well as giving references to technical guidance, it was suggested that the ADs could usefully point to documented case studies describing practical implementation of appropriate solutions. It was suggested that the Energy Savings Trust and Carbon Trust might have key roles to play here.

**Q5 - Commentary column**

- 19 There was almost universal support for this innovation. The only caveats were that care would be needed to limit the comments to explaining the background and reasons for the guidance, and not be a route to introduce additional or alternative guidance.
- 20 It was suggested that the commentary column should be used to explain the need for minimum standards and the requirements for the avoidance of solar overheating.

**Regulatory Impact Assessment**

**Q6 Target Improvement**

- 21 There was general acceptance that improvements to building energy standards were necessary, but as might be expected, there was a very wide range of opinion on the scale and timing of the improvement. It is probably true to say that the majority felt that the proposed ~25% improvement was challenging but achievable in most sectors, although there was widespread concern over the timescales for implementation, and over the degree to which compliance would be achieved in all sectors.
- 22 The biggest concern was over the requirements to train the workforce; one respondent summarised the problem by saying the material and technologies were available, but the installation skills were not. It was suggested that the targets should be set so as to achieve universal "buy-in" rather than setting them too high and creating an avoidance culture. Two ways around this problem were suggested -

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- a) Reduce the targeted improvement from 25% to 20%, which it was suggested would tie in with the government's target of 20% improvement by 2010.
  - b) Defer the implementation date for the new standards to allow more time to develop the necessary solutions and train the industry in their effective application.
- An alternative view was that it was better to set the standards a little high and miss them slightly, than to set them too low and achieve them.
- 23 In contrast to these comments, the renewable energy industry felt that their sector could make a bigger contribution to achieving higher standards than the draft ADs had signalled. A related point was that the nature of the electricity supply industry was changing dramatically, and so designing buildings to the current norms might be locking buildings into the wrong strategic decisions.
- 24 Some respondents identified particular sectors where they felt the proposed improvement would be very difficult to achieve. The main areas were -
- a) Large detached dwellings, where it was felt that the level of improvement needed to meet the TCER was much greater than 25% (a figure of 40% was often quoted).
  - b) Naturally ventilated non-domestic buildings
- 25 Another frequent comment was to criticise a perceived over-emphasis on operating CO<sub>2</sub> emissions as the sole performance criteria. The portable buildings market felt their sector was disadvantaged by not accounting for wider sustainability issues (reduced waste due to factory production, re-use of building etc). The solid fuel industry felt that more emphasis should be placed on diversity of fuel sources and issues relating to security of supply, given the large indigenous coal reserves that might still be recoverable.
- 26 One respondent felt that the exempt building classes should be reviewed, as these now often included significant energy users. Conservatories and buildings <30m<sup>2</sup> were quoted as particular examples.

**Q7 - Cost benefit data**

- 27 There was a general feeling that some of the costs had been underestimated, although many recognised the difficulties of getting realistic costs in a changing market. It was suggested that where the size of a development was significant (> 5,000 units), then managing the supply chain could deliver zero energy dwellings at zero marginal cost.
- 28 It was also pointed out that the energy costs used in the analysis were considerably lower than current prices, and that therefore the benefits were underplayed. A further related point was the suggestion that the mean internal temperature of well-insulated houses is higher than the national average, and that SAP therefore underestimates the heating requirements of such houses.
- 29 Specific aspects of the analysis that were criticised were
- a) the cost benefit analysis on window performance looked solely at heat loss and ignored the benefits of daylight and passive solar gain in winter. It was also suggested that the costs of better window standards should reflect re-tooling costs for wider window sections as well as the extra cost of low-e glass.
  - b) The extra land costs associated with wall footprints >300mm had not been accounted for.
  - c) The marginal cost of some renewable technologies could be close to zero (or even negative in some situations), since the PV replaced an alternative cladding material, which had its own costs.
  - d) Controls and system effects are increasingly influencing heating efficiency, and so relying on SEDBUK as the sole measure of performance is inappropriate, particularly if the boiler also generates the domestic hot water.
- 30 One particular area of concern was that Local Authorities felt there would be a substantial increase in non-chargeable activities such as information services, property enquiries etc.
- 31 It was suggested that there was no analysis of the costs and benefits of the improvements to the existing stock associated with proposals in ADL1B and ADL2B (although other respondents felt the costs were grossly under-estimated for non-domestic refurbishment!).

**Q8 - Categories of Risk**

- 32 One concern expressed related to shortages of insulation in the market place. This had been a problem following the last review, and there was a worry that the proposed significant increase in standards might result in further material shortages, although TIMSA indicate that this is unlikely to be a problem.
- 33 There were concerns that moving to cavity widths >100mm would result in conflicts with Parts A and E. Greater weight of insulation would also require a greater support structure.
- 34 There were concerns over the fact that products can no longer be said to comply with the requirements of Part L. This will create difficulties for specifiers, particularly the small traders who have traditionally relied on the elemental route to compliance.
- 35 There was concern over the impact of increased airtightness on the incidence of mould growth, especially toxic moulds.
- 36 It was suggested that if standards were made too demanding, then it would encourage a repair rather than a replacement culture, especially with respect to boilers and gas fires.
- 37 There was also a concern that the drive for improved standards was demanding the use of relatively untried technologies, and there might be a consequent increased risk of equipment failure.

**Q9 - Disproportionate effects**

- 38 As might be anticipated, some organisations feel that the sector they represent would be disproportionately affected by the proposals. The main sectors include
- a) Fuels other than gas, especially in situations where gas is not available.
  - b) Gas, oil and solid fuel fire markets; if a flue is included in the house then SAP increases the heating demand. This might encourage the builder to omit the flue to meet the TCER, with the owner subsequently installing an electric fire resulting in a lower overall CO<sub>2</sub> standard.
  - c) Steel windows, which it is claimed cannot achieve any of the proposed standards.
  - d) Manufacturers of soft-coat low-e; they claim they would be disadvantaged by the use of the Window Energy Rating Scheme, which they assert favours solar benefit over improved U-values.
  - e) Some sectors feel that LZC technologies have been unduly favoured over long-life measures like insulation, although the LZC industry also felt that it could make a greater contribution to CO<sub>2</sub> reduction than anticipated in the consultation document.
  - f) Commercial heating market, since it was felt that 40% of products could not meet the proposed standards.
  - g) On a related issue, the domestic boiler market feels unfairly treated because the only prescription in the ADs is for condensing technology. It was noted that although there was a large programme to train heating installers in England on condensing boilers, there was no funding for a similar programme in Wales, yet the same standards would apply.
  - h) Products that struggle to meet the benchmark elemental standards, because the overall standard is so tight that although there is trade-off in theory, there is very little room for manoeuvre in practice.
  - i) Portable buildings, especially in respect of the need to generate Asset and Operational ratings for the short-term rental market. As a related issue, some felt that there should be exemptions for temporary structures, agricultural buildings etc.
  - j) Retail buildings, as they change controlled elements more often than other building types.
  - k) Industrial rooflights, because g-values (a measure of solar control) are not available for such products.
  - l) Owners of portfolios of energy inefficient buildings, since the value of such buildings might decline as the availability of energy performance certificates make potential purchasers and tenants more aware of energy efficiency.

**Q10 - The Building Control System**

- 39 There was general agreement that bcbs would struggle to cope with the increased demands placed on them by the proposed changes. There was disagreement about how to solve this problem.
- 40 On one hand there was a wide body of opinion that saw self-certification by competent persons as the solution. In particular, many respondents recommended that only competent assessors should carry out the energy calculations that underpin ADL1A and ADL2A (it was suggested that just using accredited software would not provide sufficient quality assurance). However, others felt that CP schemes would just lead to varying standards, and that the only answer was to properly resource the building control system. On a related theme, several responses expressed concern with the delays in progressing existing CP scheme applications. It was also noted that if new CP schemes were to be ready in time, then ODPM should give a clear and early steer on their acceptability.
- 41 Another suggestion was that the Approved Inspector system should be modified to allow an AI to approve that a scheme complied with a Part or Parts of the Regulations (e.g. Part L) rather than the whole of Schedule 1.
- 42 It was suggested that for the regulations to be enforced properly, there would need to be a significant increase in the level of site inspection. It was also recognised that it was work in existing buildings where the real difficulties lay, because the degree of "reasonableness" was so context dependent, and therefore the guidance would need interpreting in the light of a good understanding of energy efficiency.
- 43 It was suggested that although the amount of work captured by the regulations might be expanded, most householders would be unaware of the requirements and so the "trigger would never get fired". One suggested solution for work on heating installations was that only a competent person should be permitted to install heating equipment.
- 44 It was noted that the Energy Efficiency Partnership for Homes has carried out a study of the levels of non-compliance with the existing Part L. This indicated worryingly high levels of non-compliance. The report is available from the EST website <sup>i</sup>.

**ADL1A - new dwellings****Q11 - Regulation 13**

- 45 A frequent comment was that there was little merit in just submitting the target carbon performance; it should be accompanied by a first estimate of the predicted performance of the dwelling. It was suggested that this requirement would mean the early involvement of expert SAP users, and this might disadvantage small businesses that might rely on the model designs approach.
- 46 Several responses stressed the need to tie together the calculations required by Article 7 and those done for demonstrating compliance. Since the former had to be done by "a qualified and/or accredited expert", it made sense to apply the same criteria to those submitting compliance calculations.
- 47 It was suggested that it was much more important to provide TCER and DCER at completion of the dwelling, when the calculations should relate to the as-built works, not on the design intent. More detail on the form of an appropriate energy statement was also requested.
- 48 A plea was also made to make it clearer which units were being used, as there was potential confusion over whether the target was based on carbon or carbon dioxide. As it is the latter, it was suggested that the terms used should be TCER and DCER. On a related issue, some felt the cost-based SAP index should be dropped altogether, since it could lead to environmentally damaging fuel switching.
- 49 It was suggested that by moving towards CO<sub>2</sub> equivalence irrespective of fuel type, undue emphasis was being placed on the environmental aspects of the sustainability agenda, with insufficient weight being given to the economic and social aspects.

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<sup>i</sup> see [http://www.est.org.uk/partnership/uploads/documents/Houses\\_airsightness\\_report\\_Oct\\_04.pdf](http://www.est.org.uk/partnership/uploads/documents/Houses_airsightness_report_Oct_04.pdf)

**Q12 - Seven step approach**

- 50 This proposed approach polarised attitudes; many welcomed it as offering appropriate flexibility in design and a stimulus to innovation. Others deplored the loss of a simple elemental route to compliance, suggesting that the 7-step method is at odds with the design process because compliance couldn't be assessed until the design was complete.
- 51 One response suggested that the seven steps could be restructured into five processes that would then be common between dwellings and non-domestic.
- 52 In terms of establishing the TCER, several suggested the use of tabulated factors was inappropriate, since it introduced discontinuities into the performance curve. The information should either be given as an equation, or as point values with interpolation between. It was also pointed out that the table of Shape Factors should be extended to cover a wider range, although some suggested the target should be independent of shape (and fuel). One respondent suggested the TCER/DCER should be based on volume rather than area to account for the effect of high ceilings.
- 53 There was some concern over the fuel factors, with many efforts to justify alternative numbers. Some of the strategic points made included
- a) Gas is unduly favoured because the figure does not adequately recognise the impact of leakage from the gas grid, and especially the relative global warming impact of methane. Further, the increased import of gas from far afield meant leakage losses were increasing.
  - b) Solid fuels should be sub-divided into 3 categories, mineral fuels, multi-fuels and bio-fuels.
  - c) Different factors should apply to day and night electricity.
  - d) Several respondents suggested that there should be a specific requirement to include an element of LZC technology in every dwelling.
- 54 There was general support for the need to include minimum standards for heating and hot water appliances (including controls) and lighting, in addition to the minimum insulation standards.
- 55 Several respondents felt that the potential for overheating should be reflected as an energy penalty, so that this would be included in the rating on the Energy Performance Certificate (EPC).

**Q13 - Terraces and flats**

- 56 There were some concerns that the proposed guidance went against the concept of issuing a SAP rating for each dwelling. A further concern was over the legal implications of an individual dwelling not achieving its TCDER, even though this would be compensated by better performing dwellings on the same development. One respondent suggested that this problem might be addressed by specifying a maximum allowable deviation from the individual TCDER, which would also help to prevent very inefficient penthouses being compensated by other flats in a block.
- 57 It was pointed out that although the proposed approach might work well with regard to heating and HWS demand, it was not really practical to average out solar overheating criteria.
- 58 It was pointed out that there was inconsistency between ADL1A and SAP2005 in respect of the guidance on how to deal with blocks of apartments with heated common areas.

**Q14 - Worst acceptable standards**

- 59 There was no dissent about the need for worst acceptable standards; indeed as previously noted, the consensus was that there should be minimum standards for heating, HWS and lighting (and possibly LZC) as well as for fabric.
- 60 There was a range of views on the individual standards, some feeling they should be tighter, while others felt that they should be less restrictive. Some of the key observations were
- a) The standards for windows should be based on the standard BFRC configurations; it was also noted that on small dwellings where the door to window ratio is bigger, the area-weighted average would be difficult to achieve, unless there was a separate standard for doors.
  - b) There should be separate standards for the different forms of roof construction

- c) There should be flexibility in the area-weighted values to enable this to be traded off between elements (i.e. walls against roofs), provided the individual element standards were met.
- d) There was concern over how thermal bridge effects should be incorporated into the U-values of small individual elements.
- e) There should be additional requirements for floor insulation where under floor heating was specified (i.e. to minimise "down losses").

**Q15 - Quality of construction**

- 61 There was general support for the need to achieve good quality construction, but there were some doubts about whether the proposals would achieve that end. In particular it was felt that there was no evidence that robust details were indeed robust, and so the system would not pick up the poor site practice, which it is alleged is the cause of much poor performance.
- 62 As with most aspects of the consultation, there was a range of views on the degree of testing that should be required. Some felt all dwellings should be tested; others felt testing should be extended to include thermography, whilst others felt the approach was too draconian without first giving the builder the opportunity for preliminary site testing.
- 63 In terms of robust details, many observed that these needed to be extended to cover extreme exposure and a wider range of insulating materials. It was also suggested that details don't exist for walls with a U-value better than  $0.3\text{W/m}^2\text{K}$ .
- 64 It was suggested that testing should be carried out by companies operating QA schemes monitored by third parties, but membership of ATTMA and its associated requirements for UKAS accreditation was an unnecessary burden for small businesses.
- 65 It was suggested that a single person be made legally responsible for ensuring and certifying that acceptable workmanship has been achieved, an approach that is apparently used in Germany, Austria and Switzerland. It was noted that this might be a role for the Appointed Person proposed in the Sustainable and Secure Buildings Act.

**Q16 - Model designs**

- 66 There was general consensus that model designs should not be part of the AD, since they might be taken as "deemed to satisfy" provisions. Albeit, it was felt that the model designs would need to be verified in some way.
- 67 It was suggested that a better approach would be for ODPM/Defra to make freely available a SAP based design tool. This could include a number of alternative default combinations of packages, which would act as starting points for the design process. This approach would encourage all designers to use the calculation procedure from the earliest stages of design, and enable seamless progression into compliance checking. This approach would also avoid the danger of stifling innovation, which some saw as a danger with the model designs approach.
- 68 It was suggested that the examples given in Appendix B concentrated overmuch on heating and hot water and not enough on overheating issues. It was also suggested that the example dwellings used in ADL1A should be the same as those used in ADF.
- 69 There was also criticism that the examples were not complete, e.g. there were no illustrations using solid fuel heating, or of packages involving secondary heating systems. It was suggested that in order to avoid bias, examples illustrating the use of all technologies should be included, or else no examples should be given.
- 70 It was suggested that the benchmark standards were too demanding; it was stated that masonry construction with aggregate block inner leaf could not achieve a U-value of  $0.27\text{W/m}^2\text{K}$  within a 300mm footprint. It was also asserted that the self-weight of insulation laid at ceiling level would compress the insulation, so that the proposed standard of  $0.13\text{W/m}^2\text{K}$  would not be retained over time.

**Q17 - Checklist approach**

- 71 This was generally supported; it was recommended that the pro-forma be made available for download, but with fields added to log details of site and plot references, and with the provision of space for recording the signatures of those signing off the various steps.

- 72 Many respondents noted the role that could be played by a registered SAP assessor in providing the evidence that several of the steps in the procedure had been satisfied. It was felt that the requirements for being recognised as qualified to undertake this role should be clearly defined, and tied in with the EPBD Article 10 training and accreditation procedures.
- 73 It was suggested that some of the organisations suggested as being competent might not be competent to address all the issues covered by the checklist. For example, those schemes dealing with boiler installation may not cover commissioning of the whole system, although it was noted that the OFTEC and HETAS schemes do indeed cover the complete system.
- 74 It was suggested that the checking of the lighting installation should be done by a competent electrical contractor, and that this approach might provide a link to the new Part P requirements.
- 75 It was also suggested that the checklist should contain a general reminder of the need to check the dwelling against all the requirements of Schedule 1, but Parts E, F and J in particular.

**Q18 - Other comments**

- 76 It was pointed out that the Regulation makes no mention of external lighting requirements. It was also suggested that external lighting should always be daylight linked so as to extinguish when not required.
- 77 Reference was made to BS EN 12170/1, which offers a framework for providing information to users, and which could be referenced from clauses 59 and 60.
- 78 There were a number of comments relating to SAP and SEDBUK, the key ones being
- a) The beneficial effects of thermal mass need to be recognised in the calculations
  - b) Solar DHW needs to be handled better, by allowing solar preheat to COMBI boilers, and by allowing the collector efficiency as determined by BS EN 12975 to be input.
  - c) SEDBUK unfairly penalises oil boilers through the capping system applied to various boiler types.
- 79 A number of specific technical points were made on the draft text, and these are picked up in the detailed log. One additional point that was raised was how to deal with parts of a dwelling that might be below ground (e.g. basements).

**ADL1B - work in existing dwellings****Q19 - Regulation 13 - Energy performance statements**

- 80 The main comment was that this requirement should only apply to significant building work, e.g. work where the threshold of £8K (or whatever level it is set at) applies. This would require clear definition of what constitutes building work that triggers this provision (e.g. is it appropriate that boiler replacement would trigger a requirement for general improvement?).
- 81 Another query was in relation to how the proposal would relate to the building notice procedure.

**Q20 - General energy efficiency improvements and controlled elements**

- 82 The main concern over the concept of consequential improvements was that it might discourage general improvement work from being carried out. Even if some work was carried out, important upgrades might be omitted to get under the threshold - replacing an old leaky oil tank as part of a boiler replacement was cited as an example. Clarity was also sought on situations where a building contained several dwellings - if the work comprised re-roofing, would consequential work be required just in the top floor dwellings or all dwellings in the block?
- 83 There was a wide range of views on where the threshold should be set, suggestions ranging from zero to £20K. Those favouring reducing the threshold argued that builders might package work so that each element came below £8K, thereby avoiding the requirement. By eliminating the threshold, the amount of improvement work required would be self-controlling, since it would be limited by the 10% marginal cost threshold. Consequently a small piece of work would not generate sufficient marginal cost to make any improvement worthwhile. It was also suggested that if the value of the refurbishment work was very high (e.g. >£50K), then more prescriptive improvements should be required, e.g. replacing any existing single glazed windows.

- 84 Another common response was that costs varied across the country and also with time, and so the threshold should be based on a more stable basis - e.g. area.
- 85 A major concern was that negotiations between the applicant and the bcb about what was cost effective would be beset with major problems. It was suggested that the only way around this was to use the procedures offered via a survey and the application of RdSAP. This would give an independent and expert assessment of possible improvements, which would be ranked into low, medium and high cost measures. It was suggested that all low cost measures and one medium cost measure should be implemented as part of the consequential works, subject to the 10% marginal cost cap. Although this would incur the costs of the survey, those costs could be part of the 10% margin, and would enable the HIP to be updated with the revised information once the work had been completed.
- 86 Another concern over consequential works was responsibility for the work. If a heating system replacement triggered cavity wall insulation, the heating installer would not be qualified to undertake or supervise the work, although it was also suggested that the responsibility lay with the instigator of the work, i.e. the homeowner.
- 87 A related theme was the suggestion that if the work was itself an energy efficiency measure (e.g. a boiler replacement), then requiring a further 10% investment was unreasonable.
- 88 Another issue was the relationship between the requirement and grants available under the EEC schemes. EEC grants were not available for work carried out to meet Building Regulations, and so grants could not be used to offset the cost of consequential work (although the grants could be obtained for improvements prior to doing the specific building work).
- 89 Concern was raised that if, as proposed, conservatories were no longer exempt, this would increase costs for the homeowner wanting to improve his property. It was suggested that if 10% were added to the cost of every conservatory, there would be £368M of consequential improvements per year. It should perhaps be noted that if conservatories were to remain exempt, the cost of the consequential improvements when building a conventional extension might result in a distortion of the market.

**Q21 - The appropriateness of the proposed levels of improvement**

- 90 There was general support for the levels of improvement, the one exception being window standards. The main points were
- a) The industry felt the same standards should apply for extensions and for replacement windows - for example, what should happen if the windows in the existing building were being replaced at the same time as an extension was being built?
  - b) The Window Energy Rating should be given by band rather than by value.
  - c) There needs to be a separate standard for doors, and that as at present, only doors with more than 50% glazing should be considered as a controlled fitting.
- 91 There were some comments on the standards for opaque elements, the key ones being
- a) GPG171 is flawed in that it doesn't define the standards that should be achieved
  - b) The cost effectiveness of topping up loft insulation to achieve  $U=0.13$  depends on the starting point.
  - c) Based on the results of a recent research project, it was suggested that improving the envelope standards in an extension over and above those in the existing building was not cost effective.
  - d) The standard for newly constructed walls should be  $0.30\text{Wm}^2\text{K}$  in 2005, falling to 0.27 in 2010.
- 92 There was some contention that historic buildings should not be allowed a blanket exemption, since new developments in window technology would allow improvements to be made without compromising historic character.

**Q 22 - Assessments of Cost Effectiveness**

- 93 There were concerns that the method was too complex and time consuming, especially for small works, and that assessments of marginal cost were too subjective. This led to more suggestions

that the sole criteria should be the recommendations coming from RdSAP (see discussion at paragraph 85). It was suggested that Home Condition Inspectors should look for evidence of compliance when preparing home condition reports. This would give added weight to enforcement being supported by the conveyancing system.

- 94 Another point made was that the approach differed significantly from that used for the exceptions procedure relating to boiler replacements, and that one consistent method should be adopted.

**Q23 - Other comments**

- 95 A number of detailed technical comments have been logged in the detailed assessment of responses. The main issues noted were
- a) Replacing a boiler with SEDBUK A or B should be non-notifiable work, although clearer guidance would need to be given on the need to upgrade controls at the same time.
  - b) It was suggested that the water temperature control requirements in Part G should be transferred to Part L, so that installer courses on Part L could cover all the necessary control issues.
  - c) It was suggested that system cleaning and appropriate water treatment (where needed) should be a requirement rather than just guidance, since this would help to maintain long term efficiency, especially given the greater use of condensing boilers. It was suggested that in the absence of water treatment, there could be a 3% year on year degradation of efficiency in hard water areas.
  - d) There were a number of detailed comments on solar hot water systems, one of which was that BS EN 12975 does not cover all systems.
  - e) The need to correlate the proposals on conservatories with the work of the Conservatories Working Party. It was suggested that the reference in clause 18ii to independent time and temperature controls might encourage electric heating - independent temperature and on/off controls might be better. It was also suggested that the guidance in clause 18 should also be extended to cover separated extensions that had average U-values greater than that allowed in clause 17, but which may not have greater glazed areas than allowed by clause 16. It was also pointed out that roof U-values for conservatories only applied to any opaque parts, and that guidance was needed on the U-value of sloping glazing.
  - f) Twin-burner range cookers need to be addressed (both gas and oil).
  - g) Insulation should only be required to visible or accessible pipework.
  - h) It was suggested that air conditioning be made a controlled service, so that passive measures could be required first (either to reduce the demand or to eliminate the need).
- 96 One suggestion was that clause 24 of ADL1B should be expressed in terms of CO<sub>2</sub> performance not just efficiency, since otherwise inappropriate fuel switching might occur. A related argument was that this clause would prevent an old gas fire being replaced with a modern fuel effect fire. It was suggested that reasonable provision would be for the fire meet the efficiency standard appropriate to its type, irrespective of the type of fire that previously existed.
- 97 It was suggested that clause 54 should be modified in respect of unvented cylinders, since it was argued that installer competence is essential.

**ADL2A - new buildings other than dwellings****Q24 - Avoiding excessive solar gains**

- 98 The main concern was that carrying out the procedure might increase the tendency to install air conditioning. As part of this, there were concerns that using the Design Summer Year (DSY) as the basis of assessment would overly penalise naturally ventilated buildings, since the DSY was an extreme year. However, others suggested that to ensure robust design, the building should also be tested against a prediction of future climate. Other responses suggested that there should be specific requirements to limit the unnecessary use of air conditioning.

- 99 The other main concern was that the assessment method must properly account for the benefits of thermal mass and other passive measures, and enable the positive influences of good daylight and the community benefit of atria to be recognised.
- 100 Other issues identified were
- a) that guidance would be needed in how to deal with high gain areas like computer suites.
  - b) how should the CO<sub>2</sub> target be set for mixed-mode buildings.
  - c) The same principles should apply in ADL2B when windows are being replaced, created or enlarged.
  - d) It was suggested that there is confusion in the trade literature over g-values, since 2 values are often quoted for the same window system.

**Q25 - Provision of LZC systems**

- 101 It was felt that the appropriateness of this guidance would be very dependent on the availability of the proposed guide to LZC systems, as there were concerns over what is practical, feasible and economic. It was also noted that there was no specific reference to LZC technologies in the draft Regulation.
- 102 It was suggested that the 10% notional benchmark was an unnecessary complication, and that only the overall improvement figure was needed. LZC could then contribute to achieving the overall target as and where appropriate.
- 103 As with dwellings, there were concerns that LZC technologies were being unduly favoured over longer life measures that have lower embodied energy content.

**Q26 - Calculation of performance, testing and commissioning**

- 104 The main concern expressed here was over the non-availability of the calculation tool. It was also pointed out that the recalculation of performance based on the as-built data is not included in the 7-step procedure.
- 105 It was suggested that thermography (which had been included as an option in ADL2(2002)) should be retained as a viable option for proving continuity of insulation. Standard test methods are being developed by UKTA, which might provide the necessary guidance.
- 106 It was suggested that clarification was needed in order to provide common standards for commissioning, and that the results of the tests should be made available before issuing the completion certificate.
- 107 One concern was that lighting quality might suffer as the result of last minute changes needed to improve a building to achieve the energy target. The guidance should therefore include appropriate references to the appropriate CEN standards on lighting design.

**Q27 - Submitting Energy Performance Certificates (Article 7)**

- 108 There was little comment on this point, other than to suggest a rating based on an area allowance disadvantaged those who "sweated the asset" through intensive use.

**Q28 - Air conditioning inspections**

- 109 It was suggested that self-certification should be possible, provided competence could be demonstrated. For example, in the NHS Estate, there were competent specialist staff who understood the special needs of hospital ventilation.
- 110 It was suggested that as inspection did not relate to building work, regulations should be made under other legislation, e.g. the Sustainable and Secure Buildings Act. See further comments under paragraphs 6 to 8.

**Q29 - Regulation 13 - Target CO<sub>2</sub> performance**

- 111 Other than the common complaint about the lack of a calculation tool, the main issue raised was the question of when, and on what basis, certificates should be prepared and made available when the building was designed and offered on the market as "shell and core". As a related issue, it was questioned whether any subsequent fit out came under ADL2A or ADL2B.

- 112 It was suggested that kgCO<sub>2</sub> was not a unit used in the design process, and that kWh would be a much more appropriate unit for setting targets.
- 113 It was also suggested that a system of making electronic submissions should be developed to facilitate the handling of the information and subsequent processing of enquiries.

**Q30 - The seven-step approach**

- 114 The main point arising was the apparent confusion that the standards defined for the notional building were those expected for the actual building. This same confusion was apparent in responses that queried why (e.g.) chiller standards were higher in ADL2B than in ADL2A. One respondent suggested replacing the notional building approach with a CO<sub>2</sub>/m<sup>2</sup> allowance for each type of activity area. Because of this, it was felt that a much clearer definition of the notional building was needed. It was also suggested that to avoid variable interpretation, there should be no trade-offs allowed in the notional building.
- 115 In terms of the improvement factors, some found the approach confusing. Some felt the LZC contribution should be higher (20%+), and that there should be a specific check that the LZC technology had been included (or, at least, properly evaluated). As mentioned previously, some felt the improvement factors for naturally and mechanically ventilated buildings seemed high in comparison to air-conditioned buildings.
- 116 The portable buildings sector wanted an adjustment to Table 2 to allow buildings manufactured from sub-assemblies manufactured prior to 2002 to conform to the 1995 standards.
- 117 Key technical issues mentioned included -
- The proposals on dual fuel boilers showed "a touching faith in human nature"!
  - The definitions of systems in Table B2 needed to be clearer. The definition of local ventilation units needed clarifying, and the quoted SFP for fan coil units was unrealistically low.
  - The admittance of the notional building should be defined so that the effect of thermal mass can be identified.
  - The suggestions relating to pf correction only mentioned central correction, whereas local correction would reduce losses inside the building as well as in the grid.
  - The lighting efficiencies and control systems in the notional building, especially for general lighting in "other" buildings needed reviewing.
  - A query as to whether CIBSE TM31 was the only acceptable form of logbook.

**Q31 - Worst acceptable standards**

- 118 Many of the comments made here were similar to that made for ADL1A and so are not repeated. Divergent views were presented on whether the values were too tight or too lax. Those arguing in favour of tighter limits were concerned about achieving the target through large amounts of LZC technology, which they felt was not robust in the long term. Those arguing for looser standards felt that overly high standards of insulation would increase the risk of overheating and the subsequent installation of air conditioning.
- 119 Five main technical issues were raised -
- It was suggested that a single value for curtain walling was inappropriate - separate standards should apply to the glazed and opaque parts, and that a distinction should be drawn between sealed facades and those with opening lights. There was a divergence of view on whether different standards should apply to different forms of roof construction.
  - It was suggested that the worst acceptable air permeability standard should vary as a function of building size, since the bigger the building, the easier the standard was to achieve. As part of this, it was also suggested that the standards should be improved (7.5 for small buildings, 5 for large).
  - The appropriateness of the weighting factors and approach used for generating seasonal efficiencies for heating and cooling plant. It was also pointed out that warm air and radiant systems were not addressed, and that since some plant operated on/off rather than modulating, variable speed drives were not always appropriate. It was also noted that the

seasonal efficiency standards should apply to all types of cooling plant, not just those that might be regarded as coming under the term "chiller".

- d) The appropriateness of a lighting standard based on  $W/m^2$ . 100 lux was challenged.
- e) It was suggested that there should be minimum daylight requirements.

**Q32 - Quality of construction**

- 120 There were concerns over rules for assessing competency for carrying out the various tests. These had to be made clear in order to achieve a level playing field. As with the response to dwellings, some felt thermography still had an important role to play.
- 121 Concerns were expressed over the lack of procedures that would need to be followed in order to demonstrate that details could be regarded as being robust. It was suggested that factory assembled products that had ISO9000 accreditation was one way of demonstrating robustness. It was also suggested that to avoid confusion with Part E details, an alternative term to "robust details" should be adopted.
- 122 There were different concerns about pressure testing at both ends of the size/complexity range. Some felt the proposals for large complex buildings offered a possible loophole to avoid testing. There was also a view that small buildings below 500m<sup>2</sup> should not be exempt from testing.
- 123 Some respondents felt that currently recommended duct leakage standards and inspection regimes were too lax and should be tightened.

**Q33 - Model designs**

- 124 Many felt that this approach was an essential simplification for many market sectors, although others felt the non-standard nature of the non-domestic market would result in the approach being impractical. It was suggested that if the approach were to go forward, a clearly defined approvals scheme should be put in place.
- 125 The main concern with the approach was the observation that overheating risk will vary by location/orientation, and a query as to how this could be accommodated in a model design.

**Q34 - Definitions**

- 126 The main comments were in relation to display windows. It was suggested that
  - a) The 3m-height limit was too restrictive; the suggestion was made that this limit should only apply to the notional building, so the impact of any higher glazing in the actual building would have to be compensated for in another way.
  - b) A fully glazed door in a shop front should be treated as display window.
  - c) A display window should have a backing wall, perhaps in conjunction with the recognition of different display requirements for different types of retail space (jewellers v builders merchant).
- 127 A somewhat related item was high-usage entrance doors; it was suggested that for such items, robustness was the primary requirement, and so different thermal standards might be appropriate. This would require definitions of different types of door. It was also pointed out that if curtain walling was to have its own standard, then it needed to be defined, along with whether window walls were included in the same category.
- 128 It was also suggested that air-conditioning should be defined, and this would need to tie in with the Article 9 definitions, especially given the trend for mainland Europe to include tempered mechanical ventilation within "air conditioning".

**Q35 - Checklist**

- 129 The approach was generally supported, although it was pointed out that its success largely depends on a supporting infrastructure of recognised competencies that doesn't yet exist.
- 130 It was suggested that steps 2 and 3 need to refer to the M&T and pf correction allowances, and step 7 to the production of the Asset Rating.

**Q36 - Appendix C example**

- 131 The example was felt to be too simplistic, especially in respect of solar shading, but it was generally felt that an AD was not the place for examples anyway.
- 132 Several responses referred to the rooflight allowance in the notional building. There was some support for reducing this to around 10%, being much more typical of current norms. Others suggested a variable allowance in the notional building depending on the area used in the actual building. It was also noted that the floor U-value should be the lower of 0.25 and the value achieved with no added insulation. Reference also needed to be made to the allowance for thermal bridges (10% was suggested as the allowance in the notional building).

**Q37 - Other comments**

- 133 There were a number of comments about the need to recognise the special requirements of smoke control items (smoke vents, smoke control fans etc). It was also suggested that if smoke vents were exempt, the same principles should apply to roof access hatches, since they provided a means of escape.
- 134 It was noted that landlord supplied meters had to meet OFGEM requirements. It was also suggested that LZC systems should always be provided with meters (2-way where appropriate). It was further suggested that lighting and small power circuits should be separately metered, although there were issues around how, with such an arrangement, the power drawn by free standing uplighters should be accounted.
- 135 It was felt that a 5% credit for automatic Monitoring & Targeting was insufficient to incentivise the adoption of improved monitoring and control, but such features could deliver substantial benefits.
- 136 It was suggested that there was a need for guidance on lighting control, and pump and motor efficiency.
- 137 There were a number of comments over the seasonal efficiency equations for boilers and chillers, and it was noted that only a gas-fired boiler standard had been given for the notional building, suggesting this unfairly penalised the design if oil boilers were to be used in the actual building.
- 138 References needed to be added to cover the cleaning and protection (both chemical and physical) of hot and chilled water distribution systems.
- 139 It was suggested that the commissioning engineer could have a key role in checking that the equipment specified in the calculations that assessed compliance and generated the Asset Rating had indeed been installed. This would add little to their work and ease the burden on BCBs considerably.
- 140 Similar to the comments in paragraph 53, it was suggested that the fuel factors needed reviewing, since they were inconsistent with the DETR guidelines (still current) on corporate reporting.
- 141 It was suggested that the lighting control factors used in the calculation of luminaire efficacy were inappropriate and should be dropped.

**ADL2B - work in existing buildings other than dwellings****Q38 - Regulation 13 - energy performance statements**

- 142 There was very little comment on this issue, other than to suggest the requirement be limited to buildings >1,000m<sup>2</sup>. It was also suggested that many improvements that should already be covered by the regulations are not being picked up - particular mention was made of lighting improvements.

**Q39 - General energy efficiency improvements**

- 143 The general thrust of the debate was very similar to that already recorded under ADL1B. In particular, it was suggested that the proposed £8K threshold was much too low, and that the requirement for consequential improvements would either result in improvement work not being carried out, or increase the tendency to demolish and rebuild, thereby acting counter to the wider sustainability agenda. The only new suggestion was that other legislation should be used to define statutory improvement targets for each building, much as has been done for disabled access.

- 144 Another point that was made is that some works have nothing to do with energy efficiency (e.g. toilet improvements, fire safety improvements), and so requiring additional energy efficiency improvements as part of such work might be considered unreasonable.

**Q40 - Changes of use**

- 145 There was general support for this proposal, although how it would impact on other parts of the Regulations would need to be considered. Particular changes of use that were suggested were
- a) If upgrading from "low levels of heating" (to close the current loophole)
  - b) If there was a significant increase in occupancy
  - c) From/to a factory, warehouse, workshop, office/commercial, retail, leisure, education or health building.

It was pointed out that this proposal would have significant impact on the portable buildings market.

**Q41 - Levels of improvement**

- 146 The general comments were again in line with those for ADL1B. There were particular concerns over the standards for walls and roofs, since these were going beyond standards that some sectors were planning for new build. For example, the new-build industrial buildings sector is looking to achieve much of the targeted improvement via improved airtightness. It was suggested as being unreasonable to have a refurbishment standard that was in advance of new build standards. One approach that was suggested would be to set the refurbishment standard in line with the ADL(2002) standards, or perhaps the worst acceptable standards as given in ADL2A.
- 147 Issues specific to ADL2B included
- a) The window area allowance of 40% in extensions may be too high for some building types; it was suggested that there should be a different standard for different classes of building.
  - b) Doors need to be defined as a separate category, subdivided by use (i.e. vehicle access doors etc.). It was suggested that the proposed standard for such doors was too demanding.
  - c) Insistence on condensing technology in existing buildings might result in practical problems that would inhibit boiler replacements being carried out. Therefore the standards for replacement works should be less demanding than in new build.
- 148 There were some concerns over technical risk, e.g. roofs have minimum upstands for cost and planning reasons, so increasing the insulation thickness might impact on weather protection. Similarly, it was noted that adding insulation to cold roofs without removing the deck might increase condensation risk.

**Q42 - Treating extensions > 100m<sup>2</sup> as new-build**

- 149 The main comment was that it might be more sensible to make the threshold a percentage of the area of the existing building, rather than an absolute figure. It was felt that treating it as a new building would be particularly problematic if existing services were being extended, and this problem might be reduced if a percentage area basis was used. However the new-build criteria was defined, there was a suggestion that the threshold should be quite small in order not to lose an opportunity to achieve the best possible standards.
- 150 It was pointed out that extensions are often achieved through an additional module from a portable hire fleet.

**Q43 - Cost effectiveness calculations**

- 151 The main comment was that because fuel costs were varying so frequently, the fuel cost data should not be in the AD but on an ODPM website, where the information could be updated regularly. It was also noted that fuel costs vary substantially, depending on the supply arrangements.
- 152 In terms of appendix B, many felt that the trigger of 50% (relating to proportion of an element being replaced) was too high, and that a figure of 25-30% would be more appropriate. It was also suggested that renewal of roof cladding should be added to the list.

- 153 It is not clear whether work on controlled elements (see clause 29) should also trigger the consequential improvements of paras 12 and 13.
- 154 It was suggested that as well as calculating payback, the assessment should include the CO<sub>2</sub> savings per unit expenditure (kgCO<sub>2</sub>/£)

**Q44 - Other comments**

- 155 There were concerns over the H&S implications of automatically extinguishing lights (see Table 3). It was also suggested that the standards for office lighting should apply to office spaces in other building types (e.g. hospitals).
- 156 Some of the guidance on HWS was inconsistent - for example, if solar systems were being installed, then there was a benefit in over-sizing the store. The same concerns over the applicability of BS EN 12975 to all types of solar HWS were noted as recorded under ADL1B.
- 157 It was pointed out that the WERS scheme only applied to dwellings.
- 158 It was suggested that improvements to airtightness ought to be considered, especially if there was evidence of discomfort draft.

**Future performance standards****Q45 - Comprehensiveness and frequency of the forward look**

- 159 The main concern seemed to be that the standards are too vague for industry to plan ahead with sufficient confidence. The contention is that industry will only commit investment against firm numbers, not against "in the region of" values. One possible way forward would be for the 2010 Part L standards to be included in the Sustainable Building Code. This would then provide an aspirational standard for those who wanted to go beyond the current building regulations, thereby developing a body of experience in applying the future standards.
- 160 Firm timetables also need to be given; it was suggested that the acceleration of the current review has perhaps reduced confidence in the value of the forward look.
- 161 There was some concern over the predominance of the discussions on U-values, especially since it was felt that improving building services efficiency and the wider adoption of LZC technologies were likely to deliver the biggest improvement in standards. It was suggested that as with the Mayor of London's policy, the inclusion of building integrated renewables should be a requirement for 2010. As part of this debate, development of integrated systems was seen as particularly important. For the assessment of heating and hot water efficiency, it was felt that the basis of SEDBUK needed critical evaluation, both in terms of conventional equipment, and the new range of integrated systems involving solar HWS, heat pumps etc.
- 162 It was suggested that since the standards were now based on a whole building CO<sub>2</sub> target, the future look should not attempt to define elemental targets. The only target that needs to be defined is the prospective improvement in overall CO<sub>2</sub> emissions that might be required. This would leave the industry and the market to find the ways of achieving that target. As part of this, there should be a timeline showing the anticipated progress towards the zero energy new building.
- 163 In terms of work in existing buildings, it was pointed out that the proposed £8K threshold would need to be kept under review.
- 164 In terms of frequency, the main points have already been reviewed under paragraphs 9 to 14. However, there was a strong feeling from the window industry that changing the window standards in 2007 was unreasonable, and that it would take the industry's eye off their commitment to achieving substantial improvements in 2010.
- 165 Three respondents pressed for the insulation of swimming pool basins to be included before 2010. Data was presented which suggested significant national savings in CO<sub>2</sub> if the proposed minimum standards were adopted. One respondent also identified areas where guidance was needed to avoid technical risks associated with selecting inappropriate insulation materials.

**Q46 - Are the forecasts sufficiently realistic and challenging?**

- 166 As might be expected, the range of opinion on the realism of the standards was wide. Some felt they were too challenging and not cost effective, others felt they were "woefully low". It was felt that

- the proposed standards were somewhat arbitrary, whereas they should be determined through the application of BATNEEC principles.
- 167 It was suggested that the development of future standards should be linked to the Carbon Vision Future Building project, which was aiming to achieve 50% reduction in CO<sub>2</sub> levels by 2030. A related comment queried why the paper suggested an improvement of 70% by 2015 (presumably arrived at by successive improvements of ~25%), when the long-term target was only a 60% reduction by 2050.
- 168 Another theme was that a key opportunity for improved efficiency was via enhanced controls, but the benefit of such measures required a suitable assessment methodology.
- 169 It was suggested that the comment on a move to heat pumps affecting the supply infrastructure was unwarranted and should be removed.

**Q47 - Other comments**

- 170 A number of comments were made on detailed aspects of the document, and these are recorded in the detailed log.
- 171 The question of how the target should be influenced by the carbon intensity of the primary fuel was again raised under this section. The lack of choice in rural areas and the need to improve security of fuel supply by diversification were again highlighted.
- 172 On embodied energy, two main themes emerged
- a) It was argued that embodied energy was already included in the cost of the material, and was therefore reflected in the existing cost benefit analysis. It was argued that any separate accounting for embodied energy would be double counting.
  - b) If the scope of the standards setting was to be widened, it should include all sustainability indicators, not just embodied energy (e.g. off-gassing and its impact on ventilation rate, ozone depletion, landfill impacts at end of life, SO<sub>x</sub>, NO<sub>x</sub> etc). It was suggested that these issues should be fed into a review of the AD in support of Regulation 7, Materials and Workmanship.
- 173 It was suggested that an R&D programme was needed on the relative merits of wet plaster and plasterboard, and the performance of low U-value rendered solid walls.
- 174 It was pointed out that system design and controls issues would be increasingly important, and that therefore there should be less emphasis on the performance of the heat generator in isolation. It was pointed out that lower heating return temperatures had been regulated in Sweden, thereby encouraging low carbon technologies (condensing boilers and heat pumps).

**Implementing the EPBD****Q48 - Article 3**

- 175 The main comment was that the EPBD was about energy efficiency, not CO<sub>2</sub> reduction. Therefore the proposals were an over-implementation that was creating a non-level playing field.
- 176 It was contended that SAP should be enhanced to address the impact of thermal mass. It was suggested that this was necessary to comply with the Annex to the EPBD, which says the calculation methodology should include "*the thermal characteristics of the building (shell and internal partitions)*". Thermal mass was also an important issue for non-domestic buildings (see paragraph 117c)).

**Q49 - Articles 4(1) and 4(2)**

- 177 The only comment was the standards should cover health issues as well as energy matters.

**Q50 - Article 4(3)**

- 178 Again, few comments were received. The main ones related to possible exemptions, as follows -
- a) Residential buildings occupied for less than 4 months should not be exempt
  - b) Buildings used as places of worship should not be exempt, since many dwellings were used for house groups. Mediaeval churches would be exempted under the historic building category.

- c) Site huts should be exempt.
  - d) Temporary buildings with a planned use of less than 2 years should be exempt (i.e. amend the current Schedule 2 Class IV exemption criteria from the present figure of 28 days).
  - e) The approach offered to Historic Buildings is too generous; it was contended that many buildings in conservation areas are "ordinary", and that therefore there should be no relaxation on replacement window standards.
- 179 It was felt that it would be important to provide very clear guidance on which buildings were exempt, so that the rules would be applied consistently by the bcbs.

**Q51 - Article 5**

- 180 There was general support for the proposals, with the only comment relating to the consideration of LZC technology. Some felt that the proposals did not capture the spirit of Article 5, which requires that the technical, environmental and economic feasibility of LZC systems be considered and taken into account. It was suggested that there should be a formal review as part of the design process. Another respondent felt that it was inappropriate to require reviews for those buildings that were obviously not suited to the technology.
- 181 It was stressed that biomass and biofuels should be recognised as LZC technologies.

**Q52 - Article 6**

- 182 The main comment was that then proposals were not sufficiently ambitious. Several respondents regretted that energy targets had not been set at the whole building level for major refurbishments.

**Q53/54 - Articles 7(1) and 7(2)**

- 183 The main strategic point was to ensure that the Housing Directorate and Land & Property Division of ODPM co-ordinated with Building Division, so that whatever the trigger requiring the preparation of a certificate, consistent procedures were applied. The other big issue surrounded the training and qualifications of assessors.
- 184 The main technical concern was over the currency of a certificate. It was suggested that 10 years was far too long, and that the certificate ought to be renewed every 5 years, or even every 3 years. It was suggested that requiring certificates for temporary buildings was unreasonable.
- 185 In terms of the need for the possible 3-year time extension, the numerical responses show that opinion was equally divided. Those who made comment on the issue generally felt that the extension would be necessary, but that a firm rollout programme should be declared, i.e. the period should be used to achieve a phased introduction, not a blanket delay.
- 186 It was suggested that it was preferable to take time to develop a robust CP scheme that would deliver real benefits, rather than rushing out a diluted scheme that would achieve little in practice.

**Q55/56 - Article 7(3)/10**

- 187 The strong balance of opinion favoured the wider definition of public building - it was suggested that this would capture an additional 25,000 buildings in the UK. It was also suggested that public display should be extended to mean public disclosure. A related suggestion was that the roll out should start with the restricted definition of public building (they should be the "flag bearers"), with the wider definition following after. It was also noted that only ADL2A included reference to the display elements of Article 7. This should be required for both new and existing buildings.
- 188 Two areas where particular guidance was felt essential were -
- a) Multi tenanted offices, where landlords had no powers to enforce tenants to disclose their meter readings. It was suggested that a procedure similar to that covering fire certificates might be appropriate.
  - b) Shopping malls - was the certificate required for the mall as a whole or the individual retail units?

**Q57/58 - Article 8/10**

- 189 The balance of comment supported an inspection regime rather than just the giving of advice (particularly in the non-domestic sector), the argument being that speculative advice would be

discarded or forgotten. It was suggested that there was a window of opportunity to get a scheme that provides advice at the time of servicing, as these issues could be built into qualifications (C&G 6084) and specifications (PAS037) being prepared by BG and BSI. It was also suggested that the Energy Advice Code of Practice developed by EST might be useful. It was noted that Defra were in the lead on the implementation of this Article, and that a separate working group was looking at how best to implement Article 8 in the UK.

- 190 The numeric analysis supported the immediate introduction of the scheme, although some who commented felt that an inspection scheme might require a phased introduction depending on the availability of accredited surveyors.
- 191 Concerns were expressed over the requirements to inspect (as opposed to service) oil and solid fuel boilers more frequently than gas fired boilers.
- 192 It was suggested that any CP schemes should require the registration of maintenance engineers as well as installers.

**Q59/60 - Article 9/10**

- 193 It was suggested that to reduce the public burden, this item could be shared between Building Control & Environmental Health legislation. See points made under paragraphs 6 to 8.
- 194 The numeric analysis supported the immediate introduction of the scheme, although some who commented felt that a phased introduction might be required, depending on the availability of accredited surveyors.
- 195 The main concern under this section was the definitions of "air conditioning system" and "common control".

**Q61 - Other comments**

- 196 The main comments in this section related to the procedures for accrediting the various experts, and how independence would be assured.
- 197 The benefits of establishing a national database of energy ratings for both dwellings and non-domestic buildings were highlighted in several responses.

**EPBD Methodology****Q62 - Asset and Operational Ratings**

- 198 There was no real consistency of view in terms of the recorded comments. Some felt the Asset Rating was the only relevant indicator; others felt the Operational Rating was all-important. Some felt that having two ratings was confusing; others felt that having two were an essential element to achieving improved standards.
- 199 It was suggested that the term Asset Rating could be confusing, and suggested it should be prefixed with the word energy (i.e. Energy Asset Rating) to minimise this possibility.
- 200 It was suggested that the Asset Rating should make an appropriate allowance for small power and business machines.
- 201 A number of detailed comments on the Operational Rating were provided and are noted in the detailed log.

**Q63 - Simplified v detailed methods**

- 202 There was a strong body of opinion that wanted only a single tool. However, those supporting this view also accepted that there would always be exceptions that would require specialist tools to be used, although they felt such use should be kept to a minimum.
- 203 It was asserted that there is no evidence to confirm that the divergence between the ratio of predicted actual to notional building performance would be less than the divergence in the absolute predictions of different tools.
- 204 There was support for a pan-European CEN-based method, and some suggested this should extend to dwellings too (a euro-SAP!).

205 It was suggested that if different tools were allowed, clear guidance should be given on when different classes of tools were appropriate. It was also suggested that there should be a single compliance function that can be incorporated into all tools accepted for use in compliance and certification.

**Q64 - Index rating scale**

206 There was general support for an index approach, it being suggested that a 0-100 scale should be adopted to be consistent with the proposed SAP scale. It was noted that CEN are looking to draft a standard in this area as part of its support activities to the implementation of the EPBD.

207 There was general agreement that the scale should be fixed so that it would not need to be recalibrated with time, i.e. it should be future-proofed as far as possible. However, some felt that accommodating possible future standards might compress the scale too much.

**Q65 - Additional tasks**

208 The main additional tasks identified were -

- a) There was a need to define a process whereby software could be accredited as being suitable
- b) It was suggested that a government supported help-line should be set up
- c) Time was needed to allow industry to adjust to the new methods.
- d) A single free-issue version of SAP and the non-domestic tool should be made available to ensure a level playing field.

209 It was also suggested that the procedures for determining the Operational Rating were less developed than for the Asset Rating. ESTA offered to help in moving this forward, based on their expert knowledge of metering.

**Q66 - Other comments**

210 Under this section, there were some who offered support for adopting EnergyPlus as the NCT, but a number of others offered detailed critiques, explaining why in their view it was not suited as being the single national calculation tool. A particularly strong message came out that EnergyPlus is completely untried in a commercial environment in the UK, and that it was therefore unreasonable to force its use on the industry.

211 There was some support for an on-line compliance and certification system, but it was also made clear that designers would want direct access to the tools in their own office.

212 There were a number of suggestions about how a labelling scheme might underpin the proposed index scale.

**Adaptation Strategy**

**Q67 - Comprehensiveness of the conclusions**

213 It was pointed out that the UKCIP scenarios had considered the weakening of the Gulf Stream, but had considered its likely impact to be very low. It was also pointed out that the scenarios will be updated every five years, and the Adaptation Strategy would need to respond to these revised scenarios. It was further suggested that the Regulations should be reacting more quickly to the implications of climate change, taking account of economic as well as climate change drivers.

214 It was suggested there should be closer integration of the planning and building control processes. Reference was made to the ODPM's recently published report "The Planning Response to Climate Change"<sup>ii</sup>.

215 It was suggested that a key factor of adaptation strategy should be to consider how fuel prices might change in the future, especially in relation to availability and security of supply issues.

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<sup>ii</sup> see [http://www.odpm.gov.uk/stellent/groups/odpm\\_planning/documents/page/odpm\\_plan\\_032088.pdf](http://www.odpm.gov.uk/stellent/groups/odpm_planning/documents/page/odpm_plan_032088.pdf)

**Q68 - Other comments**

- 216 There were a number of specific comments on U-values, as follows -
- a) Higher mass buildings require less stringent U-values, and SAP needs to recognise this.
  - b) Wind speed effects are irrelevant at the U-values under consideration.
  - c) Research into the effects of rain penetration would be welcome, but tests should be based on the typical standards of workmanship.
  - d) Raising U-value standards has negative consequences, e.g. on wall thickness.
  - e) There is some recent work that suggests U-values are better (not worse) than calculated, due to the effect of sun on the surface.
  - f) Increased insulation will reduce cooling demand, although others said it would increase cooling demand, especially in high internal gain buildings.
- 217 Other issues raised included -
- a) It was pointed out that the effect of shape is not dealt with in the proposed non-domestic methodology.
  - b) It was suggested that there should be less emphasis on building integrated systems and more on community level energy systems. It was also suggested that if LZC systems were not included on day one, the design should be future proofed to make them easily added at a later date (e.g. aspects of roof design).
  - c) Changes in air quality will require greater ventilation, and so expensively insulated windows will be left wide open.
  - d) Clauses 48-60 ignore the possibility of the climate cooling.
  - e) Differential climate change may require multiple climate regions within England and Wales.
  - f) The inference that MVHR is the preferred strategy is unsubstantiated. It was also suggested that the need to improve the controllability of natural ventilation contradicts the new draft ADF.

**Q69/72 - Dissemination strategy**

- 218 The general conclusion was that training was essential, and substantial sums need to be allocated to this activity. A particular issue was that traditionally, product manufacturers were very active in providing training, but with the move to a whole-building performance standard, their role would diminish and would have to be taken up by the design professions. **More details on the dissemination and training initiatives are the subject of a separate paper to be made available on the ODPM website.**

**Q73 - General comments**

- 219 Some of the comments entered in this section of the response form have been referred to in previous parts of this document. The remaining comments include
- a) The lack of training of the design community in whole-building calculation methods will put pressure on product manufacturers and specialist contractors to do the sums, thereby losing the holistic approach that was intended. The government was urged to find funds to train people in the use of the required new design techniques.
  - b) There should be a requirement for minimum daylight factors
  - c) There was a need to address the issue of boiler over-sizing, which, it was contended, was a major source of inefficiency. It was also noted that this was a general issue, and should not be limited to heating plant, although it was also recognised that this was perhaps more an issue for design standards than for Building Regulations.
  - d) It was suggested that greater emphasis should be given to hot water service provision in non-domestic buildings.



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2	The Energy White Paper and Energy Performance of Buildings Directive (EPBD) effectively call for Part L to be reviewed at 5-yearly intervals. Do you consider this is a reasonable and effective way to meet our climate change policy objectives?	Yes: 234	No: 30	No view 18
3	The Draft Approved Documents for Part L comprise 4 separate documents, reflecting splits between new and existing buildings on the one hand and domestic and non-domestic buildings on the other. Do you like this separation?	Yes: 250	No: 3	No view 29
4	The Draft ADs adopt a more strategic approach to the guidance than previously, relying on other approved references for much of the technical detail. Do you like this approach?	Yes: 186	No: 49	No view 46
5	The Draft ADs include a commentary column that could be used to give background to the guidance. Do you like this?	Yes: 256	No: 5	No view 21

### Section 1 - Regulatory Impact Assessment (RIA)

6	Do you consider the proposal for a reduction in carbon emissions of around 25% for new dwellings and around 27% for other buildings are an appropriate and practical target for improvement for 2005?	Yes: 162	No: 71	No view 48
7	Are the cost and benefit data and methods of analysis given in the RIA reasonable? Please use the comment box to suggest how the estimates and methods of analysis could be improved.	Agree: 77	Disagree: 97	No view 107
8	Are there categories of risk that have not been identified in the RIA? If so, please use the comment box to identify them. Thoughts on how the costs of any other risks could be quantified would also be helpful.	Yes: 92	No: 59	No view 131
9	Do you consider any particular sector of the market or industry is likely to be disproportionately affected by the proposed changes? If so, please explain how.	Yes: 161	No: 65	No view 57
10	Will the existing building control system be able to enforce the proposed changes? If not, please make suggestions and observations on what could be done to improve enforcement and/or relieve the regulatory burden.	Yes: 35	No: 202	No view 46

### Section 2 - ADL1A for new dwellings

11	Are you content with the proposed new requirement in Regulation 13 regarding the submission of target carbon performance?	Content: 181	Disagree: 20	No view 81
12	Are you content with the new seven-step approach to determining compliance for new dwellings?	Content: 167	Disagree: 25	No view 90
13	Are you content with the proposals for dealing with terraced dwellings and blocks of flats?	Content: 101	Disagree: 53	No view 130
14	Are you content with the proposals for worst acceptable standards?	Content: 137	Disagree: 83	No view 63

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15	Are you content with the proposals for achieving satisfactory quality of construction, namely robust details and sample pressure testing?	Content: 149	Disagree: 55	No view 78
16	Are you content with the model designs approach and the examples given in Appendix B?	Content: 116	Disagree: 87	No view 80
17	Are you content with the approach set out in the checklist in Appendix A? (Your thoughts on making this checklist more useful would also be welcome.)	Content: 164	Disagree: 34	No view 78

### Section 3 - Approved Document ADL1B for work in existing dwellings

19	Are you content with the proposed new requirement in Regulation 13 regarding the submission of energy performance statements?	Content: 166	Disagree: 46	No view 71	
20	Are you content with the proposals that widen obligations to carry out general energy efficiency improvements as well as the work in question (requirement L1B.2 and the new work definition of "controlled element")?	Content: 167	Disagree: 54	No view 61	
21	Do you consider the overall level of improvements proposed for existing buildings to be reasonable? (Please comment on factors affecting your view.)	Too strict:... 41	About Right: 116	Too lenient: 62	No view 60
22	Are you content with the proposals in Section 4 and Appendix A for the assessment of cost-effectiveness of improvement measures and hence the approach to compliance with Regulation L1B.2?	Content: 119	Disagree: 71	No view 93	

### Section 4 - Approved Document ADL2A for new buildings other than dwellings

24	Are you content with the proposed new requirement L2A.3 covering the avoidance of excessive solar gains?	Content: 150	Disagree: 41	No view 92
25	Are you content with the proposed new requirement L2A.4 concerning the provision of cost-effective low and zero carbon systems?	Content: 114	Disagree: 46	No view 123
26	Are you content with the proposed new requirement L2A.5 concerning the calculation of As-Built energy performance, testing of airtightness and reporting commissioning results?	Content: 149	Disagree: 31	No view 102
27	Are you content with the proposal for a new Building Regulation RN on submitting building Certificates as the best way of implementing Article 7 of the EPB Directive (or would you prefer some other legislative route)?	Content: 149	Disagree: 19	No view 115
28	Are you content with the proposal for a new Building Regulation RN+1 on regular inspections of air conditioning systems as the best way of implementing Article 9 of the EPB Directive (or would you prefer some other legislative route)?	Content: 134	Disagree: 16	No view 132
29	Are you content with the proposed new requirement in Regulation 13 regarding the submission of target carbon performance?	Content: 185	Disagree: 7	No view 90

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30	Are you content with the seven-step approach together with the data in Appendix B as the way of showing compliance?	Content: 170	Disagree: 31	No view 81
31	Are you content with the proposals for worst acceptable standards?	Content: 140	Disagree: 76	No view 67
32	Are you content with the proposals for achieving satisfactory quality of construction, namely reports from competent persons, pressure testing except in special cases, and pressure testing of ductwork?	Content: 159	Disagree: 28	No view 95
33	Are you content with the model designs approach in Section 4?	Content: 138	Disagree: 36	No view 107
34	Are you content with the definitions in Section 5?	Content: 157	Disagree: 20	No view 104
35	Are you content with the approach set out in the checklist in Appendix A? (Your thoughts on making this checklist more useful would also be welcome.)	Content: 147	Disagree: 39	No view 95
36	Are you content with the examples in Appendix C on the use of the new seven-step approach?	Content: 153	Disagree: 38	No view 91

### Section 5 - Approved Document ADL2B for work in buildings other than dwellings

38	Are you content with the proposed new requirement in Regulation 13 regarding the submission of energy performance statements?	Content: 175	Disagree: 9	No view 99	
39	Are you content with the proposals that widen obligations to carry out general energy efficiency improvements as well as the work in question (requirement L2B.2 and the new work definition of "controlled element")?	Content: 145	Disagree: 52	No view 84	
40	Are you content with the proposal in principle to widen the definition of material change of use to include changes from commercial or industrial class to class? (Your views on what classes should be included and the impacts of such a change would be particularly welcomed.)	Content: 156	Disagree: 14	No view 112	
41	Do you consider the overall level of improvements proposed for existing buildings to be reasonable? Please comment on factors affecting your view.	Too strict:... 37	About Right: 113	Too lenient: 61	No view 71
42	Are you content with the proposal to treat extensions over 100 m2 floor area as new are reasonable?	Content: 126	Disagree: 68	No view 82	
43	Are you content with the proposals in Section 4 and Appendices A and B for the assessment of cost-effectiveness of improvement measures and hence the approach to compliance with Regulation L2B.2?	Content: 102	Disagree: 60	No view 120	

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### Section 6 - Future Performance Standards for Part L

45	The aim of this section is to enable stakeholders in the procurement of new buildings, building work and materials and components can to plan ahead over a reasonable time frame. Are you content that this forecast is satisfactory for the purpose? (Views on improving comprehensiveness and frequency of updating would be welcomed.)	Content: 101	Disagree: 116	No view 67
46	The Energy White Paper gave the Government's aim in 2003 of raising standards over the coming decade learning lessons from comparable European countries. However the Regulations need to remain proportionate, reasonably flexible for designers and free of unacceptable technical risks. Are the forecasts in this paper sufficiently realistic and challenging?	Yes: 117	No: 81	No view 84

### Section 7 - Proposals for implementation of the Energy Performance of Buildings Directive (EPBD)

48	Are you content with the proposals for implementing Article 3 for dwellings? (The proposals for implementing Article 3 for buildings other than dwellings are covered below.)	Yes: 143	No: 31	No view 108
49	Are you content with the proposals for implementing Articles 4(1) and 4(2)?	Yes: 156	No: 18	No view 108
50	Are you content with the proposals for implementing Article 4(3)?	Yes: 140	No: 32	No view 110
51	Are you content with the proposals for implementing Article 5?	Yes: 157	No: 23	No view 102
52	Are you content with the proposals for implementing Article 6?	Yes: 138	No: 32	No view 112
53	Are you content with the proposals for implementing Articles 7(1) and 7(2) together with Article 10?	Yes: 132	No: 46	No view 103
54	Regarding the provisions in Article 15, do you think there is a case for requesting an extension of time for fully implementing Articles 7(1) and 7(2)?	Yes: 94	No: 93	No view 94
55	Regarding Article 7(3) are you content that the requirement should apply to commerce as well as the public sector? (Your views on this and whether such application should be immediate or phased would be particularly welcome.)	Yes: 159	No: 18	No view 107
56	Regarding the provisions on Article 15, do you think there is a case for requesting an extension of time for fully implementing Article 7(3)?	Yes: 58	No: 103	No view 121
57	Are you content with the proposals for implementing Article 8? (Your views on the content of this and of the papers placed on the ODPM web site giving the current state of development would be particularly welcome.)	Yes: 80	No: 39	No view 163
58	Regarding the provisions in Article 15, do you think there is a case for requesting an extension of time for fully implementing Article 8?	Yes: 37	No: 106	No view 139

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59	Are you content with the proposals for implementing Article 9 together with Article 10? (Your views on the content of this and of the papers placed on the ODPM web site giving the current state of development would be particularly welcome.)	Yes: 100	No: 16	No view 166
60	Regarding the provisions in Article 15, do you think there is a case for requesting an extension of time for fully implementing Article 9?	Yes: 35	No: 95	No view 152
61	This box is provided to enable you to comment on specific paragraphs in Section 7. Please give the paragraph No. to which you are responding. (Those responding in manuscript or in a separate document are requested to refer to this question No. and copy this layout)	Yes: 39	No: 8	No view 216

### Section 8 - Calculation Methodologies in support of the EPD

62	Do you agree with the proposed distinction between an Asset Rating and an Operational Rating and the way it is proposed to use these two ratings in fulfilment of the Directive's requirements?	Yes: 146	No: 31	No view 105
63	Are you content with the proposals for a developing a simplified method for most applications and a detailed simulation method for specialised ones?	Yes: 137	No: 57	No view 94
64	Are you content with the proposal to adopt an index rating scale rather than an absolute scale?	Yes: 141	No: 12	No view 129
65	The Section concludes by listing a number of tasks that need to be carried out in order to have a national methodology in time. Are there other tasks that could improve transition to the new methodology in the time available?	Yes: 84	No: <input type="checkbox"/>	No view <input type="checkbox"/>

### Section 9 - Adaptation Study

67	This section considers the impacts that the predictions of UK Climate Change could have on those aspects of the design of buildings that affect energy performance and are therefore capable of being controlled by Building Regulations. Do you agree that the conclusions are comprehensive? If not, please use the comment box to provide further suggestion?	Agree: 135	Disagree: 20	No view 126
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### Section 10 - Dissemination Strategy

69	Are there better ways of approaching dissemination than those proposed in Annex 2?	Yes: 73	No: 68	No view 140
70	Are there better ways of proceeding than those proposed in Annex 3?	Yes: 71	No: 49	No view 162
71	Is the Gantt chart programme in Annex 4 incomplete or unrealistic? (Your suggestions and observations on further activities that may be needed and on organisations who could help, and who would wish to be involved, would be welcomed.)	Yes: 71	No: 64	No view 144