

# A Carbon Management Strategy for Schools

## Consultation Response Form

The closing date for this consultation is: 20  
November 2009

Your comments must reach us by that date.

department for  
**children, schools and families**

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**Please tick if you want us to keep your response confidential.**

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If your enquiry is related to the policy content of the consultation you can contact Janice Lawson on:

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If you have a query relating to the consultation process you can contact the Consultation Unit on:

Telephone: 01928 794888

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Please tick the box that best describes you as a respondent

<input type="checkbox"/> LAs	<input type="checkbox"/> Town Planners	<input type="checkbox"/> School Senior Management
<input type="checkbox"/> Environmental organisations	<input type="checkbox"/> Construction industry	<input type="checkbox"/> Local education partnerships
<input type="checkbox"/> Public sector buying organisations	<input type="checkbox"/> Children's trusts	<input type="checkbox"/> School Governors
<input type="checkbox"/> Teachers	<input checked="" type="checkbox"/> Other	

Please Specify:

CIBSE is a Professional Building Services Engineering Institution with a specialist interest group in schools design. The principal activities of the Groups are to engage in developing and promoting a discipline that relates to building design and building services engineering and disseminating relevant information.

The CIBSE School Design Group (SDG) collaborated with University College London to produce an evidence document based on survey responses of over 150 professionals either in the schools sector or specialising in providing building engineering design services to schools as well as operational engineers and facilities managers working in the schools sector.

The survey responses are included as an Annex and specific references to evidence are made within individual responses to the consultation questions.

## Section B: Towards a carbon reduction target for the schools sector in England

1 Do you think that the schools sector should aim for carbon reduction targets that are more challenging than UK averages? - provide comments to support response.

Yes

No

Don't Know

Clearly the schools sector should aim for 'leadership' status - as part of the public sector it is essentially committed to do so by government policy.

Additionally it has the potential to act as a major client for construction and other services and through this the power to require far higher standards of environmental design / carbon impact, and negotiate more favourable contracts for low carbon goods and services than would normally be the case.

Similarly, because of its position to influence future generations in their attitudes to sustainability etc it would be an enormous failing not to take on a leadership role to ensure that its influence is appropriately positive.

2 What level of reduction do you think could be achieved 'cost effectively'? - provide comments to support response.

Traditional studies e.g. in the buildings sector, indicate cost effectiveness at around the 25% level of reduction. Such studies rarely make allowance for market movement in response to a changing environment, economics of scale etc.

In addition, many of the studies study single professional discipline issues and/or single technologies without properly examining the costs and benefits of a holistic / cross-discipline professional design approach. This systems approach achieves multiple benefits from a single action and markedly improves the viability of sustainability and energy reduction opportunities. We note the performance achieved by 'Passivhaus' buildings, where the building energy needs are in the order of 10% of traditionally designed buildings. These buildings benefit from holistic design approaches, with a capital cost penalty of 12% to 15%, but as stated, revenue costs are 90% less.

We also wish to note concern that many of the cost/benefit approaches rely on single action / single benefit cost data. This data is remarkably incomplete, and thus error-prone when used in single action / multiple benefit scenarios. Only comprehensive building modelling using guidance and techniques as developed by other groups in CIBSE is able to competently explore capital cost / revenue benefit design options.

Neither can they factor in influences such as alluded to in paragraph 2 above (Question 1). Such effects may push cost effectiveness into the 50% region.

Finally, cost effectiveness should be related to the period over which that effectiveness is measured, as all life cycle studies throw up different answers depending on the period eg. something cost effective over 15 years may not be over 5 years. One way to make people more aware of cost effectiveness is to increase the way we look (and cost) the future.

3 Meeting a challenging carbon reduction target is likely to require carbon reductions beyond the levels that are currently cost effective. What factors will support us going further this? - provide comments to support response.

The scale of the climate change problem is such that we will almost certainly need to look beyond simple market forces (i.e. cost effectiveness) to achieve the necessary reductions in carbon emissions. Essentially the issue is a health and safety one (albeit initially not apparent as such but it clearly will become acutely so) and a similar philosophy might well be employed to that implicit in much health and safety activity i.e. meeting the H&S requirements at least cost (which may or may not be cost effective).

There need to be binding demands that schools must meet or resources will be diverted to priorities other than carbon reduction.

4 What more do we need to consider to establish deliverable targets for emissions reduction from the school sector?

- (i) Developing the appropriate collaborative infrastructure to enable the schools sector to act as a coherent client body and to take advantage of the contractual power this will provide.
- (ii) Developing partnership arrangements with low carbon energy suppliers to provide the contribution to low carbon operation beyond that achievable by reducing demand and energy efficiency measures.
- (iii) Developing a Client culture that contracts for the procurement of school buildings must include 'performance-in-use' requirements, supported by appropriate contractual and funding arrangements. Designers and constructors would then need to change from the current 'code compliance' design approach to designing to include for operational realities such as occupant behaviour, inadequate maintenance and operation skills. It is essential that occupants are informed about and understand the energy performance consequences of their actions.

5 Which other carbon reducing initiatives or organisations might schools work with to achieve a greater combined reduction in emissions?

As above in 4(ii)

Figure 29 of the attached evidence document demonstrates that the majority believed additional professionals such as a carbon champion (to maintain awareness of energy requirements throughout the project's lifecycle), and person responsible for aftercare (to assist the users of low or zero carbon systems in the first year of occupancy), should be appointed. Local HE Institutions with expertise in built environment might be interested to play a role of carbon champions.

CIBSE's experience with its client focussed 100 hours of carbon clean up campaign clearly shows that carbon management requires active managers with appropriate training and support.

CIBSE has real concern that the skills necessary to achieve low-carbon impact schools have not been part of the teaching to members / applicants for membership of other professional design organisations. CIBSE through its Low-Carbon Consultants scheme ensures that appropriate skills are available.

### **Section C: Reducing emissions from energy use in school buildings**

6 a) What level of ambition is appropriate for reducing carbon emissions from energy use in school buildings?

Again as in the response in 1 a 'leadership' ambition is entirely appropriate and necessary.

To achieve an 80% reduction by 2050 we need to build schools which exceed the standards and carbon targets of Part L now, if they are to be operating at the required level in 20 or 30 years time.

6 b) From your experience, how can we deliver this?

Experience suggests that if we continue with our present policies and their evolution – essentially as outlined in the consultation paper – we simply will not deliver. Historically, promotion, encouragement, information and training programmes have had a limited effect: cost effective in their own terms but nowhere near big enough in terms of overall emissions reductions to meet the kind of cuts currently being targeted.

More effective will be greater reliance on minimum standards applied through legislation or at least through imposing severe financial penalties for non compliance (or attractive bribes for compliance) but see below.

Figure 4 of the accompanying evidence document indicates an almost equal proportion of building design professionals agreeing for and against training being adequate to handle behavioural issues indicating that additional mechanisms (incentives/penalties) are needed to deliver greater carbon reduction.

CIBSE has an existing professional development programme to help competences for the procurement of low-carbon impact buildings. This programme needs expansion to ensure adequate skills are available to meet the need for sufficient suitably qualified low-carbon designers. CIBSE has real concerns that the pool currently available to train at this level is small, and they are all very busy. If the low-carbon design training is to produce an adequate number of designers, a significant number of suitably skilled trainers will be needed. Currently, we are in a position where the UK may not have enough trainers to run the necessary courses / web training / distance learning.

7 Which of the options outlined in section C do you think would be most effective? How easy or difficult would it be to deliver these options?

There is a need to adopt a whole system approach to schools design. Energy performance, indoor air quality, acoustic performance, thermal comfort and lighting all need to work together to deliver effective buildings, and they need to be managed as complete systems through their service life.

The options with the greatest potential for effectiveness are: low carbon standards (paras 24, 26 and 27 of the consultation), extended handover (para 30) and appropriate technical training (para 31).

However without feedback from a programme of post occupancy evaluation (para 29) none of this will work. Experience thus far suggests that we are not even achieving the energy performance standards currently required by the BSF and until we understand why that is and can overcome the shortcomings, we will have little chance to move forward on even more demanding standards. This is a key issue which cannot be ignored in the way that it has been for some decades.

Sometimes the specifications laid down within contracts increases the tendency towards mechanical and energy intensive solutions to meet the rigid criteria specified. Moreover, design guidelines, especially BB93 and BB101, sometimes get misinterpreted, thus encouraging carbon intensive designs to avoid litigation (Figures 16 and 17 of the accompanying evidence document).

CIBSE has real concern on current perceptions about which designers are believed to have appropriate skills, as opposed to the persons who can properly operate the design tools necessary for competent design. These perceptions are further complicated by the need for designers to operate holistically – ie, across traditional professional skills areas. One example of this is summertime overheating, where ventilation, fabric thermal weight, solar shading, window arrangements and facilities management all play their part in the eventual performance-in-use. The first five of these areas are traditionally perceived to be under the control of the architect. In turn, the architect usually delegates this responsibility by asking the building services designers to perform a range of calculations. But these questions may be a set of requests that are too limited in their scope, because of lack of knowledge of the correct set of questions. In practice, and this has been already applied in a number of projects, there needs to be a design team led by appropriately skilled building services engineers. The architectural artistry and planning then follows the needs specified by the building services designers.



## 8 What other options are there for reducing emissions from energy use in school buildings?

The design culture needs to change from a design process where technological fixes are the 'solution' to low carbon. Instead we must have a very clear priority of going 'passive first' in the design progression. The first design decisions must relate to fundamentally minimising energy use – before any technology is used. To achieve this needs comprehensive building modelling of heating demand, lighting energy, summertime overheat, ventilation and acoustics. This will be long before the 'tick-box' items such as CHP, condensing boilers, wind turbines and photovoltaics are even thought-of. These are all building services skills, which must be discussed in a holistic design environment. Once energy minimisation has been achieved, then, and only then, should decisions on technical fixes, and energy supply options be considered? (Unfortunately, the current planning and design processes freeze many design aspects that are intimately connected with the building's carbon impact, before the relevant calculations have been made. This is perverse, and must be changed)

If we cannot reduce emissions by demand reduction and efficiencies the only options often are low carbon and renewable energy supplies. These clearly have their own sector difficulties in the short term and in the medium and even long term may require considerable subsidy in order to generate a market. Schools clearly could not contemplate widespread application without financial support.

## 9 How can we accelerate the uptake of low carbon and renewable energy technologies where appropriate in schools?

See 8 and also:

Once demand has been reduced as far as practicable emissions can be further reduced by generating energy locally from renewable sources and this can legitimately be part of a long term carbon management plan. However, schools do not have a year round demand for energy and environmental conditions may not always be well suited to exploit renewable resources. Thus in order to take maximum advantage of low carbon resources they can be shared across local communities. Thus, for many new schools it might be appropriate to include sharing of community / district energy, especially where they are a part of wider scale new development. Figure 6 indicates significant support for low carbon energy networks using renewable energy being integrated into new schools and this could work to a considerable extent for a refurbishment as well. Figure 7 indicates high support for low carbon energy networks in schools being integrated with community facilities. Once demand has been reduced as far as practicable emissions can be further reduced by generating energy locally from

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CPD programmes are also important: At present commercially there is a lack of adequate awareness regarding the technologies available for designing zero carbon schools (Figure 22 of the accompanying evidence document). Moreover, there is no reliable database of recent schools at present that would provide this type of information. Thus it becomes difficult to know for sure what technologies are being used specifically in schools. It is also important that they are extensively monitored to understand the level of success, barriers and performance of the innovative techniques in practice (Figure 23).

10 What other methods could be used to trigger behaviour change around energy use?

Traditional enforcement, promotion, training etc should be bolstered by a system of meaningful penalties or incentives to “low carbon” behaviours.

CIBSE experience shows that behaviour change is not a ‘fit and forget’ option – it requires constant ongoing effort to achieve and maintain.

#### **Section D: Reducing emissions from school travel and transport**

11 a) What level of ambition is appropriate for reducing carbon emissions from energy use in school travel and transport?

Again it is difficult to see how any ambition lower than leadership can apply.

11 b) From your experience, how can we deliver this?

The policy options listed form an impressive array of often quite sophisticated measures. Although this is not an area of CIBSE expertise we can see parallels with the buildings sector in that achievement of the goals outlined relies in the main on a wide range of people doing the right things at the right time in areas that are rarely their primary concern and where failure to do the right thing has little or no immediate impact or penalty and is therefore doomed to failure or at best limited success. More draconian use of legislation and regulation is probably the only way to move forward in some areas, eg. use of private cars, but the schools sector has no powers and government is unlikely to be brave enough to enforce a ban.

12 Which of the options outlined in section D do you think would be most effective? How easy or difficult would it be to deliver these options?

Effective options within the current legal framework would involve standard specifications and leases (para 48 of the consultation) but applied on a mandatory basis and combined with grants or discounts (para 65).

13 What other options are there for reducing emissions from school travel and transport?

As outlined in 11b above we feel the options described are wholly worthy and given time (a great deal of it) would achieve significant impacts. However, we would submit that the required time is not available and in all cases the changes aspired to will only come about within an appropriate timescale, with an imposition of a legal overlay to the policies.

14 a) To what extent do you think enhanced School Travel Plans are the appropriate framework for encouraging an increased shift towards adopting sustainable modes of travel on school journeys?

14 b) If not, how else might we achieve this objective?

Comments:

15 To what extent do you think the provision of guidance on school vehicles will reduce the carbon impact of school / local authority vehicle fleets?

A large, empty rectangular box with a black border, intended for a response to question 16.

16 To what extent do you think the proposals for reducing the environmental impact of international travel and school trips will encourage schools to make sustainable travel choices?

Comments:

A large, empty rectangular box with a black border, intended for comments on question 16. The word "Comments:" is written in the top left corner of the box.

17 Where educational trips are necessary but carry a significant carbon impact, do you think schools would take action to reduce their own carbon impact in other areas?

Comments:

18 How can we build on the existing local and national walking and cycling programmes to make sure that action to promote walking and cycling is consistent across the country?

Comments:

19 To what extent do you think the proposal to build on the current Bikeability programme will encourage children (and parents) to use their bicycles more for travel to school?

Comments:

20 Do you support the encouragement of car-free zones around schools and if so, to what extent do you think they will reduce the number of short car journeys?

Yes

No

Don't Know

Comments:

21 How can staff be encouraged and supported to travel in more sustainable ways?



Comments:

**Section E: Reducing carbon emissions from school procurement and waste**

22 a) What level of ambition is appropriate for reducing carbon emissions from school procurement?

A leadership ambition is clearly appropriate. As outlined in 11b above we feel the options described are wholly worthy and given time (a great deal of it) would achieve significant impacts. However, we would submit that the required time is not available and in all cases the changes aspired to will only come about within an appropriate timescale, with an imposition of a legal overlay to the policies.

22 b) From your experience, how can we deliver this?

As for the buildings and transport areas we believe success will only be achieved by applying a significant level of compulsion to bolster the policy options outlined, for similar reasons to those above e.g. 7 and 13

Figure 32 of the accompanying evidence indicates that most professionals noted 'technical complexity' as the main factor to consider when selecting the low and zero carbon procurement route, followed closely by 'flexibility – high probability of variations'. However, the PFI is often criticized for its long-term inflexible contracts, and potential lack of technology.

As Figure 33 illustrates, the majority agreed or strongly agreed that a lack of contractor involvement on traditional procurement projects can result in poor buildability. However, the responses regarding the PFI as an ideal arrangement for zero carbon schools were more varied. The majority strongly disagreed that this was an ideal arrangement for low and zero carbon schools and a large percentage was also uncertain, indicating that there is much doubt regarding the PFI within the industry.

23 Which of the options outlined in section E do you think would be most effective? How easy or difficult would it be to deliver these options?

Standard procurement specifications, clauses etc (paragraphs 80, 81, 82, 83, 85 of the consultation) but for mandatory use; supplier accreditation (paragraph 87); reduction in choice of suppliers / products (paragraph 88) are all likely to be highly effective and should be relatively easy to implement. Additionally the simple measure outlined in para 83 is increased use of recycled paper produces an enormous impact for a single measure and at face value has little or no down side.

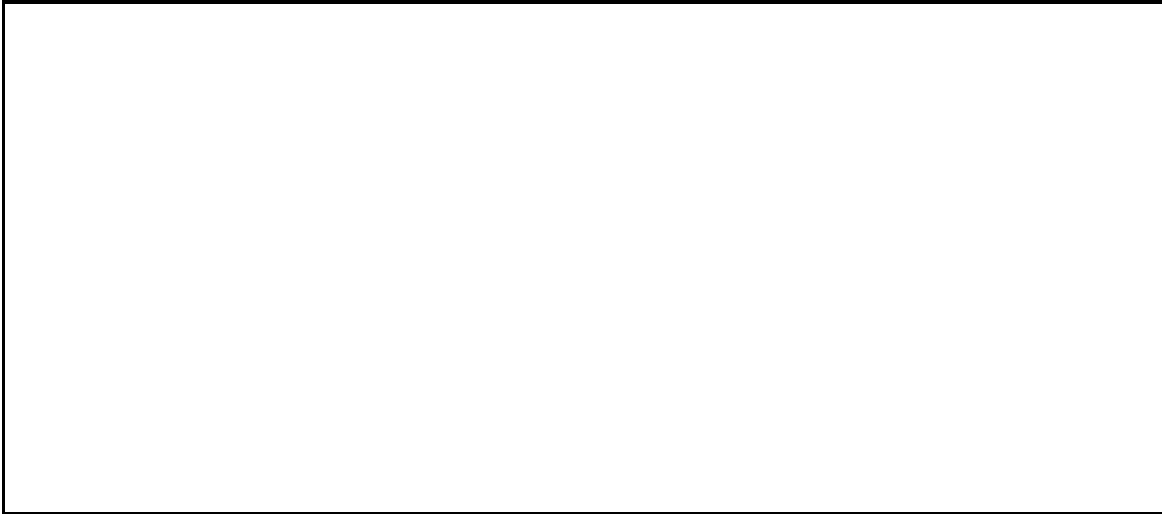
24 What other options are there for reducing emissions from school procurement?

Alongside those options outlined in 27 above, working with the supply side (paragraphs 79 & 86) would maintain a gradual improvement in standards through time – essential for future reductions.

25 To what extent would a set of standard specifications be helpful to schools, local authorities and the supply chain?

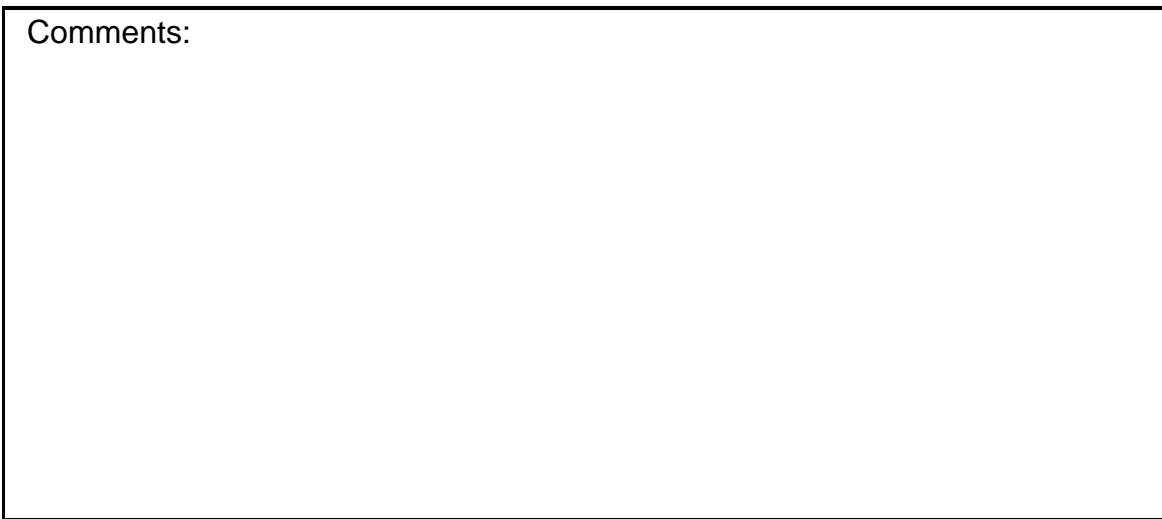
We suggest these options are both essential and should be compulsory; consistent with views expressed earlier.

26 To what extent would a Sustainable Procurement Code be useful for schools?



27 To what extent should schools be expected to only buy and use products which are low carbon, from accredited sustainable suppliers and contracts let/approved by the DCSF or local authorities which are intended to support carbon emissions reductions?

Comments:



28 How can we encourage schools and local authorities to take up quick wins and good practice recommendations?

Significant incentives.

29 Are there any barriers to schools improving their performance on waste reduction and recycling?

The primary argument outlined in 13 above is relevant.

### **Section F: Implementation and delivery**

30 What other aspects of reducing schools carbon emissions need to take place at national, regional or local authority level?

Section F outlines an extremely sophisticated array of interwoven policy initiatives, networks, measures etc. Some might say bewildering. While this may to some extent be inevitable the consequences in 13 above are relevant. Success depends on very many people doing what they will probably regard as 'extra' work for no obvious gain to them. The whole process needs to be made as decision free as possible with either compulsion or obvious incentives for doing the right thing (and possibly sanctions for not) as the only options. While such a top down approach is undoubtedly unfashionable with our present obsession with local power and responsibility, it is unlikely that we have the time available to indulge the more liberal and ultimately more philosophically satisfying regime.

31 What challenges do you foresee for schools, local authorities and others in gathering and managing data about schools carbon emissions? How might these challenges be resolved?

Comments:

32 What carbon reduction support services would the schools sector like to be available?

Comments:

- 1) School funding for capital and revenue repairs must be reviewed for adequacy to ensure that low-carbon opportunities are always taken.
- 2) Persons undertaking schools capital works and revenue repairs / minor works must have adequate competence to identify low-carbon opportunities, write specifications that include adequate knowledge of low-carbon specification and design, and include adequate allowance to ensure the expected performance is achieved. By way of example, a recent survey in Scotland looked at school boilers that had been recently installed. Out of 19 schools that had natural gas available, 15 installed high efficiency boilers. The remaining 4 had condensing boilers. Only one of the 4 would have operated with substantial condensing. The others were connected to heating circuits such that any condensing operation would only occur for less than twenty minutes a day. This is a terrible indictment on design standards and on the true competence of many designers (see answer on the pool of suitably qualified designers).

33 Thinking about all of the options discussed in this consultation paper and others you may have suggested, what combination of options do you think would be most likely to deliver significant carbon reductions by 2020?

Those which involve standards and standard approaches applied in a mandatory regime (but bear in mind the gratification related to post occupancy evaluation in 8 above)

34 Do you have any other comments?

CIBSE is a membership organisation made up of professional engineers working in the buildings / construction sector. It manages a number of special interest groups including one concerned with School Design.

As part of CIBSE's consideration of the consultation on the School Carbon Management Plan, a UCL Research group in collaboration with the CIBSE School Design group has developed a body of survey information relevant to many of the issues covered by the consultation. This was done by surveying the opinions of the school design group on:

- (i) The pointers for designing zero carbon schools developed by the DCSF Advisory Task Force.
- (ii) Whether the PFI, as the main procurement route for new build schools under the BSF programme is likely to encourage or inhibit the successful delivery of zero carbon schools;
- (iii) The strengths and weaknesses of the current school building refurbishment framework and the feasibility of an energy efficient refurbishment programme. Whether school buildings can meet the criteria for thermal comfort and energy consumption in future, under the influence of on going climate change, using measured data and thermal modelling.

Finally the UCL team proposed a research framework which might be used to interact with the ongoing school building programme to deliver an integrated design tool for school buildings. We offer the results of these activities appended to this response to highlight the richness and complexity of many of the issues outlined in the consultation and the continuing need to better understand the energy performance of buildings if we are to improve it.

The Consultation appears to focus on new buildings. Reducing emissions from the existing stock is a major challenge which needs urgent consideration. This will have to focus on a mix of behaviour change, management and where possible, technical upgrading.

CIBSE is aware that Carbon Trust Scotland have a number of documents available that would make useful reference documents for carbon management in schools across the UK. Renate Powell (a member of the CIBSE SDG) controls the use of these documents which have been in use in Scotland since spring 2009). The Overarching Briefs is a snapshot of a document in development, being prepared for a £7.8Bn schools programme in Scotland. The Overarching Briefs document is very much aligned to 'performance-in-use', rather than 'code-compliance' – necessary to overcome the sad extent of deficiencies such as has been evidenced in BSF schools.





Thank you for taking the time to let us have your views. We do not intend to acknowledge individual responses unless you place an 'X' in the box below.

**Please acknowledge this reply ✓**

Here at the Department for Children, Schools and Families we carry out our research on many different topics and consultations. As your views are valuable to us, would it be alright if we were to contact you again from time to time either for research or to send through consultation documents?

Yes

No

All DCSF public consultations are required to conform to the following criteria within the Government Code of Practice on Consultation:

Criterion 1: Formal consultation should take place at a stage when there is scope to influence the policy outcome.

Criterion 2: Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.

Criterion 3: Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and the expected costs and benefits of the proposals.

Criterion 4: Consultation exercises should be designed to be accessible to, and clearly targeted at, those people the exercise is intended to reach.

Criterion 5: Keeping the burden of consultation to a minimum is essential if consultations are to be effective and if consultees' buy-in to the process is to be obtained.

Criterion 6: Consultation responses should be analysed carefully and clear feedback should be provided to participants following the consultation.

Criterion 7: Officials running consultations should seek guidance in how to run an effective consultation exercise and share what they have learned from the experience.

If you have any comments on how DCSF consultations are conducted, please contact Donna Harrison, DCSF Consultation Co-ordinator, tel: 01928 794304 / email: [donna.harrison@dcsf.gsi.gov.uk](mailto:donna.harrison@dcsf.gsi.gov.uk)

**Thank you for taking time to respond to this consultation.**

Completed questionnaires and other responses should be sent to the address shown below by 20 November 2009

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