

Children's Services

Schools' Carbon Reduction Action Plan

2011-12

School Organisation and Capital Planning

Draft

Version Control

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Purpose of this Action Plan

This Action Plan has been produced to ensure that carbon reduction is owned and addressed by all stakeholders across the schools' estate; in implementing both behavioral and physical changes that will result in greater energy efficiency and reduced carbon dioxide (CO₂) emissions thereby minimising utility costs and mitigating against the impact of future carbon taxes.

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1. Executive Summary

The Council will become a compulsory participant in phase 2 of the Government's Carbon Reduction Commitment (CRC) scheme, having to report CO₂ emissions annually from April 2013 and start paying for allowances to cover our emissions annually from April 2014. It is understood that from April 2014 Councils will be able to recharge the allowances relating to schools through the centrally retained element of the Dedicated Schools' Grant, meaning that it is in schools' and the Council's interest to take action as soon as possible.

On this basis the School Organisation and Capital Planning Team has undertaken two projects 1) a Sustainable Design Brief relating to carbon reduction in construction projects and 2) this Schools' Carbon Reduction Action Plan to ensure that all schools are fully involved in embracing energy efficiency. This Action Plan consists of a series of recommendations in terms of the Council's actions, behavioural changes for schools to consider and potential physical changes for schools with the aim of carbon reduction across the schools' estate.

2. Background Information

A key challenge for the Council and for the services it delivers is the impact of a changing climate. The Council acknowledges the importance of taking action now in order to reduce carbon dioxide (CO₂) emissions and to ensure that Central Bedfordshire is well equipped to cope with inevitable climate change for years to come.

The Council's Carbon Management Plan details the commitments made in its Climate Change Strategy to cut the Council's own carbon footprint and reduce energy and fuel use from the Council's estate, schools, fleet and services it provides.

The Carbon Management Plan states the business case for taking action in terms of carbon reduction, particularly the huge financial costs associated with taking a 'business as usual' approach.

As noted in that Plan, currently emissions from schools make up 52% of CBC's carbon footprint and so it is clear that the schools' estate has a considerable contribution in developing and implementing CBC's Climate Change Strategy.

The Council will also become a compulsory participant in phase 2 of the Government's Carbon Reduction Commitment (CRC) scheme, having to report CO₂ emissions annually from April 2013 and start paying for allowances to cover our emissions annually from April 2014.

In 2008 the DCSF Commissioned the Zero Carbon Taskforce to advise on how new school buildings can be zero carbon by 2016. In January 2010 the

Taskforce identified a 5 step roadmap to achieving zero carbon in schools with the aim of helping schools to join the fight against climate change and at the same time save money. This report includes recommendations on how and when zero-carbon schools can be built, as well as advice on the potential to reduce carbon emissions in existing schools, including measures taken as part of refurbishment.

On this basis the School Organisation and Capital Planning Team has undertaken two projects:

1. To ensure that both new build and refurbishment projects in the schools' estate embrace energy efficiency as a core principle, a Sustainable Design Brief has been created, which sets out CBC's approach to reducing carbon in construction projects.
2. To ensure that schools which are not currently involved in building projects with CBC are fully involved in embracing energy efficiency, this Schools' Carbon Reduction Action Plan has been developed giving advice and recommendations for the whole schools' estate.

The Sustainable Design Brief and Schools' Carbon Reduction Action Plan are available at the following location:

<http://www.centralbedfordshire.gov.uk/education-and-learning/school-planning-projects/default.aspx>

Schools' Carbon Reduction Action Plan

To achieve the aim of developing a Schools' Carbon Reduction Action Plan by March 2011, the following work has been undertaken:

- The establishment of a Schools' Asset Management Planning sub group of the Schools' Forum. The Schools' Forum will ultimately be responsible for overseeing this project. This sub group consists of a cross section of school Governors, Headteachers and Business Managers from CBC's Upper, Middle and Lower schools and specialist CBC Officers.
- Research into carbon reduction to identify potential work-streams.
- The commissioning of LowC Communities, a specialist Low Carbon consultancy, to carry out investigations on site at the 10 worst performing CBC schools in terms of carbon (identified from existing data as CBC's 'improvement portfolio'). These investigations have led to both specific plans to improve energy efficiency, reduce energy consumption and effect behavioural change at each site and a summary report of ideas that can be applied to the whole estate.

On the basis of the above, three work-streams were identified for inclusion within the project:

1. Corporate context and suggested Carbon Reduction Commitment (CRC) actions for schools
2. Zero Carbon Taskforce roadmap and Eco-schools Agenda
3. Results of the LowC Commission

Each of the Project's work-streams has identified specific activity and this is now compiled within this Schools Carbon Reduction Action Plan.

3. Corporate context and suggested CRC actions for schools

This workstream was led by the Council's Corporate Policy Advisor, Climate Change / Sustainability.

Summary - corporate context

Carbon Footprint

The Council's carbon footprint for 2008/09 is measured at 33,700 tonnes of CO₂; this includes CO₂ emissions from the Council's corporate estate, schools, street lighting and outsourced service providers – such as leisure centres and highways maintenance. This would fill the Council's Priory House offices 107 times and is equivalent to the emissions caused by a plane flying around the Earth's equator 5,860 times. Of this over 50% of emissions come from energy use by schools in Central Bedfordshire.

Over the past year the Council has taken part in the Carbon Trust's local authority carbon management programme (LACM). Inclusion in this programme has given the Council access to free technical support and expertise from the Carbon Trust to assist in putting together a Carbon Management Plan which identifies opportunities for carbon reduction measures across the Council's estate (including schools) and provides a plan to enable these to be realised.

The impact of increasing energy costs

In 2009 Ofgem predicted a 60% price rise for energy by 2016. Based on the Council's and schools' current combined energy spend of £3.4 million per year, by 2015 this would represent an increased combined energy bill of up to £4.6million rising as high as £5.4million by 2016.

The work with the Carbon Trust has also allowed the Council to assess the future impact of the predicted increase in energy costs over the next 10 years. This can also be applied to schools, for example:

- For Lower schools – the average energy spend is currently in the region of £6,000, by 2020 this could be £9,100

- For Middle schools – the average energy spend is currently £20,000, by 2020 this could be £30,250
- For Upper schools – the average energy spend is currently £40,000, by 2020 this could be £60,500.

These estimates are based on a conservative estimated price increase of 5% per year.

Energy management support for schools

With effect from the end of September 2010 Energy Management is now being carried out in-house by the Council. However, clarification is still required over how this function will be undertaken and also how energy management support will be provided to schools. This function also includes the important task of gathering and validating utility use data for schools. This needs to be addressed in the Council's Carbon Management Plan.

Energy Procurement

Current gas and electricity contracts expire October 2012. As a public sector organisation with a large energy spend, the Council is required to procure energy on fully EU-compliant contracts. Currently energy is procured via a public sector buying organisation. This is based on a flexible procurement approach that is designed to minimise the risk of fixing prices in volatile market conditions. Flexible procurement means that 'blocks' of energy are bought at varying times both before and within the contracted supply period. The arrangement removes the risk of settling an authority's requirement on a single day. Aggregating the volumes for members within the arrangement enables effective market hedging.

This needs to be better communicated to schools to ensure that financial implications outside of the increase in energy costs are kept to a minimum e.g. at the last contract negotiation the standing charge was changed from quarterly to monthly which has had financial implications for schools.

Summary - suggested CRC actions for schools

Overview

Prior to October 2010 the Carbon Reduction Commitment scheme was to be operated on a 'revenue neutral' basis. This meant that all money spent on the purchase of allowances would have been 'recycled' back to the schemes participants with an adjustment made to allow for a reward or penalty depending on the organisation's performance at reducing their carbon footprint. However, following the Comprehensive Spending Review on the 20th October 2010 all revenue raised from the CRC scheme will now be given to the treasury used to support the public finances.

Currently it is expected that the Council will enter the scheme during phase 2 (April 2013), and will have to start paying for allowances to cover our

emissions annually from April 2014. Based on the Council's baseline it is estimated that 25,882 tonnes of CO₂ would have to be paid for, of which 60% relates to emissions associated with schools' energy use which the Council is liable for within the terms of the scheme (emissions from outsourced services – such as leisure, are not included with in the scope of this).

Although the current cost of carbon allowances is £12 per tonne, all of the future modelling that is now coming out of the Department of Energy and Climate Change (DECC) for the CSR etc uses a figure of £15 per tonne. This is seen as a strong indication that this will be the price for phase 2. Based on this the Council would have to pay a total of £390k. £234k of this is attributable to emissions from schools.

The cost of poor data management

CBC should also consider the possible impact of fines for incorrect data reporting. This could add to the overall 'cost' under the CRC scheme. At present the quality of CBC's data is inconsistent.

The cost of estimated meter reads

Under the CRC scheme, emissions based on estimated meter reads (non Half Hour Meter) sites are subject to a 10% uplift. For schools it is estimated that this would account for 4.8 million kWh of electricity and 20.4 million kWh of gas, which represents an additional £11.4k in cost, bringing the total schools element to £245.4k.

Since the Council will enter the CRC scheme in phase 2 (April 2013) there is an opportunity to put in place additional energy efficiency measures in order to reduce the CRC burden prior to the first period for which allowances will have to be paid.

Is the financial burden shared between the Council and schools?

CBC's CRC burden is expected to include all schools in the Central Bedfordshire area including Foundation and Trust schools, Voluntary Aided, Voluntary Controlled, Academies and PFI operated schools.

Whilst the Government intends further consultation on the simplification of the scheme for phase 2, it is understood that from April 2014 Councils will be able recharge the allowances relating to schools through the centrally retained element of the Dedicated Schools' Grant, meaning that it is in schools' and the Council's interest to take action as soon as possible.

4. Zero Carbon Taskforce roadmap and Eco-schools Agenda

This workstream was led by the Projects Officer, School Organisation and Capital Planning with background research and action points from the Chief

Executive Officer, Bedfordshire East Schools Trust & the Business Manager,
Parkfields Middle School.

Summary - Zero Carbon Taskforce roadmap

When undertaking significant capital investment regard should be given to the complementary Sustainable Design Brief which is available at the following location:

<http://www.centralbedfordshire.gov.uk/education-and-learning/school-planning-projects.aspx>

Commissioned by the then DCSF, in January 2010 the Zero Carbon Taskforce identified a 5 step roadmap to achieving zero carbon in schools:

1. Engage with LAs, schools, young people and others

The essential first step is to engage LAs, schools, students and others. It's about generating interest and the will to save energy, ensuring that occupants of school buildings understand:

- how simple day-to-day activities cause carbon emissions
- the importance of reducing carbon emissions
- simple actions they can take to reduce their energy use
- how to use display meters to learn about energy and how it is often wasted
- how this data can be used throughout the curriculum

For new, refurbished and existing schools this will require clear briefing and energy targets. This key first step calls for strong strategic direction from LAs and designers, with clear leadership from headteachers, governors and other key decision makers.

2. Reduce energy demand

Low and zero carbon energy supplies are expensive and/or difficult to achieve, so it is essential to reduce energy demand as much as is practical through simple, no / low-cost measures.

For building occupants, this might require some simple changes in behaviour – such as switching off lights and PCs when not in use.

For building designers it means taking advantage of 'passive' features of school building design:

- orientation
- passive ventilation
- daylight
- thermal insulation and air-tightness

- utilising thermal mass

3. Drive out waste through better design

It is crucial that schools and designers drive out waste, ensuring that everything within the school that uses energy is as energy efficient as possible. Low energy products should be chosen and standby facilities should be enabled wherever they are provided.

For new and refurbished schools, over-complicated controls should be replaced with effective ones that users understand and that encourage energy efficient behaviour.

The building's services should be as efficient as possible:

- low energy ICT
- high efficiency boilers
- low energy lighting
- energy efficient pumps and motors
- heat recovery

4. Decarbonise school energy supplies

Decarbonising energy supplies is a key factor. There are limits on what can be achieved through energy efficiency alone – initial studies suggest that, for building services, a maximum possible reduction of 20-40% could be achieved relative to current building regulations.

So it is important that energy demands are served using the lowest carbon supplies available. For equivalent amounts of energy, electricity has a higher carbon content than fossil fuels but is often the only suitable energy source – for example, lighting and ICT.

- optimising electricity use
- low carbon fossil fuels/biomass
- on-site renewables and CHP
- community energy schemes
- local renewable energy supplies

5. Neutralise energy supplies

For most new schools, it will not be possible to eliminate carbon emissions solely through the above measures, so neutralisation is crucial to address residual emissions.

This might be achieved through other 'allowable solutions' proposed within the CLG consultation on the definition of zero carbon homes and non-domestic buildings.

- exporting low carbon energy to neighbouring properties
- developing low carbon energy infrastructure
- retrofitting energy efficiency measures in existing school buildings as 'allowable solutions'
- using low carbon off-site ICT

In terms of CBC's Schools' Carbon Reduction Action Plan, this will focus on the first 3 steps of the roadmap since steps 1-3 are seen as initial 'easy wins' that should be scoped immediately in all cases. Steps 4 and 5 are less easy for individual schools to achieve but need to be considered in the medium / long term and when undertaking significant capital investment (as per the Sustainable Design Brief).

Summary - Eco-schools Agenda

Eco-Schools is an international award programme that guides schools on their sustainable journey, providing a framework to help embed these principles into the heart of school life.

Eco-Schools is one of five environmental education programmes run internationally by the Foundation for Environmental Education (FEE). There are 46 countries around the world that run the Eco-Schools programme, linking more than 40,000 schools – from the UK to France, from Morocco to South Africa.

Joining the Eco-Schools programme is free and it makes tackling sustainable issues manageable and easy for all schools, whether they are children's centres, nurseries, primary schools, secondary schools or schools with special status.

Once registered on the website, schools follow a simple seven-step process which helps them to address a variety of environmental themes, ranging from litter and waste to healthy living and biodiversity.

Children are the driving force behind Eco-Schools – they lead the eco-committee and help carry out an audit to assess the environmental performance of their school. Through consultation with the rest of the school and the wider community it is the pupils that decide which environmental themes they want to address and how they are going to do it. Measuring and monitoring is an integral part of the Eco-Schools programme, providing schools with all the evidence they need to really shout about their environmental success.

Schools work towards gaining one of three awards – Bronze, Silver and the prestigious Green Flag award, which symbolises excellence in the field of environmental activity. Bronze and Silver are both self accredited through this website and Green Flag is externally assessed by Keep Britain Tidy.

Benefits

The Eco-Schools programme improves the environment, saves money and brings international recognition. It provides the following key benefits:

- Saving money
- Recognition and publicity
- Links to the curriculum
- Links to the community
- School improvements

Framework

The framework consists of 7 elements:

1. Action team
2. Environmental review
3. Action plan
4. Eco-Code
5. Involving the whole school and wider community
6. Linking to the curriculum
7. Monitoring and evaluation

The framework supports schools to work on different environmental and sustainable topics.

Topics

There are 9 topics that Eco-Schools in England can work on, these are:

1. Transport
2. Waste
3. Water
4. Litter
5. School Grounds
6. Healthy Living
7. Energy
8. Biodiversity
9. Global Perspective

Current success within CBC

Many of Central Bedfordshire Council's schools are already taking part in the Eco-Schools Programme.

As of 06/01/2011, 64 (46%) of Central Bedfordshire Council's 138 schools (including Lower, Middle, Upper, Academies, Specials, LA Nurseries) are currently in the Eco-Schools Programme.

Of which –

33 have registered

18 have achieved bronze award status

10 have achieved silver award status

3 have achieved their first green flag

Greenfield Lower School has achieved its 3rd green flag

Conclusions

The Eco-schools Agenda is seen as one of the best practical means of applying the theoretical Zero Carbon Taskforce roadmap.

The Eco-schools Agenda is a readymade tool that Central Bedfordshire Council and its schools can use to implement the Zero Carbon Taskforce roadmap with minimal costs in terms of time and resources.

On this basis it is suggested that action points for schools in terms of the Eco-schools Agenda will in reality also correspond to the Zero Carbon Taskforce roadmap.

5. LowC Commission

This workstream was led by LowC consultants.

Summary - scope of investigations

CBC commissioned LowC Consulting to investigate the performance of its schools in terms of a variety of factors related to energy use. Through a desk top study interrogating the available baseline data for CBC's schools, LowC Consulting prepared an improvement portfolio of the 10 larger but poorer performing schools in terms of energy use, cost of utilities and carbon emissions per m² of floor area.

Individual site investigations were carried out at these schools to further understand the issues leading to their high energy consumption. It is anticipated that targeting these schools will produce the largest carbon reduction for CBC. However the lessons learned at these schools can also be applied to other schools in order to make carbon and cost savings throughout the schools' portfolio. A variety of different issues were noted at each school which has led to the development of a series of recommendations as to how

schools can reduce fossil fuel and electricity use, whilst improving the working environment of the school buildings.

Drivers for carbon reduction in schools:

- High and rising energy costs. Reducing energy bills frees up money that the school can spend on core education activities or reinvest in additional energy saving technologies to take advantage of further savings.
- Increasing use of electricity. The rapid growth of the amount of electrical equipment in schools, particularly for ICT, has resulted in increases in electricity bills. The carbon impact of electricity is also proportionally much higher than heating fuels.
- Manage future risks – energy and carbon issues and associated legislation and taxation are likely to become stricter in the near future. For example, CBC is committed to the CRC Energy Efficiency Scheme – the UK's mandatory carbon trading scheme, making them accountable for the energy they use and the carbon they emit (as per the Corporate Context section of this document).
- Effective use of the building(s). Comfort conditions within the building will often be improved as a result of implementing energy efficiency measures and educating the users about how the building and its controls should be used. Correct temperature, ventilation, and indoor air quality can have significant impacts on productivity and health.
- Schools' influence on the local community. Schools are often the focal point of a community, with many regular visitors to the school other than pupils and parents. This gives them the opportunity to set a good example in terms of energy and environmental issues in the hope that successes at the school will have a positive effect on the wider community.

Barriers to carbon reduction in schools:

- Financial. Tight budgets have meant that previous building works and improvements to schools have often been carried out in a piecemeal fashion. In some cases this can lead to an uncoordinated approach to building services (multiple plantrooms and control systems) and inconsistency within a building in terms of comfort levels. Often it may be hard to see the immediate value in building improvements when payback periods are extensive or unknown. Inheriting a piecemeal approach to building services also means that improvement works (such as a boiler replacement) are more difficult to implement.
- Behaviours. Schools are very busy places and pupils and teachers do not always have time to consider energy conservation during normal school activities.

The aim of the investigations (using lessons learned from actual CBC schools) is to offer solutions to these drivers and barriers by providing a series of recommendations which are designed to complement each other to improve the schools' energy performance: from capital investment in new equipment, to behavioural changes throughout the school in terms of how energy is used and how it can be conserved. The recommendations are provided with an indicative cost and have been given in order of priority for implementation, so that the most pressing issues which should have the most positive impact are considered first.

Summary - observations and impacts

Heating and Hot Water

- The age range of boilers within the sample schools range from around 2 years old to over 20 years. Old and inefficient boilers (where installed) are being used for both heating and hot water.
- There tends to be a decentralised strategy towards heating different areas of the schools. As schools expand capacity with various extensions and new buildings, new boiler houses have been added to the site with various sizes and types of boilers.
- Boiler sizes are not always sufficient to cope with the buildings demands. The opposite was also noted, with very large boilers serving small areas with minimal heating or hot water demand.
- In some areas there is only one boiler for heating and hot water. This results in the boiler running through the summer to provide hot water when there is no heating required. This can result in large plant serving very small heat loads very inefficiently.
- There is little or no zoning of the heating system. This means that should one area of the school require heat, for example during after school clubs or lettings, then the rest of the school is also heated and therefore energy is wasted. Certain areas of the building are warmer than others due to their orientation or due to the activities within the rooms (i.e. cooking classrooms) and occasionally overheat, resulting in the windows being open when the heating is on.
- Where zoning of the heating system is in place, it is ineffective – building areas are being zoned together despite different requirements for heat.
- Heating systems tend to be controlled via either a time switch and/or optimiser controls with weather compensation. Optimiser control with weather compensation involves thermostats placed inside and outside the building which take into account the external temperature to ensure the building gets to the correct temperature at the required time. On

several occasions it was noted that the thermostats for the optimiser have been ineffectively positioned. For example, an internal thermostat is placed adjacent to an external door which is frequently used. Due to the regular influx of cool air the temperature in the space will be below the set temperature point and the system will continue to call for heat, even if the other areas, such as classrooms, are warm enough.

- There is a mixture of types of heaters used – mainly radiators and fan convectors, which vary in age and efficiency.
- There is a lack of individual occupant control over the heating from room to room.
- Thermostatic Radiator Valves (TRVs) and other forms of individual control are not properly used or understood by the occupants or they have been damaged, resulting in a lack of occupant control over the individual heaters.
- Some of the pipe work within the building is not lagged therefore heat is being lost through the pipes.
- Radiators and fan convector heaters are often obstructed by objects such as filing cabinets, shelves, chairs and coats. Or the heaters are locked away behind concealed panels for protection. This results in heat being lost and can be a fire hazard where fan convectors are blocked.

Lighting

- Lighting has often been left on unnecessarily – either when there is no one occupying the room or when there is sufficient daylight to light the space, for example light fittings adjacent to roof lights.
- Natural daylight is not being utilised – blinds in classrooms are often shut and not reopened when the lesson has finished.
- Light fittings are old and inefficient – often T12 or T8 fluorescent tubes, which tend to use more electricity and produce less light per bulb, therefore requiring more bulbs to light a space. The older bulbs also have a shorter life span than newer T5 fluorescent tubes.
- Manual switches are in place for the control of most of the lighting for both classrooms and circulation spaces. This often results in the switches being left on even when the lighting is not required. There tends to be a good level of user control for the switches in classrooms, with the lighting split into 3 zones or banks of lights. This allows separate control of the teaching space/whiteboard.

Glazing

- A lot of windows in the schools are the original single glazing, from when the buildings were constructed.
- Some of the window types are also inefficient at keeping heat in the room, for example the overlapping louver style windows.
- Window frames were also in disrepair, some wooden frames were rotting.
- The result is a significant amount of heat is lost through the windows. Also during the summer the single glazed windows let in heat resulting in rooms getting too hot and possibly requiring some form of cooling which leads to more electricity being used.

Insulation

- Many of the schools' buildings were constructed before the building regulations stated that walls and roofs required insulation. This means that heat will be lost through the building fabric.
- Several areas are in need of new roofing.

I.T. Equipment

- Computers and monitors are switched on in the morning and off at the end of the school day. Computers remain on even when not in use.
- Some schools have central control over the computers, meaning they can all be switched on/off from a central location by the I.T. staff.

Electrical Equipment

- Smart boards and projectors are often left running throughout the day. They are switched on in the morning and off when the school day is over.
- Other equipment was on when not required – either in empty classrooms or in other areas when the school day was finished.

Behaviour

- Lighting and equipment are often left on unnecessarily.
- People's levels of thermal comfort vary, resulting in some being warmer/colder than others. This can often mean that windows are open when the heating is on. Also if windows are not closed by the occupants after the space has been used, heat will continue to be lost.

- In some schools it has been noted that there is a strong interest in environmental issues. However, it has previously been difficult to convince all of the pupils/staff to commit to particular initiatives or for long term campaigns to remain effective.

6. Considerations

Communications

This plan should be advertised and promoted via a number of communication channels to ensure that schools are aware of it and its contents and also that both school staff and pupils are actively engaged in achieving its aims.

Capital Funding

Consideration needs to be given to the possibility of Capital funding (from the schools' Capital Maintenance Grant) for the physical changes to schools recommended in this Action Plan.

Risks

The Ultimate risk is that schools / CBC adopt a business as usual approach and the projected financial penalties associated with this approach are imposed. Specific risks are as follows:

Actions for CBC

- CBC fails to launch the Schools' Carbon Reduction Action Plan successfully
- CBC fails to publicise the Eco-Schools Programme effectively
- CBC fails to establish Energy Management arrangements to fill the void left by the ending of the Mouchel contract
- CBC fails to publicise its Energy Management support to schools

Behavioural Changes for Schools

- Schools do not buy into the Action Plan and fail to map and reduce their energy consumption
- Targets regarding the Eco-Schools Programme are not achieved
- Schools fail to put into practice the wider behavioural / attitude actions suggested
- Schools expect an unachievable level of support from CBC

Physical Changes for Schools

- Schools / CBC do not view the Low Cost measures as making enough difference to be worthwhile in terms of time and benefit

- Schools / CBC consider the Medium and High Cost measures too expensive to adopt
- Schools expect an unrealistic level of assistance and resource from CBC

7. Combined Action Plan

The Combined Action Plan that has resulted from the Project's three work-streams is set out below.

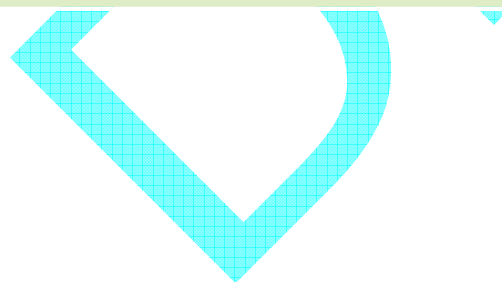
Many of the measures and opportunities identified will not only contribute to the effort to reduce CO₂ emissions but also help the schools to operate more efficiently, cut costs and go some way to protecting schools from the inevitable future increases in fuel and energy prices.

Draft

Action Plan – Actions for CBC

Project Theme	Action	Responsibility	Timescale	Additional Resources Required	Notes
Corporate Context	Carbon Footprint for 2009/10 to be finalised and validated	Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-
Corporate Context	Explore feasibility of providing schools with bespoke carbon footprints/energy use reports, including benchmarking against 'typical' schools of their type and other schools in Central Bedfordshire	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-
Corporate Context	Guidance to be provided to schools to help them better forward plan for the financial impact of increasing energy costs and CRC	Schools' Finance/ Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-
Corporate Context & LowC Commission	Better communication with schools about how and how regularly the Council procures energy, what measures are in place to ensure that best value possible is achieved (economies of scale), to explain why charges	Procurement	Short Term	Low Cost	-

	change and also to provide benchmarking against the likely charges they would face outside of the Council energy contracts				
Corporate Context	Regular updates to be provided to schools on latest developments with CRC etc to better support future financial planning	Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-
Corporate Context & Suggested CRC actions for schools	CBC's future Energy Management arrangements to be confirmed	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability to confirm how this will be delivered and what this will include	February/ March 2011	-	-



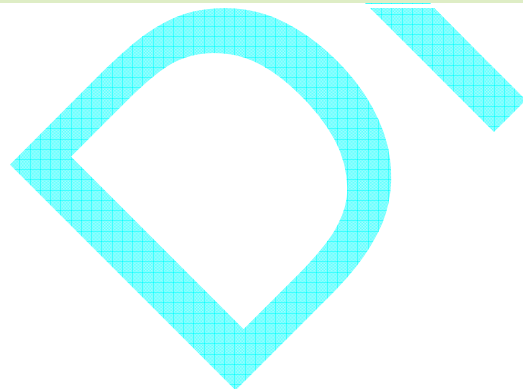
Corporate Context	Corporate funding will need to be found to resource an energy management officer. The work programme for this resource in terms of schools will be established and overseen by the Schools' Asset Management Planning sub group and progress and performance will be reported back to school forum in March 2012. This should include provision of ad-hoc advice and support, energy audits and DEC's and lead in the delivery of this action plan as well as providing proactive analysis and recommendations based on AMR data	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability to confirm how this will be delivered and what this will include	March 2011	-	Link to all behavioural and physical changes for schools
Corporate Context	Advice and coordination of joint procurement initiatives for schools, e.g. AMR's, to enable schools to share best practice and benefit from economies of scale	Corporate Policy Advisor, Climate Change / Sustainability with support from Procurement	TBC	-	-
Corporate Context	Better use of existing communications channels to highlight best practice, provide advice and regular updates	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability to	TBC	-	-

		confirm how this will be delivered and what this will include			
Corporate Context	Provision of toolkit for schools including quick wins (based on LowC reports), simple energy audit checklists to identify quick wins etc	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability to confirm how this will be delivered and what this will include	TBC	-	-
Suggested CRC actions for schools	Estimates for the Corporate cost of CRC to be revised based on 2009/10 data as soon as this is complete and been quality checked. Breakdown specifically for the schools' estate to be based on actual energy usage so that true CRC costs coming from schools' emissions can be better estimated	Sustainability team – communicated to schools via Schools' Forum	TBC	-	-
Suggested CRC actions for schools	Consultation on simplification of the scheme will happen over the next year (DECC have not announced dates for this yet). It is important that: a) The Council's response includes the implications of	Sustainability team	TBC – deadlines to be set by DECC	-	-

	having to include schools within our CRC burden b) That a coordinated response is sent on behalf of schools in Central Bedfordshire				
Suggested CRC actions for schools	Annual statements of energy use for schools are requested by the Council's energy procurement lead	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability	End of January 2011?	-	-
Suggested CRC actions for schools	Proposals for AMR metering for schools to be finalised and Schools' AMP sub group to be consulted for their views	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability	End of January 2011?	-	Link to current Project to roll out AMR for all corporate CBC buildings
Suggested CRC actions for schools	Advice on whether the financial burden will be passed onto schools to be passed to Schools' Forum following consultation for simplification of CRC. Further briefings on CRC developments to be passed onto schools	HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change /	Ongoing	-	-

		Sustainability			
Zero Carbon Taskforce roadmap & Eco-schools Agenda	CBC will publicise the Eco-Schools Programme (and success stories already occurring) with the aim of achieving the specific action points detailed further on	TBC	TBC	TBC	-
Comms	Formally launch the Action Plan	TBC	TBC	-	-
Comms	Publicise in Central Essentials – CBC’s weekly newsletter to Headteachers	TBC	TBC	-	-
Comms	Publicise in Governors Essentials – CBC’s monthly newsletter to Governors	TBC	TBC	-	-
Comms	Use the Learning Portal to feature the Action Plan (plus links to other useful websites) and to share best practice across the schools’ estate	TBC	TBC	-	-
Comms	Individual school visits – either pre planned or spontaneous	Energy management lead (TBC)	TBC	-	-
Comms	Presentations to the Council’s Youth Parliament	Energy management lead (TBC)	TBC	-	-
Comms	Provide regular updates and features on success stories	Energy management lead (TBC)	TBC	-	-
Capital Funding	Schools to have the opportunity to buy-in from CBC’s Property and Assets Team (or an external provider through a framework arrangement with CBC) a site specific Sustainability Survey similar to the ones carried out by LowC - surveys to cover observations with	AD Assets/ HofS School Organisation and Capital Planning/	TBC	-	-

	impacts and recommended actions with associated costs	Corporate Policy Advisor, Climate Change / Sustainability			
Capital Funding	Consideration given to the notion that CBC fund the recommendations suggested in this Action Plan by creating an 'invest to save' fund (from the schools' Capital Maintenance Grant) from which schools would be loaned the capital to undertake physical changes	AD Assets/ HofS School Organisation and Capital Planning/ Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-
Capital Funding	Explore opportunities for external funding / support in terms of feasibility and appropriateness	Corporate Policy Advisor, Climate Change / Sustainability	TBC	-	-



Action Plan – Behavioural Changes for Schools

Project Theme	Action	Responsibility	Timescale	Additional Resources Required	Notes
Suggested CRC actions for schools	Schools to take regular meter readings for all utilities and hold these on file	Schools	TBC	-	Link to Automatic Meter Reading (AMR) and Automatic Monitoring and Targeting (AM&T)
Zero Carbon Taskforce roadmap & Eco-schools Agenda	At least 80% of CBC schools to have registered on Eco-Schools Programme, with 50% working towards bronze award status	Schools	January 2013	-	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda	At least 30% of CBC schools to have achieved Eco-Schools Silver Award	Schools	January 2013	-	-
Zero Carbon Taskforce roadmap &	At least 50% of CBC schools to have achieved Eco-Schools Silver Award	Schools	January 2014	-	-

Eco-schools Agenda					
Zero Carbon Taskforce roadmap & Eco-schools Agenda	Individual schools to map and reduce their energy consumption	Schools	ASAP	-	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda & LowC Commission	<p>Schools to establish an environmental team involving representatives from all stakeholders in the school to identify realistic and achievable targets with measurements that will relate to the budget</p> <p>Awareness Campaign</p> <ul style="list-style-type: none"> • affecting the behaviour of staff and students • to understand the impacts of actions on energy use • easily accessible to with straight-forward arguments • schools must develop the ability to monitor and display energy consumption information • school should set achievable targets for energy reduction and demonstrate in how much the school has saved • possible competition between schools • embed campaign into curriculum • regular updates required <p>Reporting</p> <ul style="list-style-type: none"> • on the successes of the school's energy 	Schools	ASAP	Low Cost	-

	<p>awareness campaign</p> <ul style="list-style-type: none"> • school website, school notice boards and newsletters, • enhance the school's reputation 				
Zero Carbon Taskforce roadmap & Eco-schools Agenda	Schools to investigate awards and environmental bodies that provide resources and guidance to promote energy conservation and carbon footprint reduction	Schools	ASAP	-	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<p><u>General Actions</u></p> <ul style="list-style-type: none"> • Use the annual Display Energy Certificate (DEC) to identify energy efficiency and as a measure from year to year • Incorporate into target for schools • Use benchmarking website to identify major differences between schools and investigate anomalies – energy and water • Carry out energy audit 	Schools	As appropriate	-	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<p><u>Lighting</u></p> <ul style="list-style-type: none"> • Switch off lights when not in use • Use signs to get attention to action • Use energy saving light bulbs • Make use of natural light • Incorporate 'switch-off' into the cleaning / caretaking service level agreement 	Schools	As appropriate	-	Link to Lighting Controls, Fitting Replacement and Retrofit
Zero Carbon Taskforce roadmap &	<p><u>ICT</u></p> <ul style="list-style-type: none"> • turning off all active screensavers and switching on a shutdown mode 	Schools	Short Term	Low Cost	Link to Automatic Meter

Eco-schools Agenda & LowC Commission	<ul style="list-style-type: none"> switching off computers after class especially before break and lunch times and at the end of the working day automatic power down facilities for when computers are left idle Software can intelligently power manage computers across a network remotely and automatically overnight, on weekends and when not in use software can also run reporting on energy consumption of machines and energy savings as a result of powering down remotely review of central shutdown/start up control for computers (where in place) create a timetable detailing when computers are required Incorporate 'switch-off' into the cleaning / caretaking service level agreement 				Reading (AMR), and Voltage Optimisation
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<u>Heating</u> <ul style="list-style-type: none"> Shut windows Turn down thermostats Draught exclusion Close blinds/curtains at end of day Install thermostatic valves Re-configure zoning to ensure equal distribution of heat and actual shut down at a pre-determined temperature 	Schools	As appropriate	-	Link to Insulation, Optimiser / Compensator Control, Double glazing and Boiler Replacement
Zero Carbon	<u>Water</u>	Schools	As	-	-

Taskforce roadmap & Eco-schools Agenda	<ul style="list-style-type: none"> Consider measures to reduce consumption of water: <ul style="list-style-type: none"> rainwater harvesting for non-drinking functions dripping taps and toilets (adjust flow rate) install water savers in the toilets Check hot water temperature and ensure it complies, but does not exceed, temperature guidelines 		appropriate		
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<u>Electricity</u> <ul style="list-style-type: none"> Only boil actual water needed Purchase energy monitors £15 to £50 and install in specific areas to allow children to monitor use and identify areas of savings. 	Schools	As appropriate	-	Link to Free solar PV, Building Management Systems, Automatic Meter Reading (AMR), Lighting Controls / Replacement / Retrofit, Renewable Energy Technologies and Voltage Optimisation
Zero Carbon Taskforce	<u>Recycle and gain income (research to find most competitive site)</u>	Schools	As appropriate	-	-

roadmap & Eco-schools Agenda	<ul style="list-style-type: none"> • Printer cartridges - e.g. Recycloop • Mobile phones – e.g. Envirofone, Recycloop, Fonebank • Clothes, linen, shoes and curtains etc – e.g. Texrecycle • Paper, plastic and cans • Furniture – furniture re-use network • Freecycle 				
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<u>Litter – waste in the wrong place</u> <ul style="list-style-type: none"> • Reduce packaging • Encourage plated meals • CPRE litter campaign • Education of all stakeholders regarding positive and negative effects of litter control • Reward/recognition system for individuals, teams, houses, classes? • Appoint monitors • Install appealing waste disposal containers 	Schools	As appropriate	-	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<u>Staff training / CPD</u> <ul style="list-style-type: none"> • Monitor energy use – target high energy use areas first • Enhance curriculum – involve children • Links with families and increase understanding of costs and control within the home • Cross curriculum working • Consider space usage when preparing timetable • Make use of outdoor spaces where appropriate 	Schools	As appropriate	-	-

	<ul style="list-style-type: none"> • Reduce energy use 				
LowC Commission	<p>Joined up approach between schools</p> <ul style="list-style-type: none"> • learning from the successes and mistakes of others • economies of scale for procurement • decentralised renewable energy production and distribution of electricity and heat 	Schools	Short Term	Low Cost	-

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Action Plan – Physical Changes for Schools

Given in order of priority for consideration, so that the most pressing issues which should have the most positive impact are considered first. (When undertaking significant capital investment regard should be given to the complementary Sustainable Design Brief previously referred to.)



Project Theme	Action	Responsibility	Timescale	Additional Resources Required	Notes
LowC Commission	Insulation <ul style="list-style-type: none"> walls, roof, floors and building services variety of sizes and materials inspect to see if there are wall cavities and if so, fill them if no cavities, solid wall insulation panels can be fitted to the internal or external walls insulate ceiling voids draught proof windows lag external and internal pipe work 	Schools	Short Term	Low Cost	-
LowC Commission	Optimiser / Compensator Control <ul style="list-style-type: none"> self learning optimum start controls for boilers external and internal thermostats optimiser control with weather compensations review positioning of thermostats e.g. internal thermostats placed away from heaters and external doors thermostats that communicate with each other to provide an indication of the average temperature 	Schools	Short Term	Low Cost	-

	<ul style="list-style-type: none"> indoor thermostats can be inhibited for certain periods when many external doors will be opened (during breaks) 				
LowC Commission	<p>Free solar PV</p> <ul style="list-style-type: none"> schemes offering free solar PV panels and offering the building owner free electricity in return for roof space Financial Lease Agreements help schools pay for their own panels Feed-in-Tariffs take care regarding how the financial and carbon savings are apportioned between the investor and the building owner 	Schools / Property and Assets	Short Term	Low Cost	-
LowC Commission	<p>Building Management Systems or Building Energy Management Systems</p> <ul style="list-style-type: none"> control, monitor and optimise buildings heating, ventilation and cooling services manage power, lighting, fire and security systems can account for significant energy wastage if already in place, check it is correctly configured 	Schools / Property and Assets	Medium Term	Medium Cost	-
LowC Commission	<p>Automatic Meter Reading (AMR) and Automatic Monitoring and Targeting (AM&T)</p> <ul style="list-style-type: none"> methods of tracking and reporting on a buildings energy use informative tools which indicate how, where and when the school is using electricity and gas identify energy wastage help to validate bills 	Schools	Medium Term	Medium Cost	-

	<ul style="list-style-type: none"> • make collecting data and reporting for the CRC Energy Efficiency Scheme easier • Separate sub metering of different building areas allows for a clearer picture • allows schools to more accurately charge for lettings • kitchen to be separately sub metered if the school is catered by a third party 				
LowC Commission	<p>Lighting Controls - PIR/Daylight sensing/Time switch</p> <ul style="list-style-type: none"> • advanced lighting controls such as Presence Infra Red (PIR) motion detectors and/or daylight sensors to be installed in toilets, staff rooms and classrooms • such controls overcome electricity waste when rooms are unused • greater level of user control is required for the lighting in classrooms, so manual overrides are recommended • easy to install and can use the existing wiring • daylight sensors automatically dim (or turn off) the lights to an appropriate and adjustable level - constant levels of lighting provided • combination of PIR and daylight control leading to maximum savings • time controlled light switches, with a manual override 	Schools	Medium Term	Medium Cost	-
LowC Commission	<p>Light Fitting Replacement</p> <ul style="list-style-type: none"> • T5 tubes = higher light output (fewer needed) and 	Schools	Long Term	High Cost	-

	<p>longer tube life than T8 / T12 T5 tubes</p> <ul style="list-style-type: none"> • unless a retrofit device is used T5 bulbs cannot replace T12 / T8 lamps in their original fittings due to differences in physical and electrical characteristics 				
LowC Commission	<p>Lighting Retrofit (Re-lamping)</p> <ul style="list-style-type: none"> • uses existing fittings with a retrofit device and new ballast to allow T5 tubes to be used • minimal disruption to the school • less waste created • cheaper to upgrade the lighting than to replace them • but, overall savings from a lighting replacement are greater than from a retrofit 	Schools	Long Term	High Cost	-
LowC Commission	<p>Double glazing</p> <ul style="list-style-type: none"> • replacing single glazed windows with double / triple glazing • less energy required to heat the building • improved comfort conditions • better sound insulation • reduced condensation • cooler temperatures in summer • can be expensive to install • can have long payback periods in terms of the energy saved 	Schools / Property and Assets	Long Term	High Cost	-
LowC Commission	<p>Boiler Replacement</p> <ul style="list-style-type: none"> • older boilers are less efficient • individual assessments required regarding age 	Schools / Property and Assets	Long Term	High Cost	-

	and condition / potential savings and payback periods				
LowC Commission	<p>Renewable Energy Technologies</p> <ul style="list-style-type: none"> • Combined Heat and Power (CHP) unit if suitable for site • fuelled by gas or from renewable sources • the units produce electricity and the waste heat created can be used • a detailed feasibility study is required to assess the suitability 	Schools	Long Term	High Cost	-
LowC Commission	<p>Voltage Optimisation</p> <ul style="list-style-type: none"> • voltage optimisation devices provide a controlled reduction from the voltages received to the optimum required • leads to a reduction in energy use and power demand • results in cost and CO2 savings • protects electrical equipment from transients (power spikes) 	Schools	Long Term	High Cost	-
Zero Carbon Taskforce roadmap & Eco-schools Agenda	<p>Additional points not covered by previous recommendations:</p> <ul style="list-style-type: none"> • Consider installation of a combined heat and energy centre over capacity and share/sell energy. Take advantage of the Feed in Tariff and the Renewable Heat Incentive • Check for opportunities to partner with other local public organisations to share benefits and costs of producing renewable energy 	Schools	As appropriate	Cost indications not available	-

- Investigate low energy ICT equipment – old computer 300watts / £486 per term, new machine 15watts / £25 per term
- Consider other measures:
 - Energy efficient equipment (white goods)
 - Efficient heating & sustainable energy – heat exchange / recovery
 - Wind, solar, biomass, ground source
 - Push taps
 - Ventilation
 - Roof construction

Draw