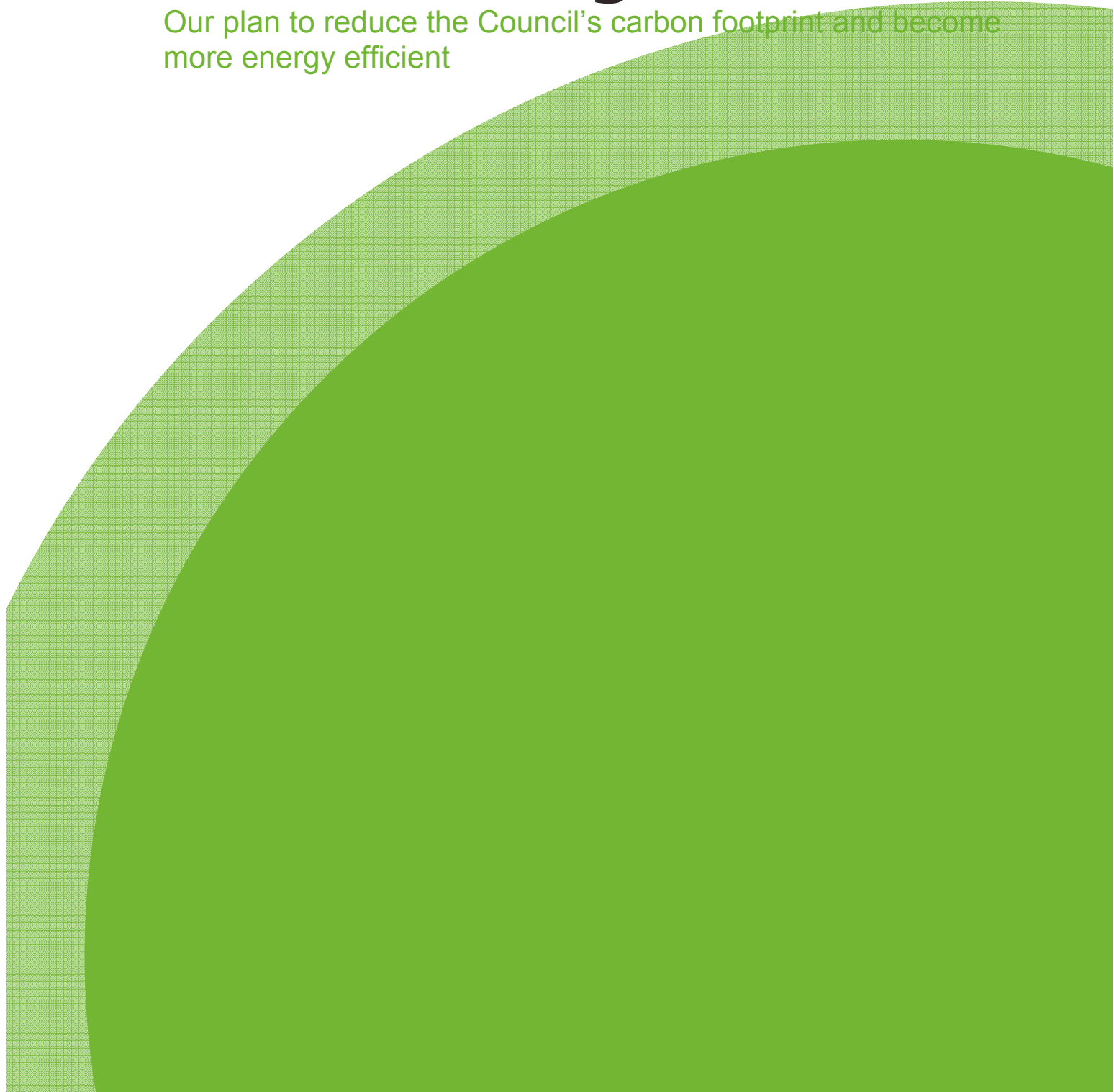




Appendix A

Carbon Management Plan

Our plan to reduce the Council's carbon footprint and become more energy efficient



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Foreword

The impact of a changing climate on the Council and how it delivers services is a key challenge. 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 in years to come.

This document, the Council's first Carbon Management Plan (CMP), details how the aspects of the Council's Climate Change Strategy that relate to reducing our own organisation's carbon footprint will be delivered. It was put together as part of the Council's participation in the Carbon Trust's Local Authority Carbon Management Programme.

Opportunities to be part of this programme are limited, and the Council's success on this scheme should be seen as a vote of confidence in the Council's ability to address this issue.

In the current challenging economic climate it is worth highlighting that many of the measures and opportunities identified will not only contribute to the global effort to reduce CO₂ emissions but also help the Council to operate more efficiently, cut costs and go some way to protecting us from the inevitable future increases in fuel and energy prices.

The Council is already working hard to reduce its CO₂ emissions and we aspire to achieve a challenging target of a 60% reduction in emissions from Council activities and operations by 2020. We are also working proactively with our partners on climate change projects and to ensure that we can all benefit from the considerable financial savings to be made through being more energy and resource efficient.



Cllr Tom Nicols
Portfolio Holder for Sustainable Communities

Introduction

What is the Carbon Management Plan?

Like all other local authorities, Central Bedfordshire Council has a key role to play in mitigating the effects of climate change – both as a community leader and through the services we provide. The Council is also a considerable consumer of energy and a direct source of CO₂ emissions arising from our activities and buildings.

This document, the Carbon Management Plan (CMP), details how the commitments made in the Climate Change Strategy relating to cutting the Council's own carbon footprint and reducing energy and fuel use from the Council's estate, schools, fleet and services it provides, will be delivered. It also captures the action being taken by our main outsourced service providers in areas such as highways, leisure and waste collection.

As an implementation plan this is a 'live' document, so the projects and opportunities detailed in it will be regularly reviewed and amended or added to as appropriate. This flexible approach is especially important when considering the challenging financial climate that the Council, and all other local authorities, currently faces now and in the coming years.

To take account of the rapidly changing state of affairs for local government – particularly in relation to finances, and implications that will have on how the Council addresses carbon reduction and energy efficiency, the CMP will be refreshed annually. It will also take account of the results of the annual compilation of the Council's carbon footprint. This will ensure that it remains an up to date and a fit for purpose plan for the Council to reduce CO₂ emissions and achieve the aspirations set out in the Climate Change Strategy, whilst at the same time being flexible enough to adapt to changing circumstances and maximise new opportunities which arise.

The target

The CMP details how the Council will begin to approach reaching the target set in the Council's Climate Change Strategy for cutting carbon emissions for our estate, schools, fleet, operations and where services are outsourced to other organisations.

Cutting the Council's carbon footprint

The medium and long term targets for cutting the Council's own carbon footprint from the 2008/09 baseline are:

- Achieve a **35%** reduction in the Council's carbon footprint by 2015; and
- Aim to achieve a **60%** reduction in the Council's carbon footprint by 2020.

Building from strong foundations

On the 1st April 2009 Central Bedfordshire Council came in to operation, replacing the former local authorities of South Bedfordshire District Council, Mid Bedfordshire District Council and Bedfordshire County Council.

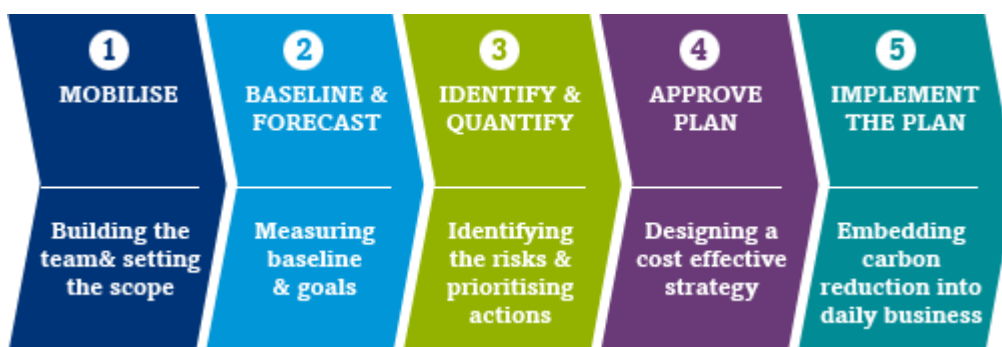
The legacy councils had already started to address the challenges of carbon reduction and climate change and made good progress in the following areas:

- **South Bedfordshire District Council** achieved EMAS accreditation, signed the Nottingham Declaration on Climate Change and had taken a range of energy efficiency measures, including upgrades to lighting in the Dunstable District Offices.
- **Mid Bedfordshire District Council** had also signed the Nottingham Declaration on Climate Change and put in place a Carbon Reduction plan that had achieved a 5% reduction in the Council's carbon footprint, primarily through energy efficiency measures installed at Priory House.
- **Bedfordshire County Council** had achieved ISO14001 certification for its Environmental Management System, and through a range of measures had reduced the County Council's carbon footprint by 9.1%. This included the operation of an 'invest to save' fund of £360,000, part funded through Salix.

In order to build on the good progress already made by the legacy councils, the Council applied for and was selected, amidst strong competition, to take part in the Carbon Trust's ambitious Local Authority Carbon Management programme.

This supported the Council through a five stage process from mobilising the organisation to take action, through to implementation of the plan.

Figure 1: The Carbon Trust's Five Step Process in the Carbon Management Programme



Emissions baseline and projections

Scope

The Central Bedfordshire Council carbon footprint and baseline is based on the 2008/09 submissions made to DECC for NI185: *Percentage CO2 reduction from LA operations* for the legacy authorities. The Bedfordshire County Council data was split based on a range of factors including: ownership of the site, geographic location and the ratio of staff at the site. A 60:40 split was made where none of these were possible.

What does it include and what else could it include?

The carbon footprint includes accurate data for energy use from the Council's estate, operations and schools. It includes the emissions of our major contractors for waste, leisure, highways and property. It includes the relevant staff business mileage for all three legacy authorities and a proportion of business travel on public transport.

In future years we will look to assess and measure CO₂ emissions of Council staff commuting to their place of work, and explore whether it would be feasible to include water use and waste from our sites.

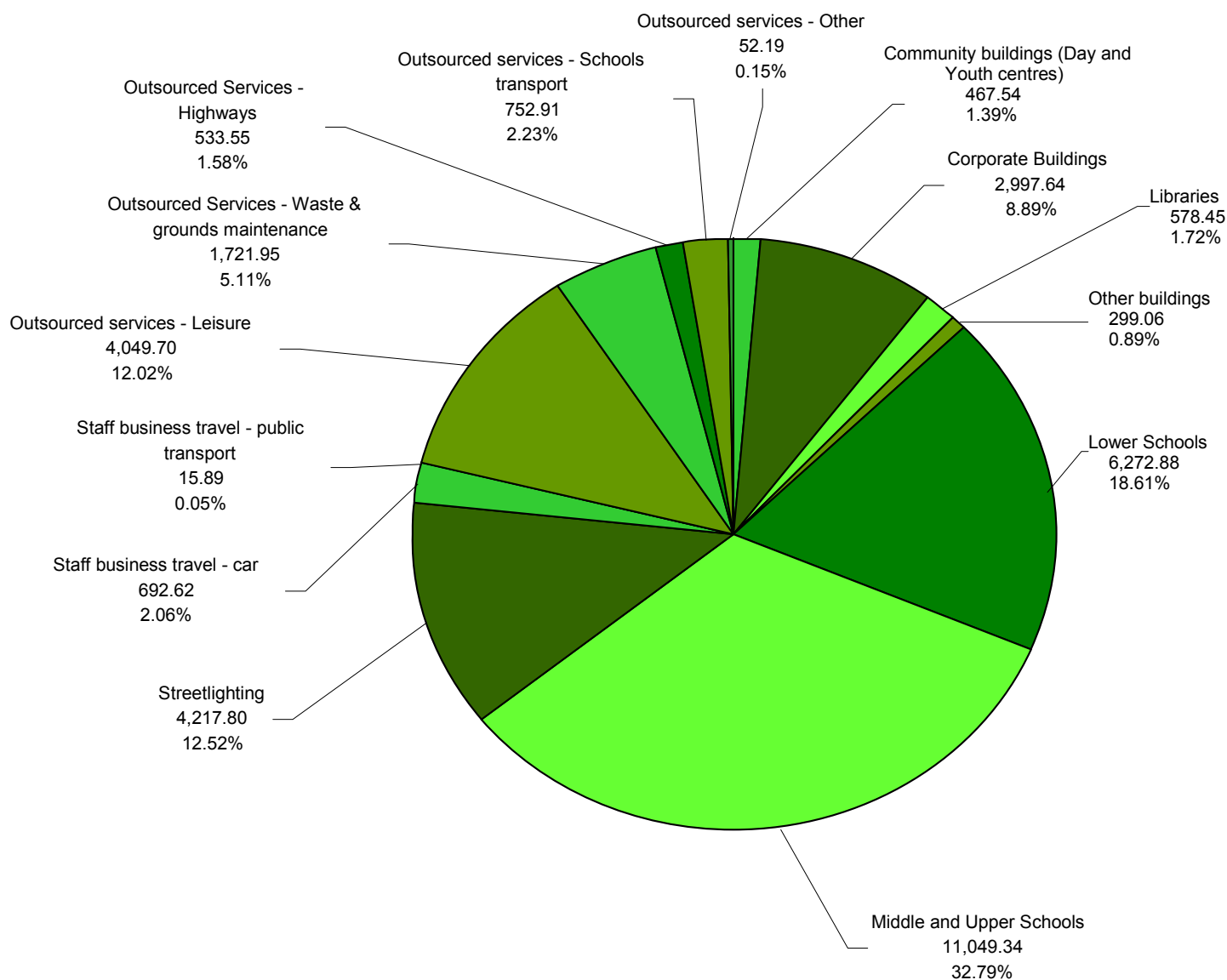
Central Bedfordshire Council's baseline carbon footprint is **33,701 tonnes of CO₂**. This relates to the year 2008/09 and will be used as the baseline from which future performance will be measured. This volume of CO₂ would fill our Priory House offices 107 times and is equivalent to the emissions caused by a plane flying around the Earth's equator 5,860 times.

What are the main sources of Central Bedfordshire Council's emissions?

A full breakdown is given in the pie chart overleaf (figure 2). This shows that:

- Currently emissions from schools make up 52% of the carbon footprint and their contribution will be significant in developing and implementing the Climate Change Strategy.
- Emissions from outsourced services make up 21% of the Council's carbon footprint. This highlights the importance of embedding sustainable and low carbon procurement principles into how the Council procures goods and services.
- Leisure Centres make up 12% of the Council's carbon footprint, this is a significant contribution from only six sites (out of a total of 192 including schools).
- Street lighting currently makes up 12% of the Council's carbon footprint; however the switch to more efficient LED streetlights and equipment gives the Council good scope to reduce emissions from this area.

Figure 2: Summary of Central Bedfordshire Council's CO₂ emissions for the baseline year 2008/09 (figures show tonnes of CO₂ and the percentage share of the Council's carbon footprint)



Monitoring progress annually

The Council will collate, calculate and report its carbon footprint annually. This will allow the CMP to be flexible enough to focus on priority areas that need addressing. The data collected is also necessary for:

- The Council's participation in the CRC Energy Efficiency Scheme – which the Council will be a compulsory participant in from phase 2 of the scheme and have to report CO₂ emissions annually from April 2012.
- The annual submission of NI185: CO₂ emissions for LA operations.

The financial implications of not taking action

Aside from the moral and environmental case for taking action to tackle climate change there are many other drivers for the Council to address this issue. These include:

- the considerable scope for more efficient use of energy to realise cost savings;
- the future impact of the increase in energy and fuel prices;

Failure to take action will leave the Council exposed to a number of financial risks including inefficiencies in dealing with climate change, increased energy and fuel costs and fines. The Council's participation in the Local Authority Carbon Management Programme included an assessment of this, specifically focusing on the predicted impact of future fuel and energy increases.

The financial and carbon cost of taking a 'business as usual' approach

It is widely accepted that fuel and energy costs will increase significantly over the next ten years. A range of projections have been made as to what the extent of the increases in costs will be.

- In 2009, Ofgem predicted a rise of up to 60% in energy costs over the next seven years. Based on current energy consumption the Council would face an increased total energy bill of up to £5.4 million by 2016 (from £3.4 million in 2008/09).
- DECC's energy and fuel price projections predict a 5.3% per year increase in energy costs and an 8.4% annual increase in fuel (petrol and diesel) costs (based on a medium price increase scenario).

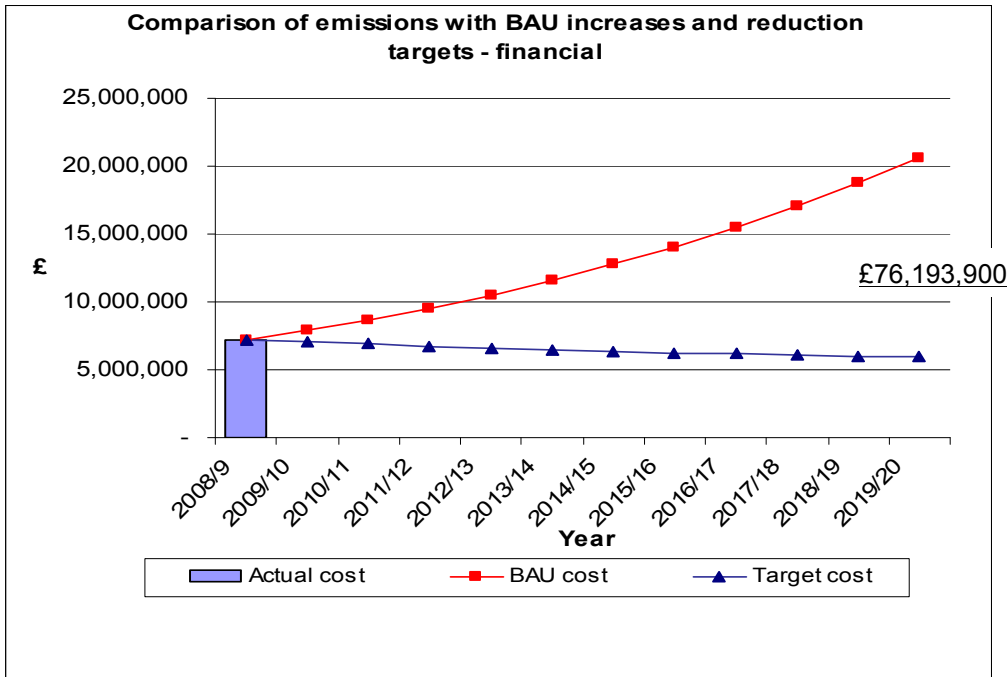
The DECC energy and fuel price projections were used to estimate the future costs to the Council, schools and our outsourced service providers for the following scenarios:

- No action is taken to reduce carbon emissions; this is called a business as usual approach (BAU).
- Carbon reduction measures are implemented that achieve the Council's target of a 35% reduction by 2015 and an aspirational 60% reduction by 2020 (from 2008/09 levels).

Both scenarios took account of a general trend of increasing energy use of 0.7% per year due to increased use of technology and other factors. The financial cost does not include the costs of implementing the reduced emissions scenario i.e. buying the new boilers etc.

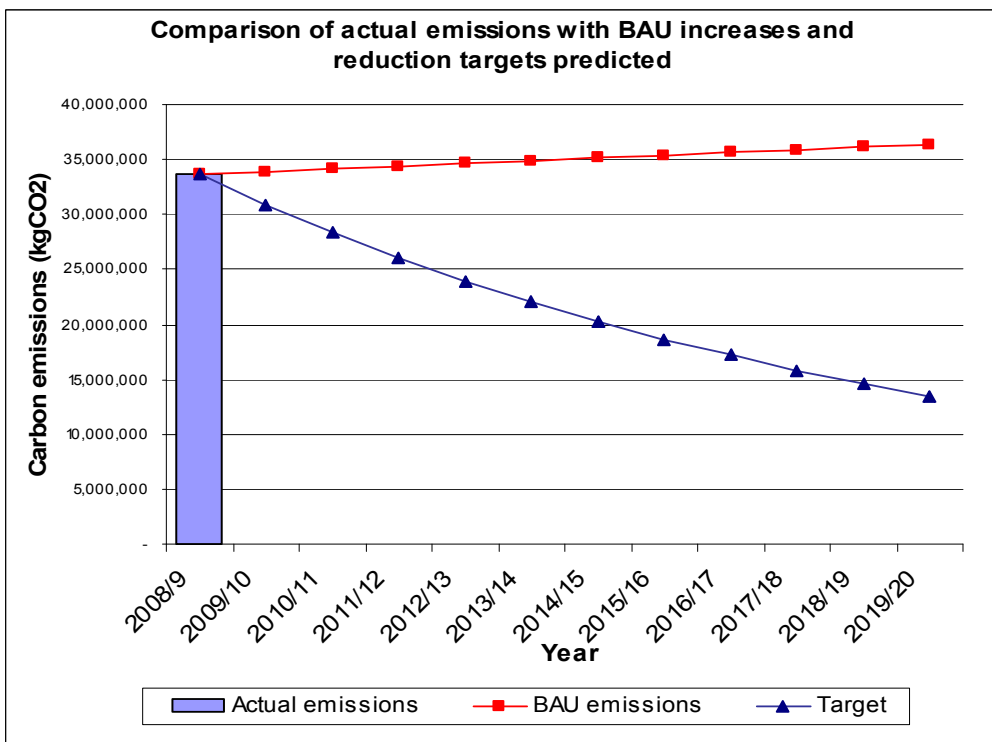
The outcome of this assessment are summarised in the following graphs, with figure 3 demonstrating the financial impact and the figure 4 considering the impact on the carbon footprint.

Figure 3: Projected costs and savings from the business as usual (BAU) and CO₂ reduction scenarios factoring in the estimated increase to fuel and energy costs over the next ten years.



The area between the two lines is called the Value at Stake. This represents the cumulative financial impact of taking a business as usual approach rather than achieving the carbon reduction targets detailed in this CMP. In this instance the total cost for the next ten years comes to just under £76.2 million. This is the cumulative financial cost to Central Bedfordshire Council of doing nothing.

Figure 4: Projected CO₂ emissions for business as usual (BAU) and reduction target scenarios.



Financing carbon reduction measures

The current economic climate and level of financial cuts that the Council faces provides an additional and significant challenge when it comes to fulfilling our potential to successfully address climate change, reduce carbon emissions and be more energy efficient.

Where in the past there may have been capital funding available to implement these projects, it is very likely that the Council will have to explore other avenues to fund the opportunities identified in the CMP. This task has been made even more difficult by the closure of several core funding streams, such as Salix and the Low Carbon Buildings Programme, which would have provided valuable additional external funding to implement many of these measures.

Whilst the financial climate is difficult there are opportunities which the Council is in a position to take advantage of. These include:

- **Entering the CRC in phase 2:** The regulations state that if two or more public bodies merge after 2008 and form a new public body, that didn't exist prior to the change, and the original bodies no longer legally exist then as this did not exist during the qualifying period it enters the scheme in phase 2. This gives the Council more time to prepare for the scheme, postponing the financial implications of having to buy allowances etc. It potentially means that resources can then be channelled into other beneficial carbon reduction activities and measures and also gives more time to take action.
- **Feed in Tariff (FITs):** Under this scheme energy suppliers make regular payments to householders and communities who generate their own electricity from renewable or low carbon sources such as solar electricity (PV) panels or wind turbines. The scheme guarantees a minimum payment for all electricity generated by the system, as well as a separate payment for the electricity exported to grid. Whilst it is unlikely that the Council has the capital resources to install these measures ourselves, the FIT does make it economically attractive for private sector companies to invest in Renewables (particularly PV) on our buildings and sell the Council the green electricity they generate at a lower than market value price. This is covered in more detail later.
- **New arrangements to be put in place for property management post September 2010:** Under the previous arrangements the contractor undertook some energy management work on behalf of the Council. This mainly focused on the collation of energy use data. The arrangements for property management post September 2010 give the Council the opportunity to implement a more effective measures for energy management, including an in-house technical resource. Currently a benchmarking exercise is being carried out to compare the resources for this area of work put in place by other comparable LA's.

It is proposed that the Council explores a range of opportunities for funding carbon reduction measures over the coming years and highlights the importance of robust contract management and engagement with our outsourced service providers in areas such as Leisure, to ensure that they also implement carbon reduction opportunities.

The CMP proposes a hierarchy by which the opportunities identified will be explored. This places a short-term emphasis on pursuing those opportunities which can be

implemented through securing external funding, investment from the private sector or by outsourced service providers under the terms of their contract.

Hierarchy for realising carbon reduction opportunities

Short term:

- Improving the energy saving aspects/features of work already programmed to take place e.g. boiler replacements and double glazing as part of the schedule maintenance/building works.
- As appropriate conduct energy surveys to determine the true extent energy efficiency opportunities across the Council's estate (including schools)
- Work with outsourced service providers, particularly in areas such as leisure to support them to take carbon reduction measures. The success of the installation of the CHP plant at Saxon Leisure Centre by Stevenage Leisure Centre provides a clear replicable model of how CHP technology can be deployed at no additional cost to the contractor.
- Take advantage Private Sector interest in FITs and PV panel installation on the public sector estate to deploy Renewables at no cost to the Council.
- Work with the proposed Schools Forum Asset Management sub-group to develop and deliver a schools carbon reduction plan.
- Utilise the EIG invests to save fund to deploy AMR's across all sites. Use the changes to the school financing regs as an incentive for schools to also install AMR's.
- Put in place robust energy management arrangements following the end of the current property contract. This should include a small dedicated budget for energy management work along with a dedicated technical resource to oversee this, use AMR data proactively and oversee the data element of the Council's participation in CRC.
- Implement the low cost/no cost measures – such as awareness raising in order to build on the success of campaigns such as 'every penny counts' and create an energy and carbon aware workforce.
- Ensure that carbon reduction opportunities are identified and investigated with sufficient background detail to enable the Council to take advantage of any funding that becomes available.
- Ensure that carbon savings from other efficiency projects are calculated and accounted for e.g. DECATS and EIG invest to save fund projects such as web-conferencing equipment.

Medium Term:

- Develop a Carbon Compensation fund for developers unable to meet the sustainable/carbon reduction targets detailed in the Council's planning policies. This money could in part be used to make our community focused buildings and schools more energy efficient as well as provide funding for domestic energy efficiency measures.
- Explore a bespoke Energy Performance Contracting arrangement in order to secure private sector investment in energy efficiency measures in the Council's estate in return for a share of the savings over a set period of time (see p12). Timing of the measures taken would also ensure that the Council gets maximum benefit in the CRC scheme (e.g. after the baseline year 2011/12) and receives award payments for good performance in the scheme.

Long Term:

- Incorporate carbon reduction and energy efficiency features as key requirements of any new buildings, including schools and as part of the Council's long term accommodation strategy and eventual aim for all Central Bedfordshire Council staff to operate from within the authority's boundaries.

Exploring innovative ways of securing investment from the private sector

Energy Performance Contracting (EPC)

This is a results driven partnership agreement between a client and an energy services company (ESCO) that overcomes the need for up front investment from the client. Under the terms of an EPC the ESCO implements a programme of practical engineered improvements to the client's estate. The ESCO is responsible for:

- Conducting all the feasibility work.
- Making the capital investment necessary to fund these improvements.
- Overseeing the implementation of the improvements.
- Guaranteeing the energy savings.

In return the ESCO receives the cash value of the annual energy savings from the improvements they have implemented for the set period of the contract.

The benefits of this approach are that an EPC allows the client to use the value of the savings from the energy efficiency improvements to pay for the measures themselves. This does mean that the full impact of the financial benefits wouldn't be realised until after the EPC had finished, however other financial benefits – particularly those relating to the CRC scheme and reward payments for good performance would be realised. This would also enable the Council to improve the energy efficiency of buildings in our estate which otherwise might not happen.

Whilst commonplace in the USA this is still a relatively new concept in Europe and the UK. Examples of organisations, from both the private and public sector, that have successfully entered in to EPC agreements include Transport for London, Royal Gwent NHS Trust, Johnson & Johnson, Ford, the municipal authority for the City of Malmo and the US Army at five bases in Germany.

Making the most of Feed in Tariffs

Feed-in Tariffs (FITs) became available in the UK on the 1st April 2010. Under this scheme energy suppliers make regular payments to householders and communities who generate their own electricity from renewable or low carbon sources such as solar electricity (PV) panels or wind turbines.

The scheme guarantees a minimum payment for all electricity generated by the system, as well as a separate payment for the electricity exported to grid. These payments are in addition to the bill savings made by using the electricity generated on-site.

FITs provide a guaranteed financial return on investment and as a result a large number of private sector companies are willing to 'rent' roof space to install PV panels. In return they usually offer the green electricity generated at a discounted or fixed price for set period of time. This provides the Council with the opportunity to progress with the installation of PV panels on our buildings, whilst at the same time not having to cover the initial cost of feasibility, installation, maintenance and other associated costs (such as insurance).

Allowable solutions/carbon compensation fund

There are currently two government consultations discussing implementation timetables and methods for zero carbon domestic and non domestic new buildings. These accept that, in many cases, on-site measures will be insufficient to achieve a zero carbon target. They therefore identify the notion of "allowable solutions" – measures which can be taken offsite to produce a net zero carbon new development.

The nature of what will be accepted as an 'allowable solution' is not yet fixed. It would be feasible for a fund to be set up that would channel contributions toward several areas, including:

- Funding energy efficiency measures in community buildings and schools.
- Reducing fuel poverty.
- Up skilling supply chains and providing local employment
- Potentially attracting other sources of carbon funding

Currently work is being carried out to explore opportunities to benefit from this approach further. This includes the potential of a DECC/CLG funded study to inform the national debate about zero carbon developments, and produce a methodology suitable to deliver them for the maximum benefit of the local authority areas.

Areas that have already successfully taken this approach will also be looked at to determine what lessons can be learnt and how these sorts of funds can be set up and operated to maximum benefit for the local area.

Engaging Schools on carbon reduction

Schools represent a significant proportion of the Council's carbon footprint (52%) and are also responsible for 60% of the emissions that the Council is responsible for under within the Governments CRC scheme.

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

- 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.

The Government's Carbon Management Plan for the School sector lays out 'five steps to zero carbon'. These will form the guiding principals for the schools' carbon reduction plan to be developed over the coming year:

1) Engage with schools, young people and others: This will build on existing communication and work with schools to generate interest and ensure the link to how simple day-to-day activities cause carbon emissions is clear. This will highlight the importance of reducing carbon emissions and the simple actions they can take to reduce their energy use. Schools will be encouraged to use display meters to learn about energy and how it is often wasted and use this data throughout the curriculum. In order to gain full commitment every school will be asked to identify a lead for the Council to work with on carbon reduction issues.

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

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 over-complicated controls should be replaced with effective ones that users understand and that encourage energy efficient behaviour.

4) Decarbonise school energy supplies: 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 and also that opportunities for schools to take advantage of the Feed in Tariff for Micro Renewables are fully explored.

5) Carbon compensation: For most schools it will not be possible to eliminate carbon emissions solely through the above measures, so carbon compensation (or offsetting) is crucial to address residual missions. This might be achieved through other 'allowable solutions', such as those proposed within the CLG consultation on the definition of zero carbon homes and non-domestic buildings, which includes:

- 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

Schools could also be in a position to benefit from other organisations wishing to pursue allowable solutions to reduce their own carbon footprint through carbon compensation, primarily through the planning system (e.g. Section 106 agreements). The Council is currently exploring the feasibility of setting up an ‘allowable solutions fund’ with the view that this money would be used to improve the energy efficiency of social housing and community focused buildings – including schools.

School’s forum sub-group

To attempt to develop ownership and actions from schools, a sub group of the School’s forum focusing on the School’s Asset Management Programme will be put together. This will be made up of representatives from schools. The group will focus on the development and delivery of a school’s carbon reduction action plan.

The Council has been working closely with LowC, the Carbon Reduction Consultants. LowC have already conducted a desktop study of schools energy use and identified the ten worst performing sites compared to the national benchmarks for energy use in school. These sites will then have a full energy audit conducted, the scope of which will include:

- Pre-occupancy, occupancy and post-occupancy checks to establish whether any equipment is being unnecessarily used out of hours. In principle to arrive when the school is unlocked and to leave when it is locked up under a normal school day scenario.
- Establish the metering capability of each school to indicate whether either a Fiscal Meter or Automatic Meter Reading (AMR) are in place, and determine whether their inclusion would be beneficial.
- Sub meter automatic Monitoring and Targeting (aM&T) data capture through Building Management Systems (BMS).
- Discover whether or not the school has an operational Building Management System. If one exists, investigate in principle what it is monitoring, whether the software it uses is up to date, whether the BMS is set up for remote access and applicable for its current level of operation.
- Establish the condition of the schools boilers and consider if they are suitable for the size of the school and the activities within the school. A review the boilers controls and start times will also be carried out.
- The type of lighting and their control system will be reviewed.
- Building fabric will be investigated to provide an indication of areas where heat is lost through building fabric such as glazing.
- Any ventilation and associated controls, such as occupancy detection will be surveyed.

- An assessment will be made of the overall attitudes towards energy consumption and conservation within the school.
- Scope for Renewables. The site will be assessed for its suitability for uptake of a range of renewable energy technologies.

The current opportunities that have been identified for potential carbon reduction measures in schools also are detailed in the CMP.

Carbon reduction opportunities

A range of projects will be implemented over the next ten years to allow the Council to cut its carbon footprint by 35% by 2015 and 60% by 2020. These include both 'hard' and 'soft' measures and will be delivered across all areas of the Council.

The following section gives an overview of these projects – with a clear separation of existing projects, and future opportunities.

All figures quoted are based on estimates, which are in turn based on:

- Technical advice from the Carbon Trust
- The experience of other LA's who have already taken these measures
- Estimated costs are based on the typical payback for the measure or best estimate.

Important note: The following tables identify opportunities that the Council could pursue to reduce its carbon footprint. Some of the measures have, or are in the process of being implemented. Where this is the case this is made clear in the 'How could this be funded column'. The estimated savings are based on a range of assumptions – which are again detailed in the table.

Where these opportunities are to be developed further a more detailed analysis of the potential savings will be carried out as part of the compilation of a robust business case, this would include obtaining more detailed technical information from suppliers on power savings and potential costs, where appropriate including technical surveys.

Estimated savings from existing projects

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
<p>Implementation of the Streetlighting Strategy (CMPR ref: 63, 64, 65, 66, 67)</p>	<p>The strategy will implement a range of measures applied to suitable areas which include:</p> <ul style="list-style-type: none"> • New more efficient LED lights • Diming of lights along all traffic routes by at least 25% in-between or from 23:00 and 06:00. • Trimming – using more energy efficient photocells to switch lights on later in the evening and off earlier in the morning. • Part night lighting – switching off of lights between the hours of midnight and 06:00am 	<p>Annual savings: £133,600 1,330 tonnes CO₂</p> <p>Percentage of: CBC footprint: 3.9% 35% target: 11.27</p> <p>Assumptions: Streetlighting electricity charged at night rate of 5.4p/kWh.</p> <p>LED lamps: Based on the impact of switching to all LED lamps which use 68.64 kWh compared to the old style lamps that use 236.6 kWh.</p> <p>Diming of lights: Assumed this will apply to 30% of streetlights, will achieve 25% savings on them.</p> <p>Trimming: Assumed this will apply to all streetlights, will achieve 5% savings on them.</p> <p>Part night lighting: Assume will apply to 30% of streetlights, will achieve 50% savings on them</p> <p>All savings from all measures above have been factored down by 10% to compensate for possible double counting. Saving figure based on full implementation of the Strategy.</p>	<p>Streetlighting Strategy adopted by Council, however economic climate means that for 10/11 Members' instruction was that budget would only be sufficient for life-expired assets, and activity in 10/11 would centre on replacement work where catastrophic failure was a risk. This forms a temporary focus for one year, albeit that the long-term strategy (to reduce lighting consumption) remains unchanged over the 5-10y horizon.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
Medium term accommodation strategy - move to Technology house (CMPR ref: 39)	Based on the premise that staff will be moved from a range of buildings – some of which are fairly energy inefficient (for example Borough Hall has a G rating on its Display Energy Certificate) to a more efficient building – namely Technology House – which has a C rating on its Energy Performance Certificate.	<p>Annual savings: £122,350 in energy costs 882 tonnes CO₂</p> <p>Percentage reduction of: CBC footprint: 2.6% 35% target: 7.5%</p> <p>Assumptions: Actual energy data used for existing buildings where available. Where not available (e.g. the building is rented) the standard energy benchmarks have been used. For Technology House the standard benchmark was used.</p>	Funded as part of the Medium Term Financial Strategy
Awareness raising Staff Green Champions Club (CMPR ref:3, 4)	Staff are motivated and engaged to take the wide range of small measures (turning lights of, not leaving equipment on stand-by, car-sharing etc) that individually have a small impact but cumulatively have a larger impact. Also a better aware workforce will lead to the flagging identification of faults, building systems not working properly etc quicker.	<p>Annual savings: £18,000 141 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.04% 35% target: 1.2%</p> <p>Assumptions: Initial calculations assumed a 5% reduction in building energy use (based on Carbon Trust estimates), however this has been revised downwards to 2.5% to take account of the impact of other measures such as AMR, BMS and automatic lighting controls and to avoid double counting of savings.</p>	Initial awareness campaigns run for low cost from existing budget and making use of internal resources and free external resources e.g. from the Energy Saving Trust. Links to 'Every Penny Counts' campaign to build on brand recognition etc and large number of environmental suggestions received.
ICT measures	Server virtualisation: This means	Annual savings:	Server virtualisation covered ICT

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
<p>including:</p> <ul style="list-style-type: none"> • Server virtualisation (CMPR ref: 14) • Energywise setting on Cisco phones (CMPR ref: 8) • Thin Clients (CMPR ref: 74) 	<p>running many virtual server images on a single physical box. A typical non-virtualised physical server only averages around 2-5% CPU utilisation. By virtualising these many servers onto fewer physical boxes (typically 10:1 ratio) we can drive up the utilisation and reduce power consumption.</p> <p>Cisco Energywise setting: All of our 3000+ internal phones draw their power from our network switches. There is software available (as a free upgrade) to allow the programming switches to drop the power to the phones at scheduled times. For example between 8pm and 6am when they are unlikely to be used. A recent pilot carried out at a similar sized council estimates a saving of £12,000 to £15,000 per annum in electricity costs.</p> <p>Thin Clients: Thin client technology based on Citrix is used to deliver all of Central Bedfordshire's ICT applications. This means in the long term we will replace PCs with thin client devices which require far less power resulting in further revenue and CO2 savings.</p>	<p>£32,250 212 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.6% 35% target: 1.8%</p> <p>Assumptions: Server virtualisation: Figures supplied by IT. For every physical server we have virtualised we have saved c£1500/annum in power costs and the accompanying CO₂ emissions. Currently 190 servers have been virtualised out of 276 servers in total (of which 30 will remain physical to host the virtual servers).</p> <p>Cisco Energywise setting: Assumed energy use of an individual phone is 1.8W. If the phone is off for 10 hours a day this would save 18Whrs, and if repeated for the nights of 200 working days it would save 3.6 kWhs. If the phone is powered down for 24 hrs over weekends and on public holidays it would save 43.2Whrs per 24 hours or 7.1 kWh over the 165 days that are weekends or public holidays per year. The total saving per phone is therefore 10.7 kWh. There are approximately 3000 phones so the total saving is 32,100 kWh or £2,250 (based on an electricity price of 7p/kWh).</p> <p>Thin clients: Based on replacing 1500 PC's - energy use of 80 watts (range between 60 - 100w) with Thin Clients – energy use of 12</p>	<p>by budget. Energywise setting on Cisco phones is a free upgrade so will cost nothing to implement. Roll out of Thin Clients currently covered within Your Space budgets</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
		watts (range between 8 - 15w) used 5 days a week, 52 weeks per year.	
Multi Functional Printing Devices (MFD's) (CMPR ref: 9)	Replaces a large number of printers scanners and photocopiers with a single machine that can do all the functions that these separate machines carry out. The cumulative energy use of the many devices being replaced is higher than the energy use of the MFD's.	<p>Annual savings: £2,775 21.3 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.06% 35% target: 0.2%</p> <p>Assumptions: The estimated savings assume replacing 300 printers with 30 MFDs at a ratio of 10:1. Estimates to be reworked when final figures are provided by ICT/My Space team. Printers used for this example are Lexmark T640 dtn, energy use is 180 Whrs, 1.8kWh for a 10 hour day and 360 kWh if used 200 days per year. There are 300 printers being replaced have a combined energy use of 108,000 kWh at a cost of £7,560.</p> <p>Electricity price is 0.07p/kWh and 1 kWh of electricity produces 0.537kg of CO₂.</p> <p>Typical MFD's use 0.97Kwh, 9.7kWh per 10 hour day and 2,279.5 kWh if used 253 days per year. Energy use for 300 printers is 394,680 kWh per year and energy use for 30 MFD's is 68,385 kWh. Assumed energy saving is therefore 39,615 kWh per year, or £2,775, or 21.3 tonnes of CO₂.</p>	This is funded as part of the Medium-term Accommodation Strategy/My Space project.

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
<p>Property improvements as part of maintenance and capital works (CMPR ref: 7, 11, 12)</p>	<p>This accounts for the range of measures taken as part of the on-going capital programme for the maintenance of the Council's buildings and schools for 2008/10. It includes measures such as:</p> <ul style="list-style-type: none"> • Boiler replacement at various sites as part of routine maintenance • Reroofing of flat roofs using warm roof method as part of routine maintenance • Replacement of single glazed windows with double glazed windows as part of routine maintenance <p>This sort of activity is on-going across the Council's estate and savings will be captured annually. Further analysis of the works list will be carried to give more accurate figures in relation to both the financial and CO₂ savings.</p>	<p>Annual savings: £ 1,810 (realised across sites where the works have been carried out) 17 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.05% 35% target:0.14%</p> <p>Assumptions: Boiler replacement: Assume that this applies to 1% of all sites (including schools) and will result in a 10% saving on heating (gas use). Reroofing of flat roofs: Assume 1% of sites with 2% saving on heating. Replacement of single glazed windows: Assume that this applies to 1% of all sites (including schools) and will result in a 5% saving on heating (gas use).</p>	<p>Measures funded as part of capital budgets already allocated for property works.</p>
<p>Improvements to Technology House by the landlord. (CMPR ref: 6, 13)</p>	<p>Additional improvements to Technology House being undertaken by the landlord including reroofing and a new boiler.</p>	<p>Annual savings: £ N/A – would be realised by the landlord 10 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.02% 35% target: 0.08%</p> <p>Assumptions: The figures used for the calculation of savings from the relocation of staff to technology house don't take into account the impact of these</p>	<p>Funded by Landlord</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? How could this be funded?	Funding
		improvements; therefore these are included as an additional opportunity that has been realised. For the new boiler it is assumed a 10% reduction in gas use for heating and reroofing will reduce gas use by 2%. The Technology House gas use figure is based on benchmarks, the information in the EPC and based on area occupied by the Council.	
CHP at Saxon leisure Centre (CMPR ref: 23)	<p>Combined Heat & Power (CHP) is a form of a decentralised energy technology. Systems are typically installed onsite, supplying users with heat and power directly at the point of use. This avoids the significant losses which occur in transmitting electricity from large centralised plant to customer.</p> <p>Key Features and Benefits:</p> <ul style="list-style-type: none"> • Electricity is generated close to where it is to be used as a by-product of heat generation. • CHP's high efficiency leads to a reduction in the use of primary energy. <p>Consumes up to 40% less fuel than conventional heating systems and provides a 30 – 40% reduction in CO₂ as less fuel is burned. Also reduces other toxic by-products of combustion.</p>	<p>Annual savings: £12,000 350 tonnes CO₂</p> <p>Percentage of: CBC footprint: 1% 35% target: 2.9%</p> <p>Assumptions: All figures supplied provided by Stevenage Leisure. Increased gas use through the CHP offset by it being a more than offset by it the electricity it is used to generate. Saving figures factor in the purchase of the electricity generated by the CHP plant by the provider for 4p/kWh.</p>	Funded via a contract between Stevenage Leisure and Ener-G. All financial savings will go to Stevenage Leisure as they are responsible for Utility costs. CHP installed an operational since the end of Jan 2010.

Future carbon reduction opportunities to be explored

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
<p>Automated Meter Reading equipment (AMR's) at Corporate buildings, Libraries and others. (CMPR ref: 1, 28)</p>	<p>AMR meters work by automatically sending data on how much energy is being used, tagging it with a unique meter reference and time stamp, and sending this to a central point for analysis. This is usually the supplier and will be available to facilities etc to review.</p> <p>Details of consumption are automatically read and can then be transferred to a software package for interpretation and analysis. This provides a better understanding of how energy is being used, with this information providing the basis of an energy management programme.</p> <p>AMR can be applied to gas, water or electricity meters. Whilst the AMR itself will not save energy - although it does generate savings through reducing billing errors and charges for meter reading – if acted on proactively it will highlight energy wastage and maintenance issues, which if acted upon could reduce energy costs by up to 10%.</p>	<p>Annual savings: £31,700 241 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.7% 35% target: 2%</p> <p>Assumptions: The energy savings from AMR's rely on the data captured being proactively analysed and acted upon – it should be noted that savings will only be realised if this happens. The financial savings only consider the possible savings associated with proactive use of data and do not take account the savings from more accurate billing and a reduction in charges for meter reading.</p> <p>Carbon Trust 'Rules of thumb' state that a 10% saving in energy is a reasonable estimate to use on the proviso the above happens. Research by the Carbon Trust with SME's found that businesses using AMR's reduced energy use by 12.3% on average (Advanced Metering for SMEs' report by the Carbon Trust published 14 May 2007). To allow for double counting against the impacts of other potential opportunities explored in the CMP a 5% energy reduction (5% gas and 5% electricity) is assumed for the basis of this estimate. Based on energy use in 08/09 this equals 266,440 kWh of gas and 357,855 kWh of electricity.</p>	<p>Depending on the supplier and type of meter the estimated cost to install is £315 per meter with an annual fee of up to £115 per meter.</p> <p>Currently exploring whether this can be funded from existing budgets. Whether this is revenue or capital depends on if the AMR's are purchased outright or leased. Future licence costs would be funded from revenue budgets allocated for energy use.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
		<p>Gas is charged at 2.5p/kWh and electricity at 7p/kWh, with 1 kWh of gas resulting in 0.185 kg of CO₂ and 1 kWh of electricity resulting 0.537 kg of CO₂. The estimated financial savings do not include any discounts gained from utility companies in relation to meter reading, savings through correct meter readings and reduction in costs under the CRC scheme – which gives 10% uplift to any emissions based on estimated readings.</p>	
<p>Increased use of teleconferencing equipment at all offices (CMPR ref:75)</p>	<p>The aim is to reduce the need for staff to travel from site to site for meetings. This is primarily being lead as an EIG project in order to reduce business mileage costs, however avoiding car use also has a positive impact with regards to CO₂ emissions. This would be approached in to phases.</p> <p>Phase 1: Promotion and encouragement to make use of existing teleconferencing facilities e.g. Cisco phones can tele conference up to four people at a time. Phase 2: The provision of video/web conferencing facilities.</p> <p>To support this each Directorate would be asked to reduce business mileage by 5 to 10%.</p>	<p>Annual savings: £ 65,000- £130,000 55 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.4% 35% target: 1.1%</p> <p>Assumptions: Based on a 5 to 10% reduction in staff business mileage for the remaining three quarters of 10/11. Figures from Business Transformation team. CO₂ saving based on estimated no of miles paid to achieve lowest estimated saving.</p>	<p>It is estimated that phase 1 would cost in the region of £300 to promote existing facilities and approx. £40,000 to install and implement web conferencing facilities.</p> <p>EIG to advise on phase 2 funding. Phase 1 funding met from existing budgets.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
Automatic lighting controls at Dunstable officers (CMPR ref:2)	Automatic controls ensure that lighting is switched off when rooms, areas of the floor etc aren't in use and outside of set office hours.	<p>Annual savings: £ 7,780 60 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.2% 35% target: 0.5%</p> <p>Assumptions: Assumes lighting accounts for 50% of the buildings electricity use. Initial calculations factored in a potential saving of 35%, however in order to take account of the potential impact of other opportunities detailed in the CMP and avoid double counting of savings this has been revised to 25%.</p>	<p>Based on the typical payback for this technology of 4.5 years the estimated cost to implement would be £35k – further investigation would be required to confirm this.</p> <p>Potential to fund this measure through a 0% SALIX loan with repayments covered by the energy savings. This is a time limited offer and the project would need to meet SALIX's criteria.</p> <p>Outside of this no funding has yet been identified for this so a bid to capital projects pot would be required.</p>
Photo Voltaic (PV) panels at Priory and Dunstable	<p>Based on the footprint of the buildings there is considerable scope for a large PV array to generate a proportion of each buildings electricity from renewable sources. The introduction of the Feed in Tariff make this more economically viable with many private companies willing to cover the capital costs in return for the feed in tariff.</p> <p>Implementation of this measure would be subject to contract provisions being</p>	<p>Annual savings: £35,000 over a 15 year period from reduced energy costs 38 tonnes CO₂ per year</p> <p>Percentage of: CBC footprint: 0.1% 35% target: 0.3%</p> <p>Assumptions: Savings are based on the PV panels being installed and owned by a private company who</p>	<p>Potential for all costs/risk to be covered by private sector company (see p12) for further details. If the Council could find its own funding to implement then it would benefit from the Feed in Tariff – which gives an estimated rate of return of around 9%. More work would need to be done to explore costs of this.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
	deemed satisfactory.	in return would receive the feed in tariff. The Council would benefit from buying the electricity purchased at a fixed price for the life of the contract and therefore avoiding mitigating the impact of future price increases. The size of the PV installed at each site is 250m ² and generates 35,000 kWh of electricity per annum which is brought back by the Council at the fixed price of 7.6p/kWh for the next 15 years. It is assume energy prices will increase at 5% per year.	
Building Management System (BMS) fine tuning at Priory House & Dunstable (CMPR ref: 5)	<p>Well-managed building controls can help reduce costs associated with energy, maintenance, repair and replacement.</p> <p>BMS is a computer-based system that automatically monitors and controls a range of building services – primarily those concerned with heating and cooling of a building. It can also provide energy performance data to support a targeted energy savings programme.</p>	<p>Annual savings: £3,986 32 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.1% 35% target: 0.3%</p> <p>Assumptions: Assumed that savings of 3% from heating and 2% electricity from air handling/air conditioning would be achievable from Dunstable where the BMS system is outdated and would not have been designed to take account of the significant changes to the office layout being put in place as part of the Medium Term Accommodation Strategy. This saving relates to gas (heating) and electricity (air handling/conditioning). For Priory House the assumed saving is 3% as although a BMS is in place there is the opportunity to fine tune this</p>	Estimated cost is £20k for both sites. No funding is identified for this so additional revenue funding would be required.

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
		<p>to make it work better to allow for the greater numbers of staff etc in each wing and the savings relate on to gas use (heating) but not electricity as there is no air con.</p> <p>These estimated savings take into account the impacts of other opportunities detailed in the CMP and to try and avoid double counting of potential savings. Gas is charged at 2.5p/kWh and electricity at 7p/kWh, with 1 kWh of gas resulting in 0.185 kg of CO₂ and 1 kWh of electricity resulting 0.537 kg of CO₂.</p>	
<p>Improved lighting schemes for libraries and other buildings (CMPR ref: 29, 30)</p>	<p>Based mainly around the implementation of the technologies:</p> <p>Automatic controls: Ensure that lighting is switched off when rooms aren't in use and outside of set office hours.</p> <p>Localised lighting: Ensure that lighting relates only to the areas of a room in use – particularly effective in open plan offices.</p> <p>Upgrade to T5 lamps: Relates mainly to the older buildings which still use T12 lamps. T5 lamps use 50% of the electricity.</p>	<p>Annual savings: £10,615 81 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.24% 35% target: 0.7%</p> <p>Assumptions: For these types of buildings lighting typically represents 50% of a buildings electricity use and this assumption is used for the estimated savings for this opportunity. For automatic controls is assumed that these will reduce the electricity used for lighting by 20%. For localised lighting it is assumed that this measure would reduce energy use by 7%. Both % reductions have been set at a lower level than initial calculations in order to attempt to factor in the impact of other opportunities identified in the CMP.</p>	<p>Estimated costs for this programme of works in the region of £50k. No funding identified for this so a bid for additional capital funding would be required. Project could be spread over several years to reduce upfront costs but ability to get economies of scale would be compromised.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
OPPORTUNITIES FOR SCHOOLS			
AMR's at schools (CMPR ref: 44)	See above.	<p>Annual savings: £31,700 241 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.7% 35% target: 2%</p> <p>Assumptions: Carbon Trust 'Rules of thumb' state that a 10% saving in energy is a reasonable estimate to use on the proviso the above happens. Research by the Carbon Trust with SME's found that business using AMR's reduced energy use by 12.3% on average (Advanced Metering for SMEs' report by the Carbon Trust published 14 May 2007). Given that schools buildings are used less throughout the year than corporate buildings - schools are closed for school holidays etc it is assumed that a 6.5% reduction in energy costs from proactive analysis of and action of energy use data by schools. This is less than the potential savings figures quoted by the Carbon Trust in order to allow for the potential of double counting against the positive impacts of the other opportunities identified in the CMP when implemented.</p> <p>Cost to implement and funding: Depending on the supplier and type of meter the estimated cost to install is £315 per meter with an annual fee of up to £115 per meter.</p>	Cost to implement would be covered from schools capital budgets. Council would facilitate procurement to get economies of scale.

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
<p>Schools awareness raising (CMPR ref: 32, 46)</p>	<p>Focus on the promotion of pupil engagement schemes such as Eco-Schools and Carbon Detectives, to use the curriculum to drive behaviour change in schools.</p> <p>This would also be supplemented by some training aimed specifically at site agents on energy management as well as using existing groups such as the quarterly Schools Finance meeting and Schools forum to raise awareness with head teachers, bursars, school business managers and governors.</p>	<p>Annual savings: £51,825 (shared proportionally by energy use across all schools) 433 tonnes CO₂</p> <p>Percentage of: CBC footprint: 1.3% 35% target: 3.7%</p> <p>Assumptions: Initial calculations assumed a 5% reduction in building energy use (based on Carbon Trust estimates), however this has been revised downwards to 2.5% to take account of the impact of other measures such as AMR, BMS and automatic lighting controls, to avoid double counting of savings and to also take account for the proportion of the year that the schools buildings are in use and therefore scope of influence of pupils. It has been assumed that this saving would be achievable across all schools.</p>	<p>Will initially focus on promoting free schemes such as EcoSchools through existing communications channels such as school's newsletter and forums. CRC seen as a major driver for this. Pilot project being carried out with Groundwork to look at energy saving via the curriculum in one Central Bedfordshire school. Full schools awareness raising plan to be drawn up – this may require additional resource to implement e.g. other LA's have dedicated schools energy/sustainability officers. As yet no funding has been sought for this and options are being explored.</p>
<p>Improved Lighting schemes for schools (CMPR ref: 31, 37, 41, 45, 54, 57)</p>	<p>Based mainly around the implementation of the technologies:</p> <p>Automatic controls: Ensure that lighting is switched off when rooms aren't in use and outside of set office hours.</p> <p>Localised lighting: Ensure that lighting relates only to the areas of a room in use – particularly effective in open plan offices.</p> <p>Retrofit T5 lamps: Relates mainly to the older buildings which still use T12 lamps.</p>	<p>Annual savings: £54,875 (to be realised proportionally amongst the schools where the measures are taken) 410 tonnes CO₂</p> <p>Percentage of: CBC footprint: 1.2% 35% target: 3.4%</p> <p>Assumptions:</p>	<p>The estimated costs of a programme of this scale would be in the region of £250k. Cost to implement would be covered from schools capital budgets. Council would facilitate procurement to get economies of scale.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
	<p>T5 lamps use 50% of the electricity.</p>	<p>In schools lighting uses 35% of the schools electricity consumption.</p> <p>Automatic lighting: Assumed that this is applied to 25% of lower and middle schools and 25% of upper schools. Based on estimates from the Carbon Trust these controls can reduce lighting consumption by up to 35%.</p> <p>Localised lighting: Applies to 10% of lower and middle schools and 10% of upper schools. It is assumed that this measure reduces lighting consumption by 10%.</p> <p>Retrofit T% lamps: Applies to 20% of lower/middle schools and 20% of upper schools. It is assumed that this measure reduces lighting consumption by 25%.</p> <p>It is assumed that these different opportunities will be carried out at different schools, however to allow for where all measures may have been carried out at a single school the total % reductions have been reduced by 10% to try and mitigate double counting.</p>	
<p>New BMS installation and fine tuning of existing BMS systems in schools. (CMPR ref: 48, 49)</p>	<p>Well-managed building controls can help reduce costs associated with energy, maintenance, repair and replacement.</p> <p>BMS is a computer-based system that automatically monitors and controls a range of building services – primarily those concerned with heating and cooling of a building. It can also provide energy performance data to support a targeted</p>	<p>Annual Savings: £9,025 (to be realised by schools) 76 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.2% 35% target: 0.7%</p> <p>Assumptions: Assumed that these measures will apply to</p>	<p>Cost would need to be determined on a school by school basis as this is dependant on the type of BMS that is in place. Would look to support schools in identifying this either as a quick win to generate cost savings or to source funding to carry this out or the cost to implement would</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
	<p>energy savings programme.</p> <p>The Carbon Trust estimate that BMS can deliver energy efficiency improvements of 10-20%, compared with an independent control</p>	<p>10% of lower and middle schools, reducing air conditioning and heating use by 2%, and will apply to 25% of upper schools with scope to reduce heating and air conditioning energy use by 3%.</p> <p>The savings will relate to both gas (for heating) and electricity (for air conditioning) use. The opportunity is greater in upper schools due to the larger size of their buildings. The number of schools that this could be applied to is also expected to be greater than the estimates used for this assumption. The estimated percentage savings are below the Carbon Trusts estimates in order to take account of the impact of other measures identified in the CMP and to attempt to avoid double counting of savings.</p>	<p>be covered from schools capital budgets. Council would facilitate procurement to get economies of scale.</p>
<p>Upgrade to condensing boilers in schools (CMPR ref: 42, 60)</p>	<p>Focuses on a targeted programme for schools to replace and upgrade existing boilers with more efficient and effective condensing boilers. This would also include ensuring that controls are fit for purpose and the school buildings can be heated in zones.</p>	<p>Annual savings: £34,400 (to be realised by schools) 318 tonnes CO₂</p> <p>Percentage of: CBC footprint: 0.9% 35% target: 2.7%</p> <p>Assumptions: It is assumed that this would apply to 25% of lower and middle schools and 25% of upper schools. The improvements have the scope to reduce heating bills by up to 20%. For this example it has been assumed that these measures will reduce heating costs by 15%,</p>	<p>The estimated costs of a programme of this scale would be in the region of £160k. Cost to implement would be covered from schools capital budgets. Council would facilitate procurement to get economies of scale.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
		<p>this is to take account of the impact of other opportunities identified in the CMP (e.g. BMS) and avoid double counting of savings.</p> <p>The main heating fuel is gas, 1 kWh of which = 0.185kg of CO₂ and is charge at 2.5p/kWh.</p>	
Photo Voltaic (PV) Panels at five schools	As with above but PV panels installed at 5 schools.	<p>Annual savings: £ 87,500 (split proportionally between the schools over a 15 year period) 95 tonnes CO₂ per year</p> <p>Percentage of: CBC footprint: 0.3% 35% target: 0.8%</p> <p>Assumptions: Savings are based on the PV panels being installed and owned by a private company who in return would receive the feed in tariff. The schools would benefit from buying the electricity purchased at a fixed price for the life of the contract and therefore avoiding mitigating the impact of future price increases.</p> <p>British Gas is offering schools PV panels for free and the electricity generated by them for free, this is for a limited number of schools and is on an application basis. It would obviously generate much higher savings in the region of £57,000 per school over the 15 year period.</p> <p>The size of the PV installed at each site is</p>	<p>Potential for all costs/risk to be covered by private sector company (see p12 for further details) or under British Gas scheme (although this is limited). If the schools could find their own funding to implement then it would benefit from the Feed in Tariff – which gives an estimated rate of return of around 9%. More work would need to be done to explore costs of this. There is also potential funding available from the Lottery and E-On to cover some of the costs.</p> <p>Remaining grant funding pots being promoted to schools to facilitate implementation.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
		250m ² and generates 35,000 kWh of electricity per annum which is brought back by the Council at the fixed price of 7.6p/kWh for the next 15 years. It is assume energy prices will increase at 5% per year.	
OPPORTUNITIES FOR LEISURE			
Additional CHP installations at 3 other Leisure Centres (CMPR ref: 20, 24, 73)	Potential to replicate CHP installation carried out at Saxon Leisure Centre at other Leisure Centres, such as Dunstable, Tiddenfoot and Kingsland.	<p>Annual savings: £36,000 1,050 tonnes CO₂</p> <p>Percentage of: CBC footprint: 3% 35% target: 8.7%</p> <p>Assumptions: Assumed that CHP units are the same specification as the one installed at Saxon Leisure Centre and therefore scope for savings (both CO₂ and £) is the same. Proposed that CBC would seek to work with Leisure providers to follow funding model successfully implemented at Saxon Leisure. This involves a private company funding the costs and maintaining ownership and operational responsibility for the CHP plant and in return the Leisure Centre purchase electricity at a reduced rate (assumed that this would be in the region of 4p/kWh). Financial savings would be kept by the Leisure services provider with the exception of Kingsland which is operated as part of a school campus.</p>	Cost covered by Leisure service provider. Will support the Leisure service providers to explore options similar to the CHP plant installed at Saxon Leisure Centre which was funded via a contract between Stevenage Leisure and an ESCO called Ener-G. Ener-G pay the capital costs for installation and on-going operation and maintenance costs. In return they sell the Electricity generated back to the Leisure Centre at a fixed price (lower than the current market rate). They also received payments under the Feed in Tariff scheme.

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
<p>Range of measures at Saxon Leisure Centre (CMPR ref:26, 27)</p>	<p>Focuses on the implementation of the following measures currently being explored by Stevenage Leisure, this being primarily being LED lighting and the installation of a small photovoltaic (PV) array.</p> <p>LED lighting: LEDs are light emitting diodes, and use a semi-conductor to emit light and additional optics to direct that light. These have progressed rapidly in recent years and can now be used to replace existing halogen spotlights. LED lights use 30% of the electricity that the current lighting system uses.</p> <p>Photovoltaic Array: This would see the installation of a small PV array to generate a proportion of the Leisure Centre's electricity. The main benefits would be in relation to any Feed in Tariff payments that the Centre's operator would receive.</p>	<p>Annual savings: £5,214 (to be realised by Stevenage Leisure as they pay the utility costs) 70 tonnes CO₂</p> <p>Percentage of: CBC footprint:0.2% 35% target: 0.6%</p> <p>Assumptions: Assumes Voltage Optimisation saves 10% of the electricity demand. This is based on guidance from the Carbon Trust and is also substantiated by other examples of where this has been implemented e.g. The national Archives achieved a 12.2% reduction. The saving from this are calculated at the supplier average price of 7p/kWh.</p> <p>The LED lighting calculation assumes that lighting represents 15% of the Leisure Centre's electricity use, which is typical for a Leisure Centre with a pool. The LED lights will replace 80% of the Centres lighting and use 30% of the electricity that would have been used by what they replace. As the Centre already has in place a CHP plant that provides a proportion of its electricity, it is assume that this is supplying the electricity used by lighting and there for the savings are take account of the reduced rate paid for energy from the CHP of 4p/kWh.</p> <p>Financial savings for the PV array are not</p>	<p>These measures would be funded by Stevenage Leisure or an ESCO (e.g. with the PV) as part of their on-going operation of the Leisure Centre and proactive stance with regards to energy efficiency.</p>

Carbon Reduction Opportunity	How does it work?	What are the estimated savings and assumptions they are based on? What would this cost and how could this be funded?	Funding
		included as these would be impacted on by the Feed in Tariff rate that is secured and also how this is funded e.g. by a third party or not. CO ₂ savings are based on the assumption that 10% of the roof space is utilised for PV and PV operates at 15% efficiency.	

Financial costs and sources of funding

The CMP outlines in one document the ideas, opportunities and existing initiatives to reduce the carbon footprint of the Council. The ideas and opportunities require further development before they can enter into the Medium Term Financial Planning processes for revenue and capital budgets. There is a need for the ranking of ideas and opportunities into an approved delivery programme. In particular, those proposals which under a cost-benefit analysis show the higher 'return' should receive an earlier priority for implementation. This document provides useful information to support the compilation of the MTFP without committing the Council to investments or expenditures prior to rigorous assessment and approval.

One of the major financial risks identified for CBC is the volatility of energy prices. Industry sources predict rising prices over the long term that are above general inflation. As Council revenue support grant (RSG) and council tax tend to be based on general inflation, any idea or opportunity to mitigate the risk of rising energy prices needs to be fully explored and implemented as needed. Energy budgets for services need to be reviewed when the supply contracts for energy are re-tendered.

Central Government will publish its Comprehensive Spending Review (CSR) in October 2010 and the CSR will give strong indication of the priorities and direction of the new government. The RSG allocations for CBC over the medium term to 2014/15 will become clearer allowing the CMP to be reviewed in light of the funding available.

Estimated cost for the new opportunities have been provided in this document where possible, however it should be noted that further investigation – including the requesting of quotes from potential suppliers, along with technical surveys (where appropriate) will need to be sought.

The opportunities do not represent a definitive programme of works and it should be made clear that whether they are pursued or not is dependent on suitable funding or finance being either obtained or provided by the Council. This includes the investigation of alternative financing models, such as Energy Performance Contracting (detailed on p12).

Embedding carbon management in to how the Council operates

It is recognised that the Council can also do a lot to reduce its carbon footprint and tackle climate change by embedding sound carbon management principals into how it operates. As part of the process the Council went through with the Carbon Trust an initial assessment was made using the matrix in Appendix A.

To make progress in being able to demonstrate level 5 (or best) behaviours action plans will be developed. The action plans will reflect key elements of the carbon management matrix as well as those actual projects that will deliver CO₂ savings.

Area	How this is being addressed
Corporate Strategy - embedding CO ₂ saving across the organisation	To further embed carbon reduction across the Council CCMB will oversee work in the coming year that will explore: <ul style="list-style-type: none"> • Disaggregation of targets out to service areas as an effective way of building ownership across the organisation – this would be based on the Council's carbon footprint, • Individual carbon footprint reports for schools, tracking level of emissions and source against area and national benchmarks. • Ensure that climate change implications are considered fully and highlighted in all committee reports.
Programme Management – bringing it all together effectively	The formulation of the CMP has been programme managed by Climate Change Management Board. CCMB is made up of senior managers from those key areas responsible for implementing many of the measures.
Responsibility - being clear that saving CO ₂ is everyone's job	Carbon reduction is truly a cross cutting issue that has implications for all areas of the Council. To ensure that the message is clear and that all areas take responsibility for their role in this the following measures will be taken: <ul style="list-style-type: none"> • Regularly brief Directors and key senior managers about the implementation of the CMP (and wider Climate Change Strategy) to ensure that they remain fully engaged. • Launch a Green Champions club for staff to raise awareness and empower staff to take action. • As projects progress towards implementation the CMPR and CMP will be updated to give lead officer details.
Data Management – measuring the difference and measuring the benefit	Ongoing measurement of the impact of measures taken, as well as to identify further opportunities will be facilitated by the roll out of AMR's across all sites. This will be supported by training for facilities managers and site agents on energy management to ensure that these are used properly. The Council will report on its carbon footprint annually and as part of this include: <ul style="list-style-type: none"> • a progress report against the 2008/09 baseline; • Details of the key projects that have been implemented; • Details of the estimated financial saving made; • An overview of the action planned for the forthcoming year. As data management mechanisms improve (through AMR's) the Council will explore producing a quarterly report on actual progress from metering etc.

Area	How this is being addressed
<p>Communication & Training – ensuring everyone is aware</p>	<p>Green Champions Club: The Green Champions Club will encourage employees to sign up to be champions to help save energy and make Central Bedfordshire Council a more environmentally friendly place to work..</p> <p>Induction Programme: Materials are already provided for staff induction workshops to raise awareness of the Council’s carbon footprint and role of staff in carbon reduction.</p> <p>Bespoke Training: Where appropriate bespoke training will be arranged. This will be based around specific themes or developments</p> <p>Web Pages: The Council’s internal and external WebPages will be developed over the coming year to provide a valuable resource to staff on carbon reduction and climate change. They will also be used to communicate the CMP and Climate Change Strategy and report on performance in this area.</p>
<p>Finance & Investment – the money to match the commitment</p>	<p>Revenue and capital budgets will be reviewed over the MTFP to enable approved projects to be delivered. CBC will prioritise those projects that are self-funding or where external funds have been obtained.</p>
<p>Policy Alignment – saving CO₂ across your operations</p>	<p>All new Council policies will include an assessment of the sustainability implications of the policy – as part of the committee approval process. This will include identifying and incorporating carbon reduction elements as appropriate.</p>
<p>Engagement with Schools – influencing Schools to reduce their CO₂ footprint</p>	<p>Schools represent a significant challenge as we develop and implement a carbon reduction and climate change strategy. Currently emissions from schools make up 52% of our carbon footprint and just over 1% of the area’s carbon footprint. The Council’s Educational vision – ‘<i>Transforming learning</i>’ makes the following commitments:</p> <ul style="list-style-type: none"> • Each school will be provided with data on its carbon footprint and we will work closely with schools to maximise energy efficiency and the use of renewable technologies alongside other issues such as waste minimisation and recycling, water conservation and biodiversity. • Any new schools and major refurbishments will be designed to ensure they meet high standards to minimise environmental impact. • We are also developing a strategy on sustainable modes of travel for educational establishments to promote walking, cycling and the use of sustainable transport to school. • We will encourage schools to showcase good sustainability practices in energy, water, waste, travel, food and procurement in buildings and grounds to their pupils, staff and communities. This will place schools at the centre of community action on climate change and promote learning about the environmental features of buildings and also about wider sustainability and environmental issues.
<p>Engagement of your Suppliers – working with suppliers to reduce your</p>	<p>The Council spends £165 million on external goods and services annually. As shown in the Council’s carbon footprint, many of these procurement decisions have the potential to reduce CO₂ emissions and ultimately the Council’s carbon footprint.</p>

Area	How this is being addressed
carbon footprint	<p>Procurement processes are being put in place by the Council that will allow us to drive forward environmental improvements and use our buy power to help shape the market.</p> <p>The Council's Corporate Commissioning & Procurement Strategy is committed to sustainable procurement and will adopt the flexible framework as recommended in <i>Procuring the Future, Sustainable Procurement National Action Plan</i> produced by the government's Sustainable Procurement Taskforce¹.</p>

¹ More details at: <http://www.defra.gov.uk/sustainable/government/publications/procurement-action-plan/index.htm>

Appendix A: Carbon Management Matrix - Embedding

	CORPORATE STRATEGY	PROGRAMME MANAGEMENT	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	POLICY ALIGNMENT *	ENGAGEMENT OF SCHOOLS
5 BEST	<ul style="list-style-type: none"> • Top level target allocated across organisation • CO₂ reduction targets in Directorate Business Plans • Action plans in place to embed strategy. Progress routinely reviewed 	<ul style="list-style-type: none"> • Cabinet / SMT review progress against targets on quarterly basis • Regular diagnostic reports provided to Directorates • Progress against target published externally 	<ul style="list-style-type: none"> • CM integrated in responsibilities of senior managers • CM part of all contracts / T's&C's • Central CO₂ reduction advice available • Green Champions leading local action groups 	<ul style="list-style-type: none"> • Regular collation of CO₂ emissions for all sources • Data externally verified • Monitoring & Targeting in place for: <ul style="list-style-type: none"> ○ buildings ○ street lighting ○ transport/travel 	<ul style="list-style-type: none"> • All staff given formalised CO₂: <ul style="list-style-type: none"> ○ induction and training ○ communications • Joint CM communications with key partners • Staff awareness tested through surveys 	<ul style="list-style-type: none"> • Finance committed for 2+yrs of Programme • External funding being routinely obtained • Ring-fenced fund for carbon reduction initiatives 	<ul style="list-style-type: none"> • CO₂ friendly operating procedure in place • Central team provide advice and review, when requested • Barriers to CO₂ reduction routinely considered and removed 	<ul style="list-style-type: none"> • A 'whole school approach' including curriculum • Mature programme of engagement in place • CO₂ saving in schools having a wider community impact
4	<ul style="list-style-type: none"> • CO₂ reduction commitment in Corporate Strategy • Top level targets set for CO₂ reduction • Climate Change Strategy reviewed annually 	<ul style="list-style-type: none"> • Sponsor reviews progress and removes blockages through regular Programme Boards • Progress against targets routinely reported to Senior Mgt Team 	<ul style="list-style-type: none"> • CM integrated in to responsibilities of department heads • Cabinet / SMT regularly updated • Staff engaged through Green Champion network 	<ul style="list-style-type: none"> • Annual collation of CO₂ emissions for: <ul style="list-style-type: none"> ○ buildings ○ street lighting ○ transport/travel • Data internally reviewed 	<ul style="list-style-type: none"> • All staff given CO₂ reduction: <ul style="list-style-type: none"> ○ induction ○ communications ○ CM matters communicated to external community 	<ul style="list-style-type: none"> • Coordinated financing for CO₂ reduction projects via Programme Board • Funding principles and processes agreed • Finances committed 1yr ahead • Some external financing 	<ul style="list-style-type: none"> • Comprehensive review of policies complete • Lower level policies reviewed locally • Unpopular changes being considered 	<ul style="list-style-type: none"> • A clear emphasis on energy / CO₂ reduction in schools • Council activities fully coordinated • Broad set of education stakeholders engaged • Funding in place
3	<ul style="list-style-type: none"> • CO₂ reduction vision clearly stated and published • Climate Change Strategy endorsed by Cabinet and publicised with staff 	<ul style="list-style-type: none"> • Core team regularly review CM progress: <ul style="list-style-type: none"> ○ actions ○ profile & targets ○ new opportunities 	<ul style="list-style-type: none"> • An individual provides full time focus for CO₂ reduction • Key individuals have accountability for carbon reduction • Senior Sponsor actively engaged 	<ul style="list-style-type: none"> • Collation of CO₂ emissions for limited scope i.e. buildings only 	<ul style="list-style-type: none"> • Environmental / energy group(s) given ad hoc: <ul style="list-style-type: none"> ○ training ○ communications 	<ul style="list-style-type: none"> • A view of the cost of CO₂ reduction is developing, but finance remains ad-hoc • Some centralised resource allocated • Finance representation on CM Team 	<ul style="list-style-type: none"> • All high level and some mid level policies reviewed, irregularly • Substantial changes made, showing CO₂ savings 	<ul style="list-style-type: none"> • A person has responsibility for Schools CO₂ reduction • Schools CO₂ reduction projects coordinated • Ad-hoc funding
2	<ul style="list-style-type: none"> • Draft Climate Change Policy • Climate Change references in other strategies 	<ul style="list-style-type: none"> • Ad hoc reviews of CM actions progress 	<ul style="list-style-type: none"> • CO₂ reduction a part-time responsibility of a few department champions 	<ul style="list-style-type: none"> • No CO₂ emissions data compiled • Energy data compiled on a regular basis 	<ul style="list-style-type: none"> • Regular awareness campaigns • Staff given CM information on ad-hoc basis 	<ul style="list-style-type: none"> • Ad hoc financing for CO₂ reduction projects 	<ul style="list-style-type: none"> • Partial review of key, high level policies • Some financial quick wins made 	<ul style="list-style-type: none"> • Ad-hoc schools projects to specifically reduce energy / CO₂
1 Worst	<ul style="list-style-type: none"> • No policy • No Climate Change reference 	<ul style="list-style-type: none"> • No CM monitoring 	<ul style="list-style-type: none"> • No recognised CO₂ reduction responsibility 	<ul style="list-style-type: none"> • No CO₂ emissions data compiled • Estimated billing 	<ul style="list-style-type: none"> • No communication or training 	<ul style="list-style-type: none"> • No specific funding for CO₂ reduction projects 	<ul style="list-style-type: none"> • No alignment of policies for CO₂ reduction 	<ul style="list-style-type: none"> • No CO₂ / energy reduction policy for schools

* Major operational policies and procedures, e.g. Capital Projects, Through Life Costing, Procurement, HR, Business Travel