



Harlow Council Carbon Management Plan April 2016 – March 2021

Contents

Foreword from Cllr Jon Clempner, Leader of the Council and Malcolm Morley, Chief Executive	3
1 Introduction	4
1.1 Benefits of the Carbon Management Plan	4
1.2 Scope	5
1.3 Baseline	6
2 Targets and objectives	8
2.1 Carbon Value at Stake and Costs	8
2.2 Financial Value at Stake and Costs	9
3 Carbon Reduction Management Projects	11
3.1 Identified projects	12
3.2 Projected achievement towards target	12
4 Carbon Management Plan Financing	13
4.1 Assumptions	14
4.2 Benefits / Savings	14
5 Data Collection Methodology	15
Glossary	16

Foreword from Cllr Jon Clempner, Leader of the Council and Malcolm Morley, Chief Executive.

Harlow Council recognises the importance of reducing its carbon footprint and use of resources in both its own operations and across the district. In 2011 the Carbon Trust stated “Cutting carbon emissions as part of the fight against climate change should be a key priority for all public sector organisations. Carbon management is about realising efficiency savings, transparency, accountability and leading by example. The UK government has identified the public sector as key to delivering carbon reduction across the UK. This Carbon Management Plan will see the Council building on actions already taken and carry forward similar actions over the next five years. Councillors and Officers recognise the role carbon reduction plays and are continually working towards reducing the Council’s carbon footprint whilst encouraging residents and local businesses to do the same.

The per capita carbon emissions for the district of Harlow are shown in the table below. These figures include emissions from industry and the commercial sector, domestic emissions and those from road transport. When the Council’s first Carbon Management Plan was published the most recent data had shown that 2007 emissions were at seven tonnes per capita and since then have reduced by a further 11%, despite an increase in population of 5%. The Council’s target reduction of 25% in its 2011 Plan has also been achieved.

Year	Grand Total CO ₂ (kT)	Population ('000s, mid-year estimate)	Per Capita CO ₂ Emissions (tonnes)
2011	508	82.2	6.2
2012	520	82.7	6.3
2013	512	83.4	6.2

The Council has set a target of reducing its operational carbon emissions by a further 25% by 2020/21 (from a baseline of 2014/15). The baseline represents 2700 tonnes CO₂ produced from Council operations including energy, waste and water usage. A target of 25% by 2020/21 will see these emissions reduced by 5%, or 135 tonnes CO₂ each year. Identified within the Plan are 199 tonnes of saving with the majority of projects paying back within five years. Meeting this target will see the Council reducing its resource consumption and improving efficiency, saving costs and increasing sustainability for the future.

The Council is committed to building upon the work it has already done to achieve its previous carbon reduction targets, valuing the effect that this has on the overall sustainability of Harlow as a place to live, work and enjoy.



Malcolm Morley
Chief Executive

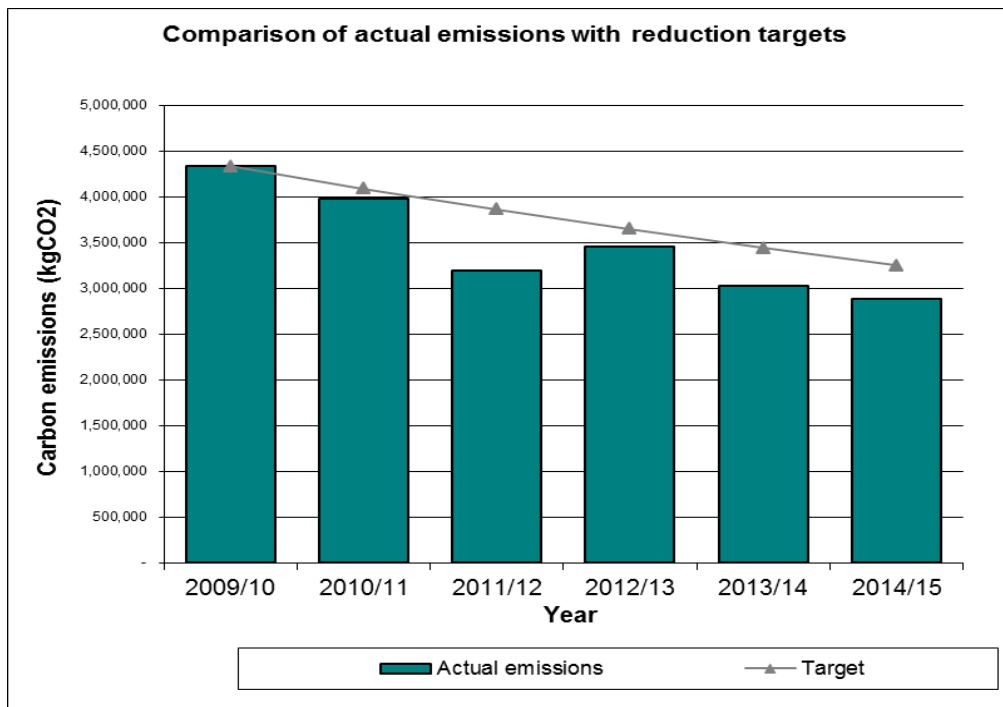


Councillor Jon Clempner
Council Leader

1 Introduction

This Plan outlines the actions required over the next five years in order to achieve a 25% reduction in carbon emissions from Council operations. These actions will enable the Council to meet statutory requirements alongside local targets.

In 2010 the Council participated in the Carbon Trust's Local Authority Carbon Management Programme providing the Council with relevant support and guidance in the carbon reduction arena. A team of Officers within the Council were involved in the Programme which created the Council's first Carbon Management Plan in 2011, implementing actions across a spectrum of Council activities and set a target of reducing operational carbon emissions by 25% by 2015/16. By 2014/15 the Council had already achieved this target.



The target was met through work across Council services which saw a number of measures put in place such as voltage optimization equipment installed at the Civic Centre and Latton Bush Centre, flange insulation applied at four key sites, virtualisation of the Council's server set up, reduction in Council building opening hours, fine tuning of building management systems to match building use, LED lighting trials at two car parks and changes to landlords lighting in some residential areas. Additionally, the Council's ability to precisely calculate carbon emissions through billing under smart meters has provided confidence in the reduction figures recorded and ensured expenditure on energy is accurate.

1.1 Benefits of the Carbon Management Plan

- Reduce costs of energy usage and waste collection
- Provide leadership and guidance for Officer and residents in carbon reduction
- Meet local and national targets
- Contribute towards a low carbon future

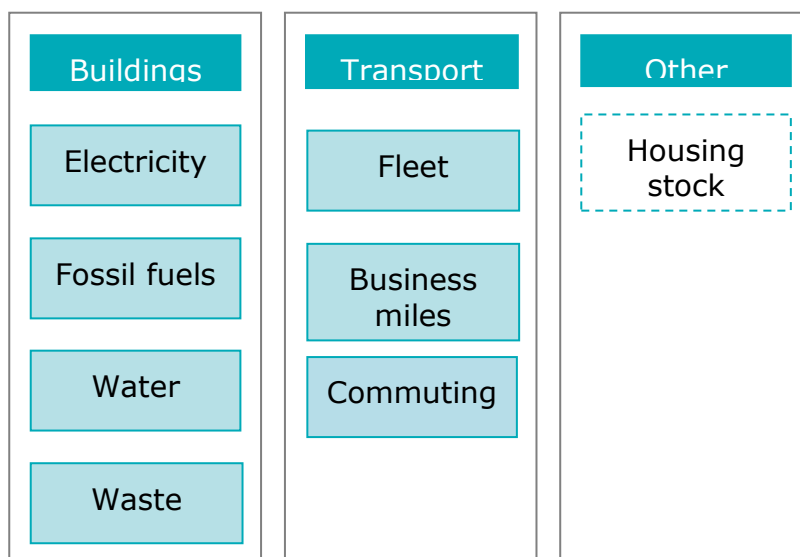
Practical action by councils is marked out by DEFRA as a key to meeting the challenge of providing secure and sustainable supplies to a growing population. The EU Directive on Energy Performance of Buildings (2006) requires Energy Performance Certificates to be displayed on Council owned commercial buildings highlighting the carbon cost of resources. By analysing operational and behaviour patterns the Council is in a better position to understand the challenges and potential opportunities ahead. Associated legislation relating to the Council's leased properties, including commercial stock will see the Council investing in reducing carbon emissions from its whole portfolio of residential and commercial properties, as well as its own operations which are addressed through this Plan.

Due to the increased responsibility for delivery of quantifiable and unquantifiable benefits across all areas of the Council, carbon reduction has become a corporate issue rather than confined to a single department. Developing a robust method of measuring carbon impacts of each service was considered, but the value of granulating carbon impact in this way had no tangible benefits when many of the measures to put in place are on a corporate level. Instead, the Council's Green Workplaces Group served to provide some of the individual engagement that was sought through that process. The introduction of 'Green ideas' into the Council's existing 'Bright Ideas' campaign also cemented this further. The Green Workplaces Group has also delivered two green office weeks, highlighting savings and existing schemes that colleagues and residents can make use of.

1.2 Scope of the Plan

The scope follows on from the Council's previous 2011 Carbon Management Plan, taking into consideration those areas in which the Council can measure, and affect the levels of change required to reduce carbon emissions. The diagram below shows the scope of emissions as included in the baseline for the Carbon Management Plan. The area in the dashed box has been considered, but not included in the scope at this time.

Harlow Council Scope of Emissions



The decision not to include the Council's housing stock was taken in 2010 as the volume of property could broaden the scope too widely and detract from the other areas. This decision has been taken again as the reintroduction of the requirement to produce a two yearly HECA report means that the energy portion of the carbon footprint of the housing stock, and the

associated issue of fuel poverty, is already being addressed. In order to shape and inform the Council's asset management and investment approach, in 2015/16 an in-depth bespoke study was commissioned from a specialist energy and sustainability consultancy, Rickaby Thompson Associates. This work confirmed the positive impact on the energy efficiency and performance of the Council's Housing Stock of the Modern Homes Programme work to date in regard to the fitting of new boilers, windows and doors and external wall insulation with the Standard Assessment Procedure (SAP) rating for the stock increased to an average of 68, compared to 65 in 2012/13 and the current national average SAP of 57. Furthermore, 388 households were identified as currently being in fuel poverty. The study enabled the Council to identify for 2016/17 a clear framework of initiatives, with commensurate budget resources, to pursue:

- a) Specific energy efficiency works targeted to improve the affordable warmth performance of the 54 worst performing Council properties (as per their current F and G rating within their Energy Performance Certificate (EPC) assessment rating – improving this rating to a minimum of C.
- b) A similar level of targeted works to be planned in 2016-17 to also bring to EPC level C minimum the further 771 properties identified within the study as currently being rated at level E.
- c) Commencing in 2016/17 the programme of replacement and improvement works, beginning with the scheme at Tanys Dell in April 2016 for the Council's portfolio of 10 District and 15 Communal Heating Systems

Arising from discussions around the scope of the Carbon Management Plan baseline for the previous Carbon Management Plan, a Green Travel review for the Council was developed with Essex County Council, achieving bronze accreditations in 2012/13 and 2013/14 respectively. Work on travel will need to continue however as the accreditation programme recognises measures taken against a small element of the transport related emissions and continuing with this process will concentrate on staff commuting only. Emissions from fleet especially will require joint working with our partners and contractors in the areas of waste collection and activities under Harlow Trading Services (Property and Environment) Ltd.

A review of copying/printing and the subsequent waste of power and paper through excess usage are also taking place in parallel to the Carbon Management Plan. The excess energy from printing will be included in the scope of the Carbon Management Plan as this is recorded within the baseline energy figures. The waste paper sent for recycling (as all copied/printed materials are within Council buildings) is not measured at present and the contractor has no facility to do so. However any reduction in procurement of paper can be monitored and cost savings from this will be recorded along with carbon and cost savings from reduced energy usage. Reductions from this project will therefore feed into the Council's overall carbon reduction.

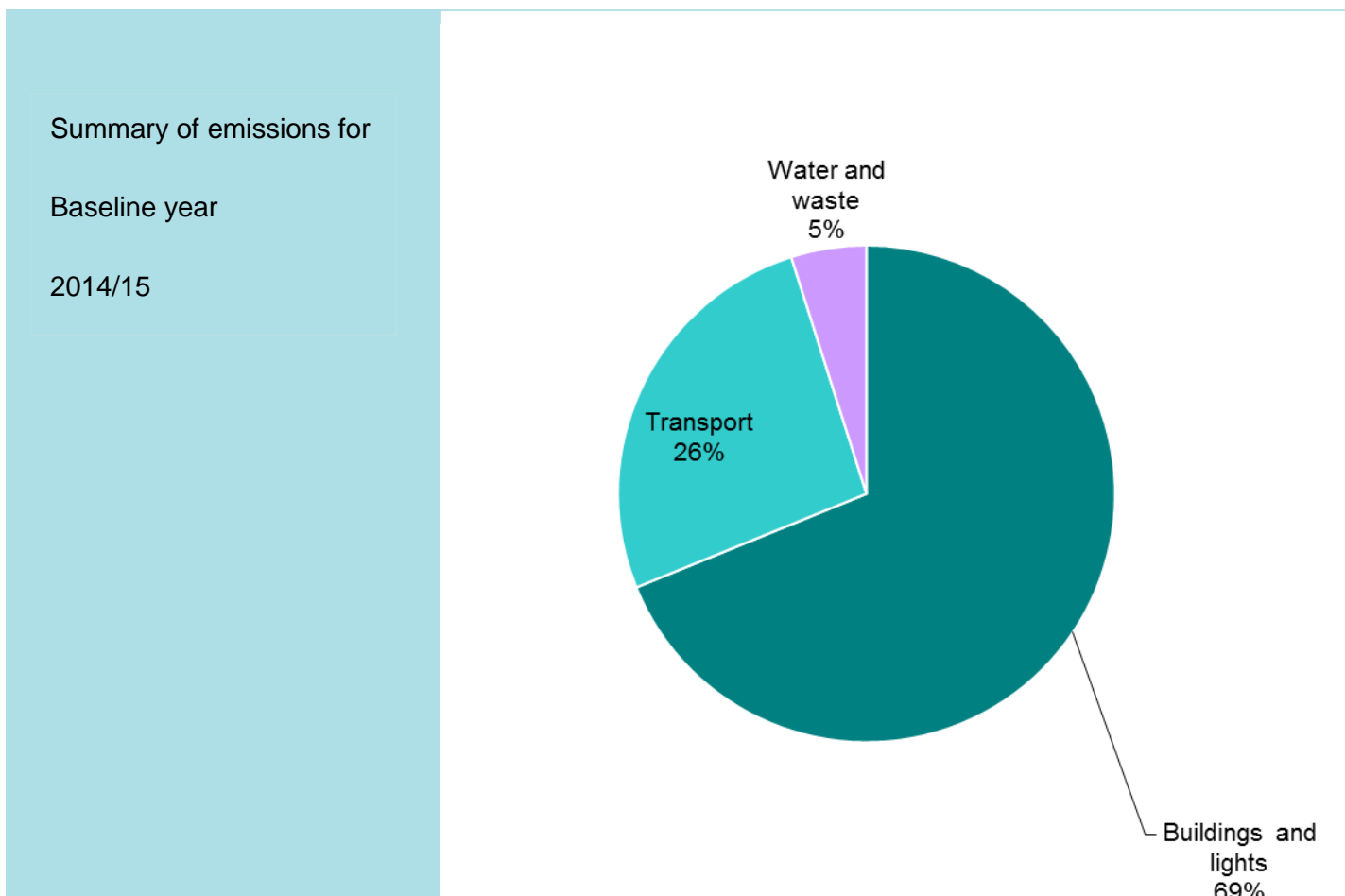
1.3 Baseline

As in the previous 2011 Carbon Management Plan the baseline for this Carbon Management Plan allows the quantification of savings from a 'do nothing' option verses carbon management actions being put in place. The baseline is made of the CO₂ emissions from the period of one year. For the purpose of this Plan the financial year 2014/15 is used as the baseline. The target set is a percentage reduction of these emissions for future years, in comparison with the baseline.

Harlow Council CO₂ emissions baseline for 2014/15

	CO ₂ (tonnes)	%
Buildings and street lights	1,859	69%
Transport	709	26%
Water and waste	132	5%
	2,700	100%

Emissions data is calculated from consumption figures of each fuel source, a data collection methodology is set out in Section 5. Mandatory smart meter installation has been rolled out from 2013 onwards and 90% of the Council's electricity meters are now smart metered. The Council has additionally installed automated meter reading equipment for its gas meters. The 2014 DEFRA greenhouse gas emissions factors have been applied to each emissions source in order to convert the amount of fuel consumed/waste collected into kg CO₂ for the baseline, which identifies the biggest area of CO₂ emissions within the Council's operations as buildings and lighting as seen in the diagram below.



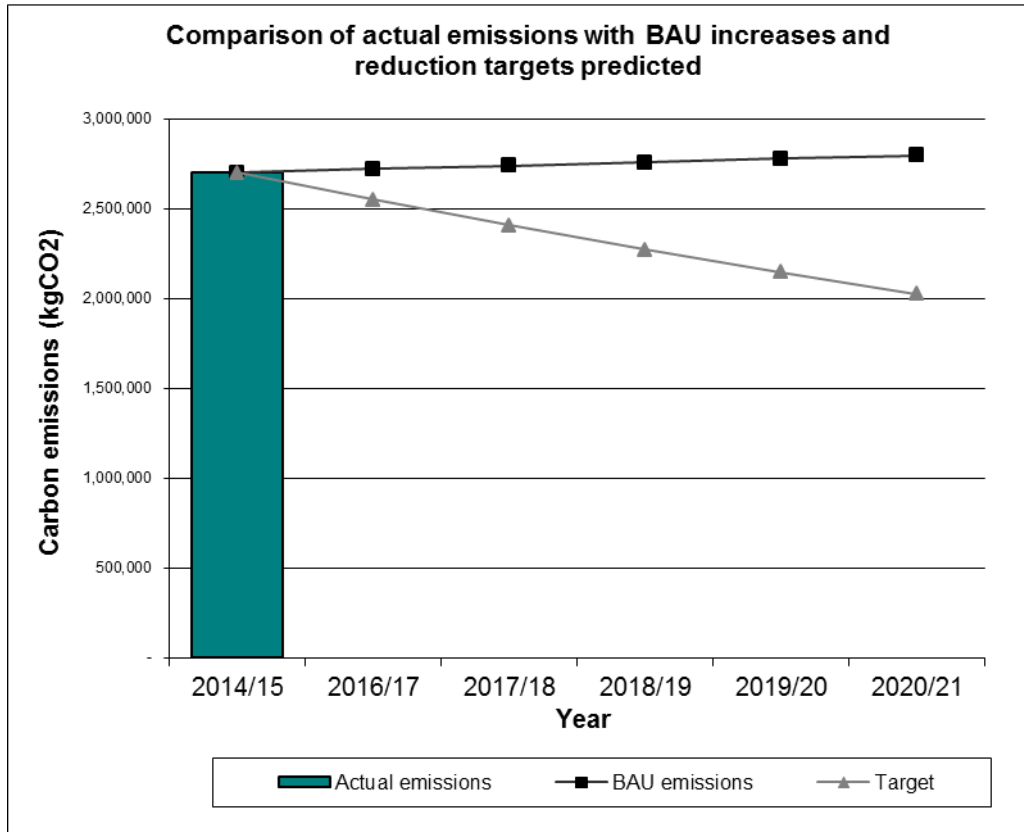
2 Targets and objectives

The Council has prioritised a Clean and Green Environment and in achieving this will also tackle the increased financial pressure and threat of climate change on the Council's operations. This emphasis echoes the concerns of members of the public as highlighted though the recent Department for Energy and Climate Change survey (November 2015) which showed that 24% of people are currently very, or fairly worried about paying for their energy bills and 58% report feeling concerned about UK supplies of fossil fuels being sufficient to meet UK demand for them. Reliance on fossil fuels and carbon intensive energy generation was the subject of the December 2015 Paris Energy Summit which saw 196 parties discuss a new agreement which would see goals set to limit global warming and temperature increases, requiring zero emissions some time between 2030 and 2050. Harlow Council recognises its role in this which is why a further ambitious target of 25% has been set in this plan.

The Council has set a target of reducing its CO₂ by a further 25% by 2020/21, using 2014/15 data as a baseline. Its carbon footprint for 2014/15 was 2,700 tonnes of CO₂, costing £380,394. This target will result in a reduction of 675 tonnes CO₂ emissions by 2020/21. The Carbon Management Plan would set investment of £120,000 from the Council's Environment Fund over the next five years, with additional funding of £100,000 to be found from business as usual spending. The Council's Environment Fund operates as a ring fenced "Invest to Save" fund within the Council's reserves that will provide for the carbon savings needed, savings from projects in year 1 will go back into the fund to pay for projects in year two, and so on. Failure to act on reducing carbon emissions would lead to the Council incurring additional expenditure of £357,000 for the same period based on 'Business as usual' increases in usage against a reduced emissions scenario.

2.1 Carbon Value at Stake and Costs

The term 'Business As Usual', (BAU) describes the scenario if the Council chooses to take no action in relation to reducing its CO₂ emissions. The projected forecast, if no action is taken, is that the Council is likely to see a rising increase in CO₂ emissions as reliance on electrical equipment and fossil fuelled transport continues. The Business As Usual scenario is generated by applying assumptions relating to demand for each emission source over the next five years, for each of the sources captured in the plan (electricity, gas, water, fleet and waste) an increase of +0.7% has been assumed (based on Energy Paper 68 Energy Projections for the UK - DTI/BERR).



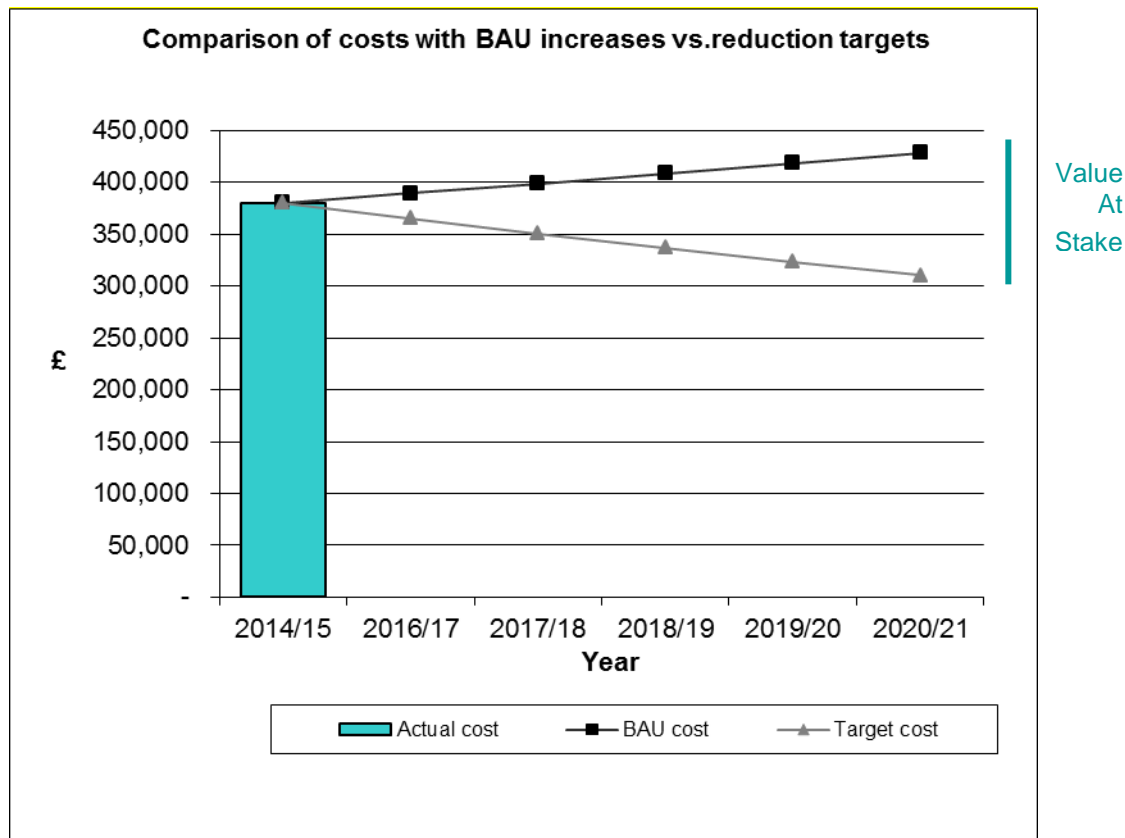
The term Value at Stake refers to the carbon that will be emitted under a Business as Usual scenario compared to the carbon that will be emitted if targets set in this Carbon Management Plan are met. The cost of doing nothing to reduce carbon is significant. The graph below highlights the rising CO₂ emissions in a BAU scenario compared to the level of reduction in emissions if the target set is met.

2.2 Financial Value at Stake and Costs

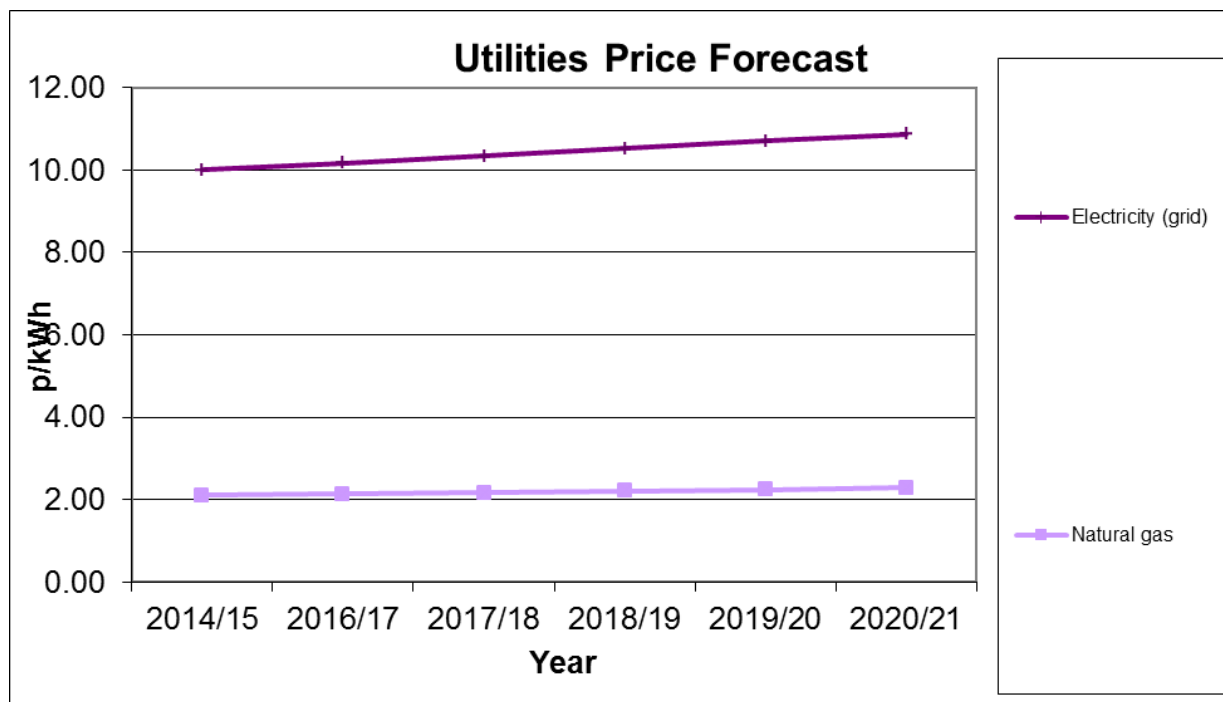
It is also important to look at the financial Value at Stake. The financial Value at Stake is the difference in cost over a period of time, between doing nothing (as per the BAU scenario) and implementing projects to reduce carbon emissions. The graph below shows the difference in cost to the Council (or Value at Stake) between taking no action, and implementing carbon reduction actions based on the 25% target set.

The financial Value at Stake over the initial five years of the plan is shown below. The table shows that cumulatively over five years the difference in expenditure between taking no action and implementing carbon saving action to achieve a 25% reduction is £357,848.

£	2016/17	2017/18	2018/19	2019/20	2020/21
BAU scenario	£ 389,568	£ 398,964	£ 408,587	£ 418,442	£ 428,534
Reduced emissions though CMP	£ 365,230	£ 350,671	£ 336,692	£ 323,270	£ 310,384
Reduction since year 1	4%	8%	11%	15%	18%
Total Value at Stake	£ 25,829	£ 51,251	£ 76,298	£ 101,000	£ 125,387
Cumulative Value at Stake	£ 24,338	£ 72,632	£ 144,527	£ 239,698	£ 357,848



Added to the business as usual costs is the rising cost of energy. The Council knows that electricity and gas prices will rise, cost projections for utilities are shown in the chart below, based on projections from DECC.



The 'cost avoidance' factor of potential projects is also considered when looking at drivers for change and action. Cost avoidance refers to actions taken to remove the impact of future costs above the current level of expenditure, such as rising energy prices. In the case of energy reduction projects the use of funds to introduce energy saving measures will not only cut costs at the current level, but also avoid incurring costs at a higher level in the future as energy prices rise.

Through reducing carbon emissions the Council can cut costs from diminishing activities undertaken and efficiencies achieved. Further reductions in cost are realised through the avoidance of paying bills at increased energy. The projects identified in this Carbon Management Plan will see reductions of 198 tonnes CO₂, with further projects to be identified in order to meet the 25% target and achieve savings of 675 tonnes CO₂. Due to greater than anticipated cuts to local government spending, there is a high level of uncertainty around investment in identified carbon reduction projects. Therefore, the Carbon Management Plan will be reviewed in 2018 to analyse whether the Council can achieve its target reduction of 25%. The gap between these projects and the target set will be met through the introduction of renewable energy sources as and when existing building services systems are replaced.

3 Carbon Reduction Management Projects

The Council has set a target of reducing its Carbon emissions by 25% over five years. Research shows that the Council will increase its emissions through business as usual energy use by 0.7% a year, because of this the Council will need to find more than its ambitious target of 25% reduction in reality.

Work carried out by the Carbon Trust has identified that an organisation can work towards achieving its targets in a number of ways:

- a) through good housekeeping – saving at least 10%
- b) through 'invest to save' projects – saving at least 20%

- c) through design and asset management – saving at least 10%

To ensure that the Council meets its target, a range of initial projects have been identified in the next section. Projects have been prioritised based on payback periods to recover capital expenditure and savings achieved. Some projects are part of a planned maintenance schedule so no 'extra' funds are required; merely a more carbon friendly approach has been taken to the task in hand e.g. routine boiler maintenance.

3.1 Identified Projects

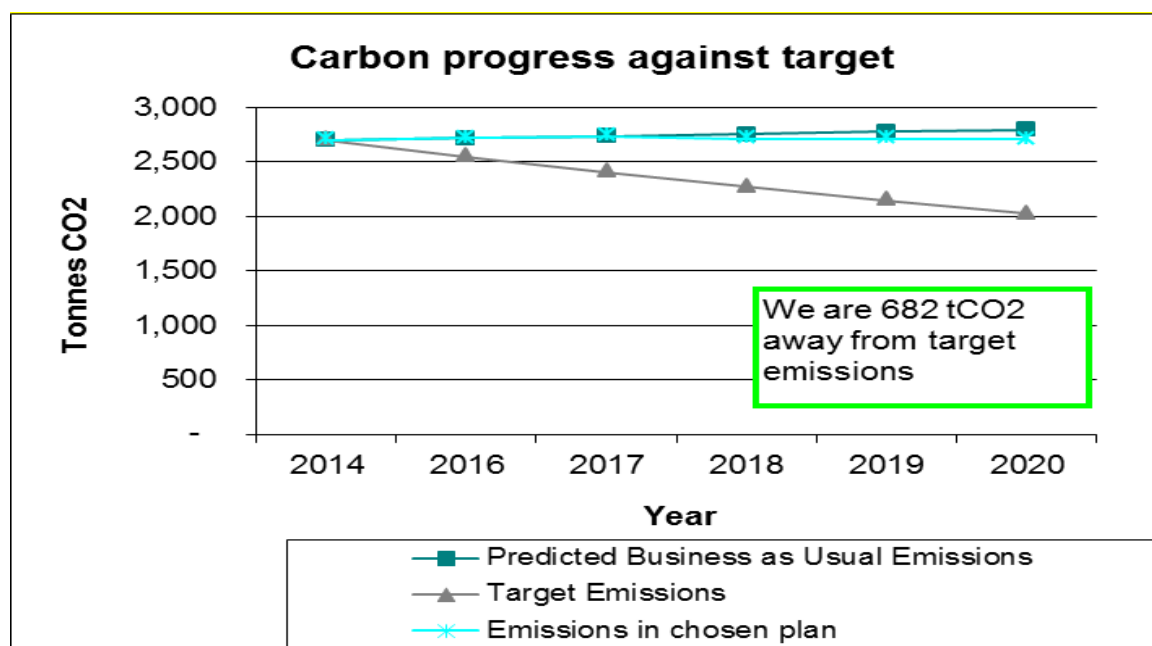
The projects listed in the table below have been identified for consideration between 2016 and 2021. Financial figures for the total capital costs and any subsequent operational costs have been included in the project quantification process but these will be subject to detailed financial appraisal. The length of payback period, i.e. the time in which it takes for savings to be recouped in order to cover the initial capital investment, is also recorded. The CO₂ reduction achieved from each project is calculated and recorded as an annual saving. Each project can also be considered as a percentage of the overall target in order to see how much of an impact any given project will make. In the table below the '% of target' column shows the proportion of the 25% savings target each project potentially represents. Each project will require additional feasibility studies to be carried out before full savings can be realized. Savings calculated are therefore illustrative. As in the previous Carbon Management Plan funding for these projects will be from the Environment Reserve and within "Business as Usual" spending. This is the case for all the projects included in the Carbon Management Plan which are not part of ongoing maintenance and replacement costs. Where this occurs costs will be met from existing revenue budgets. Any additional funds needed because of the use of a higher specification in order to achieve the required CO₂ savings will come from the Environment Reserve on an 'invest to save' basis.

Ref	Project	Estimated Cost	Annual Saving (year 1)		% of Target	Year
		Capital	Financial	CO ₂		
CP01	Playhouse – Voltage Optimisation	£15,758	£2,882	19.1	2.83	2018
CP02	Latton Bush Centre – Solar PV Panels	£126,532	£2,333	15.5	2.29	2020
CP03	Civic Centre – Solar PV Panels	£74,325	£1,852	12.3	1.82	2019
CP04	Civic Centre – Solar Thermal Insulation	Unknown	£163	1.8	0.26	2019
CP05	Dishwashers vs Handwashing	£1,000	£1,058	-9	TBC	2017
CP06	Water Hippos (Operational Buildings)	£300	£956	0.6	0.09	2016
CP07	Aerators Fitted to Taps	£500	£1,331	0.8	0.12	2016
CP08	Latton Bush Centre – Energy Efficient Hand Dryers	£3,000	£748	5.0	0.73	2017
CP09	Nanotech Magnet Boiler Installation	£10,700	£3,488	37.7	5.59	2017
CP10	Heating – Replacement Boilers	Unknown	£413	4.5	0.66	2017
CP 11	LED Car Park Lighting	£2,000	£249	1.7	0.25	2016
CP 12	LED Landlord Lighting	£2,000	£158	1.0	0.16	2016
		£236k	£16k			

3.2 Projected Achievement Towards Target

The total carbon savings of all the identified projects make a significant contribution to the 25% target over 5 years.

The chart below shows the progress of quantified projects against the 25% target at the point the Carbon Management Plan is formally adopted by the Council (March 2016). The level of emissions under a 'Business as Usual' scenario is included to show the effect that taking no action would have.



The projection used for 'Target Emissions' is based on a straight-line calculation with a built in assumption that projects naturally become less effective unless maintained. The emissions reduction achieved through the Carbon Management Plan are on course to achieving the target of 25% reduction over 5 years, with a review in 2018 to assess whether the Council is still on target to achieving these savings.

There still remains a gap of 682 tonnes CO₂ for which actions for reduction need to be identified in order to meet the 25% reduction target. The projects identified so far represent an estimated 7% of the 25% reduction in CO₂ over five years. Actions to address the remaining 484 tonnes will be identified through reviewing the actions already in the Plan as feasibility studies may identify further savings than those already calculated, however, anticipated cuts in funding will affect the implementation of certain projects and will determine whether the Council can achieve its target. Furthermore, improvements in technology and changes to business procedures in terms of building usage and home working will also affect the carbon emissions from buildings and business travel and until these changes have been further developed, savings arising from them cannot be fully realised and quantified and therefore have not been included in this plan.

4 Carbon Management Plan Financing

The overall cost of the identified projects in the Carbon Management Plan is 198 tonnes CO₂ saved for £236,115 spent based on currently quantified projects. Further projects will be identified to find savings in order to achieve the 25% target over 5 years and be considered as part of the 2018 review of the Plan. In order to achieve these savings it is necessary to identify funding for the projects involved. The movement towards justifying carbon reduction projects in terms of payback period has lead the way for establishing an 'Invest to Save' fund for energy projects. The Council's Environment Reserve was established for this purpose. The use of an earmarked reserve enables a clear overview of the savings being achieved and ensure that they are fed back into the Fund to enable delivery of future projects.

The Council's Capital Programme will also be considered to support funding as it has been recognised that the Environment Reserve may not be able to support all new energy projects and external financing sources will be pursued.

4.1 Assumptions

The financial savings projected from the implementation of carbon reduction projects are based on the following assumptions:-

- a) The cost of gas/electricity as at 2015/16 prices
- b) Demand for energy supply increases 0.7% annually due to increases in service provided (assumed within 'Business As Usual' scenario emissions increase).
- c) Information provided by manufacturers/suppliers of technologies relating to savings

The most critical of these assumptions is the cost of energy; and the increase in energy demand in the Business as Usual scenario. The expected rate of increase for energy prices, based on projections published by the Department for Energy and Climate Change, mean that the financial cost savings may increase from those currently projected. In addition, this would reduce the payback periods of the projects and may mean projects with a greater capital outlay may, in future, fall within the 5 year payback criteria used for project acceptance. For this reason projects will be continually reviewed and new projects considered over the 5 years of the Plan. It is intended that the plan will evolve and expand dependant on changing circumstances in relation to energy usage and prices, and the availability of new technologies.

4.2 Benefits / Savings

2014/15	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Annual CO₂ saving	1.65	4.12	42.34	61.47	89.25	198.84
% of target achieved	0%	1%	6%	9%	13%	29%
Annual overall cost expenditure (Cumulative of projects)	£2,800	£16,700	£15,758	£74,325	£126,532	£236,115
Annual cost saving	£413	£2,858	£8,565	£11,447	£15,633	
Cumulative annual cost saving	£413	£3,271	£11,836	£23,283	£38,916	£77,719

The cumulative saving over five years is £77,719 based on expenditure of £236,115, in which payback would be achieved in 7.5 years. This assumes that the current project list does not change over the period of the Carbon Management Plan.

In developing this Carbon Management Plan, and through experience of implementing the previous 2011 Carbon management Plan, benefits which cannot be quantified have also been identified. These benefits are mostly concerned with reputational and legislative matters. The effect on the Council's reputation and status as community leader for carbon reduction and management will also be improved. This Carbon Management Plan will offer savings beyond quantifiable carbon and finance to offer a sustainable approach to the future.

5. Data Collection Methodology

Good data management allows effective measurement and quantification of the benefits of each of the projects. Data collection for the Council's carbon footprint follows the methodology used for the previous 2011 Carbon Management Plan, allowing robust comparison of reduction across the two plans and future plans to follow. Data for energy and water usage is provided on a monthly basis through the Council's suppliers, with gas and electric data provided electronically. External verification of consumption data has been considered, however following a successful exercise with the Council's energy suppliers during 2010 this is not considered necessary. Officers will continue to verify consumption data on a quarterly sampling basis to ensure that this data remains accurate. Data for waste collection is supplied on request from the Council's waste contractor and transport data is collated through the Human Resources service at the Council, Kier Harlow and our waste contract partners.

Energy and transport data is reviewed internally and, through NI 185 procedures, the related CO₂ emissions for buildings, street lighting and transport are collated. The NI 185 reporting tool was internally adapted in December 2009 to record monthly consumption and CO₂ emissions of building data in order to accurately monitor usage for individual buildings. This data will be communicated to Officers through existing project management performance reports and updates within WIS. Publication of data will raise staff awareness of the implications of their energy use.

The Council wishes to move to regular collation of data for all sources of CO₂ emissions so that a full data set for carbon emissions is available. The Council took part in an industry review of billing during May 2010 and urged the water companies to move to electronic billing in order to make this process even easier to manage. In order to ease and improve current data collection practices a request to receive electronic water billing has been made in light of the impending de-regularisation of the water industry and our current supplier has committed to bringing this live in 2016. The data is used to provide building managers with an annual profile of consumption alongside targets for consumption reduction.

Transport data is currently collected annually and involves several agencies, however in order to promote ownership of the emissions created through transport, it is envisaged that each agency will be responsible for internally collating their data on a quarterly basis and setting their own targets for reduction. This way each agency will work towards their target in a way which is meaningful to them, whilst at the same time contributing to a corporate Council target to reduce emissions.

Glossary of Terms

BAU	Business as usual
CO ₂	Carbon Dioxide
DECC	Department of Energy and Climate Change
DEFRA	Department of Food and Rural Affairs
DTI/BERR	Department of Business, Enterprise and Regulatory Reform (BERR), formerly the Department of Trade and Industry (DTI)
EPC	Energy Performance Certificate
EU	European Union
HECA	Home Energy Conservation Act
LED	Light Emitting Diode
SAP	Standard Assessment Procedure
UK	United Kingdom
WIS	Weekly Information Sheet