working with

Hampshire Fire and Rescue Service Carbon Management Plan

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Approval status:

Contents

Joint foreword from the Chief Officer and Chairman of Hampshire Fire and Rescue Authority

We are pleased to present this plan setting out the organisation's objectives for cutting its carbon footprint up to March 2016. The importance we place on our environmental impact is shown by 'Environment' being one of the five priorities in our Service Plan. Despite the current financial constraints there is a very strong case for investing in our buildings, staff and transport infrastructure to deliver real energy and fuel savings. This carbon management plan shows how we will meet our commitments and deliver a substantial cut in our carbon footprint. As a fire and rescue service we see the impacts of extreme weather events both in our county and the wider world. We believe that as a public body we must show leadership by reducing our contribution to climate change and adapting to the changing climate.

[photo & signature]
John Bonney
Chief Officer, Hampshire Fire and Rescue Service

[photo & signature]

Councillor Royston Smith
Chairman, Hampshire Fire and Rescue Authority

Foreword from the elected member Environmental Champion

As the elected member Environmental Champion I fully support this carbon management plan. This plan sets out the actions the Service will continue to take to reduce its carbon footprint and to embed carbon management within the organisation. I look forward to championing the development of more carbon saving projects to allow the ambitious target to be met.

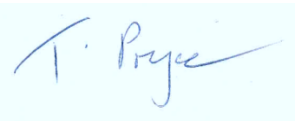
[photo & signature]
Councillor Adam Carew
Member Environmental Champion

Foreword from the Carbon Trust

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 in line with its Climate Change Act commitments, and the Carbon Trust is pleased to have partnered with Hampshire Fire and Rescue Service on our 2011/12 Public Sector Carbon Management Programme to help it meet this challenge.

This carbon management plan will help Hampshire Fire and Rescue Service to save money on wasted energy and put it to better use in other areas, while making a positive contribution to the environment by lowering carbon emissions. It commits Hampshire Fire and Rescue Service to a target of reducing CO_2 by 30% by 2016 and underpins potential financial savings and cost avoidance to the organisation of around £2m by that date.

Public sector organisations can contribute significantly to reducing CO_2 emissions and improving efficiency. The Carbon Trust is therefore very proud to support Hampshire Fire and Rescue Service in their on-going implementation of carbon management.



Tim Pryce
Head of Carbon Management
Carbon Trust

Executive Summary

This Carbon Management Plan explains what we will do to reduce our carbon footprint over the next five years. The plan has been prepared with support from the Carbon Trust and has allowed us to set realistic targets and plans for how any costs will be met. The plan contains invest-to-save projects as well as changes to our procedures and behaviour which will ensure we embed consideration of our carbon emissions in how we work and make decisions.

Since our Hampshire Fire and Rescue Service Plan 2008 to 2011, there has been an objective on "reducing our impact on the environment" and specifically on reducing our contribution to climate change by cutting our carbon emissions.

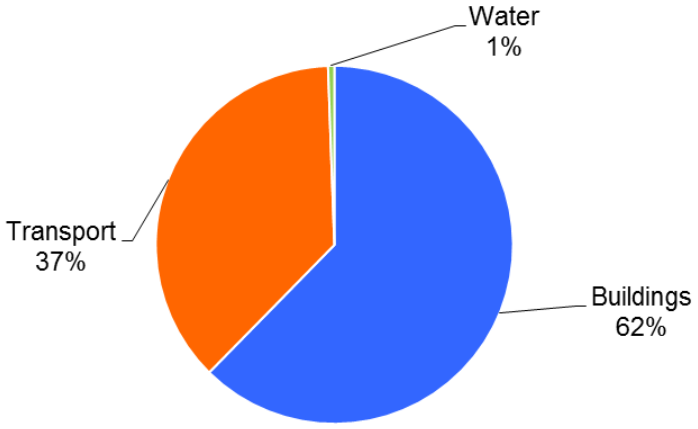
Between 2007-2008 and 2010-2011 we achieved a 7% reduction in our carbon footprint. Recognising that we needed to make substantial further cuts we asked to take part in the Carbon Trust's Public Sector Carbon Management Programme which provided the support for the development of this plan. This plan builds upon the significant progress already made since 2007 in working to reduce our environmental impact; including reducing our carbon emissions. By taking a lead and reducing our fuel and energy use we can save money as well as cutting our carbon emissions.

saving energy and fuel = saving carbon = saving money

Because of changes in the methods for calculating our carbon footprint we chose to set a new baseline year of 2010-2011 for this Carbon Management Plan.

Our new baseline (2010-2011) carbon footprint (shown in the chart and table below) was 4670 tonnes of carbon dioxide equivalents (tCO_2).

62% of the baseline carbon emissions came from our buildings, 37% from transport and 1% from domestic water use.



Baseline (2010-2011) carbon emissions

	tCO_2	%	Cost (£)
Buildings	2,912	62%	£421,928
Transport	1,730	37%	£1,111,222
Water	27	1%	£59,370
Total	**4,670**	**100%**	**£1,592,520**

Our low carbon **vision** and **target** are:

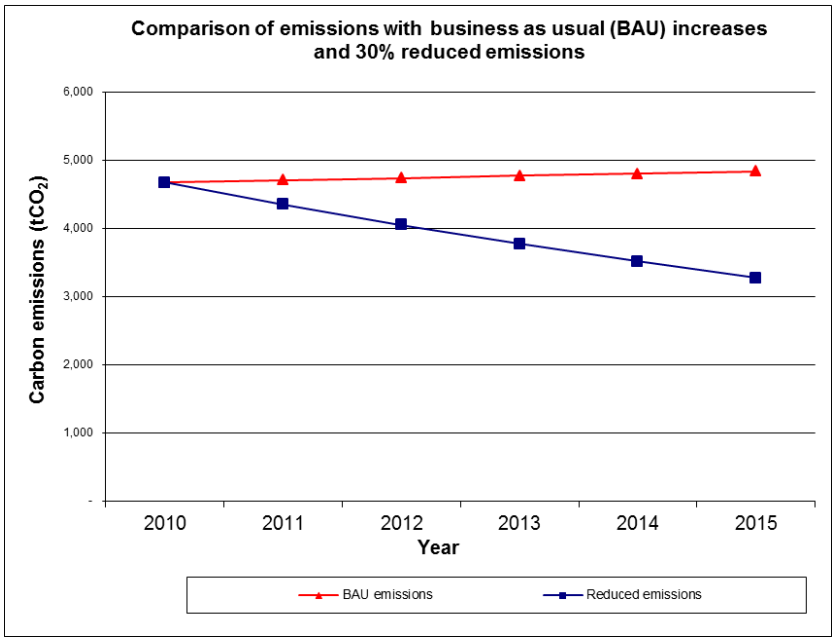
"We will reduce the carbon footprint of our day-to-day activities in a sustainable way"

"Hampshire Fire and Rescue Service will reduce the carbon emissions from its buildings and business travel by 30%, from a 2010-2011 baseline of 4670 tonnes CO_2, by the end of March 2016"

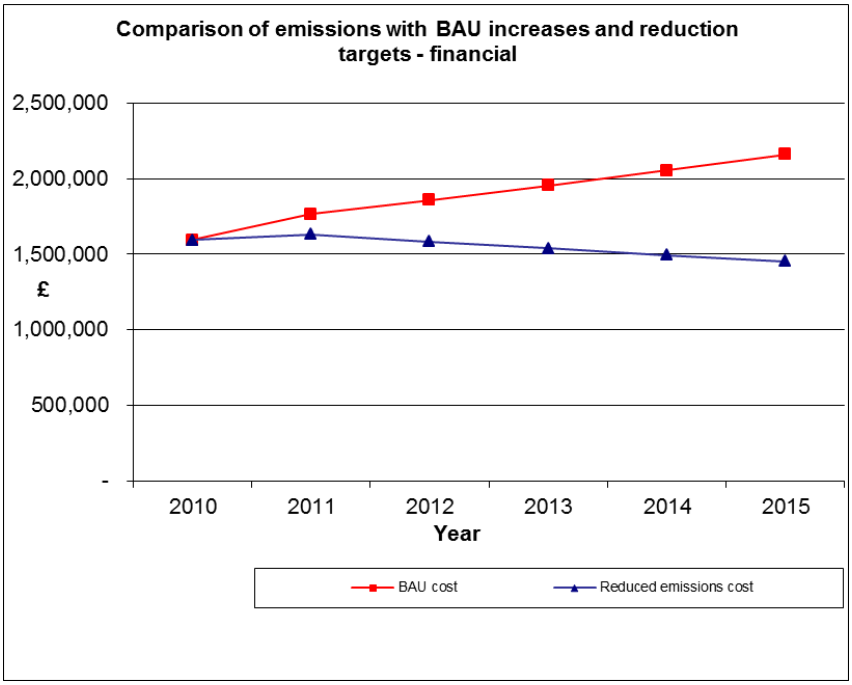
The graphs below illustrate:

- The position if no action is taken – 'business as usual' (BAU)
- The effect of implementing a 30% reduction in carbon emissions across the whole organisation – 'reduced emissions'

The first graph shows the consequences for the carbon emissions of adopting a 30% reduction plan. The area between the two lines shows a cumulative benefit of 4897 tonnes of CO_2 over five years (1567 tonnes of CO_2 in the final year).



The second graph illustrates the notional financial benefit of adopting a 30% reduction plan (excluding any costs of investment).



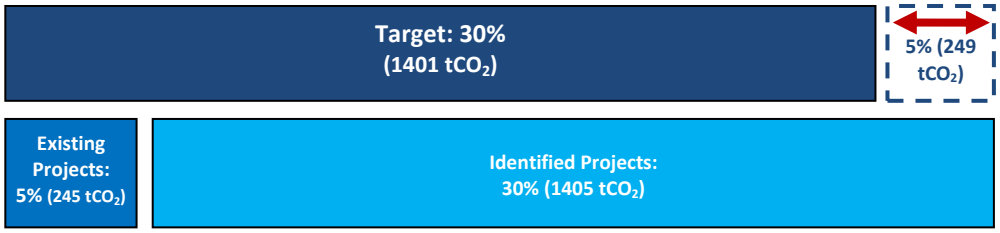
The area between the two lines shows a cumulative notional saving/cost avoidance of £2.05 million over five years (with notional savings/cost avoidance of £673,500 in the final year).

However the graph does not represent the actual cost savings we expect to secure with the projects identified in the plan. This is because we are unable to make 30% cuts in our transport emissions by virtue of the nature of the service we provide. The detail we have developed on savings and costs from specific projects supersede this analysis.

A number of key projects have been identified which will help the Service to meet the target. These include:

- Encouraging a culture change in business travel to support more sustainable choices and providing information and training on how to reduce fuel use and miles travelled.
- Installing automatic meter reading to gather more useful data on where building energy efficiency can be improved
- A significant programme of invest-to-save in our buildings to reduce our energy consumption and exposure to rising fuel prices.
- Making use of our staff volunteer Environmental Champions to raise awareness of how simple behaviour changes can reduce our carbon emissions.
- Embedding carbon management into the organisation so it becomes 'normal'.

A 30% reduction is a challenging target and we recognise that while we have identified projects which exceed our target we will need to monitor their progress closely. The projects in the current plan provide a 35% reduction from the baseline (117% of the target reduction). The diagram below illustrates the savings in the current plan.



The overall target and the size of any gap will be reviewed each year. If it proved necessary to find additional savings during this five year period it is expected that further savings could be identified from: a reassessment of the scope for making higher reductions in our transport emissions; further energy efficiency projects; and a review of energy savings from renewable technologies.

To implement the projects defined in this plan will cost £2,569,668 of which £1,372,007 has already been spent on existing projects, and the remaining additional £1,197,661 has already been allocated.

In the final year of the plan the implemented projects will result in estimated annual financial savings / cost avoidance of £355,525 and carbon savings of 1650 tonnes of CO_2. The overall payback period of the projects in this plan is 7.5 years. Over the five years of the plan the cumulative cost saving from the identified projects is estimated to be £1,064,568 and a cumulative carbon saving of 4688 tonnes of CO_2.

The Carbon Management Plan is governed by a Programme Board (the Service's Directors) with the Director of Corporate Services as the Project Sponsor. The Project Leader for carbon management is the Environmental Impact Project Coordinator who heads up a Project Team which has representatives from key departments across the Service. The Project Leader will provide regular reports on progress to the Project Board. The Carbon Management Plan will be reviewed each year and progress will be reported to the Hampshire Fire and Rescue Authority and published in the Annual Report section of the Service Plan and on www.hantsfire.gov.uk.

1. Introduction

This Carbon Management Plan explains what we will do to reduce our carbon footprint over the next five years. It sets the strategic context and the 'case for action', our current carbon emissions, a programme of proposed projects and actions to reduce our emissions, how much this will cost and save, as well as the governance arrangements to keep the programme on track.

In the remaining sections of this introduction we will set out:

- Our low carbon vision and target
- Our drivers for reducing our carbon emissions
- The context of the programme and how it supports other organisational initiatives

1.1 Our low carbon vision and target

Our Vision is:

We will reduce the carbon footprint of our day-to-day activities in a sustainable way

We will take into account the effect our activities have on the environment and show leadership in reducing the negative impacts. This will include improving our understanding of the carbon footprint of our day-to-day activities and how this can be reduced through changes to our processes and behaviours. We will embed consideration of the environment and carbon management in the processes and culture of the organisation. We will 'invest to save' in energy, water and transport efficiencies.

This is a long term commitment to finding sustainable solutions and reducing the negative effects we have on the environment. We will continue to work with other organisations to show public sector leadership on carbon management.

Our target is:

Hampshire Fire and Rescue Service will reduce the carbon emissions from its buildings and business travel by 30%, from a 2010-2011 baseline of 4670 tonnes CO_2, by the end of March 2016

1.2 Our drivers and priorities for reducing our carbon emissions

Climate change is globally recognised as the greatest environmental and economic threat faced by national governments and individuals. As a public sector organisation we have a responsibility to demonstrate leadership in climate change mitigation by reducing our carbon emissions. It is also an opportunity for energy and transport efficiencies to produce financial savings.

In September 2009 Hampshire Fire and Rescue Authority signed the Nottingham Declaration making a public commitment to taking action on climate change:

"Hampshire Fire and Rescue Authority acknowledges the increasing impact that climate change will have on our community during the 21st century and commits to tackling the causes and effects of a changing climate on our county."

The UK Government has been a world leader in recognising the impact of climate change by introducing the Climate Change Act in 2008. This legislation requires the UK to reduce its carbon emissions by at least 80% by 2050, against a 1990 baseline. The UK Low Carbon Transition Plan (2009) sets out the long term UK carbon budgets that are necessary to meet the legally binding 80% target. This includes a requirement to cut UK carbon emissions by 34% by 2020, against a 1990 baseline.

In May 2010, the Prime Minister announced that "this government would be the greenest ever" and central government organisations are now working towards a 25% carbon reduction target by 2015 (against an 2009/10 baseline). Other public sector organisations have been encouraged to match and exceed this level of ambition to help the UK meet its legally binding targets for cutting carbon emissions.

As an organisation we therefore have three main drivers for reducing our carbon emissions:

The **scientific case for global climate change** is clear and this is our main driver:

- We see climate change as a foreseeable risk and so as a Fire and Rescue Service we must prepare for its impacts on the communities we serve and work to reduce our contribution to global carbon emissions.
- We acknowledged this by signing the Nottingham Declaration.

The Climate Change Act 2008 is the main **legislative driver** which commits the UK to legally binding cuts in carbon emissions:

- While this does not currently place binding targets on public sector organisations the Government rightly expects us to show leadership in cutting carbon emissions.
- A range of other legislation directly effects the construction, running and refurbishment of our buildings in terms of energy efficiency and taxation on carbon emissions. This includes Display Energy Certificates, Building Regulations and the CRC Energy Efficiency Scheme. While we are not currently subject to the CRC Energy Efficiency Scheme the energy consumption thresholds might be lowered in future years.

The **financial driver** is particularly significant at a time of rising energy prices and budget reductions making energy efficiency a priority. Energy prices have been increasing at rates well above inflation and this trend is not expected to improve, due to the increasing scarcity of fossil fuels and the necessary increasing use of renewable energy sources. Transport fuel costs have also risen considerably over the past few years. We rely on vehicles for delivering our services so we are particularly affected by price increases and find this a challenging area to tackle.

- We have a responsibility to make efficient use of public funds not just in the short term but for the long-term.
- This means investing in our buildings, vehicles, equipment and staff to make long term savings in energy and fuel costs. Often projects to deliver energy efficiency savings can also reduce the costs of on-going maintenance.
- A continued 'invest to save' approach will reduce our exposure to rising energy and fuel prices (and taxation) by reducing our demand. This leaves more of our resources for continuing to deliver our core services to the public.

saving energy and fuel = saving carbon = saving money

1.3 The context for our Carbon Management Programme

In 2007 the Service chose to undertake a Best Value Review of its impact on the environment. The review reported on progress over a two-year period with the final report being published in 2009 as the "Environmental review and report 2007/09". As part of the review outcomes the Hampshire Fire and Rescue Service Plan 2008 to 2011, for the first time, included an objective on "reducing our impact on the environment" and specifically on reducing carbon emissions.

In the 2009 to 2012 Hampshire Fire and Rescue Service Plan 'Environment' became one of our five on-going priority areas along with the commitment "We are determined to reduce the effect of fires and other emergency incidents on the environment, as well as reducing our own carbon footprint". That commitment covers both the carbon emissions from fires and from our own activities as a fire and rescue service. In September 2009 Hampshire Fire and Rescue Authority signed the Nottingham Declaration making a public commitment to taking action on climate change:

This carbon management plan is specifically about managing the carbon footprint from our activities rather than the carbon footprint of the fires we attend. We continue to focus on reducing the number and severity of fires and other emergency incidents through our community safety activities (to prevent them occurring in the first place) and by improving our equipment and response to incidents.

Our Carbon Management Plan is our principal means of reducing (mitigating) our emission of greenhouse gases which contribute to climatic change. As well as mitigating our contribution to climate change we are also preparing to adapt to the changes that we expect due to climate change. We are reviewing our plans to ensure that they consider climate change adaptation and that this is included in decision making.

This Carbon Management Plan is one of the key action plans for reducing our impact on the environment which are part of our Environmental Management System (EMS). Our EMS allows us to identify our most significant environmental effects, prioritise areas for improvement, and provides a clear framework for assessing and reporting our progress against targets on our carbon footprint.

Through our participation in the Carbon Trust's Public Sector Carbon Management Programme we have benefited from a coordinated approach to carbon management which has been used successfully by more than 530 other public sector organisations. The five-stages of the Public Sector Carbon Management approach are summarised by the diagram below.

1. **Mobilise** the organisation - identify key individuals and create a team, determine the scope for the carbon management strategy and level of ambition of the implementation plan.
2. **Baseline and forecast –** this stage establishes a baseline carbon footprint and costs for the organisation to show "where are we now?" and then makes forecasts of how that could change over the next five years. The forecasts make assumptions about energy and fuel prices and growth of the organisation to produce two scenarios a 'business as usual' scenario and a 'reduced emissions' scenario. The reduced emissions scenario shows the effect of making cuts in the carbon footprint in line with an ambitious target reduction.
3. **Identify and quantify –** compile initial ideas for carbon saving projects, prioritise them based on scale of saving and ease of implementation, gradually adding more detail on costs and quantified savings. This involves meeting with key staff to identify projects and works that will reduce energy usage.
4. **Approve plan –** review and complete the plan; gaining approvals from key stakeholders. Tell everyone in the organisation about the plan.
5. **Implement the plan –** carry out the actions and projects identified in the plan, monitor progress, review actions and develop further projects to ensure targets are met. Tell stakeholders about progress and any actions to remove barriers to success.

2. Emissions baseline and projections

The carbon baseline is a record of our carbon emissions in a chosen year – our carbon footprint. Targets and performance in reducing emissions are measured against this figure as a percentage of the baseline value. The baseline is not just a single figure for carbon emissions for the whole organisation; it is a record of how much of our emissions come from different buildings or activities. The details of our baseline have been used to help target our plans for reductions so that we focus our efforts on those areas which we believe will show the most improvement.

This section outlines what parts of our emissions are included in the baseline, what year we have chosen as our baseline and how we have calculated that baseline.

2.1 Scope

Our baseline includes the following sources of emissions:

- Energy use in all our buildings (electricity, gas and heating oil) – this covers 52 separate sites across Hampshire.
- Metered water used in our buildings.
- Diesel and petrol used in all our fleet vehicles and equipment – the current fleet is 336 vehicles.
- Reimbursed business mileage by motor vehicle; often labelled 'grey fleet' mileage.

The following sources are not included in the baseline:

- Water used for fire fighting and training; water from hydrants is not metered. We recognise the impact on Hampshire's environment of current rates of water use and strive to minimise our use of water.
- Business travel by rail, bus, ferry, taxi, and flights; we do not have suitable information available to include these types of travel but we aim to improve our collection of information and bring this into scope in the future.
- Offsite emissions from our supply chain and outsourced services; such as equipment deliveries by suppliers and payroll and computer data centre services provided by Hampshire County Council.
- Waste and recycling; we will aim to improve our collection of information and bring this into scope in the future.
- Employee commuting to and from work; we do not have suitable information available to include commuting but we will consider improving our collection of information to bring this into scope in the future.
- Emissions from smoke and destruction of materials from fires and other emergency incidents we attend; these are not directly attributable to us but we continue to work to reduce them through both our prevention and response work.

2.2 Baseline

We first calculated our carbon footprint back in 2008; covering the 2007-2008 financial year and have continued to calculate it each year since then. Considering carbon dioxide emissions alone for the period 2007-2008 to 2010-2011 the Service achieved a 7% reduction in carbon footprint – this is the figure presented in our Hampshire Fire and Rescue Service Annual Report 2010 to 2011.

Although we have been calculating our carbon footprint since 2007-2008 we have chosen a new baseline year of 2010-2011. The decision to re-baseline was taken because we have extended the scope to include emissions from heating oil and water use and used newer emissions factors which include all main greenhouse gases rather than only carbon dioxide emissions. Previously our carbon footprint used emissions factors which only considered carbon dioxide emissions and was reported in tonnes of carbon dioxide. The new 2010-2011 baseline is reported in terms of tonnes of carbon dioxide equivalents (for simplicity we will continue to refer to savings as tonnes of CO_2 or tCO_2 but it will always be in carbon dioxide equivalents)[1].

The new baseline information was entered in the 'Baseline Tool' provided by the Carbon Trust and using the recommended carbon emissions conversion factors from the published 2011 Defra/DECC greenhouse gas conversion factors guidance.

[1] Carbon dioxide is not the only gas which contributes to climatic change. Many other gases actually have more warming effect than carbon dioxide. So emissions of those other main gases are converted into an amount of carbon dioxide that would have the same warming effect – hence carbon dioxide equivalent.

Due to the large number of estimated energy and water bills manual meter readings were generally used to improve the accuracy of the baseline information.[2] Heating oil data came from invoices for delivered amounts of fuel because there is no system for monitoring actual consumption during the year.

The baseline diesel and petrol consumption data were from invoices for fuel deliveries during the baseline year and for 'fuel card' purchasing records for our fleet vehicles. Financial records of miles travelled on business claimed by our staff (often referred to as 'grey fleet') were used to provide estimated emissions. The Defra/DECC greenhouse gas conversion factors for different types and sizes of vehicles were used as the actual diesel and petrol consumption was not available.

Our baseline (2010-2011) carbon footprint was 4670 tonnes of carbon dioxide equivalents (tCO_2)

An overview of the baseline carbon emissions and costs is shown in Figure 2.1; with a more detailed breakdown in Figure 2.2.

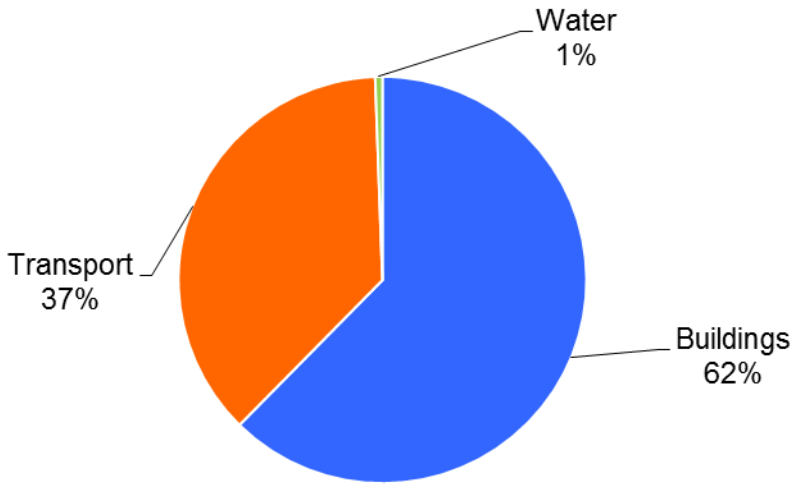


Figure 2.1 Overview of baseline (2010-2011) carbon emissions with associated costs

	tCO_2	%	Cost (£)
Buildings	2,912	62%	£421,928
Transport	1,730	37%	£1,111,222
Water	27	1%	£59,370
Total	**4,670**	**100%**	**£1,592,520**

Transport

Around 37% of carbon emissions and 70% of costs come from transport which reflects the services we provide. The large percentage cost of business travel reflects the amounts of business travel undertaken by our employees in their own vehicles ('grey fleet') for which they are reimbursed using mileage rates. This is the subject of an on-going project to reduce grey fleet mileage and inform staff about more sustainable transport choices.

Water

Although domestic water use makes only a 1% contribution to our carbon emissions it accounts for 4% of costs and as an increasingly scarce local resource has broad environmental drivers for reduction.

[2] The baseline energy and water data came from a combination of billing information and our own monthly manual meter readings at each site. Initial work to reduce consumption meant estimated bills were often much higher than our actual meter readings.

Buildings

Buildings make up 62% of overall carbon emissions and 26% of costs. The percentage carbon emissions from different sorts of buildings shows how our approach to carbon saving will need to take account of large variations in building size, occupancy and main uses.

Our Headquarters building accounts for 15% of the total carbon footprint – as much as the 38 small retained fire stations (RT Fire Station) combined. Our Fleet Maintenance Centre and Stores building (FMC/Stores) accounts for 5% of the footprint. This means the buildings on our Headquarters site account for 20% of the baseline.

The 13 wholetime fire stations (WT Fire Station, occupied 24 hours a day) account for 27% of the carbon emissions

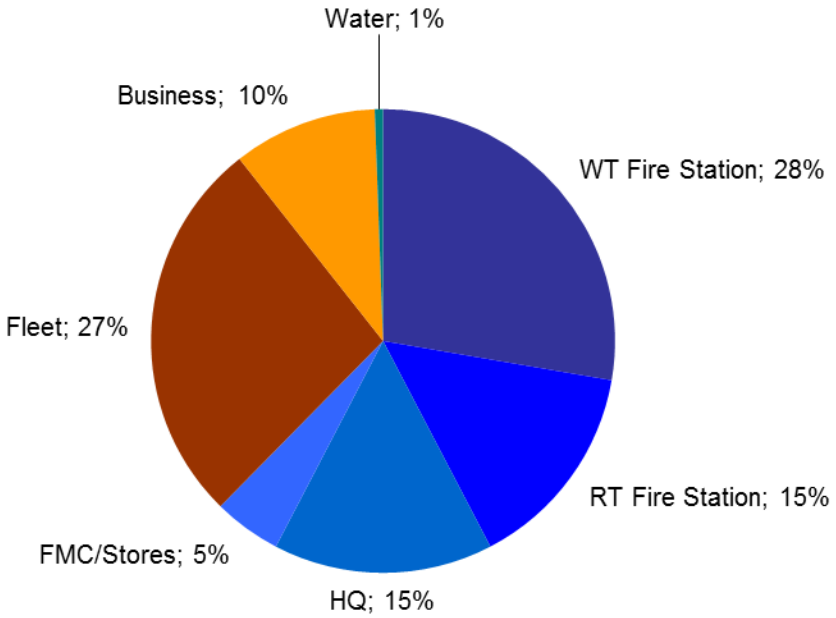


Figure 2.2 Breakdown of carbon emissions from different parts of the Service with associated costs.

Category		tCO_2 2010	%	Cost £	%
Buildings	WT Fire Station	1294	28%	£189,897	12%
	RT Fire Station	683	15%	£97,907	6%
	HQ	714	15%	£102,624	6%
	FMC/Stores	221	5%	£31,501	2%
Transport	Fleet	1,261	27%	£496,127	31%
	Business	469	10%	£615,094	39%
Water	Water	27	1%	£59,370	4%
	Total	**4,670**	**100%**	**£1,592,520**	**100%**

Figure 2.3 shows the split between energy consumption across all our buildings was about 30% electricity and 70% gas and oil. This contrasts with the split in costs and carbon footprint; with electricity making up 52% of the cost and 54% of the carbon emissions compared to 48% of the cost and 45% of the carbon emissions from gas and oil. This illustrates the much higher price of energy from electricity and its greater **carbon intensity**[3]. Energy efficiency projects targeting electricity use will have the potential for high cost and carbon savings. However the bulk of our energy use is from gas (space heating for the estate) and the scope for reducing gas consumption through improved insulation and

[3] The carbon intensity of fuels varies: using the baseline year costs, 1906 kWh of electricity is 1 tonne CO_2 (costing around £137), 5447 kWh gas is 1 tonne CO_2 (£155), 4052 kWh burning oil is 1 tonne CO_2 (£122)

heating controls is considerable. This consideration of the differences in carbon footprint and cost for different sources of energy is important for determining how to maximise both cost and carbon savings.

Figure 2.3

	Total kWh	%	Cost (£)	%	tCO_2	%
Electricity	3025064	30	217950	52	1587009	54
Natural gas	7022130	69	199583	47	1289263	44
Burning oil	146502	1	4395	1	36158	1
Total	10193696		421928		2912430	

2.3 Projections and value at stake

The value at stake of not achieving a 30% emissions reduction could notionally cost Hampshire Fire and Rescue Service a cumulative £2.05 million by 2016.

Using the 'Baseline Tool' provided by the Carbon Trust we have made some high level assessments of how our carbon footprint and costs could change over the five years of the plan.

These 'value at stake' assessments compare:

- The position if no action is taken – 'business as usual' (BAU)
- The effect of implementing a 30% reduction in carbon emissions across the whole organisation – 'reduced emissions'

The 'business as usual' (BAU) position shows the calculated growth in carbon emissions and related costs that we would experience within the organisation if we do nothing to reduce consumption. The BAU position includes assumptions on how our consumption might increase and also what increases in energy tariffs we are likely to experience. Based on research provided by the Carbon Trust a BAU increase of 0.7% per year has been used. The scenario also makes assumptions about increases in energy prices (5.8% per year), transport costs (3.7% per year) and water costs (2.5% per year). The Service's new electricity and gas prices for the 2011-2012 year have also been included in the BAU position with subsequent years continuing to rise by the assumed 5.8%.

The 'reduced emissions' position shows the effect of implementing a 30% reduction in carbon emissions across the whole organisation. The 'reduced emissions' position assumes that the reduction in carbon emissions is linear so that the 30% reduction is achieved by the end of the plan. The 'reduced emissions' position also makes the same assumptions as the BAU position about cost and demand increases. The financial assessment for the 'reduced emissions' position assumes that the reduction in carbon emissions has come from all the emissions sources: i.e. transport, buildings and water. However this is only a notional cost estimate, which does not represent the actual cost savings we expect to secure with the projects identified in section 3 of this carbon management plan. This is because we are unable to make 30% cuts in our transport emissions - by virtue of the nature of the service we provide where travel to emergency incidents is essential. The capital costs of projects required to meet the reduction are also not included in this analysis.

The value at stake is the year-on-year difference between the BAU and 'reduced emissions' scenarios and can be expressed in terms of either carbon footprint or cost. The value at stake is a high level analysis, as it can be produced early on in the process of developing a carbon management plan and helps make the case for taking action. However the detail we have developed on savings and costs from specific projects presented in sections 3 and 4 supersedes this analysis.

Figure 2.4 shows the consequences for the carbon emissions of adopting a 30% reduction plan. The area between the two lines shows a cumulative benefit of 4897 tonnes of CO_2 over five years (1567 tonnes of CO_2 in the final year).

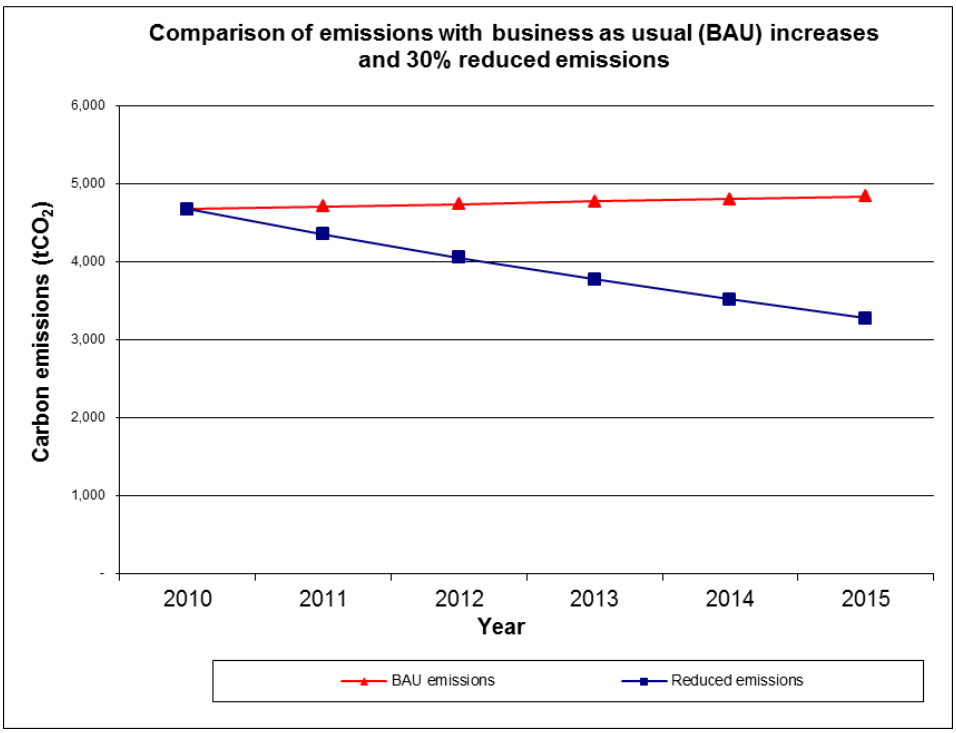


Figure 2.4

The Figure 2.5 illustrates the notional financial benefit of adopting a 30% reduction plan (excluding any costs of investment). The area between the two lines shows a cumulative notional saving/cost avoidance of £2.05 million over five years (with notional savings/cost avoidance of £673,500 in the final year).

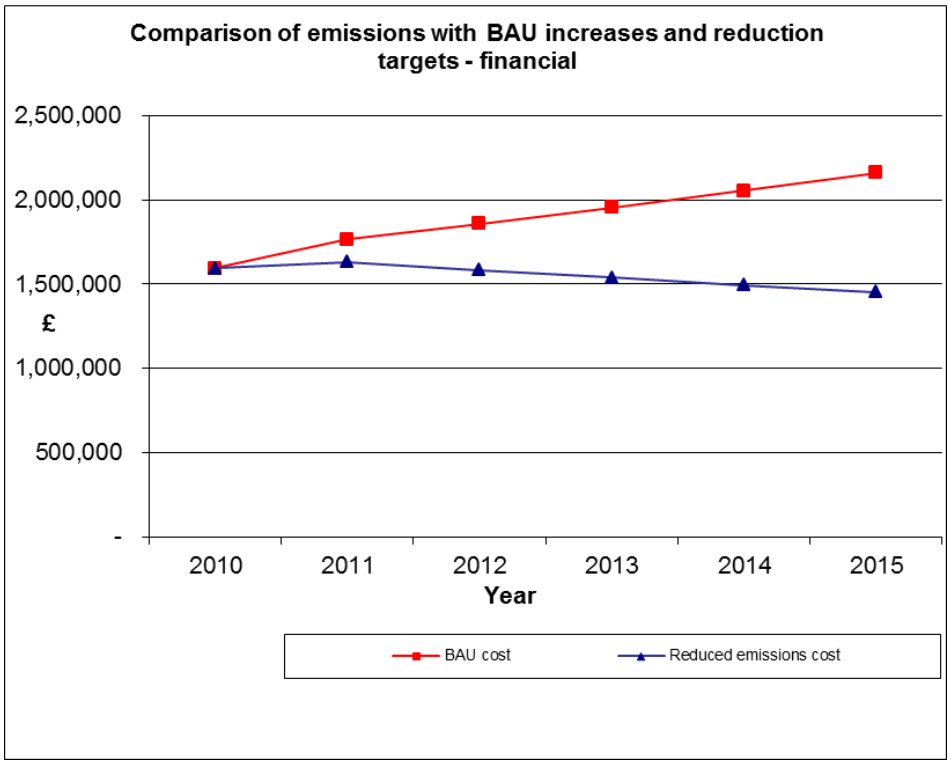


Figure 2.5

However Figure 2.5 does not represent the actual cost savings we expect to secure with the projects identified in the plan. This is because we are unable to make 30% cuts in our transport emissions. The value at stake analysis is superseded by the detail we have developed on savings and costs from specific projects which is presented in the following section.

3. Carbon management projects

Projects have been identified that could achieve 117% of our 30% target

Project status	Cost		Annual Savings (yr 1)		Pay back (yrs)	% of Target
	Capital £	Annual £	Financial (Gross)	tCO_2		
Existing:						
Maintenance programme	1,229,748	£0	21,441	112	57.4	8.0
Efficiency projects	141,759	£500	41,331	133	3.5	9.5
Sub totals: Existing	**1,371,507**	**£500**	**62,772**	**245**	**22.0**	**17.5**
Planned/Funded:						
Maintenance programme	20,000	£0	6,432	34	3.1	2.4
Efficiency projects	1,121,754	17,121	237,489	1,203	5.1	85.9
Transport	14,000	£0	48,833	168	0.3	12.0
Sub totals: Planned/Funded	**1,155,754**	**17,121**	**292,754**	**1,405**	**4.2**	**100.3**
Totals	**2,527,261**	**17,621**	**355,525**	**1,650**	**7.5**	**117.8**

The projects in the following sections have been identified through a range of processes and all key data recorded in the Carbon Management Project Register (CMPR) tool provided by the Carbon Trust. The tables in Appendix C contain the detailed project data from the CMPR. The CMPR will also be used to record further development of projects and progress as more projects are implemented.

- Many buildings projects were identified from the Service's property condition assessments – where key building services are highlighted for refurbishment or replacement. In some cases replacement work (e.g. window replacement) was brought forward to avoid costly repairs and to allow more efficient replacements.
- Some projects had already been completed during the baseline year or were already in development for unrelated reasons - their estimated carbon savings have been captured during the development of the carbon management plan e.g. project reference 30: the ICT switching project was primarily developed to reduce the requirement for staff overtime of some of the ICT technicians but should provide significant travel and carbon savings too. A large number of the existing projects came from the on-going maintenance and repair work on our buildings; for which estimates of the likely savings have been made.
- The bulk of the new projects for energy efficiency in the built estate (invest to save works) have been identified through commissioned work by Hampshire County Council Property Services department under an existing Service Level Agreement for property services. The arrangements for this work, including how projects were prioritised have been described in more detail in section 3.2 and Appendix C. The projects identified by this work were also entered into the CMPR so that a second phase of prioritisation could take place and to ensure that all key project information would be recorded in a single location.
- Other projects have been developed specifically as energy / travel efficiency projects with key information being recorded in the CMPR to allow projects to be prioritised based on simple payback, net present cost, and marginal abatement cost curve (MACC).

The individual projects (or groups of closely related projects) which make the greatest contribution to the target have project definitions which provide further detail. These are located in Appendix A.

3.1 Existing projects

Project status category	Cost		Annual Savings (yr 1)		Pay back (yrs)	% of Target
	Capital £	Annual £	Financial (Gross)	tCO_2		
Existing - Maintenance programme	1,229,748	0	21,441	112	57.4	8.0
Existing - Efficiency projects	£141,759	500	41,331	133	3.5	9.5
Totals: Existing	**1,371,507**	**500**	**62,772**	**245**	**22.0**	**17.5**

The projects in this section were commissioned during the 2010-2011 baseline year or during 2011-2012 while the Service was working with the Carbon Trust on this plan. The projects have either been completed or are on-going.

The full capital costs of each project have been included along with estimated cost savings on energy/travel. The focus of this plan is on the carbon savings but some estimates of the avoided maintenance savings associated with building works have also been made – this amounted to £20,000 per annum. The building projects also contain unforeseen costs such as removal of concealed asbestos. As most maintenance projects are not expected to payback from the energy savings the projects have therefore been separated into two groups; those mainly undertaken because of a maintenance requirement and those driven mainly by carbon and efficiency savings. In Appendix C projects marked "does not payback" take longer than their estimated lifespan to payback from the energy/travel savings.

Savings estimates use Carbon Trust published guidance, "rules of thumb" and guidance provided during the Public Sector Carbon Management Programme which have been applied to the individual transport or fuel consumption for each project area. Buildings based projects have had savings applied sequentially so that the combined effect of projects are not overestimated e.g. if a building had a boiler replacement and loft insulation then the rule of thumb saving for the boiler replacement was applied first and the lower gas consumption figure then used for estimating the saving from the loft insulation.

Where "rules of thumb" had ranges of possible savings advice has been provided by our Public Sector Carbon Management Programme advisor on ensuring the savings were cautious estimates. As a result there is a high degree of confidence in the savings estimates.

Existing - Maintenance programme

- Boiler replacements on 6 fire stations; 3 wholetime and 3 retained.
- Roof insulation on 6 fire stations; 2 wholetime and 4 retained.
- Double glazing on 24 fire stations; 7 wholetime and 17 retained.
- Double glazing at Headquarters.
- Improved heating controls on 1 wholetime station.
- New appliance bay doors on 1 retained station.

Existing – Efficiency projects

- ICT switching project to reduce the number of journeys to each fire station during network upgrades.
- Installation of LED lights and lighting controls in part of Headquarters.
- A small increase in the server room set temperatures; reducing the need for air conditioning.
- Removal of air conditioning from two rooms at Headquarters where natural ventilation provides suitable cooling.
- Thermostatic radiator valves on 5 fire stations; 3 wholetime and 2 retained.
- A series of projects at Headquarters to reduce gas consumption for space heating and domestic hot water, including:
    - Loft insulation
    - Insulation of pipework
    - Thermostatic radiator valves
    - Thermostatic mixer valves for hand washing basins

- Installation of gas and electricity automatic meter reading (AMR) across the whole estate ready for use in staff awareness raising campaigns and for monitoring of savings from other projects.
- Project targeting reductions in business mileage claims by encouraging use of fleet pool vehicles and avoiding unnecessary journeys (e.g. through use of phone and video conferencing).

As well as the larger projects listed above a large number of very small projects have been implemented or approved for funding based on 'quick wins' suggestions from our Environmental Champions on fire stations – these have included simple measures such as improvements to draught proofing, fitting of water saving devices, changes to heating settings, installation of simple timer controls and thermostats. These projects were assessed using Carbon Trust publications and 'rule of thumb' payback periods before funding was committed. Due to the small scale of these projects energy and carbon savings have not been estimated. Savings from some of these projects will be reflected in actual energy consumption when the 2011-2012 baseline is compiled. These measures were funded from maintenance budgets and an internal 'quick wins' fund. Some of the more costly suggestions from Environmental Champions were developed into larger proposals covering several buildings and appear as projects in the sections below.

3.2 Planned / funded projects

Project status category	Cost		Annual Savings (yr 1)		Pay back (yrs)	% of Target
	Capital £	Annual £	Financial (Gross)	tCO_2		
Planned/Funded - Maintenance programme	20,000	0	6,432	34	3.1	2.4
Planned/Funded - Efficiency projects	1,121,754	17,121	237,489	1,203	5.1	85.9
Planned/Funded - Transport	14,000	0	48,833	168	0.3	12.0
Total: Planned/Funded	**1,155,754**	**17,121**	**292,754**	**1,405**	**4.2**	**100.3**

Funding for some of the projects in this section has already been agreed and allocated from the 2012-2013 property budget. The majority of the projects here will be funded as described in section 4 using a combination of capital bids and reserves. The projects have been separated into three groups:

- property based projects -mainly undertaken because of a maintenance requirement
- property based projects driven mainly by carbon and efficiency savings
- transport based projects

Planned / Funded – Maintenance programme

- The major refurbishment or rebuilding of Basingstoke Fire Station planned for 2013-2014 is expected to provide a reduction in utilities consumption due to the current much higher energy efficiency standards required by building regulations.
- Boiler replacement and reduction of area of temporary buildings at the Eastleigh annex.

The savings estimates on these projects involve high level estimates so are less certain than the other projects. As these projects develop the cost and savings calculations will become more certain. The capital cost of the refurbishment or rebuilding of Basingstoke Fire Station has been omitted as this considerable investment is driven entirely by maintenance requirements.

Planned / Funded – Efficiency projects

This includes projects which will make use of data from the automatic meter readers (AMR) installed in 2011-2012 to raise awareness of wasted energy and to demonstrate how individual actions can lower consumption. The "AMR and awareness savings" projects (references 31-34) had savings which were estimated from the remaining electricity and gas consumption on each site after the effects of all other projects (existing and planned) had been applied; this helps to ensure savings are not overestimated when multiple projects are targeting the same fuel consumption (often referred to as the 'dilution effect').

The bulk of the new projects for energy efficiency in the built estate (invest to save works) have been identified through commissioned work by Hampshire County Council Property Services department under an existing Service Level Agreement for property services. The main outputs of this work were included in a report "*HCC Property Services. On behalf of Hampshire Fire and Rescue Service. Invest to save in energy efficiency*" submitted to the Service in July 2012 as supporting evidence for the approval of the funding of these projects.

The report contains information on the most and least efficient buildings by benchmarking of energy use per square metre of building area. The report also contains the outputs from a model of building energy efficiency 'measures' developed by Hampshire County Council Property Services for the Hampshire Fire and Rescue estate. Detailed information about energy efficiency opportunities (and maintenance savings) were built up from engineers surveys of seven representative fire stations and the Headquarters site.

The seven sample fire stations were chosen as they represented typical 'average' properties in the estate portfolio based on type of activity, energy use, building construction, engineering services. The engineers used industry standard benchmarks for energy and carbon savings to estimate the whole life costs of various energy efficiency measures.

The model was then used to scale up the survey data to provide information on energy savings at the other sites. The model outputs were also reviewed by both Hampshire County Council engineers and Service Facilities staff to ensure that the efficiency measures were tailored to the specific circumstances of each site in the estate. The use of professional judgements on whether individual measures were applicable on each site allowed staff from both the Service and Hampshire County Council to make best use of their extensive working knowledge of the buildings. The model savings figures include the 'dilution effect' of applying multiple energy saving measures which target the same energy source within a single building. The different measures are applied sequentially so that the second applicable measure is applied to the energy consumption with the effect of the first measure already applied. This process helps ensure that the combined effect of projects are not overestimated. The combination of the model, the dilution process, and the professional knowledge about the estate provides a good level of confidence in the cost and savings information.

The model outputs were prioritised by reference to a 25 year assessment period using:

- Whole life cost (assessed over a standard 25 year period using Net Present Value)
- Whole life savings (assessed over a 25 year period)
- Whole life CO_2 savings (assessed over a 25 year period)

This allowed all the projects to be put into a priority order for financial investment using a 'savings to investment' ratio (ratio of the whole life savings and whole life costs).

The projects identified by this work were also entered into the CMPR so that a second phase of prioritisation could take place and to ensure that all key project information would be recorded in a single location.

The main types of energy efficiency measures were:

- Cavity wall insulation
- Changing temperature set points to prevent heating and cooling systems running at the same time.
- Improving control of equipment drying rooms
- Installing reflective radiator panels
- Retrofitting devices to existing boilers to reduce inefficient 'dry cycling'
- Insulating pipes and valves in building plant rooms
- Power flushing radiators
- Replacing fluorescent and halogen lighting with high efficiency LED lighting with controls
- Fitting timers to electric boiling water taps.

Planned / Funded - Transport

- Provided vehicles project. This project is about providing vehicles to staff following the closure of the lease car scheme which had previously been available. The project was originally conceived as being cost neutral and because there will be more restrictions on the choice of replacement vehicles there will be a reduction in carbon emissions.

- Driver training project to extend the amount of training for non-emergency driving which includes fuel efficient driving techniques. Focus is on pool vehicles and high mileage (non-emergency) van fleet.
- Fleet fuel (and mileage) management programme. Range of activities targeting both fuel and mileage management in our fleet vehicles; lead by a 'Fuel Champion'

3.3 Projected achievement towards target

The carbon savings from the projects listed in sections 3.1 and 3.2 (see Appendix C for detail) bring the Service to 117% of the 30% target reduction from the baseline; this is 249 tonnes of CO_2 more than the target which is represented by Figure 3.1

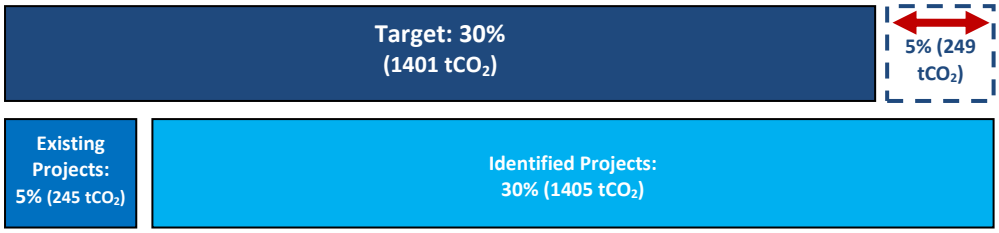


Figure 3.1 Projects identified against target

Figure 3.2 below shows predicted business-as-usual (BAU) emissions and the target emissions. The 'emissions in chosen plan' plot shows the emissions reductions from the projects scheduled across the years of this plan. This plot includes the effect of BAU forces, so for example after 2014 the emissions begin to rise again because there are no new projects in the current plan for 2015. Also the impact of project life is included, so if a short life project is finished (e.g. the business travel awareness raising project) before the end of the programme (and not maintained or repeated) the trend would show a stepwise increase in emissions.

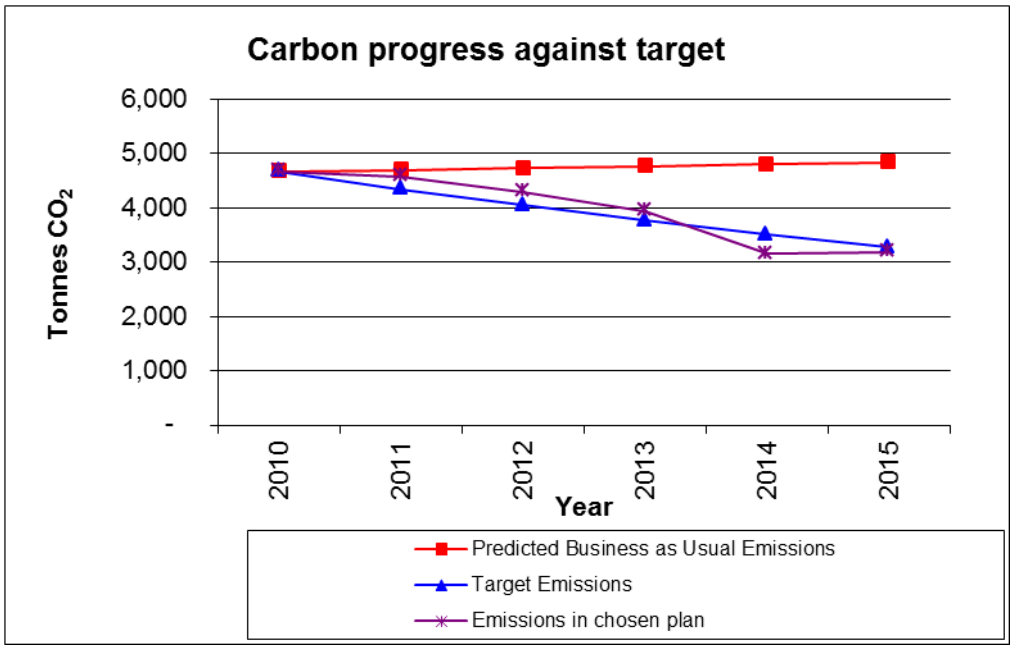


Figure 3.2 Projection of impact of projects on meeting carbon target

By including these effects we are trying to model some of the real life factors that may impact on our ability to meet our target. Because of these additional factors Figure 3.2 does not directly agree with a simply summed list of the carbon saving impact of the projects such as that provided in Figure 3.1.

When an allowance is made for the BAU increase in carbon emissions (as shown in Figure 3.2 and the Figure 3.3) the projects in the plan are estimated to deliver 78 tonnes of CO_2 more than the target in the final year (2015-2016). Note

these figures may not exactly match those reported in sections 3 and 4 because Figure 3.2 assumes that projects do not deliver full savings until a year after their implementation year and that the savings are lost if the project ends before the end of the plan.

Year	Predicted Business as Usual emissions (tCO_2)	Target emissions (tCO_2)	Total CO_2 saving for this year (tCO_2)	Emissions in chosen plan (tCO_2)
2010	4,670	4,670	-	4,670
2011	4,702	4,348	129	4,574
2012	4,735	4,049	440	4,295
2013	4,768	3,770	819	3,949
2014	4,802	3,510	1,650	3,152
2015	4,835	3,269	1,650	3,185

Figure 3.3 Summary CO_2 figures used in Figure 3.2.

Monitoring of progress against the target, the size of the target gap, and work on finding further savings will continue throughout the period of the carbon management plan. This will be reported to the Finance and General Purposes Committee as part of their oversight of the Service Plan environment priority.

If it proved necessary to find additional savings during this five year period it is expected that further savings can be identified from the following areas:

- transport projects as the initial savings estimates were cautious.
- further energy efficiency projects – many investible projects were excluded from the Hampshire County Council Property Services model outputs as they showed a smaller return. These low return projects could be reassessed once the actual savings from some of the existing projects have been measured. Some of these projects are also likely to be implemented because they are required purely for maintenance reasons and will therefore provide some further energy savings which have not been planned e.g. some further double glazing projects; flat roof insulation and boiler replacements are likely to fall into this category.
- Investment in renewable or low to zero carbon (LZC) technologies such as solar PV, solar thermal, and ground source heat pumps. These technologies are generally most applicable to the largest and most used sites such as headquarters and the wholetime stations. Some of these could be incorporated into the rebuilding of Basingstoke Fire Station during 2013-2014 but this might only provide one full year of savings during the target period.

Additional projects must deliver their savings by the 2015-2016 year or they will not contribute to the target. This means that any additional projects need to be delivered during 2014-2015 at the latest. It will therefore be necessary to have identified projects during 2013-2014 so there is adequate time to deliver them the following year.

4. Carbon management plan financing

To implement the projects defined in this plan it will cost £2,569,668 of which £1,372,007 has already been spent on existing projects, and the remaining additional £1,197,661 has already been allocated.

When all these projects are implemented it will result in estimated annual financial savings / cost avoidance of £355,525. The overall payback period of the projects in this plan is 7.5 years.

Over the last few years considerable investment has been made in major building repairs such as window and roof replacement, both to reduce on-going maintenance requirements and to improve the energy efficiency of the estate. This approach of combining energy efficiency with maintenance requirement will also continue.

Carbon management projects will be funded using a number of routes.

The Authority will initially target external sources of funding such as government capital grants, loans (including Salix Finance interest-free loans). These sources of funding are generally more restrictive than the use of reserves but could provide a valuable funding route for some of the proposed projects.

The bulk of the building energy efficiency projects already identified were the subject of a bid to the Department for Communities and Local Government for capital grant funding for Fire and Rescue Authorities in England for the years 2013-2015. The capital bids are assessed using a benefit cost ratio based on Net Present Value calculations. The capital bid results will be announced in November 2012 and at that stage any remaining funding decisions including the use of reserves will be taken. The information in section 4.1 reflects the proportion of project costs submitted as a capital bid, with the remainder coming from reserves.

Energy and water efficiency projects in our buildings will be funded through both capital and revenue budgets. Existing building maintenance budgets will be maintained and will be supplemented from reserves in order to fund projects which deliver both energy efficiency and maintenance savings. Hampshire Fire and Rescue Authority has agreed that acceptable projects will generally be funded from the ‘Improvement and Sustainability Reserve’.

The ‘Improvement and Sustainability Reserve’ is used to help deliver value for money improvements and to pump-prime environmental initiatives. To date the level of the reserve has been largely maintained through recycling of savings achieved.

The Authority has provisionally identified £1.2 million for future carbon management projects. Financial savings from carbon management projects will return to the ‘Improvement and Sustainability Reserve’ where they can be reallocated to further projects. Because this is a reserve fund the phasing of projects can be chosen to provide the maximum carbon saving.

Where applicable the Authority will consider the implications of other government initiatives such as the Green Deal, feed-in tariffs and the renewable heat incentive.

The Authority will approve projects primarily on the basis of cost and carbon savings. There are currently no set criteria which individual projects must meet to have funding approved e.g. maximum payback period. Each project will be assessed on its merits; taking into consideration that some projects will be required to facilitate rather than deliver carbon savings e.g. the improved consumption information provided by automatic meter reading (AMR) should assist in identifying where other projects are required. Where projects will deliver long-term reductions in maintenance costs or staff time this will also be considered. Combinations of carbon saving measures will be considered to allow overall paybacks to be minimised and the Service to gain maximum financial and carbon savings from its investments.

Regular reports are already presented to the Finance and General Purposes Committee of the Hampshire Fire and Rescue Authority on the ‘Environment’ priority. These reports will continue and include information on the Carbon Management Plan so that members of the Authority will be kept up to date on project progress and receive new project proposals as they are developed. New proposals will be funded through external sources where possible; or available reserves where external funding is not possible.

The headline data in this section and the detailed figures in sections 4.1 and 4.3 have been taken from the CMPR which is the central store for project information.

4.1 Financial costs and sources of funding

	2010-2011 £	2011- 2012 £	2012-2013 £	2013-2014 £	2014-2015 £	2015-2016 £	Total £
Annual costs:							
Project capital costs	249,997	1,121,510	420,899	734,855	0	0	2,527,261
Projects annual costs	0	500	2,000	4,665	17,621	17,621	42,407
Total costs	**249,997**	**1,122,010**	**422,899**	**739,520**	**17,621**	**17,621**	**2,569,668**
Committed funding:							
Existing capital - maintenance programme	249,997	979,751					1,229,748
Existing capital - efficiency projects		141,759					141,759
Existing annual - efficiency projects		500					500
Total to date	**249,997**	**1,122,010**					**1,372,007**
Future programme:							
Maintenance Programme			20,000				20,000
Total Maintenance			**20,000**				**20,000**
Future projects:							
Capital – buildings			386,899	734,855			1,121,754
Capital - vehicles			14,000				14,000
Annual - buildings			2,000	4,665	17,621	17,621	41,907
Total Future Projects			**402,899**	**739,520**	**17,621**	**17,621**	**1,177,661**

The exact distribution of expenditure between the 2012-2013 and 2013-2014 years will depend on how much of the programme of building energy efficiency can be procured and delivered in 2012-2013. Because of the nature of the funding sources movement of some projects between 2012-2013 and 2013-2014 should not have any significant financial impact.

4.2 Assumptions

- When calculating savings current average energy prices for 2011-2012 year have been used (£0.10 per kWh for electricity, £0.035 per kWh for gas, £0.046 per kWh for burning oil)
- Many of the projects have savings based on 'rules of thumb' from Carbon Trust guidance applied to the known energy consumption of each building. Project costs have generally been estimated for each site based on floor area rates from previous projects or quantity surveyor's calculations. The savings estimates are generally cautious so there is a good level of confidence in the data.
- For the projects that have been completed the costs are full costs for the work rather than additional expenditure for environmental efficiencies. In many cases the bulk of the cost is not related to efficiency; it is a cost associated with necessary replacement of parts of a building or its services with a small additional cost for improved efficiency. Payback periods are therefore worst case rather than optimistic assessments.
- In financial assessments of net present cost the Treasury Green Book figure of 3.5% has been used for both the financial discount rate and the inflation rate.
- Due to their large size the estimated capital costs of the replacement of Basingstoke Fire Station and the Provided vehicles project have been excluded from the calculations but capital funding for both has already been approved.

4.3 Benefits / savings – quantified and un-quantified

	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Annual financial saving (£)	0	33,456	128,267	191,795	355,525	355,525
Cumulative financial saving	0	33,456	161,723	353,518	709,043	1,064,568
Annual tCO_2 saving	0	129	440	819	1,650	1,650
Cumulative tCO_2 saving	0	129	569	1,388	3,038	4,688
% of baseline 30% reduction achieved	0%	9%	31%	58%	117%	117%

The savings figures above do not take account of inflation. Generally the figures are based on savings being achieved the year after a project has been implemented.

Based on the projects in the current plan (not accounting for project expenditure) there is a cumulative cost saving over the five years of the plan of £1,062,226 (with a saving of £354,354 in the final year) and cumulative carbon saving of 4688 tonnes of CO_2 (with 1650 tonnes of CO_2 in the final year).

Some of the benefits of the carbon management programme cannot easily be quantified; these include:

- Demonstrating leadership and commitment to reducing our contribution to climate change – to our staff, community and other organisations.
- Contributing to the UK's binding carbon reduction targets.
- Improved staff and elected member engagement and understanding on carbon management and wider environmental issues.
- Savings on utilities and fuel consumption from improvements in organisational decision making to embed carbon management.
- System of automatic meter reading (AMR) will shift staff time from collection and administration of meter readings to interpretation of data and taking actions to make savings.
- Improved building and asset management will also improve the working environment for our staff.

5. Change Management Action Plan

Embedding carbon reduction activities throughout the organisation is essential for ensuring that the Service meets its targets and is able to continue identifying further improvements. The following sections describe specific changes/actions that will be taken in the first year to begin those changes. This action plan will be updated as part of the annual review of progress on the Carbon Management Plan. As well as looking at which actions have been achieved the review will make use of the Carbon Trust Carbon Management Matrix to qualitatively track progress in embedding carbon management – the matrix is provided in Appendix B.

5.1 Corporate Strategy – embedding carbon reduction across our organisation

The Service has already made some good progress in including carbon reduction in its strategic plan (the Hampshire Fire and Rescue Service Plan) as part of the 'environment' priority. The actions in this section are about strengthening the consideration of carbon reduction by linking this carbon management plan into the existing work and corporate strategy under the 'environment' priority.

Ref	Change Action	Owner	When complete
CM1	Signed 'statement of commitment to the Public Sector Carbon Management Programme' from Hampshire Fire and Rescue Authority.	Environmental Impact Project Coordinator	November 2011
CM2	A commitment to publishing this Carbon Management Plan in 2012-2013 will be included in the Hampshire Fire and Rescue Service Plan.	Director of Corporate Services	April 2012
CM3	The new carbon reduction target from this Carbon Management Plan will also be included as a organisational target in the next Hampshire Fire and Rescue Service Plan. Updates on progress towards that target will be included in each subsequent Service Plan as part of the Annual Report.	Director of Corporate Services	By March 2013
CM4	Progress on Carbon Management Plan targets will be monitored as part of the operation of our Environmental Management System.	Environmental Impact Project Coordinator	By December 2012 and then at least annually

5.2 Responsibility – being clear that saving carbon is everyone's job

Individual actions are particularly significant in reducing or increasing carbon emissions; for example making a decision to travel, turning up the heating. The actions in this section are about engaging with all the Service staff and elected members of the Authority so that everyone knows they have a part to play in making carbon savings. Our voluntary 'Environmental Champions' will play an important role in conveying the sense of responsibility to all parts of the Service.

Ref	Change Action	Owner	When complete
CM5	Continue to recruit and develop our existing network of staff environmental champions across all our sites – encouraging more staff to be actively involved in reducing our environmental impacts and supporting carbon saving projects.	Environmental Impact Project Coordinator	On-going activity
CM6	Review possibility of staff voluntarily including a carbon reduction objective within the Personal Development Review System	Environmental Impact Project Coordinator	December 2012
CM7	Hampshire Fire and Rescue Authority will ensure it maintains a nominated member Environment Champion.	Finance and General Purposes Committee	On-going

5.3 Monitoring and reporting

The actions in this section are about improving our systems for collection of baseline emissions data and for using that data for monitoring (and reporting) the progress of carbon saving projects. In areas like waste and recycling we will

begin collecting data to allow our baseline emissions from waste to be estimated for the first time. Once we have established a baseline we can use the data to help identify where we should focus our efforts for cutting emissions by reducing waste generation and increasing recycling. The project to install automatic meter reading (AMR) will provide much better data on utilities which will be very helpful in monitoring other savings projects and for targeted awareness campaigns.

Ref	Change Action	Owner	When complete
CM8	Improve quality of data collection on business travel by plane, rail, bus, ferry and taxi to allow estimated emissions data to be included in the future	Director of Human Resources	December 2013
CM9	Improve quality of data collection for waste and recycling to allow estimated emissions data to be included in the future	Property Services Manager	March 2013
CM10	Ensure we have systems in place to allow all staff to make use of the improved AMR data to identify areas for improvement in their workplace. This data will also be used to monitor the success of carbon saving projects.	Environmental Impact Project Coordinator	October 2012

5.4 Communication and training – ensuring everyone is aware

The actions in this section are about how we communicate our plans and ensure that we give everyone the information and confidence to allow them to make positive changes.

Ref	Change Action	Owner	When complete
CM11	Agree a communications plan for the carbon management plan supported by our Marketing and Communications team including at least these areas:	Environmental Impact Project Coordinator	August 2012
CM12	An introduction to the environment priorities of the Service in the staff induction procedures, along with information on the Service Environmental Management System and Environmental Champions network.	Environmental Impact Project Coordinator	September 2012
CM13	A ‘members awareness session’ for elected members of the Hampshire Fire and Rescue Authority will be run with a focus on carbon management and energy efficiency work.	Director of Corporate Services	September 2012
CM14	Awareness campaigns linked to specific projects – e.g. TRVs, at HQ. using posters/email/presentations to target the campaign at specific buildings where work is being done. Consider a specific environment newsletter (electronic circulation) for updates on latest projects and ideas from champions. Campaigns will make use of the incoming AMR data and the HH data at HQ and be targeted at particular buildings or groups of buildings. Promotion of agreed ‘switch-off’ policy to all staff.	Environmental Impact Project Coordinator	August 2012 then linked to main projects as they are delivered
CM15	Review and updating of environmental pages on intranet and website. Including creation of new pages for Environmental Champions with a practical ‘Environmental Champions Handbook’. This will be based on the materials produced by the North West region Fire and Rescue Services.	Environmental Impact Project Coordinator	December 2012

5.5 Engagement of our stakeholders – leading by example

This section includes the actions which will help us to involve our wider stakeholders; from our staff and elected members, other public sector organisations, fire and rescue services, and the public.

Ref	Change Action	Owner	When complete
CM16	Updates on progress of this carbon management plan will be included in the Hampshire Fire and Rescue Service Plan.	Environmental Impact Project Coordinator	March 2013 and then annually
CM17	Updates on project progress will be included in communications to Environmental Champions.	Environmental Impact Project Coordinator	Every quarter from July 2012 onwards
CM18	This carbon management plan and all updates of this plan will be published on www.hantsfire.gov.uk	Environmental Impact Project Coordinator	April 2013 and then annually
CM19	Review of standard procurement procedures to include Service environmental commitments and expectations of suppliers that they will actively identify where they can help the Service to reduce its carbon footprint.	Procurement Manager	December 2012
CM20	Specific information on our environmental ethos will be provided to all external training providers that deliver training for our staff on our sites.	Training and Development Manager	December 2012
CM21	Share our experiences in carbon saving projects with other organisations through our participation in the Hampshire Public Sector Sustainable Development Group.	Environmental Impact Project Coordinator	on-going
CM22	Arrange a national Fire and Rescue Service information sharing workshop on sustainable fire stations and energy efficiency projects. Workshop to be hosted at Winchester Fire Station.	Environmental Impact Project Coordinator	December 2012

5.6 Policy Alignment – saving CO_2 across our operations

These actions are about embedding environmental and carbon reduction thinking in the organisation by improving policies and procedures.

Ref	Change Action	Owner	When complete
CM23	Review of all procurement policies: • standard procurement procedures to include Service environmental commitments and expectations of suppliers that they will actively identify where they can help the Service to reduce its carbon footprint. • Extension of use of whole life costing from vehicles to other procurement	Procurement Manager	December 2012
CM24	Identify existing and new contracts and Service Level Agreements where key performance indicators for carbon reduction could be included.	Head of Facilities	December 2012
CM25	Service-wide implementation of a new impact assessment process for all new or reviewed Service projects, policies, and events. The process will include the direct consideration of environmental impacts (including carbon emissions).	Project and Programme Manager	December 2012 Full review within 3 years.
CM26	Review of building utilisation across our estate.	Head of Facilities	December 2012
CM27	Introduction and promotion of the 'travel hierarchy' of sustainable travel to Service business travel guidance.	Director of Human Resources	January 2012

CM28	Completed review of business travel policies.	Director of Human Resources	September 2012
CM29	Agreement of 'switch-off' policy for computers, printers, photocopiers etc. with Head of ICT. This policy would then be communicated to staff as part of awareness campaigns.	Environmental Impact Project Coordinator	August 2012

6. Programme management of the carbon management programme

John Beckerleg, Director of Corporate Services is the Project Sponsor for the Carbon Management Plan and is also an Environmental Champion.

David Mallard, Environmental Impact Project Coordinator is the Project Leader for the Carbon Management Plan.

The following sections show the governance structure for carbon management in Hampshire Fire and Rescue Service.

6.1 The Programme Board – strategic ownership and oversight

Our Directors will continue to form the Programme Board for our carbon management activities. This is a pre-existing group with all the directors which meets weekly. The group will consider items related to carbon management at least quarterly with reports from the Project Leader.

- John Bonney – Chief Officer
- Dave Curry – Director of Service Delivery
- Geoff Howsego – Director of Human Resources
- John Beckerleg – Director of Corporate Services (Project Sponsor)

Terms of reference:

- champion and provide leadership on carbon management
- set and review strategic direction and targets
- own the scope of the carbon management programme and prioritise carbon reduction projects
- link carbon management with other high level initiatives / programmes
- monitor progress towards objectives and targets
- remove obstacles to successful completion of carbon management projects
- champion plans for financial provision for carbon management projects
- ensure there is a framework to co-ordinate projects in the carbon management programme

6.2 The Carbon Management Team – doing the projects

The core membership of the Carbon Management Team is decided by the Programme Board following recommendations from the Project Leader. Additional staff can be asked to participate in the work of the Carbon Management Team based on project requirements. The team is chaired by the Project Leader.

Terms of reference:

- Develop new carbon saving projects including considering ideas from other staff and environmental champions to allow the Project Leader to make proposals to the programme board.
- Deliver and monitor allocated carbon saving projects - either by members being the direct project owner or having delegated ownership to a member of their department.
- Agree and contribute to the communications plan for the carbon management plan.
- Collectively review the change management action plan and review (at least bi-annually) the Carbon Trust Carbon Management Matrix (Appendix B) to qualitatively track progress in embedding carbon management within the organisation.
- Team members will report on progress (including data gathering and analysis) and risks for their projects to the Project Leader to allow reports to the programme board.
- Members will actively promote carbon management within their departments, support recruitment of volunteer environmental champions and awareness campaigns in order to facilitate positive organisational changes.

This group includes staff with direct responsibility for major areas of organisational activity; many are also direct owners of identified carbon saving projects. This team develops and delivers the carbon saving projects, updating the Project Leader on progress of their projects and risks so that this can be reported to the programme board.

The team seeks to communicate monthly (not always meeting) but each project owner provides regular updates to the Project Leader. Regular communication methods include email updates, phone calls, and individual meetings between some of the team.

- Alan Murray – Group Manager Service Delivery (Community Safety) Protection
- Graham Starke – Property Services Manager
- Tim Mansbridge – Fleet Manager
- Paul Drake – Procurement and Contracts Manager
- Joanna Matthews – Financial Services Manager
- Danny Masters - Infrastructure Project Manager, Information Services
- Julie Jacobs – Communications Officer
- Nicki Whitehouse – Performance Review Manager
- David Mallard – Environmental Impact Project Coordinator (Project Leader)

It is expected that two fire station based volunteer Environmental Champions will also be members of this team.

6.3 Succession planning

The Programme Board are collectively responsible for succession planning for the carbon management plan including appointing replacements for the Project Sponsor and Project Leader and agreeing the membership of the Carbon Management Team. In most cases responsibilities in the carbon management plan are related to specific staff roles and will transfer following any changes in staff. If the Project Sponsor were to leave the Programme Board would identify a replacement at a suitably senior level. In any interim period Andy Chapman (Head of Facilities) would become Project Sponsor and sit on the programme board. In the event of the loss of the Project Leader Andy Chapman (Head of Facilities) would chair the Carbon Management Team to ensure work continued until a replacement was identified. The Programme Board will also encourage the Authority to maintain a nominated elected member Environmental Champion.

Key information relating to the carbon management plan, the Programme Board and the Carbon Management Team will be stored in a dedicated electronic folder on our shared drive. The folder is named “Carbon Management Plan” and access has been granted to all members of the Carbon Management Team and the Project Sponsor.

6.4 Routine and annual reporting

The Project Leader will report at least quarterly to the Programme Board

The Project Leader’s reports will include:

- an update on progress of key projects and the change management action plan – focusing on any projects/actions with issues by using a RAG status (Red – serious issue or failing to make progress; Amber – significant issue or delay in progress; Green – minor or no issues or delay in progress)
- any risks to the overall carbon management plan (not individual project risks unless they are particularly significant)
- update on numbers of environmental champions and awareness campaigns run
- available summary evidence of actual carbon/cost savings from completed projects compared to expected figures
- the predicted size of the gap between the projects in the plan and the target emissions in the final year

As the carbon management plan progresses the reports will contain increasing amounts of summary information on the evidence for energy/fuel savings from delivered projects using the agreed measures of success from the project definitions such as tonnes of carbon saved / kWh saved. Reports will be presented using information from the latest CMPR Dashboard reporting tool provided by the Carbon Trust.

Reports to the Fire Authority (elected members)

- Regular reports are already presented to the Finance and General Purposes Committee of the Hampshire Fire and Rescue Authority on the 'Environment' priority. These reports will continue and include information on the Carbon Management Plan so that members of the Authority will be kept up to date on project progress and receive significant new project proposals as they are developed. The reports will also contain the predicted size of the gap between the projects in the plan and the target emissions in the final year. All reports to committees are included in minutes to the Authority.

Annual 'follow up' with Carbon Trust

At the end of each financial year we will report on the progress of our projects to the Carbon Trust.

An annual progress report on the Carbon Management Plan will be included in the Annual Report section of the Service Plan and published on www.hantsfire.gov.uk

An end of year update on progress on carbon management plan projects and progress against the target reductions in carbon emissions will be prepared by the Project Leader for review by the Project Board. The report will include the total carbon footprint for the year, a breakdown of the footprint by emissions type, financial and carbon savings (tonnes of CO_2) and percentage reduction in carbon footprint against the baseline year. A summary of this report will then be included in the next Annual Report which is approved by the Hampshire Fire and Rescue Authority.

Appendix A: Definition of major projects

Project: **Reference:**	Installation of AMR and awareness campaigns 31, 32, 33, 34
Owner (person)	Property Services Manager (AMR and energy management system) & Environmental Impact Project Coordinator (Awareness campaigns)
Department	Facilities
Description	Automatic meter reading (AMR) for all billed electricity and gas meters was implemented across the entire estate in 2011-2012. This involved electricity meter exchanges and data logging devices for gas meters. The AMR data will be used for billing purposes. The AMR meters will provide energy data at half hour intervals available to staff in an online energy management system. The system will show the detailed consumption at each site and used to identify where savings can be made e.g. through changes to heating control settings. The data will also allow energy savings from carbon saving projects to be monitored. AMR data will be central to providing targeted awareness campaigns to encourage both more energy efficient behaviour and for staff to actively identify areas where savings can be made. Awareness campaigns will be supported by the growing network of staff volunteer Environmental Champions spread across our sites. The campaigns will be based around a communications plan described in section 5.4.
Benefits	• Financial savings: £16,664 per year • CO_2 emissions reduction: 87.4 tonnes of CO_2 per year • This project will contribute 6.2% of our target each year.
Funding	• Operational costs: £1,500 per year for awareness campaign materials. • AMR installation and operational cost included within metering charges funded from existing utilities budgets.
Resources	• Management of installation process and registration of meters with suppliers will be done under an existing contract with Hampshire County Council. • Resources required to deliver staff training for use of energy management system is under assessment. Likely to be cascade training involving both site managers and Environmental Champions for each site.
Ensuring Success	• The ability of staff to directly access energy data for their site is critical to the success of the project - the main risk is therefore around the ability to provide sufficient logins to the system and appropriate training. Some standard reports must be prepared to allow easy access to data.
Measuring Success	• AMR installed to expected timescale and providing project monitoring information. • Targeted awareness campaigns show results in AMR data.

Timing	• Milestones / key dates
	  ○ All meters and data loggers installed and working by 1/5/2012
	  ○ Energy management system and user guide to be in place by 1/8/2012
	  ○ Training of key Facilities staff by 1/7/2012
	  ○ Training cascaded to site managers and Environmental Champions by 1/12/2012

Notes	AMR alone does not directly save carbon, it provides the detailed data which allows other projects to be monitored and for identifying where savings are possible. Using rules of thumb provided by the Carbon Trust some estimated carbon savings have been provided for this project. Savings have been calculated based on the reduced energy consumption for each site after the effect of all other energy saving projects has been applied. 7% savings have been assumed on wholetime stations and 5% on retained stations.

Project: **Reference:**	Fleet fuel (and mileage) management programme 25
Owner (person)	Fleet Manager
Department	Facilities
Description	Range of activities targeting both fuel and mileage management in our fleet vehicles. The fuel management element builds upon the recent installation of both a fuel management system for our bulk diesel supplies (Time plan) and a fleet management system (Tranman) which will provide improved data for identifying and monitoring fuel management projects. The fleet manager will act as a 'fuel champion' and propose projects to deliver at least an 8% reduction in fleet fuel use. Some of budget is allowance for service wide publicity as part of "Drive Safe and Green" initiative providing driver tips and linking in with the improved documentation provided to staff through a new 'driver handbook' resource (which is mainly a safety led initiative but ideally suited to extending to fuel efficiency). The initiative will include anti-idling, route planning, vehicle checks (tyre pressure is key), avoiding harsh breaking/acceleration, use of air conditioning vs. open windows. A 4 pool vehicle pilot of route planning equipment with 'in car' driver feedback on efficient technique will take place. This project will complement and coordinate with the communications for the business mileage management project which is primarily targeting 'grey fleet' business mileage.
Benefits	• Expected cost savings £44,995 per year • Estimated saving of 99 tonnes of CO_2 per year based on lower business mileage. • This project will contribute 7.1% of our target each year • This project is expected to payback in less than a year • Project also contributes to reduced road risk through the driver handbook.
Funding	• £8000 cost estimated for the driver feedback and route planning pilot and for awareness raising materials
Resources	• This project will be owned and resourced by the Fleet Manager with support from Driver Training Manager and Environmental Impact Project Coordinator.
Ensuring Success	• Regular, engaging staff communications are fundamental to maintaining the success of this work. • Linking of safety and efficiency messages must take place to allow this work to be embedded in organisational culture.
Measuring Success	• Fleet fuel consumption will be the primary metric, each individual project proposed by the Fuel Champion will specify how data will be collected to demonstrate any savings.
Timing	• Expected to deliver savings in 2012-2013 from the awareness raising of the "Drive Safe and Green" initiative • Pool vehicle pilot during 2012-2013
Notes	Costs of route planning estimated at £600-700 per vehicle for a one year trial of GPS tracking, route planning and 'in car' driver feedback on efficient technique for at least 4 pool vehicles. Savings calculations locations are included in the CMPR.

Project: **Reference:**	Business mileage management ("Overtime and travel project") 24
Owner (person)	Director of Human Resources (Project Sponsor)
Department	Human Resources
Description	Range of activities targeting mileage (and fuel) management in our 'grey fleet'. This is part of an on-going efficiency project targeting travel and overtime costs. The on-going project is expected to make savings of £150,000 over four years. At the core of this work is 'travel avoidance' as well as promotion of more sustainable and cost effective travel using a 'travel hierarchy'. The project emphasises both managers responsibility to actively manage travel costs and individuals responsibilities to make informed travel choices. Organisational policies and guidance relating to business travel are being reviewed as part of this work. The project seeks to raise awareness of: • travel costs to the organisation – financial and in lost work time • alternatives to travel such as phone and video conferencing • information sources to help select more sustainable ways of travelling Thereby gradually changing the culture of travel within the organisation so that sustainable travel becomes embedded. Although the focus is on business travel the promotional work will also be linked to information on reducing the carbon footprint of staff commuting (currently not in our baseline).This project will complement and coordinate with the fuel and mileage management project which is primarily targeting fleet travel.
Benefits	• Expected cost savings £19,594 each year for 4 years. • Estimated saving of 55.8 tonnes of CO_2 per year based on lower business mileage. • This project will contribute 4% of our target each year The benefits are estimated from the grey fleet emissions in the baseline using an emissions average for business mileage. The saving is expected to come from travel avoidance.
Funding	• These activities are on-going and being delivered from within existing resources. £500 per year allowance has been made for promotional activities.
Resources	• On-going project begun in 2011 using existing resources from HR Support, Finance, Marketing and Communications and Environment departments. Initial resource commitment to the work lasts until 2015.
Ensuring Success	• Regular, engaging staff communications are fundamental to maintaining the success of this work. • Although this began as a cost saving project its long term success will come from communication of the environmental as well as cost benefits and embedding of policy changes so that it produces a permanent change in the organisational culture.
Measuring Success	• Quarterly review of business travel expenditure by department • Increased use of video conferencing facilities • Number of visits to 'travel hierarchy' pages on intranet
Timing	Project started in 2011 and is intended to run to April 2015
Notes	The saving is based on an estimated 5% reduction of grey fleet miles each year using the "average car unknown fuel" carbon factors and costs from the Baseline Tool (see CMPR) No specific account has been taken of miles displaced from grey fleet onto fleet vehicles although on average (based on engine size data on travel claims) this will also show a carbon saving due to the generally newer more efficient vehicles within the fleet. As the purpose of the project is to embed a change in travel culture the savings are expected to be maintained after the 4 year focused project has finished.

Project: **Reference:**	Headquarters LED lighting and lighting controls (phase 1 and phase 2) 4, 43
Owner (person)	Property Services Manager (phase 2) (& Environmental Impact Project Coordinator, phase 1)
Department	Facilities
Description	Installation at Headquarters building of highly efficient and long lasting LED light fittings and lighting controls. Work in two phases; with phase 1 completed in 2011-2012 and phase 2 expected in 2012-2013. The LED fittings are replacing a mixture of fluorescent lights of T12 and T8 types, many in fittings which are nearing the end of their life. Savings listed here are based on reduced energy consumption – but there are considerable additional savings on the cost of not needing to replace lamps. The information is for both phases combined. The lighting controls include occupancy detection in offices and presence detection in toilets and corridors. Some areas also have lux metering to allow lights to shut off when high levels of natural light are available.
Benefits	• Expected cost savings £34,654 per year • Estimated saving of 181 tonnes of CO_2 per year • This project will contribute 13% of our target each year • This project is expected to payback in 6.4 years These savings are likely to be an underestimate as they did not consider during phase 1 many areas were found to be over lit and therefore fewer LED fittings were needed than planned.
Funding	• £224,828 combined capital cost for both phases • Phase 1 was funded through a Salix Finance interest-free loan
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• Supplier needs to survey the phase 2 areas in more detail to ensure over lighting does not take place and so more detailed cost savings can be developed. • Communications to all staff about how to operate lights which have occupancy switches.
Measuring Success	• Temporary sub-metering will be used prior to phase 2 to provide estimated before and after savings. • Evidence of savings in the building AMR data will be investigated. • Feedback from staff on the correct operation of the lighting controls
Timing	• Milestones / key dates e.g. o Phase 1 completed in 2011-2012 o Phase 2 expected in 2012-2013
Notes	The phase 1 savings were based on a detailed lighting survey by the supplier and using the difference in wattage of the original and replacement lamps and estimated occupancy hours. The phase 2 cost is a supplier cost for the number of LED fittings needed to finish the entire building. As a supplier saving calculation for phase 2 has not yet been completed the savings from phase 1 have been scaled up in proportion to the costs then reduced by 20% to provide a very cautious savings estimate. The actual savings on phase 2 are expected to higher. The savings from less frequent lamp replacement have not been included in the figures. See CMPR for detail.

Project: **Reference:**	Lighting controls and LED conversions (11 stations and FMC) 44, 45
Owner (person)	Property Services Manager
Department	Facilities
Description	Installation at 11 wholetime stations and the FMC buildings of a mixture of lighting controls, LED replacements for fluorescent lamps, and LED replacements for external floodlights. The LED lights are highly efficient and long lasting. The LED fittings are replacing a mixture of fluorescent, halogen and metal halide lamps, many in fittings which are nearing the end of their life. Savings listed here are based on reduced energy consumption – but there are considerable additional savings on the cost of not needing to replace lamps. The lighting controls allow for occupancy detection in offices and presence detection in toilets and corridors. Some areas will be suitable for lux metering to allow lights to shut off when high levels of natural light are available.
Benefits	• Expected cost savings £24,448 per year • Estimated saving of 128.3 tonnes of CO_2 per year • This project will contribute 9.2% of our target each year • This project is expected to payback in 7.6 years
Funding	• £185,629 capital cost, £3,611 operational cost • Funding has been identified from a capital bid with any remainder being met from reserves.
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• Suppliers will need to do lighting surveys so more detailed cost savings can be developed and to ensure over lighting does not take place and controls are suitable for each building. • Communications to all staff about how to operate lights which have occupancy switches.
Measuring Success	• On larger schemes temporary sub-metering might be used prior to installation to provide estimated before and after savings. • Evidence of savings in the building AMR data will be investigated. • Feedback from staff on the correct operation of the lighting controls
Timing	• Milestones / key dates e.g. ○ Expect work to be completed in 2013-2014 to allow success of Headquarters lighting projects to be assessed first.
Notes	This is a mixture of lighting projects with controls and LED replacements. Some sites identified as being suitable for lighting controls may in fact have full lighting replacements if fittings are in poor condition. In those circumstances additional costs would need to be met from maintenance budgets or reserves. The savings from less frequent lamp replacement have not been included in the figures. See CMPR for detail.

Project: **Reference:**	Double glazing 17, 18, 19
Owner (person)	Property Services Manager
Department	Facilities
Description	Two year programme (2010-2012) of replacement of single glazed windows with double glazing units on 7 wholetime stations, 17 retained stations and the Headquarters building. This work was carried out because of the poor condition of the existing windows and the increasing maintenance cost of decoration. The new double glazed units are powder coated aluminium, with a thermal break and as well as improving energy efficiency have provided a draught free working environment.
Benefits	• Expected energy cost savings £13,771 per year • Avoided maintenance costs (from repairs and redecoration) were estimated at £19,857 a year • Estimated saving of 72.2 tonnes of CO_2 per year • This project will contribute 5.2% of our target each year
Funding	• £763,500 capital cost funded through existing Property Services budgets
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• All installations have been successfully completed • To gain maximum savings the heating controls and set points on each site will need to be reviewed now the buildings are losing less heat through the windows. This will be addressed as part of the overall invest-to-save energy efficiency programme.
Measuring Success	• Use of manual meter readings and AMR data to demonstrate savings on sites with new windows. • Savings from the 2010-2011 installations should be visible in the 2011-2012 baseline.

Timing	• Milestones / key dates e.g.
	  ○ Majority of installations completed in 2011-2012
	  ○ Full savings from the 2011-2012 installations will not be visible until 2012-2013.

Notes	Savings have been estimated using a percentage saving on the space heating load on each site using ‘rules of thumb’ provided by the Carbon Trust. Where boiler replacements have taken place the saving from the boiler change has been applied first and the saving from the windows calculated on the expected lower heating load. This accounting for the inter-dependencies (or dilution) between energy efficiency measures increases the confidence in the savings estimates. See CMPR for detail. The avoided maintenance savings are based on the budget cost and frequency of external redecorations required on single glazed windows which has been converted into an annualised figure.

Project: **Reference:**	Cavity wall insulation 38, 39, 40, 41, 42
Owner (person)	Property Services Manager
Department	Facilities
Description	Programme of cavity wall insulation to reduce heat losses through the walls of or buildings. This is expected to include Headquarters, 9 wholetime stations and 33 retained stations.
Benefits	• Expected cost savings £17,587 per year • Estimated saving of 92.3 tonnes of CO_2 per year • This project will contribute 6.6% of our target each year • This project is expected to payback in 3.7 years
Funding	• £64,503 capital cost • Funding has been identified from a capital bid with any remainder being met from reserves.
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• Inspections of the wall cavities must be undertaken by the installers to ensure each building is in suitable condition for cavity wall insulation. • Any structural/water penetration problems identified by cavity surveys must be addressed before insulation can proceed. • To gain maximum savings the heating controls and set points on each site will need to be reviewed once the buildings are losing less heat through the walls. This will be addressed as part of the overall invest-to-save energy efficiency programme.
Measuring Success	• Use of manual meter readings and AMR data to demonstrate savings on sites • Savings will generally only be obvious in the heating season after insulation.
Timing	• Milestones / key dates e.g. ○ Installations expected in begin in 2012-2013 with completion depending on the procurement approach which is taken.
Notes	This programme of cavity wall insulation is part of the model outputs from the HCC report “Invest to save in energy efficiency”. See CMPR for summary information and the HCC report for details on the calculation methodology and site specific costs and savings.

Project: **Reference:**	Powerflush radiators 81, 82, 83, 84
Owner (person)	Property Services Manager
Department	Facilities
Description	Programme of cleaning of heating pipework and radiators to remove metallic and non-metallic debris which reduces the efficiency of the heating system – this saves considerable amounts of gas. This is expected to include Headquarters, Fleet Maintenance Centre, 11 wholetime stations and 8 retained stations.
Benefits	• Expected cost savings £15,197 per year • Estimated saving of 79.7 tonnes of CO_2 per year • This project will contribute 5.7% of our target each year • This project is expected to payback in 3.4 years
Funding	• £52,309 capital cost, £2,211 operational costs per year. • Funding has been identified from a capital bid with any remainder being met from reserves.
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• Inspections of each heating system must be undertaken to confirm that the pipework will be suitable for powerflushing. In some cases inspections may reveal poor pipework condition which would lead to consideration of repairs, replacement or fitting of debris filtration systems instead of a powerflush.
Measuring Success	• Use of manual meter readings and AMR data to demonstrate savings on sites • Savings will generally only become apparent in the following heating season.
Timing	• Milestones / key dates e.g. ○ expected in begin in 2012-2013 with completion depending on the procurement approach which is taken.
Notes	This programme of powerflushing of heating systems is part of the model outputs from the HCC report “Invest to save in energy efficiency”. See CMPR for summary information and the HCC report for details on the calculation methodology and site specific costs and savings.

Project: **Reference:**	Dry cycling retrofit devices on boilers 55, 56, 57, 58
Owner (person)	Property Services Manager
Department	Facilities
Description	Programme of retrofitting dry cycling devices to gas boilers. The devices prevent the boiler from 'dry cycling' i.e. preventing the boiler from going through its heating cycle when there is no true demand for heat – this saves considerable amounts of gas. This is expected to include Headquarters, Fleet Maintenance Centre, 11 wholetime stations and 3 retained stations.
Benefits	• Expected cost savings £21,403 per year • Estimated saving of 112.3 tonnes of CO_2 per year • This project will contribute 8% of our target each year • This project is expected to payback in 3.2 years
Funding	• £68,284 capital cost, £1,370 operational costs per year. • Funding has been identified from a capital bid with any remainder being met from reserves.
Resources	• Design and management delivered under existing Service Level Agreement for property services with Hampshire County Council.
Ensuring Success	• Inspections of each boiler must be undertaken by the installers to confirm that the technology is suitable. In some cases inspections may reveal poor boiler condition which would lead to consideration of complete boiler replacement.
Measuring Success	• Use of manual meter readings and AMR data to demonstrate savings on sites • Savings will generally only be obvious in the heating season after insulation.
Timing	• Milestones / key dates e.g. ○ Installations expected in begin in 2012-2013 with completion depending on the procurement approach which is taken.
Notes	This programme of dry cycling retrofit devices is part of the model outputs from the HCC report "Invest to save in energy efficiency". See CMPR for summary information and the HCC report for details on the calculation methodology and site specific costs and savings.

HAMPSHIRE FIRE AND RESCUE SERVICE working with CARBON TRUST

Appendix B: Carbon Trust Carbon Management Matrix

Carbon Trust Carbon Management Matrix - Self Assessment

	CORPORATE STRATEGY	PROGRAMME MANAGEMENT	RESPONSIBILITY	DATA MANAGEMENT	COMMUNICATION & TRAINING	FINANCE & INVESTMENT	POLICY ALIGNMENT *
Mature 5	· Top level target allocated across organisation · CO_2 reduction targets in Directorate Business Plans · Action plans in place to embed strategy. Progress routinely reviewed	· Cabinet / SMT review progress against targets on quarterly basis · Regular diagnostic reports provided to Directorates · Progress against target published externally	· CM integrated in responsibilities of senior managers · CM part of all contracts / Ts & Cs · Central CO_2 reduction advice available · Green Champions leading local action groups	· Regular collation of CO_2 emissions for all sources · Data externally verified · Monitoring & Targeting in place for: o buildings o street lighting o transport/travel	· All staff given formalised CO_2: o induction and training o communications · Joint CM communications with key partners · Staff awareness tested through surveys	· Finance committed for 2+yrs of Programme · External funding being routinely obtained · Ring-fenced fund for carbon reduction initiatives	· CO_2 friendly operating procedure in place · Central team provide advice and review, when requested · Barriers to CO_2 reduction routinely considered and removed
4	· CO_2 reduction commitment in Corporate Strategy · Top level targets set for CO_2 reduction · Climate Change Strategy reviewed annually	· Sponsor reviews progress and removes blockages through regular Programme Boards · Progress against targets routinely reported to Senior Mgt Team	· CM integrated in to responsibilities of department heads · Cabinet / SMT regularly updated · Staff engaged though Green Champion network	· Annual collation of CO_2 emissions for: o buildings o street lighting o transport/travel · Data internally reviewed	· All staff given CO_2 reduction: o induction o communications o CM matters ~ communicated to external community	· Co-ordinated financing for CO_2 reduction projects via Programme Board · Funding principles and processes agreed · Finances committed 1year ahead · Some external financing	· Comprehensive review of policies complete · Lower level policies reviewed locally · Unpopular changes being considered
3	· Vision for CO_2 reduction clearly stated and published · Climate Change Strategy endorsed by Cabinet and publicised with staff	· Core team regularly review CM progress: o actions o profile & targets o new opportunities	· An individual provides full time focus for CO_2 reduction · Key individuals have accountability for carbon reduction · Senior Sponsor actively engaged	· Collation of CO_2 emissions for limited scope i.e. buildings only	· Environmental / energy group(s) given ad hoc: o training o communications	· A view of the cost of CO_2 reduction is developing, but finance remains ad-hoc · Some centralised resource allocated · Finance representation on CM Team	· All high level and some mid level policies reviewed, irregularly · Substantial changes made, showing CO_2 savings
2	· Draft Climate Change Policy · Climate Change references in other strategies	· Ad hoc reviews of CM actions progress	· CO_2 reduction a part-time responsibility of a few department champions	· No CO_2 emissions data compiled · Energy data compiled on a regular basis	· Regular awareness campaigns · Staff given CM information on ad-hoc basis	· Ad hoc financing for CO_2 reduction projects	· Partial review of key, high level policies · Some financial quick wins made
1 Start	· No policy · No Climate Change reference	· No CM monitoring	· No recognised CO_2 reduction responsibility	· No CO_2 emissions data compiled · Estimated billing	· No communication or training	· No specific funding for CO_2 reduction projects	· No alignment of policies for CO_2 reduction

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

Appendix C: Project summary information tables from the Carbon Management Plan Project Register (CMPR)

Throughout the tables in this section some abbreviations have been used:

- HQ = Headquarters building
- WT = Wholetime fire stations, occupied 24 hours a day
- RT = Retained fire stations, occupied infrequently
- AMR = Automatic meter reading
- TRV = Thermostatic radiator valves
- TMV = Thermostatic mixer valves on domestic hot water supply
- AC = air conditioning
- AHU = Air handling unit – for mechanical ventilation and cooling/heating
- LED = Light Emitting Diode energy efficient lighting.
- Corp Serv = Director of Corporate Services
- HR = Director of Human Resources
- * = indicates projects which do not pay back from energy savings

The individual projects (or groups of closely related projects) which make the greatest contribution to the target have project definitions which provide further detail these are located in Appendix A.

Existing - Maintenance programme

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	Net Present Cost(£)	% of Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO_2				
9	Boiler replacements [3 stations] WT	Corp Serv	£121,700		£4,219	22.1	*	£52,162	1.6%	2011
10	Boiler replacements [3 stations] RT	Corp Serv	£102,997		£1,574	8.3	*	£77,051	0.6%	2010
11	St Marys heating control modification WT	Corp Serv	£14,551		£395	2.1	*	£10,003	0.1%	2011
14	Roof insulation [2 stations] WT	Corp Serv	£82,000		£899	4.7	*	£67,178	0.3%	2011
15	Roof insulation [4 stations] RT	Corp Serv	£121,000		£428	2.2	*	£113,944	0.2%	2011
16	Hardley appliance bay doors RT	Corp Serv	£24,000		£153	0.8	*	£21,472	0.1%	2011
17	Double glazing HQ	Corp Serv	£147,000		£4,925	25.8	*	£65,829	1.8%	2010
18	Double glazing [7 stations] WT	Corp Serv	£307,250		£5,605	29.4	*	£214,875	2.1%	2011

19	Double glazing [17 stations] RT	Corp Serv	£309,250		£3,242	17.0	*	£255,822	1.2%	2011
Totals			**£1,229,748**		**£21,441**	**112**	**57.4**		**8.0%**	

* indicates projects which do not pay back i.e. take longer than their estimated lifespan to payback from the energy/travel savings.

Existing – Efficiency projects

Ref	Project	Lead	Cost		Annual Savings (year 1)		Pay back (yrs)	Net Present Cost(£)	% of Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO_2				
1	HQ Server room increase temp from 20 to 23 deg c	Corp Serv	£0		£1,171	6.1	0.0	-£2,224	0.4%	2011
3	HQ - removal of two AC units	Corp Serv	£3,303		£1,289	6.8	2.6	-£17,949	0.5%	2011
4	HQ LED lights phase 1 (salix)	Corp Serv	£30,000		£4,775	25.0	6.3	-£9,708	1.8%	2011
5	HQ TMVs to basins	Corp Serv	£5,000		£1,973	10.4	2.5	-£17,726	0.7%	2011
6	HQ TRVs throughout building	Corp Serv	£22,000		£1,736	9.1	12.7	-£2,678	0.7%	2011
7	HQ loft insulation	Corp Serv	£8,656		£1,579	8.3	5.5	-£13,779	0.6%	2011
8	HQ perimeter pipework insulation	Corp Serv	£25,000		£174	0.9	*	£22,139	0.1%	2011
12	TRVs [3 stations] WT	Corp Serv	£4,500		£816	4.3	5.5	-£8,945	0.3%	2011
13	TRVs [2 stations] RT	Corp Serv	£2,300		£315	1.7	7.3	-£2,885	0.1%	2011
24	Overtime and Travel Project	HR	£0	£500	£19,594	55.8	0.0	-£86,209	4.0%	2011
29	PrintSmart - printer rationalisation	Corp Serv			£0	0.0			0.0%	2011
30	ICT - layer2 switching	Corp Serv	£41,000		£7,910	4.6	5.2	-£24,787	0.3%	2011
Totals			**£141,759**	**£500**	**£41,331**	**133**	**3.5**		**9.5%**	

Planned / Funded – Maintenance programme

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	Net Present Cost(£)	% of Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO_2				
22	Basingstoke refurbish/rebuild to higher standard	Corp Serv			£5,483	28.8			2.1%	2013
23	Eastleigh annex project (reduce size and new boiler)	Corp Serv	£20,000		£949	5.0	21.1	£4,367	0.4%	2012
		Totals	**£20,000**	**£0**	**£6,432**	**34**	**3.1**		**2.4%**	

The capital cost of project reference 22 – the refurbishment or rebuilding of Basingstoke Fire Station has been omitted as this considerable investment is driven entirely by maintenance requirement. The level of confidence in the savings from this project is therefore lower than the others.

Planned / Funded – Efficiency projects

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	Net Present Cost(£)	% of Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO_2				
2	HQ - improvements to lecture room AHU control	Corp Serv	£1,500		£1,170	6.1	1.3	-£8,230	0.4%	2012
20	Water efficiency rollout	Corp Serv	£10,000		£2,969	1.3	3.4	-£14,688	0.1%	2012
21	AMR on water	Corp Serv	£12,000		£5,937	2.7	2.0	-£56,379	0.2%	2013
31	AMR and awareness savings HQ	Corp Serv	£0	£400	£1,244	6.5	0.0	-£11,991	0.5%	2011
32	AMR and awareness savings FMC	Corp Serv	£0	£100	£2,195	11.5	0.0	-£29,771	0.8%	2011
33	AMR and awareness savings [13 stations] WT	Corp Serv	£0	£500	£8,442	44.3	0.0	-£112,879	3.2%	2011
34	AMR and awareness savings [38 stations] RT	Corp Serv	£0	£500	£4,783	25.1	0.0	-£60,870	1.8%	2011

36	50W Halogens to LED [HQ]	Corp Serv	£2,300	£146	£1,020	5.4	2.6	-£12,107	0.4%	2012
37	50W Halogens to LED [Fareham + Andover] WT	Corp Serv	£1,631	£103	£147	0.8	*	£912	0.1%	2013
38	Cavity Brick Wall Insulation [HQ]	Corp Serv	£9,796	£0	£4,434	23.3	2.2	-£63,280	1.7%	2013
39	Cavity Brick Wall Insulation [9 stations] WT	Corp Serv	£18,266	£0	£7,919	41.5	2.3	-£112,245	3.0%	2013
40	Cavity Brick Wall Insulation [27 stations - gas heating] RT	Corp Serv	£29,673	£0	£4,189	22.0	7.1	-£39,363	1.6%	2013
41	Cavity Brick Wall Insulation [3 stations - oil heating] RT	Corp Serv	£2,602	£0	£298	1.6	8.7	-£2,311	0.1%	2013
42	Cavity Brick Wall Insulation [3 stations - electric heating] RT	Corp Serv	£4,166	£0	£748	3.9	5.6	-£8,155	0.3%	2013
43	HQ Phase II LED lighting and lighting controls	Corp Serv	£194,828	£1,311	£29,880	156.8	6.8	-£276,024	11.2%	2012
44	FMC lighting controls	Corp Serv	£19,520	£392	£4,198	22.0	5.1	-£43,222	1.6%	2013
45	WT lighting controls and LED conversion [11 stations]	Corp Serv	£166,109	£3,220	£20,249	106.2	9.8	-£114,570	7.6%	2013
46	Cooling systems temperature settings in both office and IT spaces [HQ]	Corp Serv	£333	£7	£1,495	7.8	0.2	-£24,200	0.6%	2013
47	Cooling systems temperature settings in both office and IT spaces [FMC]	Corp Serv	£170	£3	£501	2.6	0.3	-£8,024	0.2%	2013
48	Cooling systems temperature settings in both	Corp Serv	£1,160	£23	£1,515	7.9	0.8	-£23,419	0.6%	2013

	office and IT spaces [10 stations] WT									
49	Cooling systems temperature settings in both office and IT spaces [2 stations] RT	Corp Serv	£230	£5	£26	0.1	11.0	-£116	0.0%	2013
50	Door replacement [5 stations] WT	Corp Serv	£30,991	£0	£2,138	11.2	14.5	-£4,249	0.8%	2013
51	Door replacement [7 stations] RT	Corp Serv	£15,313	£0	£1,255	6.6	12.2	-£5,371	0.5%	2013
52	Draught proofing [HQ]	Corp Serv	£10,741	£916	£2,459	12.9	7.0	-£14,690	0.9%	2013
53	Draught proofing [10 stations] WT	Corp Serv	£21,054	£1,795	£4,716	24.7	7.2	-£27,083	1.8%	2013
54	Draught proofing [7 stations] RT	Corp Serv	£5,523	£471	£1,178	6.2	7.8	-£6,124	0.4%	2013
55	Dry Cycling retrofit devices [HQ]	Corp Serv	£8,050	£161	£5,549	29.1	1.5	-£80,752	2.1%	2013
56	Dry Cycling retrofit devices [FMC]	Corp Serv	£4,600	£92	£1,462	7.7	3.4	-£17,975	0.5%	2013
57	Dry Cycling retrofit devices [11 stations] WT	Corp Serv	£37,427	£751	£12,120	63.6	3.3	-£149,949	4.5%	2013
58	Dry Cycling retrofit devices [4 stations] RT	Corp Serv	£18,207	£365	£2,272	11.9	9.5	-£13,224	0.9%	2013
59	Drying rooms/cabinets: on central heating [3 stations] WT	Corp Serv	£2,070	£0	£2,384	12.5	0.9	-£37,221	0.9%	2013
60	Drying rooms/cabinets: on central heating [5 stations] RT	Corp Serv	£1,725	£0	£211	1.1	8.2	-£1,745	0.1%	2013
61	Drying rooms/cabinets: Timers for drying facilities to prevent	Corp Serv	£967	£19	£2,723	14.3	0.4	-£43,593	1.0%	2012

	running when no longer required. [HQ]									
62	Drying rooms/cabinets: Timers for drying facilities to prevent running when no longer required. [11 stations] WT	Corp Serv	£3,813	£76	£5,947	31.2	0.6	-£92,940	2.2%	2012
63	Drying rooms/cabinets: Timers for drying facilities to prevent running when no longer required. [25 stations - gas heating] RT	Corp Serv	£8,400	£168	£2,762	14.5	3.2	-£34,340	1.0%	2012
64	Drying rooms/cabinets: Timers for drying facilities to prevent running when no longer required. [3 stations - oil heating] RT	Corp Serv	£1,039	£21	£200	1.1	5.8	-£1,922	0.1%	2012
65	Drying rooms/cabinets: Timers for drying facilities to prevent running when no longer required. [3 stations - electric heating] RT	Corp Serv	£1,039	£21	£504	2.6	2.2	-£6,917	0.2%	2012
66	Heat recovery on heating flues [HQ]	Corp Serv	£25,780	£435	£3,700	19.4	7.9	-£28,020	1.4%	2013
67	Heat recovery on heating flues [11 stations] WT	Corp Serv	£59,884	£1,011	£8,080	42.4	8.5	-£56,614	3.0%	2013
68	Heat recovery on heating flues [2 stations] RT	Corp Serv	£5,479	£93	£534	2.8	12.4	-£1,796	0.2%	2013
69	Heating controls and zoning	Corp Serv	£11,500	£231	£1,031	5.4	14.4	-£1,692	0.4%	2013

	[Southsea] WT									
70	Install reflective radiator panels [HQ]	Corp Serv	£6,445	£0	£3,191	16.7	2.0	-£46,145	1.2%	2013
71	Install reflective radiator panels [FMC]	Corp Serv	£3,293	£0	£841	4.4	3.9	-£10,561	0.3%	2013
72	Install reflective radiator panels [11 stations] WT	Corp Serv	£14,971	£0	£6,969	36.6	2.1	-£99,881	2.6%	2013
73	Install reflective radiator panels [9 stations] RT	Corp Serv	£4,242	£0	£1,663	8.7	2.6	-£23,169	0.6%	2013
74	Installation of New Boilers [Bordon] RT	Corp Serv	£5,956	£0	£419	2.2	14.2	-£955	0.2%	2013
75	Insulate valves in the plant room [HQ]	Corp Serv	£6,900	£0	£1,774	9.3	3.9	-£22,330	0.7%	2013
76	Insulate valves in the plant room [FMC]	Corp Serv	£2,300	£0	£467	2.5	4.9	-£5,401	0.2%	2013
77	Insulate valves in the plant room [11 stations] WT	Corp Serv	£41,344	£0	£3,873	20.3	10.7	-£22,493	1.5%	2013
78	Insulate valves in the plant room [2 stations] RT	Corp Serv	£4,218	£0	£266	1.4	15.9	-£164	0.1%	2013
79	Pakaway review and replace heaters with alternative [Fareham, Andover] WT	Corp Serv	£5,750	£115	£3,357	17.6	1.8	-£47,677	1.3%	2013
80	Pakaway review and replace heaters with alternative [9 stations] RT	Corp Serv	£25,875	£519	£3,823	20.1	7.8	-£28,579	1.4%	2013
81	Power flush radiators [HQ]	Corp Serv	£10,741	£431	£3,652	19.2	3.3	-£42,341	1.4%	2013
82	Power flush radiators [FMC]	Corp Serv	£5,488	£220	£962	5.0	7.4	-£6,737	0.4%	2013
83	Power flush radiators [11 stations] WT	Corp Serv	£25,974	£1,154	£7,976	41.8	3.8	-£86,459	3.0%	2013

84	Power flush radiators [8 stations] RT	Corp Serv	£10,105	£406	£2,608	13.7	4.6	-£26,184	1.0%	2013
85	Preventing simultaneous use of heating and cooling systems [HQ]	Corp Serv	£215	£4	£3,877	20.3	0.1	-£63,605	1.5%	2013
86	Preventing simultaneous use of heating and cooling systems [FMC]	Corp Serv	£115	£2	£1,298	6.8	0.1	-£21,238	0.5%	2013
87	Preventing simultaneous use of heating and cooling systems [10 stations] WT	Corp Serv	£1,150	£23	£3,927	20.6	0.3	-£63,191	1.5%	2013
88	Preventing simultaneous use of heating and cooling systems [3 stations] RT	Corp Serv	£350	£7	£76	0.4	5.0	-£792	0.0%	2013
89	Roof Insulation (pitched) [Cosham] WT	Corp Serv	£5,226	£0	£1,050	5.5	5.0	-£12,076	0.4%	2013
90	Roof Insulation (pitched) [8 stations] RT	Corp Serv	£28,366	£0	£3,829	20.1	7.4	-£34,734	1.4%	2013
91	HQ rationalisation of Air Handling Units	Corp Serv	£138,000	£400	£8,561	44.9	16.9	£3,503	3.2%	2012
92	Timers for all major appliances e.g. boiling water taps etc. [HQ]	Corp Serv	£5,001	£100	£2,952	15.5	1.8	-£41,996	1.1%	2012
93	Timers for all major appliances e.g. boiling water taps etc. [FMC]	Corp Serv	£2,555	£51	£988	5.2	2.7	-£12,889	0.4%	2012
94	Timers for all major appliances e.g. boiling water taps etc. [11 stations] WT	Corp Serv	£11,616	£233	£3,202	16.8	3.9	-£37,313	1.2%	2012

95	Timers for all major appliances e.g. boiling water taps etc. [24 stations] RT	Corp Serv	£5,842	£117	£874	4.6	7.7	-£6,632	0.3%	2012
96	Electric heating strategies review [3 stations] RT	Corp Serv	£1,830	£0	£438	2.3	4.2	-£5,382	0.2%	2013
		Totals	**£1,121,754**	**£17,121**	**£237,489**	**1,203**	**5.1**		**85.9%**	

The cost and savings from project reference 91 “HQ rationalisation of Air Handling Units” are high level estimates as this complex project to combine the Control Room and Server Room air handling requires further development.

Planned / Funded - Transport

Ref	Project	Lead	Cost		Annual Savings (yr 1)		Pay back (yrs)	Net Present Cost(£)	% of Target	Implementation Year
			Capital	Operational	Financial (Gross)	tCO_2				
25	Fuel Management Programme	Corp Serv	£8,000		£44,955	99.0	0.2	-£365,876	7.1%	2012
26	Driver Training Project	Corp Serv	£6,000		£3,877	8.5	1.5	-£11,507	0.6%	2012
27	Provided Vehicles project stage 1 - FDS	Corp Serv			£0	60.0			4.3%	2012
		Totals	**£14,000**		**£48,833**	**168**	**0.3**		**12.0%**	