

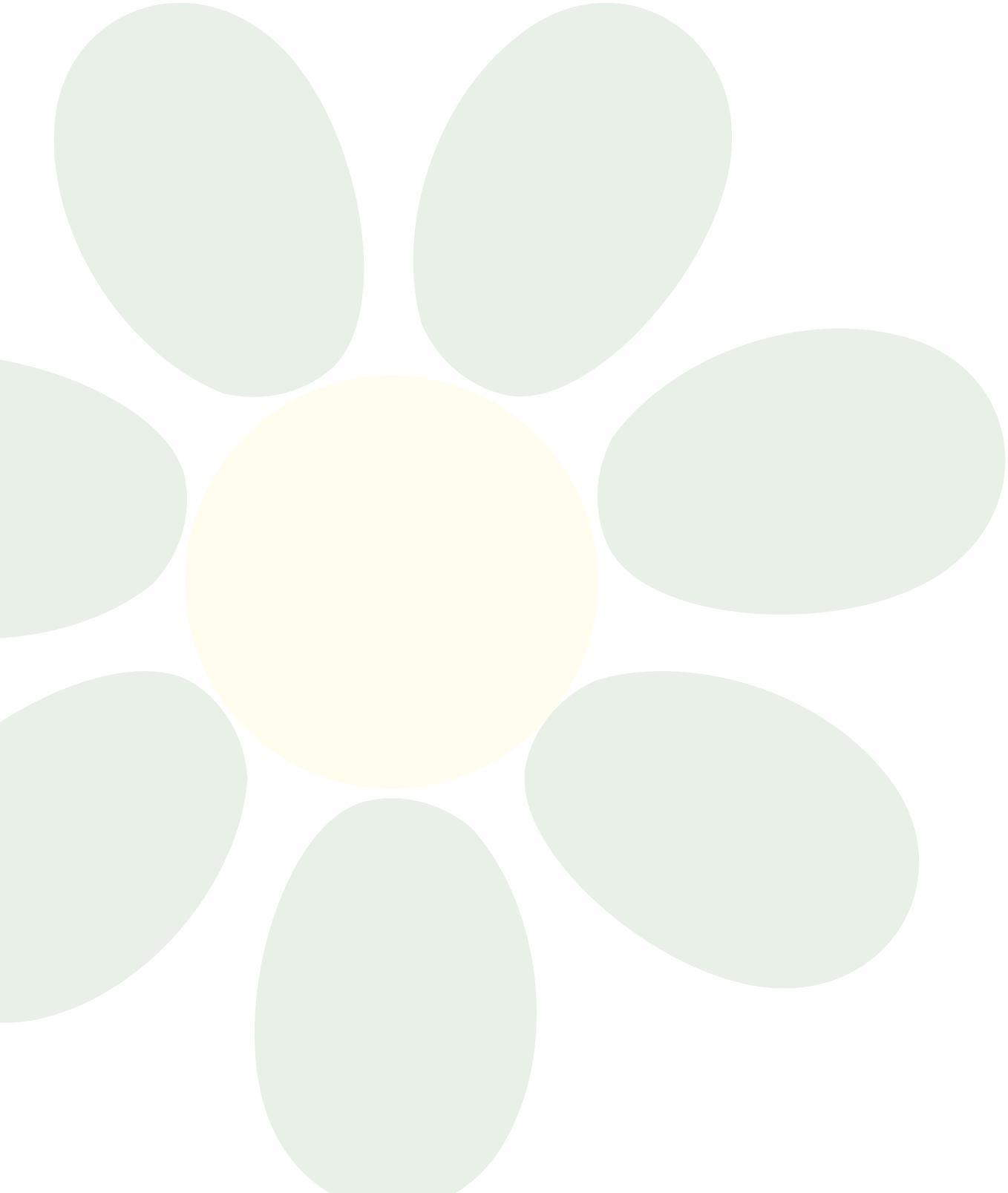
Carbon Management Programme

Carbon Management Plan 2 (CMP2) and Climate Change Action Plan



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Forewords

Roger Grant, Chair, Planning and Environment Services Committee

Climate Change is arguably the most important challenge currently facing humanity. Sea levels are on target to increase by around half a metre by the end of the century with major implications for coastal areas the world over. Over the next few generations, without action to control our carbon usage, increased greenhouse gas emissions will exacerbate this rise. However, unlike other global challenges we face, climate change is an issue that can be addressed at an individual, business and local government level with as much success as that at a national and international scale.

Scotland has set itself the most challenging targets in the world of a reduction in carbon dioxide emissions of 42% by 2020 and 80% by 2050. This Carbon Management Plan sets out the actions that Dumfries and Galloway Council plans to undertake to reduce its carbon emissions in line with national targets. Along with this huge challenge comes an exciting opportunity. Lord Stern suggested recently that we are on the cusp of a green industrial revolution where changes to how we use and produce energy will have the same impact as the development of steam power in the 18th century.

Dumfries and Galloway is already at the vanguard of renewable energy development. With its longstanding hydro power industry, wind farm developments and being the location for the wood biomass power station (the largest in the UK), our regional carbon reduction credentials are well established. As a Council, we have already made a clear statement on Environment and Climate Change by naming Environmental Protection a 'Council Priority' in 2010. Our challenge now is to develop further policies and practice that will reduce our carbon footprint and help to demonstrate success in meeting Scotland's challenging reduction target.

Alistair M Speedie, Director, Planning and Environment Services

Dumfries and Galloway is the third largest local authority area in Scotland with a tremendous natural environment but a relatively sparse population density. As a result carbon management creates specific challenges for the Council with over 100 miles between the most eastern and westerly offices and relatively limited public transport outwith the main population centres. Car use is therefore higher than the national average and at present, for many people, public transport is not a viable alternative. Similarly the choice of energy source is constrained by the rural nature of the area with a high dependence of oil, LPG and solid fuel rather than less polluting natural gas.

Dumfries and Galloway Council faces many of the same opportunities and challenges as the wider population in the region. The Council operates from a built estate ranging from the state of the art DG One leisure centre with solar thermal water heating and a combined heat and power plant, to granite built cottages with combed ceilings and cavernous 'A' listed town halls. The challenge that the Council faces in reducing its energy consumption in an increasingly technological world will mirror those facing the wider population. We hope that the lessons we learn on our journey to a lower carbon economy will be as relevant and inspiring for the whole region as it will be for us as a Council.

This review of Dumfries and Galloway Council's Carbon Management Plan comes at a particularly challenging time with unprecedented cuts in local government finance and as a result, changes to structures and staffing to ensure that the Council's duties can be fully met. The protection of the environment and carbon management in particular is one of the six key priorities of the council. The Carbon Management Plan will perform two key jobs; it will identify our current footprint and demonstrate the actions we need to take to reduce our carbon usage over the next few years.

Paul Wedgewood, Manager, Carbon Trust,
Scotland

Cutting carbon emissions as part of the fight against climate change should be a key priority for all public bodies - it's all about getting your own house in order and leading by example. The Scottish and UK governments have identified the public sector as key to delivering carbon reduction across Scotland and the UK, in line with Kyoto commitments and the world-leading Scottish and UK Climate Change legislation.

The Carbon Trust's Public Sector Carbon Management programme is designed in response to this. It assists organisations in saving money on energy and putting it to good use in other areas, whilst making a positive contribution to the environment by lowering their carbon emissions.

Dumfries and Galloway Council (DGC) was selected to take part in this ambitious programme. DGC partnered with the Carbon Trust in order to realise substantial carbon and cost savings. This Carbon Management Plan commits the organisation to a target of reducing carbon dioxide equivalent by 20% by 2014/15.

There are those that can and those that do. Public bodies can contribute significantly to reducing CO₂ emissions. The Carbon Trust is proud to support Dumfries and Galloway Council in the on-going implementation of its carbon management.



List of Abbreviations and Acronyms

2A schools	A classification for scheduling of new build schools
BAU	Business as Usual
CO₂	Carbon Dioxide. This unit is used primarily when referring to CRC (see below), as this scheme pertains to carbon dioxide reduction only.
CO_{2E}	Carbon Dioxide Equivalent. This unit is used when referring to most emissions reduction targets in this plan. Greenhouse gases other than Carbon Dioxide are converted to CO _{2E} allowing the different greenhouse gases to be compared on a like for like basis relative to one unit of carbon dioxide.
CEEF	Central Energy Efficiency Fund
CMP	Carbon Management Plan
CMP 1	Dumfries and Galloway Council Carbon Management Plan 2009
CMP 2	Dumfries and Galloway Carbon Management Plan 2011
CMT	Corporate Management Team
CPD	Continued Professional Development
CRC	Carbon reduction commitment energy efficiency scheme
DGC	Dumfries and Galloway Council
ECM	Energy and Carbon Management
ELV	Extra Low Voltage
EPC	Energy Performance Certificate
ERP	European Recycling Platform
EST	Energy Savings Trust
EU	European Union
FIT	Feed in Tariff
GHG	Greenhouse Gases
IT	Information technology
LED	Low Emitting Diode
MSW	Municipal Solid Waste
NA	Not applicable
PES	Planning and Environment Services. Title of the Council service
PHES	Planning, Housing and Environment Services. Title of the Council committee
PFI	Private Finance Initiative
PPP	Public Private Partnership
PV	Photovoltaic (as in solar photovoltaic panels)
RHI	Renewable Heat Incentive
SDECM	Sustainable Development and Energy and Carbon Management
SOA	Single Outcome Agreement
SSN	Sustainable Scotland Network
tCO_{2/ZE}	Tonnes of carbon dioxide/carbon dioxide equivalent
TBC	To be confirmed
WEEE	Waste Electrical and Electronic Equipment

Management Summary

Strategic Fit

Since the development of Dumfries and Galloway Council (DGC)'s first Carbon Management Plan (CMP1) the legislative framework associated with climate and carbon management has developed significantly. In 2009 the Climate Change (Scotland) Act came into effect. As well as this, the Carbon Reduction Commitment was introduced, essentially amounting to a £12 per tonne tax on the carbon our Council emits. This will add approximately £360,000 per year to our Council's costs. The respective duties and costs associated with this national policy shift have helped to raise the profile of carbon use and energy consumption within our Council.

This reviewed Dumfries and Galloway CMP (CMP2) differs from many other Scottish authorities in that our Council manages the energy bills and CRC reporting of both the Police and the Fire and Rescue services. This reflects the contiguous boundaries that are shared between organisations in the region. Both the Police and the Fire and Rescue service produce independent CMPs with the support of the Carbon Trust and therefore to avoid double counting, the key outputs of the Police and Fire and Rescue Services' CMPs are included within the DGC CMP. This will capture the headline savings of Police and Fire and Rescue to complement the actions directly undertaken by our Council.

The production of CMP1 has led to the evolution of carbon management into a key part of the policy agenda within our Council. Carbon management is being integrated into our Council's policy, business planning, performance management and strategic processes as part of a wider sustainable development agenda. Key to the success of the programme will be devolving responsibility for energy usage and carbon emissions to all services along with a regular requirement to report progress to service committees, full Council and our Council's Corporate Management Team (CMT). Carbon management and the reduction of buildings and travel emissions will also be one of the key environmental measures in the Community Plan and be reflected in the Single Outcome Agreement (SOA) for the region.

Key Areas for Carbon Cuts

CMP1 and CMP2 both focus firmly on the emissions of our Council in particular relating to the following functional areas:

- Buildings-Energy consumption in Council and Police and Fire and Rescue buildings
- Street lighting - All Council street lighting, traffic signals and road signs throughout Dumfries and Galloway
- Transport- All travel done by staff on business, using fleet vehicles or by other means. All mileage covered by plant. Travel done by the Police and Fire and Rescue services.
- Waste - Internal waste arisings and Municipal Solid Waste (MSW)
- Water

It should be noted, however, that the scope of the baseline differs between CMP1 and 2 with reference to Waste.

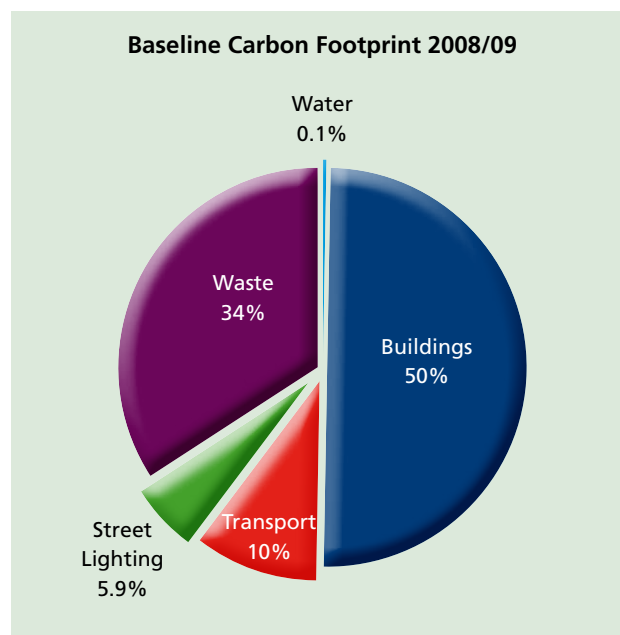


Figure 1: The breakdown of the 2008/9 baseline carbon footprint which forms the basis for CMP2.

Figure 1 illustrates the contribution to the carbon footprint of the 5 functional areas listed above and which together show our Council's baseline carbon footprint for CMP2 using 2008/09 as the baseline year. Note that this includes the emissions from both the Fire and Rescue and Police Services.

Carbon and Cost Saving

Our Council currently spends approximately £9 million on the combined costs of water and energy. This equates to approximately 2% of the annual Council budget. The cost of energy has consistently risen above the base rate of inflation. As such the actions encompassed within CMP2 will help to reduce budget pressures as well as reduce exposure to CRC charges which are programmed to increase to £30 per tonne of carbon dioxide (tCO_{2e}) by 2020.

Figure 2 below shows the overall consumption of energy by our Council over the last 12 years which

remains reasonably flat together with the cost of energy which has risen dramatically since 2003/4. Similar trends are likely to be noted in transport costs, such as diesel and petrol.

Our Council is very aware of its responsibility in regard to efficient use of public funds and maximising cost saving. Mindful of this and the pattern of increasing energy costs, the need to reduce our Council's energy costs must be a priority.

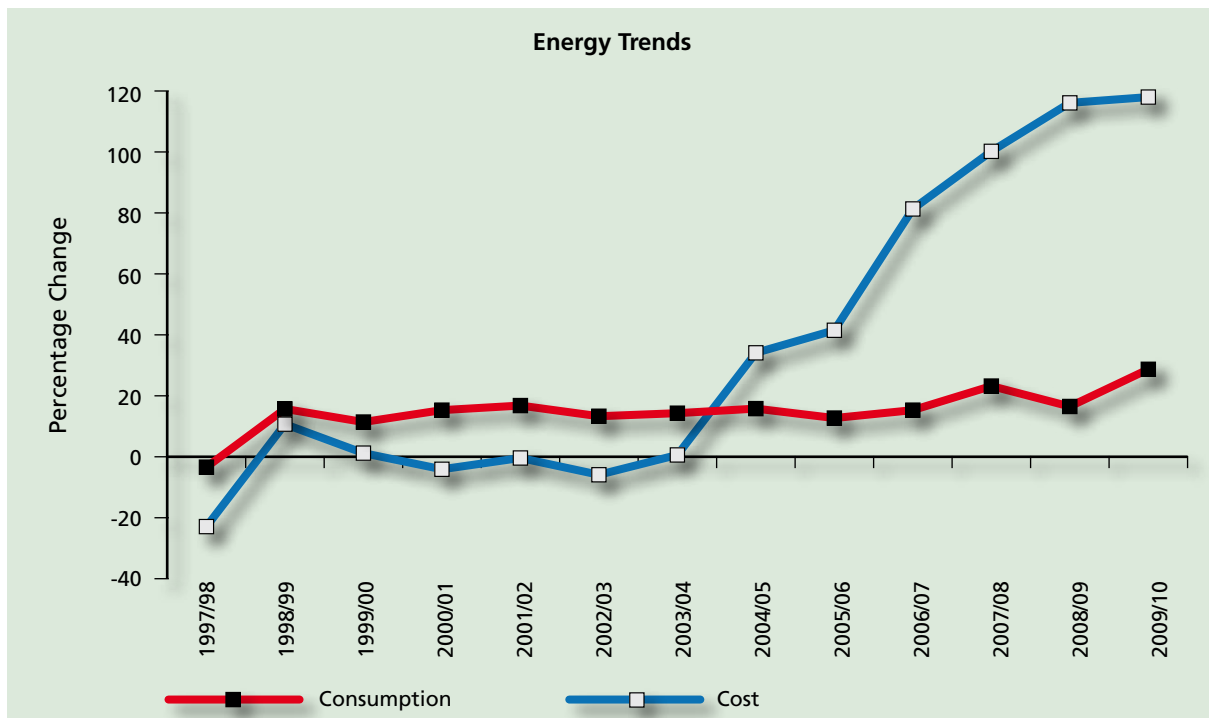


Figure 2: Energy consumption and cost trends from 1997/8 to 2010/11

Key Achievements of CMP1

The key achievement of CMP1 was to start the process of embedding carbon management as a Council priority. A link was forged between the Energy Management and Sustainable Development teams to lead this important agenda.

On a practical level, three main project areas were identified to help deliver carbon reduction within CMP 1:

- A cultural change programme which encourages change in behaviour and attitudes of Council staff and engenders personal responsibility for the management of carbon in the workplace and the reduction in energy consumption in buildings
- The construction and operation of new schools, a combination of 8 Public Private Partnership (PPP) and 3 2A schools commissioned and built through our Council's design services team.
- The treatment of our Council's internal wheeled bin waste arisings at the Ecodeco waste plant in Dumfries to divert biodegradable waste and other resources from landfill
- In addition to the key project themes a number of smaller spend-to-save initiatives have been undertaken which have further helped to reduce carbon pressures.

Gas capture at Lochar Moss landfill site was a key initiative listed in CMP1 which has been implemented and contributes to a significant reduction in emissions levels. However it should be noted that this does not come within the scope of CMP1 (or CMP2) and so cannot be counted as reducing carbon emissions from our Council's carbon footprint.

The cultural change programme, launched in September 2010, started later than planned but has made a start in raising awareness and changing behaviour amongst staff. As yet we have no quantifiable data to measure its impact against. Previous experience in other organisations, including local authorities, would indicate that a conservative estimate of the savings to be made as a result of cultural change programme is advisable. With this in mind, emissions savings target for our Council through this programme will be in the region of 1% per year.

Of the three main projects, the PPP schools programme has been the most disappointing in terms of energy consumption in buildings. The new schools are undoubtedly better, more efficient buildings but, as seems to have been the case across the country, the total energy use has not reduced as anticipated. Larger buildings, changes in building regulations requiring additional ventilation and increased use of Information Technology (IT) have not collectively led to the anticipated decrease in energy consumption compared to the schools they replaced.

CMP1 had a baseline of 46,614 tonnes of carbon dioxide equivalent (CO_{2e}) for year 2007/8 and a 20% reduction target for 2013/14 of 9,283 tonnes. The projects in CMP1 achieved an actual reduction of 3,177 tonnes by the end of 2009/10, according to an assessment carried out by Carbon Trust on behalf of our Council. This equates to just over one third of the 2013/14 target.

The Revised Carbon Management Plan

Our vision for carbon management in our Council is as follows: "Dumfries and Galloway Council will reduce its carbon footprint by integrating carbon management into its strategies and operational procedures. Through this, we can provide an exemplary lead to the public and partners in our journey towards a 'low carbon future'". Our Council is committed to this vision and aims to achieve it through the vehicle of CMP2.

In the next few years, the carbon management programme will develop on the successes of CMP1. These include the various projects and policies initiated in waste management. The cultural change programme will begin its first full year of operation and start to have a more dramatic impact on energy use in our Council's estate. On a more fundamental level, a cultural change shift in the way carbon management is dealt with throughout our Council will be sought. It is aimed that for new projects, carbon will take a more central role in the decision making process, with impacts on carbon identified in the initial stages along with measures taken to minimise emissions. Departments responsible for projects impacting on CO_{2e} emissions will be held accountable and report on carbon as they would on finance. Furthermore, each department will have responsibility for its own energy consumption, again reporting on this and utilising measures such as energy reps to minimise consumption. Whereas CMP1 focused on new build PPP and 2A schools to limit emissions, this revised Plan aims to initiate a process of priority based structural upgrade (in way of insulation and so on) and fitting of renewables with all Council buildings taken into consideration. Thus, a more rounded and far reaching approach has been taken with CMP2 to ingrain carbon management into the very ethos and functionality of our Council.

The scope of CMP2 has changed compared to that of CMP1. In particular the waste baseline now includes all Council internal waste arisings and all Municipal Solid Waste (MSW).



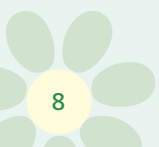
Key project areas for CMP2 will be;

- Institution of a reporting framework to keep full Council informed and ensure continued scrutiny of carbon management processes as they develop within our Council from the launch pad of CMP2
- Devolvement of carbon management activities including energy consumption in buildings, transport and waste to a service level to improve responsibility and accountability and thus improve carbon emissions reduction
- Embedding carbon management into the performance management systems of our Council
- Confirmation of existing Council policies which relate to energy use, such as controlled use of portable electrical heaters with additional measures to improve implementation and enforcement.
- Introduction of new Council policies aimed at reduction in Council carbon emissions resulting from energy consumption such as summer heating switch off and reduction of Council pool car use through a pool car share scheme for business travel
- Capture and quantification of all carbon reduction activities across our Council
- Capture and quantification of all new carbon generating activities across our Council
- Rationalisation of our Council's building portfolio
- Exploration of opportunities through renewable technologies eligible for the Feed In Tariff (FIT) or Renewable Heat Incentive (RHI) schemes
- Use of lifetime costing will be widespread in building procurements and refurbishments, as well as in decision making on new projects
- Investment in buildings upgrades to improve energy efficiency, through asset management planning and one off programmes possibly funded by the Central Energy Efficiency Fund (CEEF). This is necessary to reduce carbon in its own right and to ensure eligibility of our Council's buildings for the Feed In Tariff (FIT) and Renewable Heat Incentive (RHI) should renewable technologies be installed.
- Implementation of the Zero Waste Investment Plan to divert waste from landfill and promotion of waste prevention activities to meet the requirements of the Zero Waste (Scotland) regulations.
- Implementation of our Council's commitment to halve the level of construction and demolition waste sent to landfill
- Establishment of an all-diesel pool car fleet and the addition of two electric vehicles
- Replacement of lamps in traffic signals to Extra Low Voltage (EVL)/ Light Emitting Diode (LED) equivalents
- Carbon reducing actions by the Police and Fire and Rescue Services include buildings upgrades such as the installation of insulation, building rationalisation, reduced need for heating to maintain vehicles in working order and investigation into the use of renewable technologies.
- Partnership working with neighbour authorities, the Sustainable Scotland Network (SSN), Carbon Trust, Energy Savings Trust and various organisations working with schools to develop project ideas and opportunities for future implementation.
- Improvement of data recording for activities which contribute to CO_{2e} arisings, to aid target setting, monitoring and CRC reporting

The baseline for CMP2 is 64,318 tCO_{2e} (2008/9). A 20% target reduction of 12,863 tCO_{2e} for 2014/15 and a 42% target reduction of 27,014 tCO_{2e} for 2019/20 have been set by our Council in CMP2. It is estimated that the projects outlined in this plan will achieve a reduction of 8,448 tCO_{2e}, or 66% of the interim 2014/15 target.

Table 1 shows projected emissions by 2014/15 following various scenarios. Table 2 displays the anticipated achievement versus target based on the projects detailed in this plan, represented as a whole and broken down into functional areas. Although Waste are predicted to achieve 292% achievement versus target it will be taken that they have simply fulfilled their target in order that the other functional areas continue to strive to meet their targets. Our Council must acknowledge the overall 34% shortfall in achievement versus target and must investigate further measures to make this up.

It can be seen from table 9 that the areas where further carbon reductions are especially required are street lighting and buildings (energy consumption). Significant policy changes to street lighting particularly with regard to late night switch off may be needed to achieve the carbon savings required in this area. With regards to energy consumption in buildings, it is proposed in this plan that energy responsibility be devolved to each service within our Council along with the reductions targets requires, the aim being that this new ownership will lead to greater savings. In addition, a comprehensive buildings upgrade programme improving insulation, window condition, heating controls etc to meet national standards is recommended. This would also raise our buildings to the standard needed for eligibility for the Feed In Tariff (FIT) and Renewable Heat Incentive (RHI) schemes if renewable technologies are to be installed in the future. Such a programme will have to be developed and agreed through the Strategic Asset Board.



Year	Predicted Business as Usual (BAU) emissions (tCO _{2e})	Target emissions (tCO _{2e})	Predicted emissions through projects in CMP2(tCO _{2e})
2008/9	64,318	NA	NA
2014/15	67,067	51,455	58,619

Table 1: Emissions in baseline year 2008/9 and year of the interim 20% reduction target 2014/15.

Functional Area	2008/9 baseline (tCO _{2e})	Interim reduction target 2014/15 (%)	Interim reduction target 2014/15 (tCO _{2e})	Anticipated emissions reduction by 2014/15 through projects in CMP2 (tCO _{2e})	Anticipated % achievement vs target emissions reduction by 2014/15
Overall	64,318	20 %	12,863	8,448	66%*
Buildings	32,002	20 %	6,400	3,103	48%
Transport	6,612	20 %	1,322	1,014	77%
Street Lighting	3,923	20 %	785	22	3%
Waste	21,542	20 %	4,308	12,576	292%*
Water	240	20 %	48	0	0%

Table 2: Interim 2014/15 target and achievement breakdown per functional area.

*It is predicted that waste will have exceeded its target by 2014/15 (based on the Carbon Trust method of calculating carbon emissions from waste activities using the number of tonnes of waste landfilled). However, in order that other functional areas continue to strive to meet reduction targets, the overall achievement versus target has been calculated assuming waste has achieved only 100% of target.

Impact on Carbon Reduction Commitment (CRC) Charges

From July 2012 our Council will be obliged to pay £12 per tCO₂ emitted, under the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. The scheme primarily applies to emissions resulting from energy consumed in buildings. The first payment is expected to amount to between £350,000 and £400,000 for 2011/12. If the 2014/15 reduction target for buildings energy consumption is achieved (6,400 tCO₂), the CRC payment for 2014/15 will be

reduced by approximately £80,000. If the 2019/20 buildings energy consumption reduction target (13,441 tCO₂) is achieved the payment will be reduced by approximately £160,000. If plans to increase the rate to £30 per tonne CO₂ by 2020 are implemented, the 2019/20 payment will be reduced by approximately £400,000 per year if we achieve the 2019/20 buildings energy consumption reduction target.



1 Introduction

Climate change is not only a massive threat to the global environment; it is perhaps the greatest economic challenge facing us in the twenty-first century. The projected impacts of climate change extend beyond dramatic sea level rise and changing weather systems to global food shortages and for the first time, environmental refugees. Climate change demands an urgent and radical response across the developed and developing world. To this end, world leaders are introducing legislation and looking to economic instruments to mitigate climate change by reducing carbon emissions. Those most pertinent to Scotland are the Climate Change (Scotland) Act 2009 and the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. Local authorities have a duty to implement the carbon cuts called for in these obligations and our Council is doing this in the first instance through its Carbon Management Plan. It should be noted that the main aim of this plan is mitigation of climate change. Adaptation is a different response strategy which will be dealt separately by Dumfries and Galloway Council (DGC).

DGC produced its first Carbon Management Plan (CMP1) in 2009 with the support of the Carbon Trust under their Local Authorities Scheme Carbon Management Programme for 2008/9. In autumn 2010 Carbon Trust provided the opportunity of a supported review of the plan leading to a revised plan (CMP2) which will guide carbon management activity in our Council until 2014/15. The aim of the revised plan is to learn lessons from the implementation of CMP1 and to refocus activities to secure the most effective outcomes for our Council in its carbon reduction activities.

The review has covered a number of key steps:

- Reviewing the impact of CMP1
- Recalculating the carbon emission baseline based on the 2008/9 financial year
- Redefining the scope of CMP2
- Developing buy in to the carbon management agenda from across our Council and identifying new or updated projects to take the carbon reduction process forward for the next 5 years.

By the time of its completion in autumn 2011 the programme will also have:

- Produced an updated Carbon Management Plan (CMP2)
- Secured approval for CMP2 from DGC's Corporate Management Team (CMT) and Council Elected Members through committee approval of the plan.

CMP1 focussed on the emissions of our Council in particular relating to:

- Buildings-Energy Consumption
- Street lighting
- Transport-Vehicle fleet and staff travel on business
- Waste management-Council internal waste arisings only
- Water

This will remain the case for the duration of CMP2, except in the case of waste where the scope has changed considerably compared to CMP1. Over the first two years of CMP1, savings totalling 3,177 tonnes carbon dioxide equivalent (CO_{2e}) were achieved. This equates to 6.8% of the overall footprint of 46,414 tonnes and just over one third of the 9,283 tonne reduction target for 2013/14. The projects initially undertaken through CMP1 focussed on those supported under the CEEF (Central Energy Efficiency Fund) and reduction in waste sent to landfill through the waste management activities implemented including the use of waste treatment facilities such as Ecodeco in the region. The focus of carbon management activity for CMP2 will continue to be buildings, street lighting, transport, waste management and water.

2 Carbon Management Strategy

2.1 Context and Drivers for Carbon Management

An increase in awareness and understanding of climate change in recent years has led to a raft of new requirements which constitute the drivers for the actions outlined in CMP2.

DGC Internal Drivers

Our Council has made a clear statement on environment and climate change by naming 'Environmental Protection' as a Council priority in 2010.

- We will protect and sustain our environment
 - Implementing our Carbon Management Plan (reducing our carbon footprint by reducing energy use in buildings, including by new build and reducing office space, and reducing travel)
 - Promoting our Council's Waste Management Strategy especially recycling and street cleanliness

Furthermore, Dumfries and Galloway's Single Outcome Agreement (2009-11) Local Outcomes are currently being revised for extension beyond 2011.

The existing Outcomes identify:

- Use of Public Transport and
- Megawatts of renewable energy capacity consented

It is envisaged that more effective Outcomes might include:

- Carbon reduction in buildings
- Reduction of business mileage

Legislative Drivers

- The Climate Change (Scotland) Act 2009 contains the world's most stringent targets for the reduction of Greenhouse Gases (GHG's). Scottish legislators have set a reduction target of 42% reduction in GHGs by 2020, and 80% reduction by 2050. As a local authority, DGC has a legal responsibility to act sustainably towards these targets as well as deliver Climate Change Adaptation plans.
- The Climate Change Delivery Plan sets out the high level measures required in each sector to meet the statutory emissions reductions targets set out in the Climate Change (Scotland) Act 2009 for 2020 and 2050.

Three of the four transformational outcomes which the Scottish Government is working towards through the Climate Change Delivery Plan are relevant to CMP2. They are:

- A largely de-carbonised electricity generation sector by 2030, primarily using renewable sources for electricity generation with other electricity generation from fossil fuelled plants utilising carbon capture and storage.
- A largely de-carbonised heat sector by 2050 with significant progress by 2030 through a combination of reduced demand and energy efficiency, together with a massive increase in the use of renewable or low carbon heating.
- Almost complete decarbonisation of road transport by 2050 with significant progress by 2030 through wholesale adoption of electric cars and vans, and significant decarbonisation of rail by 2050.

Most sectors have seen a reduction in carbon emissions since 1990 except for transport where emissions were 7% higher in 2008 than in 1990, accounting for 22% of Scottish emissions in 2008.

- Our Council, along with every other Scottish local authority has, since 2007, been a signatory to the Scottish Climate Change Declaration. In it, our Council acknowledges the reality and importance of climate change, commits to mitigate our impact by reducing emissions and to work with communities to react to the effect. An annual report on our performance in regard to this Declaration is presented to Councillors in October of each year and must be published by our Council and on the Climate Change Declaration website <http://climatechange.sustainable-scotland.net/>
- Waste (Scotland) Regulations 2011 – The Waste (Scotland) Regulation 2011.SS1 2011/226, which transposes the EU Waste Framework Directive (2008/98/EC) into Scots law.
- Scotland's Zero Waste Plan – This sets out the Scottish Government's vision for a zero waste society in Scotland. This vision describes Scotland where all waste is seen as a resource, waste is minimised, valuable resources are not disposed of in landfills, and most waste is sorted, leaving only limited amounts to be treated.

- European Union (EU) Waste Framework Directive 2010 - The EU has a framework for coordinating waste management in the Member States to limit the generation of waste and to optimise the organisation of waste treatment disposal.
- The 2009 Audit of Best Value and Community Planning for our Council pointed to several examples of good practice in regards to Sustainable Development in our Council but found that it was 'not an integral part of service planning and delivery across our Council as a whole.' The completion of a quality CMP is a key step in rectifying this situation.
- The cost of landfill tax has increased from £32 per tonne of waste in 2008/9 to the current rate of £56 per tonne. Based on the landfill escalator, the cost of landfill tax will be £80 per tonne in 2014/15 and will not fall below this between 2014/15 and 2019/20.
- The cost of energy has risen by 120% since 2003/4. With this trend set to continue, DGC must take steps to minimise the impact this will have on Council energy bills. From the baseline year of 2008/9 to 2010/11 Council energy usage increased from approximately 100 million kWh to 109 million kWh. Furthermore, energy costs increased by 120% from 2005 to 2011. These increases, coupled with CRC charges, have left our Council's combined bills for energy and water at £9 million in 2011. There are clear indications that energy costs will continue to rise. Energy efficiency measures detailed in the CMP projects will contribute to money savings as well as carbon savings. Furthermore, cultural change and awareness programmes aim to reduce the rate of energy consumption by our Council as a whole.

Financial Drivers

- Since October 2010, the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) constitutes a tax on carbon, whereby a charge is levied on all organisations to cover all organisations using more than 6,000MWh per year of electricity (equivalent to an annual electricity bill of approximately £500,000). Our Council falls within this category and from 2012 on will pay £12 per tonne of CO₂ we emit. This will equate to an estimated £350,000 in the first year (2012), on top of our current energy bills. The price paid per tonne of carbon is set to increase and is predicted to reach £30 per tonne by 2020.

Figure 1 below shows the overall consumption of energy by our Council over the last 12 years which remains reasonably flat together with the cost of power which has risen dramatically since 2003/4.

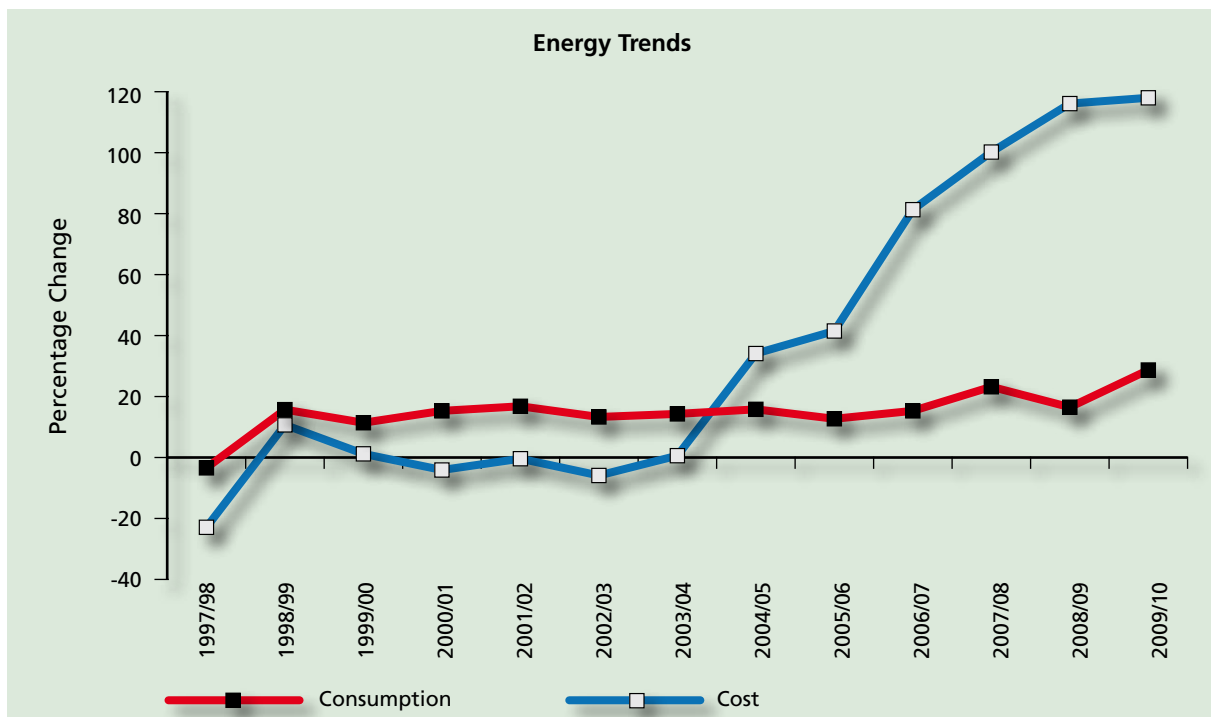


Figure 1: Energy consumption and cost trends within DGC from 1997 to 2011.

2.2 Our Low Carbon Vision Collective

Vision

Our vision is that Dumfries and Galloway Council will reduce its carbon footprint by integrating carbon management into its strategies and operational procedures. Through this, we can provide an exemplary lead to the public and partners in our journey towards a 'low carbon future'.

2.3 Strategic Themes

2.3.1 Functional Areas through which Emissions Savings will be made

These are:

- Energy consumption in buildings
- Transport
- Street lighting
- Waste
- Water

2.3.2 Achieving Emissions Reductions; Strategic Partnerships

Strategic partnerships with key departments are being developed as part of the move towards our required emissions reduction. The key partnerships, broken down by functional area are:

- Building Management
 - Strategic Property Services, Energy and Carbon Management, DG Design.
 - Specific to schools
Eco-Schools as well as other parties associated with PPP schools in order to address issues relating to energy performance therein.

As renewable technologies are considered for providing energy to Council buildings partnerships will also be built with third party renewable companies and the Planning Department.

- Transport
 - Fleet Services, Transport Scotland
The move of fleet services from DG First to Planning and Environment Services (PES) in October 2011 means all Council transport departments have been streamlined into one service and as such should operate more efficiently.
- Street Lighting
 - Street Lighting, Traffic Engineering
- Waste
 - Waste Management, Planning and Environment Services (PES), DG First, Shanks Waste Management, Ener-g, Natural Power, Zero Waste Scotland and the European Recycling Platform (ERP).

- Water
 - Strategic Property Services, Energy and Carbon Management, Scottish Water

In addition, our Council is working with Community Planning Partners to identify opportunities to share expertise and experience to help reduce carbon emissions. An example of this is the provision of an electric car which belongs to DGC fleet for use by the NHS at Dumfries and Galloway Royal Infirmary.

Dumfries and Galloway are in the unique position of the Police and Fire and Rescue Services having their own CMPs but still forming part of the baseline of this plan and falling under our Council's jurisdiction for CRC. Owing to this, a close working partnership will be encouraged between our Council and these two bodies.

2.3.3 Changing Existing Policies and Procedures and Creation of New Policies

1 Existing Policies

Recommendations contained within our Council's Energy and Carbon Policy.

Our Council's Energy Policy has been amended and is now entitled 'Energy and Carbon Policy'. It can be seen in Appendix D. Existing recommendations contained within this document which require reinforcement and implementation include:

- Making provision within our Council's capital and revenue budgets for an appropriate level of investment in energy conservation measures subject to availability of financial resources.
- Implementation of programmes of physical and management measures to reduce energy consumption in accordance with our Council's Carbon Management Plan.

The above two recommendations will include implementing the recommendations listed on Energy Performance Certificates which our Council hold for buildings of more than 1000m². They are critical for reducing carbon emissions in themselves, but also for ensuring our buildings are of a suitable standard to be eligible for the Feed in Tariff (FIT) and Renewable Heat Incentive (RHI) should renewable technologies be installed.

- Promoting good design practice in our Council's capital and revenue programme to reduce energy consumption.

Good design practice should entail priority for lifetime costing and minimising carbon emissions. Again new builds should be of a minimum standard to ensure they are eligible for the FIT and RHI financial incentive schemes associated with any renewable technologies which may be installed.

- Acceptance that the Building Regulations are a minimum standard and design and construct all new or refurbish Council buildings to perform at least 10% better than current Building Regulations to reduce energy usage and contribute to a reduction in our Council's energy footprint
- Agreement that the maximum temperature for heating in all Council buildings will be 21°C unless there are special needs of the occupants.
- Agreement that all supplementary electric heaters are removed from Council buildings and only re-introduced where it is proven that the existing heating system cannot provide an occupancy temperature of 19°C within one hour of starting work.
- Monthly meter readings for all Council properties are necessary to comply with legal requirements. All services will ensure that monthly meter readings for all utilities are provided for all buildings under their control.

Existing Waste Policies

- Corporate Waste Management Strategy
This strategy details our Council's vision for sustainable waste management solutions with a strong emphasis on waste prevention, recovery of resources from waste and the diversion of waste from landfill, particularly biodegradable waste.
- Halving construction waste to landfill
Our Council will endeavour to halve the amount of construction waste which is sent to landfill based on the commitment promoted by Zero Waste Scotland and signed by our Council in September 2011.

2 Proposed Policies

Policies contained within our Council's Energy and Carbon Policy

The following policies are proposed as part of our Council's Energy and Carbon Policy, shown in Appendix D.

- As a matter of course, new buildings should be designed to include or accommodate renewable technologies with a view to reducing our Council's carbon emissions. It must be noted that use of electricity purchased from a utility supplier using renewable sources will not be considered a substitute for this.
- Equipping buildings undergoing refurbishment with the capacity to accommodate renewable technologies where appropriate, for the same reasons as outlined above.

- Progressive devolvement of responsibility for energy consumption to local managers and provision of full support through the use of target profiles, monitoring and diagnostic advice.
- Assisting local managers to encourage, involve and motivate building users and staff to save energy and reduce carbon emissions by means of training, publicity and where appropriate incentives.
- Agreement that all heating within Council buildings will be turned off during the summer which for this purpose is from 1st June to 15th Sept each year.

Proposed policies relating to energy consumption not included in the Energy and Carbon Policy but which are recommended through their carbon reducing capacity are:

- Where there is a refurbishment programme to upgrade lighting in or associated with Council buildings the most energy efficient lighting available at that time will be installed.
- Life time costing of all projects and proposals should be considered in all new works and major decisions undertaken by our Council so that short term capital savings do not lead to long term revenue cost.

Proposed Waste Policies

- Route optimisation of waste collection services.
This will develop more efficient collection routes for refuse collection vehicles and minimise transport costs.

Proposed Transport Policies

- Car Share Initiative for Council Pool Car Fleet
Plans are underway to introduce a car share initiative for staff using Council pool car vehicles. This may also be aided by a new application on Council GIS application, which will calculate quickest route and the emissions associated.

Proposed Street Lighting Policies

A street lighting policy is required which ensures any repair, refurbishment or replacement programme replacing lights with the lowest energy alternative taking factors such as illumination requirements and whole life costs into account.

2.3.4 Creation of New Functions, Responsibilities and Posts

- Responsibility for energy billing will be moved from Strategic Property Services to Energy and Carbon Management, meaning this department will be solely responsible for all energy matters. This will ensure more efficient functioning of this service and clarity of energy data, essential

for reporting on the CRC. Clarity of energy data is also critical for plans to devolve energy management to departmental level

- One member of staff per building will be appointed as an 'Energy Representative', with the duty of encouraging staff to comply with energy policies and general good energy housekeeping.
- It is proposed that energy and carbon management duties will be included as indicators in Council business plans and job descriptions and as such will be linked to performance. Using this strategy working units and staff will have to demonstrate energy efficient working practices to achieve their annual objectives. A programme of building upgrades will be undertaken to reduce CO_{2E} emissions resulting from energy use on a list of priority buildings. Improvements will include initiatives such as insulation, secondary double glazing, low energy lighting, replacement heating systems, advanced heating controls and renewable technologies such as solar panels and so on as appropriate. The start of the programme will require for existing data held on Council buildings to be augmented beyond the scope of EPCs. Time should be allocated for (a) qualified person(s) to complete this task during project development processes.

2.3.5 Allocation of Budgets

1 Existing Internal Funds

- Buildings – Energy Consumption
 - Central Energy Efficiency Fund (CEEF)

This is an interest-free loan funded through Scottish Government and administered through the Energy and Carbon Management team. It is intended to fund carbon emission reduction projects related to energy efficiency which can demonstrate sufficient carbon savings to ensure payback within seven years for general improvement projects and 10 years for investment in renewable technologies.

Dumfries and Galloway Council has a total allocation of £300,000 under CEEF. An example of the type of project which has been funded through CEEF is the installation of efficient cooling chillers for servers at Monreith House. It is assumed that CEEF will continue to constitute an important funding source in the future.
 - Capital Maintenance Block Funding

This is our Council's main fund for maintenance and upgrade of its building stock. Spend is prioritised by the Asset Management Plan and can be augmented

as appropriate by CEEF. Energy efficiency is one of the parameters used in the decision making process to prioritise work carried out.

CEEF and the Capital Maintenance Block Funding can also be used to install micro renewable technologies, such as solar panels, on Council buildings.

- Street Lighting
 - Capital Funding, Revenue Funding

These are used variously for renewing existing fittings, electricity costs, maintenance etc.
 - Area Committee Funding

Committee funding is occasionally secured to fund various projects in street lighting across the region
- Transport
 - Revenue Funding
- Waste
 - The Waste Management Revenue Budget includes the former Waste Management Revenue Budget, the former Strategic Waste Fund and the Scottish Government Level Playing Field support
 - Certain capital and revenue funding is accessed through the Zero Waste Fund from the Scottish Government.

2 Investment Incentives

The cost of investment in renewable technologies can be supported by two government-run incentive schemes designed to increase uptake of carbon efficient heating and power generation equipment. These are the Feed in Tariff (FIT) and the Renewable Heat Incentive (RHI).

- The FIT scheme provides financial support to encourage the installation of renewable electricity generation equipment such as solar photovoltaic cells, wind turbines or hydro schemes. The payments last for up to 25 years and are index-linked to the Retail Price Index (RPI). They will be paid on a sliding scale with the earliest adopters receiving the highest payments.
- The RHI scheme supports the uptake of heat generation plant equipment which uses renewable fuels to generate heat to keep houses, offices and other buildings warm. These include ground source heat pumps, biomass (wood pellet, log and chip) solar thermal and biomethane systems. The payments are made for up to 20 years, again are RPI linked and again will provide the maximum benefit to early adopters. This scheme is only applicable to properties without access to mains gas such as rural areas dependent on oil, apart from in the case of solar thermal panels.

Both schemes can significantly reduce the payments periods for renewable technologies. To maximise financial returns, a detailed understanding of the technologies, the proposed site and the incentive mechanisms is required. Eligibility to the schemes requires that buildings are of a minimum standard of energy efficiency, so it is critical we invest to upgrade buildings in this regard if we are to benefit from the incentives.

3 External Grants and Support

Carbon Trust

Carbon Trust operates a public sector support programme which helps to fund a proportion of the cost of research works on technical issues associated with the carbon impact of climate change mitigation. The Carbon Trust have contributed 75% of the cost of this CMP review project.

Transport Scotland

Transport Scotland is the national transport agency for Scotland. It has responsibility for rail and trunk road networks, ferries ports and harbours and local roads policy, amongst other things.

Zero Waste Scotland

Zero Waste Scotland provides support to Councils on a range of issues from technical support to assistance with campaigns. There is dedicated support to local authorities through the Local Authority Support Manager and a number of other resources, both internal and via contact third parties that Councils can draw upon to help them shape their services and support the necessary changes that are likely to be required to meet the Zero Waste Plan.

2.3.6 Communicating Progress, Involving Staff

1 Cultural Change Programme

A cultural change programme has been initiated to reduce energy consumption in buildings through staff behaviour change. This is presently run on an informal basis with members of the Sustainable Development and Energy and Carbon Management (SDECM) team presenting at team meetings on our Council's obligations to reduce energy consumption and how best to achieve energy reduction in the work place. A proposal is currently being considered to formalise this training and link it to performance indicators in business plans and staff job descriptions. Work is ongoing with Business Planning and the Training Department to devise the best strategy for this project. This may include E-training and training of management staff.

2 Communications Strategy

The proposed plan for communicating carbon management, including progress towards the vision and targets set out in this plan is shown in Appendix A. Engaging with staff from all departments within our Council is critical for our Council to achieve significant carbon reductions. The Carbon Trust workshops 'Embedding Carbon Management' and 'Change Management' are targeted at the Corporate Management Team

and Operations Managers respectively and aim to ensure buy-in for carbon management at a strategic level and commitment to lead on behavioural change throughout the organisation.

CMP2 will be brought before Council ensuring elected members are fully informed and armed to support the Plan.

CMP2 will be launched to staff using a variety of communication methods including either presentation directly from the SDECM team or through downward cascade from management. Hard copies of the full Plan, pamphlets and cards containing key messages will be distributed and the Plan and key messages will be disseminated through our Council's intranet. In addition, the proposed Energy Awareness training programme for managers and continued presence of the SDECM team at staff team meetings will promote the CMP to staff across our Council along with key messages of energy efficiency in the work place. Staff in new buildings which feature carbon cutting measures such as Beattock Primary or in existing buildings where carbon reducing upgrades have taken place will also receive training on CMP2.

Successful reduction of emissions also requires each department to take responsibility for their own energy use. Energy Representatives will be appointed to promote efficient energy practice within individual buildings. Managers will help ensure levels of energy use/consumption are communicated to staff and Council energy policies and general good energy housekeeping practices are complied with.

In schools, the SDECM team will continue to promote Energy Awareness through provision of teacher Continued Professional Development (CDP) and liaison with third part organisations such as Eco-Schools and Carbon Busters.

The Communications Strategy for CMP2 will be reviewed on a 6-monthly basis so that communication messages can be prioritised as CMP2 activities continue and evolve.

As CMP2 now includes all Municipal Solid Waste (MSW) (see Appendix B for detail of what is included in MSW) the Waste Management Communications Plan, led and implemented by Waste Management, PES, will assist in engaging households to reduce CO_{2e} emissions related to household waste arisings. Communication to householders regarding waste includes provision of information about waste prevention (reduce and reuse), recycling and recovery. This information is distributed through leaflets, Broadcast, web-based information, at Recycling Centres, Customer Service Centres, waste events, visits to the Ecodeco waste treatment facility and through specific waste projects being implemented (such as the planned Waste Electrical and Electronic Equipment (WEEE) recycling project in Annandale and Eskdale).

3 Emissions Baseline and Projections

3.1 Scope

The scope of emissions sources considered in measuring the emissions baseline is as follows:

- Buildings energy consumption: consumption in all Council buildings throughout the region including offices, schools, day care centres, community centres, depots, fire stations and police stations.
- Street lighting: all Council street lighting, traffic signals and road signs throughout Dumfries and Galloway (although these components are managed by distinct departments within DGC)
- Transport: all travel done by staff on business, using fleet vehicles or by other means. All mileage covered by plant machinery. Travel covered by the Police and Fire and Rescue services.
- Waste: Council internal waste arisings and Municipal Solid Waste (MSW)
- Water: all water used by our Council

The scope of CMP2 includes the carbon footprints of the Police and Fire and Rescue services within Dumfries and Galloway as detailed in their respective CMPs.

Changes in Scope of CMP2 Compared with CMP1

The scope of the baseline has not changed between CMP1 and CMP2 except in the functional area of waste. The CMP1 waste section was based on waste arisings from Council generated internal waste arisings only, estimated with a baseline of 2,359 tCO_{2E}. CMP2 has a different scope, and includes Council generated internal waste arisings as well as all MSW arisings. It should be noted that neither CMP1 nor CMP2 have included CO_{2E} emissions from the five landfill sites which are managed by DGC, or the emissions savings from the Lochar Moss landfill site gas management systems. Further details of our Council's waste management activities not included in the scope of CMP2 are given in Appendix B, along with a description of the Carbon Trust method of calculating carbon emissions associated with waste landfilled.

3.2 Baseline

CMP2 uses a 2008/9 financial year as a baseline. The baseline has been developed as part of the review of CMP1 and identifies a baseline tonnage of 64,318 tCO_{2E}. It should be noted that the baseline figures for Police and Fire and Rescue are from

2009/10, the baseline year in their respective CMPs. Table 1 illustrates the breakdown of emissions from different sources with associated costs.

	Total	Buildings	Street Lighting	Transport	Waste	Water
Baseline CO ₂ emissions (tCO _{2E})	64,318	32,002	3,922	6,612	21,542	240
Baseline Cost (£)	20,792,411	4,962,662	542,008	644,430	13,455,311	1,188,000

Table 1 – Summary table of emissions and costs associated for baseline year 2008/9.

Costs comprise:

- Buildings – heating and electricity costs
- Street Lighting – electricity costs of street lighting, traffic signals and road signs
- Transport – diesel and petrol costs
- Waste – all costs associated with collection and disposal of waste defined in the scope
- Water – energy costs in processing and pumping water used by our Council.

DGC Carbon footprint
baseline 2008/09:

64,318 tCO_{2E}

Baseline Carbon Footprint 2008/09

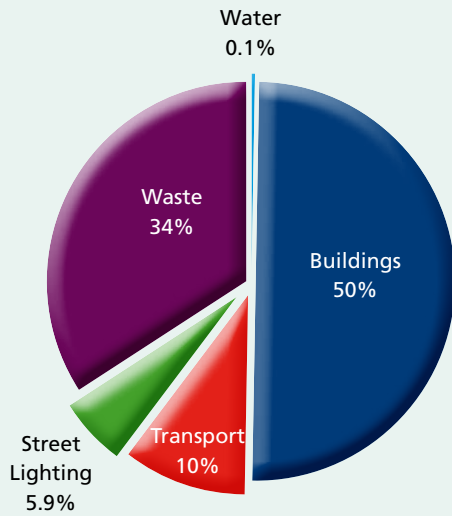


Figure 2: The breakdown of the 2008/9 baseline which forms the basis for the Carbon Management Plan

It should also be noted that the baseline years for CMP2 and the Carbon Reduction Commitment (CRC) are distinct, being 2008/9 and 2010/11 respectively. The progress of CMP2 will be reported annually, aiming for the first progress report to be presented in December 2012. At this time, carbon emissions for 2009/10, 2010/11 and 2011/12 will be reported. Figures from 2010/11 onwards will be in line with the figures reported through CRC.

Figure 3 shows the sources of our Council's carbon emissions as broken down by functional area.

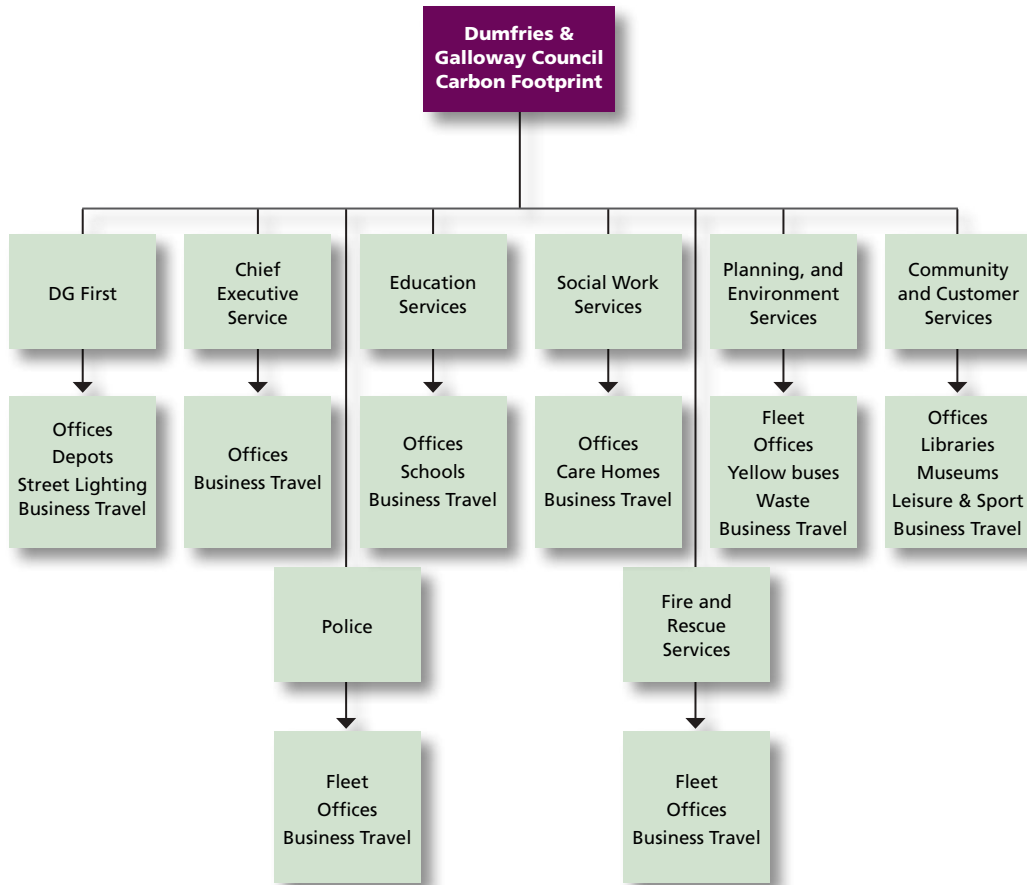


Figure 3: Dumfries and Galloway Council structure showing sources of carbon per service.

Please note, plans are in place to disaggregate the Police and Fire and Rescue Services from Dumfries and Galloway Council.

3.3 Targets and Objectives

Interim 2014/15 and Long Term 2019/20 Target

DGC will reduce the CO_{2e} emissions from its activities by 20% of the 2008/9 baseline by 2014/15 and 42% of the 2008/9 baseline by 2019/20. The 42% target is in line with the 2020 target set out in the Climate Change (Scotland) Act 2009 for Scotland. Setting an interim term (2014/15) and

long term (2019/20) target emphasises the need for continuous and sustained action to reduce emissions in line with the public sector duties.

Tables 2 and 3 display the 2014/5 and 2019/20 carbon reduction targets respectively for each functional area.

Functional Area	2008/9 Baseline (tCO _{2e})	2014/15 Reduction target %	2014/15 Reduction target (tCO _{2e})
Whole Footprint	64,318	20%	12,863
Buildings	32,002	20%	6,400
Street lighting	3,923	20%	785
Transport	6,612	20%	1,322
Waste	21,542	20%	4,308
Water	240	20%	48

Table 2: 2014/15 (interim) carbon reduction targets represented as percentages and tonnes CO_{2e} overall and per functional area.

Functional Area	2008/9 Baseline (tCO _{2e})	2019/20 Reduction Target %	2019/20 Reduction Target (tCO _{2e})
Whole Footprint	64,318	42%	27,014
Buildings	32,002	42%	13,441
Street lighting	3,923	42%	1,648
Transport	6,612	42%	2,777
Waste	21,542	42%	9,048
Water	240	42%	101

Table 3: 2019/20 (long term) carbon reduction targets represented as percentages and tonnes CO_{2e} overall and per functional area.



3.4 Projections and Value at Stake

Figures 4 and 5 show the trends in CO_{2e} emissions (figure 4) and the costs associated with these emissions (figure 5) respectively. Based on a Business As Usual (BAU) model, the red lines indicates what will happen if DGC takes no measures to reduce its carbon emissions and show that by 2019/20 we could be producing just under 70,000 tCO_{2e} emissions through Council activities at a cost of approximately £35 million per annum allowing for inflation.

The target line in blue is based on the 2014/15, 20% carbon reduction target and the 2019/20 42% carbon reduction target. If progress towards our target is actively pursued, emissions should, of course, fall (figure 4). However it is anticipated that

the cost associated with this emissions reduction will have risen by approximately £2 million by 2019/20. Therefore, even if the carbon reduction target is met the absolute cost of the emissions will have risen by 2019/20. The BAU scenario will see the cost rise with an even steeper trajectory though, as can be seen from figure 5, with a difference of approximately £14 million from the targeted cost by 2019/20 (the 'value at stake'). This in itself is significant justification for action through the carbon management programme.

For the purposes of these estimated projections, an annual inflation allowance of 10% for gas and electricity and 5% for liquid fuels has been made.

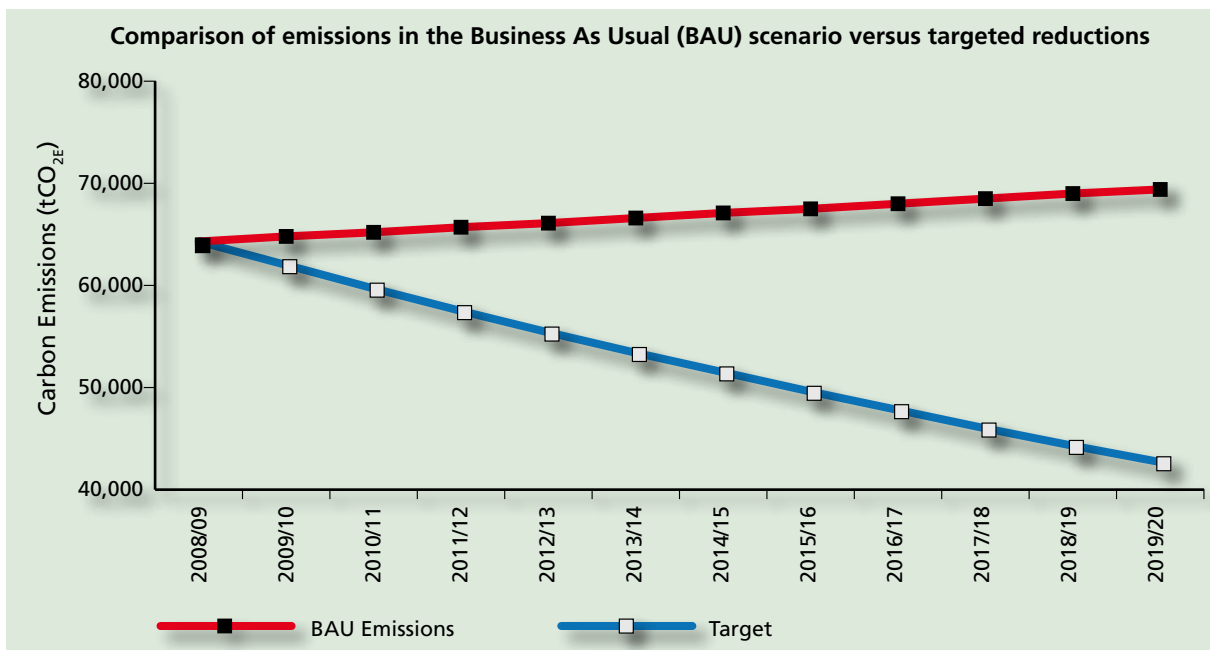


Figure 4: Emissions following the Business and Usual (BAU) scenario compared with reducing emissions to target levels

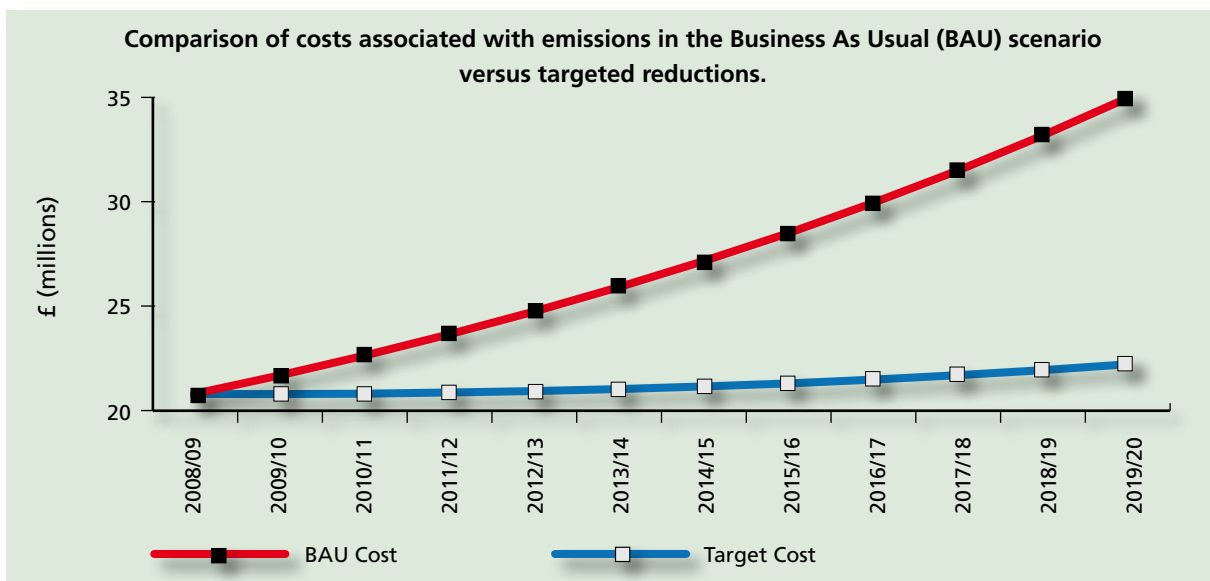


Figure 5: Costs associated with emissions following the Business As usual (BAU) scenario compared with reducing emissions to target levels

4 Carbon Management Projects

4.1 Project Lists

Tables 4 to 7 below list the carbon reduction projects which currently are known to exist in or are planned by our Council.

Existing Projects

Table 4 shows existing projects. The table captures projects which were initiated between the 08/09 baseline and the time of writing CMP2 in October 2011. These projects may have been completed within this timescale, may have a completion date beyond October 2011 or may be ongoing.

Planned/Funded Projects

Table 5 contains planned or funded projects, which are those which had not been initiated by the time of writing in October 2011 but for which finances have been allocated.

Near Term and Long Term Projects

Tables 6 and 7 contain projects which are proposed but have not necessarily been approved or given financial consent. Table 6 contains near term proposed projects, or those proposed for 2011/12 (except for Fire and Rescue whose near term projects are proposed for 2013) and table 7 projects

proposed for the medium to long term, between 2012/13 and 2020.

The carbon and financial savings given in tables 4 to 7 are estimates which have been made on a project by project basis. The estimate made for the energy reducing capacity of roof insulation in one building may differ from that of another because factors such as the proportion of roof space insulated and depth of insulation have been considered. Furthermore, some of the projects listed may have been part of a wider refurbishment programme which has had a saving of carbon emissions as a side benefit. In this case the cost of the project may appear disproportionate to the carbon and associated financial savings.

The project lists are dynamic and will be amended as new projects are planned or become known; for example, a general spend-to-save upgrade of Council buildings is called for, but as the structure of this programme has not been defined it does not appear in the project tables. A fuller explanation of examples of the projects appearing in the tables below is given in Appendix C.

4.1.1 Table 4: Existing Projects

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
Buildings EB1	Ryan Leisure Centre, Variable Speed Drive on Pumps	John Currie	£4,100	£0	£1,079	7.3	NA	3.8	2008/9
EB2	Market Street, Castle Douglas, Boiler Replacement	Keith Rae	£42,763	£0	£600	3.7	NA	NA	2008/9-2009/10
EB3	Woodbank, Oil to Gas Boiler Replacement and Improvement of Boiler Controls	Keith Rae	£98,904	£0	£9,000	25	NA	11	2009/10
EB4	Lockerbie Town Hall, Insulation, Boiler Replacement and Improvement of Boiler Controls	Sue Best/ Keith Rae	Insulation £4000, boiler replacement and controls £103,882	£0	£5,400	33	NA	NA	2009/10

Dumfries and Galloway Council Carbon Management Programme

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
EB5	Woodbank, Draft Proofing Windows	Angela Lamont	£2,763	£0	£397	2.2	NA	7	2010/11
EB6	Penningham Centre, Improvement of Boiler Controls	John Currie	£900	£0	£807	3	NA	1.1	2010/11
EB7	Various Buildings: T8 to T5 lightbulb replacement	John Currie	£2,000	£0	£784	5.3	NA	2.5	2011/12
EB8	Municipal Chambers, 90% Low Energy Lighting, Draft Strips	Sue Best	Lighting £90,000, draft stripping £10,000	£0	£1,440	9.7	NA	NA	2011/12
EB9	Old Bridge House, 100% Roof Insulation, Low Energy Lighting	Sue Best	Insulation £600, lighting £1800	£0	£168	1.1	NA	NA	2011/12
EB10	DG1 Leisure Centre, Inverter Drives/Control Improvement	John Currie	£23,553	£0	£10,203	69	NA	2.3	2011/12
EB11 *	Estate Rationalisation Phase I	Peter Nelson	£92,500 per annum (£185,000) by 2010/11 **	£0	£16,795 per annum (£33,590 by 2010/11) **	110 per annum (220 by 2010/11) **	NA	11	2008/9-2010/11
Schools EBS1	New Abbey Primary Lighting Upgrade	John Currie	£1,890	£0	£170	1.1	NA	11.1	2008/9
EBS2	Penpont Primary, Loft Insulation	John Currie	£2,019	£0	£434	2.1	NA	4.6	2008/9
EBS3	Cargenbridge & Lincluden Primaries, Biomass Boilers	Sue Best	£35,000 per school	£3,305 per school	£0	34	RHI 20 year income £167,422 per school † † †	NA	2009/10
EBS4	Lincluden & Troqueer Primaries, Solar Thermal Panels	Stuart Wixon	£70,400	£0	£1,368	21.5	RHI 20 year income £81,784 † † †	18	2009/10

Carbon Management Plan 2 and Climate Change Action Plan

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2E} Saving (tonnes)			
EBS5	Cargenbridge Primary, Solar Thermal Panels	Stuart Wixon	£24,640	£0	£485	7.5	RHI 20 year income £28,624 † † †	19	2009/10
EBS6	St Columbas Primary, Roof Insulation	Sue Best	£120,000	£0	£360	1.7	NA	NA	2009/10
EBS7	Langholm Primary, 85% Window Replacement	Sue Best	£32,080	£0	£88	1	NA	NA	2009/10
EBS8	Whithorn Primary, 60% Window Replacement	Sue Best	£17,391	£0	£218	1	NA	NA	2009/10
EBS9	Johnstonebridge Primary, Low Energy Lighting	Sue Best/ Keith Rae	£41,595	£0	£288	1.9	NA	NA	2009/10
EBS10	Laurieknowe Primary, Insulation	Sue Best	£58,000	£0	£180	1.1	NA	NA	2010/11
EBS11	Kirkcowan Primary, Insulation	Peter Nelson/Sue Best	£6,000	£0	£315	1.4	NA	NA	2010/11
EBS12	Garlieston Primary, Insulation	Sue Best	£35,000	£0	£61	0.3	NA	NA	2010/11
EBS13	Castle Kennedy Primary, Replacement of 15 windows	Sue Best	£19,747	£0	£231	1.5	NA	NA	2010/11
EBS14	Colvend Primary, Overcladding of Portacabin	Peter Nelson	£52,000	£0	£399	2.7	NA	NA	2010/11
EBS15	Dalbeattie Primary, Partial Building Refurbishment	Peter Nelson	£160,000	£0	£68	0.4	NA	NA	2010/11
EBS16	Garlieston Primary, Window Improvement and Secondary Double Glazing	Peter Nelson	£40,000	£0	£1,448	6.1	NA	28	2010/11
EBS17	Johnstonebridge Primary, Window Replacement	Peter Nelson	£35,000	£0	£518	3.5	NA	68	2010/11

Dumfries and Galloway Council Carbon Management Programme

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
EBS18	St Columbas Primary, Boiler Replacement	Peter Nelson	£30,000	£0	£1,080	4.5	NA	28	2010/11
EBS19	St Joseph's Primary, Stranraer, Insulated Render on External Walls	Peter Nelson	£148,815	£0	£780	3.3	NA	NA	2010/11
EBS20	Twynholm Primary, Window and Door Replacement	Peter Nelson	£45,000	£0	£1,552	6.5	NA	29	2010/11
EBS21	St. Ninian's Primary, 33% Roof Insulation	Sue Best	£36,306	£0	£825	3.5	NA	NA	2010/11
EBS22	Hottsbridge Primary, 85% Window Replacement	Sue Best	£8,244	£0	336	2.3	NA	NA	2010/11
EBS23	Noble Hill Primary, Improvement of Boiler Controls	John Currie	£2,000	£0	£489	3	NA	4.1	2010/11
EBS24	Beattock Primary Solar Thermal Panels	Peter Nelson	£9,600	£0	£324	1.4	RHI income after 20 years, £11,152 +++	17	2011/12
EBS25	Beattock Primary, Installation of Biomass Boiler	Alan Hewitt	£45,000	£3,832	£0	19	RHI income after 20 years, £194,115 +++	4.5	2011/12
EBS26	Beattock Primary Solar Photovoltaic Panels	Stuart Martin	£120,000	£0	£2,560	17.2	FIT income after 25 years, £337,215	10.5	2011/12
EBS27	Kirkcolm Primary, Installation of Wet Heating and Biomass Boiler	Peter Nelson	£106,000	£1,280	£9,232	71	RHI Income after 20 years £189,262 +++	11.5	2011/12
Transport ET1	Establishment of Pool Car Fleet	Shelley Sloan	£344,264	£352,169	£72,337	947	NA	4.8	2009/10

Carbon Management Plan 2 and Climate Change Action Plan

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2E} Saving (tonnes)			
ET2	Electric Cars	Shelley Sloan	£210,056	TBC	£5,580	9.3	NA	19	2011/12
ET3	Electric Road sweeper	Shelley Sloan	£117,409	£4,819	£359	1.6	NA	NA	2010/11
Technology Solutions ETS1	Free Cooling in Server Rooms	Graeme McIlorum	£155,500	£60,000	£20,000	135	NA	3.6	2008/9
ETS2	Virtual Servers	Graeme McIlorum	£255,000	£0	£18,370	124	NA	13.9	2009/10
ETS3	Print Strategy	Kenny Wallace/ Donna Maxwell	£0	£0	£3000 -£8000 per building	27	NA	NA	2009/10- 2013/14
Sustainable Development ESD1	Cultural Change Programme	Chris Wood-Gee	£20,000 per annum (80,000 by 2014/15)	£200 per annum (£800 by 2014/15) **	£44,969 per annum (£179,876 by 2014/15) **	296 per annum (1,184 by 2014/15) **	NA	0.45	2014/15
Waste EW1	Zero Waste Investment Plan	Greig Blaney	£6,669,000	TBC	£643,000	12,576 †	NA	10.5	2008/9- 2013/14
EW2	Waste Prevention and Waste Communication Programme	Moira Weatherup	£0	£50,000	£345,000	Linked to EW1 figure through reduction in waste arisings	NA	See EW1 above	2009/10- 2010/11
EW3	Withdrawal of Blue Box Scheme	Alistair Speedie	£0	£0	£25,895	59.2	NA	NA	2009/10
Street Lighting ESL1 †	Newton Stewart, Riverside Walk, low energy street lights	Calum Edgar	£0 † †	NA	£139	0.9	NA	NA	2011/12
ESL2	Dumfries Irish Street, low energy street lights	Calum Edgar	£2,600	NA	£93	0.6	NA	NA	2011/12
Police EP1	Police Projects 2010	Nicola Challis	£87,456	£1,780	£65,650	267	NA	1.3	2010
Fire & Rescue EF1	Fire and Rescue Projects 2010	Neville Wright	£25,000	£0	£4,417	1.2	NA	6	2010

Notes for Tables 4-7

* This project is split into Phase I, II and III for the purposes of this plan only. Phase I reflects the part of the project completed at the time of writing (2008/9-2010/11). Phase II (Table 7, MB1) reflects the part of the project which impacts on the 2014/15 target (2010/11-2014/15) and phase III (Table 7, MB2) the part which impacts on the 2019/20 long term target (2014/15-2019/20).

** These projects are staggered over the period given (in the 'Year' column) meaning they have cumulative costs and savings at the end of the period they run for. Both annual and cumulative figures are represented in the tables. The annual figures presented are average figures.

† This figure represents the annual saving which will be made in 2013/14.

† † The zero cost associated with this project is due to the lights having to be replaced anyway because of vandalism, so the cost is internalised.

† † † The Renewable Heat Incentive (RHI) was under consultation during the writing of this plan so the figures given are estimates based on July 2010 figures. RHI has been available for local authority properties since November 2011.

† † † † This refurbishment project is split into Phase I and II for the purpose of CMP2 only, to reflect the time frames of the interim 2014/15 target and long term 2019/20 target respectively.

4.1.2 Table 5: Planned / Funded projects

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
Buildings PB1	Cargen Towers, Solar Photovoltaic Panels	Ian Wallace, Owner of Cargen Towers	£0	£0	£6,536	44	NA	NA	2011/12
Street Lighting PSL1#1 † † † †	Refurbishment of traffic signals with extra low voltage (ELV) and light emitting diode (LED) lights. Phase I	Russel Wears	£19,467 per annum (£38,934 by 2014/15) **	NA	£1,254 per annum (£2508 by 2014/15) **	8.4 per annum (16.8 by 2014/15) **	NA	NA	2012/13-2014/15
Street Lighting PSL1#2 † † † †	Refurbishment of traffic signals with extra low voltage (ELV) and light emitting diode (LED) lights. Phase II	Russel Wears	£19,467 per annum (£38,934 by 2019/20) **	NA	£1,254 per annum (£6,270 by 2019/20) **	8.4 per annum (42 by 2019/20) **	NA	NA	2014/15-2019/20
Schools PBS2	Annan Academy, Installation of Biomass Boiler	Stuart Wixon	£55,000	£4,795	£0	24	RHI 20 year income £242,643 † † †	NA	2011/12
Education IT PEIT1	Automated PC Shut Down Software	John Tait	£42,200	£9,680	£5,625	34	NA	8.5	2011/12
Police PP1	Police Projects 2011	Nicola Challis	£53,000	£300	£26,815	92.4	NA	2	2011
Fire & Rescue Service PF1	Fire and Rescue Projects 2011	Neville Wright	£22,000	£500	£39,962	24	NA	0.5	2011
PF2	Fire and Rescue Projects 2012	Neville Wright	£594,000	£0	£11,640	16	NA	51	2012

4.1.3 Table 6: Near Term Projects

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
Buildings NB1	Ailsa House, Partial Refurbishment, 100% Roof Insulation	Peter Nelson/ Sue Best	£260,000	£0	£46	0.3	NA	NA	2011/12
NB2	Daar Road, Kirkcudbright, 80% Window Replacement	Peter Nelson/ Sue Best	£164,846	£0	£1,478	8	NA	NA	2011/12
NB4	Ewart Library, Roof Insulation, Possible Oil to Gas Boiler Replacement	Peter Nelson/Sue Best	£6,000	£0	£7,800	20	NA	1.4	2011/12
Schools NBS1	St. Michaels' Primary School, oil to gas conversion	Peter Nelson/Sue Best	£63,250	£0	£4,973	11.6	NA	NA	2011/12
NBS2	Troqueer Primary, Recommissioning of Biomass Boiler	Peter Nelson/Sue Best/ Keith Rae	£35,500	£3,305	£0	17	RHI 20 year income £167,424 † † †	NA	2011/12
NBS3	Langholm Primary, New Build Primary, Biomass Boiler	Peter Nelson/ Sue Best/ Keith Rae	£35,500	£3,305	£0	17	RHI 20 year income £167,424 † † †	NA	2011/12
NBS4	Maxwelton High School, Reroofing	Peter Nelson/Sue Best	£364,318	£0	£938	6	NA	NA	2011/12
NB9	Minigaff Primary School, Reroofing	Peter Nelson/ Sue Best	£298,417	£0	£498	2	NA	NA	2011/12
NBS3	St. Teresa's Primary, Reroofing Phase 2	Peter Nelson/ Sue Best	£556,475	£0	£1,560	10	NA	NA	2011/12
Street Lighting NSL1	New Luce – reduction of street light wattage	Calum Edgar	£9,200	£0	£326	2.2	NA	NA	2011/12
NSL2	Glentool – removal of street lights and reduction of wattage	Calum Edgar	£7,200	£90	£280	2.5	NA	NA	2011/12

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
Police NP1	Police Projects 2011	Nicola Challis	£35,000	TBC	£8,678	47.4	NA	4	2011
NP2	Police Projects 2012	Nicola Challis	£44,350	TBC	£29,734	80.9	NA	1.5	2012
Fire & Rescue NF1	Fire and Rescue Projects 2012	Neville Wright	£30,000	TBC	£3,923	12.5	NA	7.6	2012
NF2	Fire and Rescue Projects 2013	Neville Wright	£44,450	TBC	£14,395	63	NA	3	2013

4.1.4 Table 7: Medium to long term projects

Ref	Project	Lead	Cost		Savings		Estimated FIT/RHI Income	Payback (years)	Year
			Capital	Revenue	Estimated Annual Financial Saving	Estimated Annual CO _{2e} Saving (tonnes)			
Buildings MB1#1 *	Estate Rationalisation Phase II	Peter Nelson	£35,000 per annum (£140,000 by 2014/15) **	£0	£6,355 per annum (£25,420 by 2014/15) **	42 per annum (168 by 2014/15) **	NA	NA	2010/11-2014/15
MB1#2*	Estate Rationalisation Phase III	Peter Nelson	£35,000 per annum (£175,000 by 2019/20) **	£0	£6,355 per annum (£31,755 by 2019/20) **	42 per annum (210 by 2019/20) **	NA	NA	2014/15-2019/20
Schools MBS1	St. Ninian's Primary, Installation of Biomass Boiler	Keith Rae	£70,000	£6,610	£0	34	RHI 20 year income £750,278 + + +	NA	2012/13
MBS2	Lochmaben Primary, Installation of Biomass Boiler	Andy Robb	£140,000	£12,950	£0	66	RHI 20 year income £405,150 + + +	NA	2012/13
Policy MPO1	Enforcement of Portable Heating Ban	Chris Wood Gee	£0	£0	£24,000	161	NA	NA	2012/13
MP02	Enforcement of 21oC Max Temp Policy	Chris Wood Gee	£0	£0	£1,448	6	NA	NA	2012/13
MPO3	Summer Heating Shut Down	John Currie	£0	£0	£1,439	6	NA	NA	2012/13
Police MP1	Police Projects 2013	Nicola Challis	£139,000	TBC	£25,329	142	NA	5.48	2013
MP2	Police Projects 2014	Nicola Challis	£10,000 min	TBC	£12,487	67	NA	0.8	2014
Fire & Rescue MF1	Fire and Rescue Projects 2014	Neville Wright	£10,000 min	TBC	£2,500	0.3	NA	4	2014
MF2	Fire and Rescue Projects 2015	Neville Wright	£48,000	TBC	£9,000	14.3	NA	6	2015

4.2 Projects on a Functional Area Basis

4.2.1 Buildings – Energy Consumption

- **Generating Energy**

The installation of renewable sources of heat and electricity are planned for several Council premises. These projects include replacing schools' gas and oil heating systems with biomass boilers and the fitting of PV cells to Council roofs. These projects are important as they provide a source of non fossil fuel based energy for our Council and so reduce our carbon footprint. Funding for these projects will be supported by the FIT and RHI schemes. However, because our Council will benefit from the financial incentives accruing through FIT, savings cannot concurrently be claimed through CRC (though this does not apply for RHI). In addition, our buildings must be of a minimum standard of energy efficiency to be eligible for the FIT and RHI schemes. For these reasons, and because energy from buildings constitutes 50% of our total carbon footprint it is essential that our Council undertakes a spend-to-save programme on insulation, draft proofing etc across its built estate. This proposed programme would have to be agreed and developed through the Strategic Asset Board.

- **Reducing Energy Consumption**

- **Spend to Save**

For the reasons given in 'Generating Energy' above and because of the poor state of repair of many Council buildings, spend-to-save measures such as insulation, secondary double glazing, replacement of heating systems, upgrade of heating controls and draft proofing are strongly recommended to increase efficiency and reduce energy consumption in buildings. It is suggested that a programme of priority upgrades take place, starting with the augmentation, beyond the scope of EPCs, of existing data Council buildings so that carbon benefit associated with particular building improvements can be assessed rapidly. It is also suggested that the system for identifying spend to save needs through the repairs service be strengthened and made more transparent to ensure these measures are carried out where appropriate.

- **Policy**

It is anticipated that the enforcement of existing Council approved decisions on maximum heating temperatures and an existing policy to ban portable electric heating devices from Council premises will result in significant emissions savings. New policies, including a complete heating shut down over a defined period during the summer, will also have an impact on emissions.

- **Behaviour Change Training**

The roll-out of the behaviour change programme in its existing format and new proposed format, along with general awareness-raising among staff should also result in a reduction in emissions from Council workplaces.

- **Technology Solutions**

Significant savings have been made through projects run by Technology Solutions. These include the adoption of virtual servers and the use of free cooling to reduce the amount of air conditioning required to cool the servers.

4.2.2 Street Lighting

- **Traffic Signal Refurbishment**

The bulk of emissions reduction in street lighting will result from the Traffic Signal Refurbishment Programme where traditional 230v lights are to be replaced with 48v Extra Low Voltage (ELV)/ Light Emitting Diode (LED) lights on pedestrian crossings and traffic signal junctions. This saves 16 tCO_{2E} per pedestrian crossing and 31 tCO_{2E} per junction. The programme is to take place over a 15 year period. However, if this could be hastened it would prove financially beneficial as electricity prices are predicted to rise by 10% over the foreseeable future and energy consumption associated with street lighting is likely to be liable for CRC charges from 2014.

- **Street Light Programmes**

Other street lighting projects include reducing the wattage and number of street lights and street light dimming programmes, where the illumination capacity of lighting is reduced between certain hours. A street lighting policy is needed which ensures when any street lighting repair, refurbishment or replacement programme is carried out the lights are replaced with the lowest energy alternative taking into account considerations such as required illumination and whole life costs. Additional, more stringent measures such as night time street light switch off programmes may have to be considered if Street Lighting are to meet their target.

4.2.3 Transport

- **Staff Travel on Business; Data Capture**

In the area of staff travel, the development of an appropriate data capture system will be key in order that our Council can accurately record emissions and savings. An improved cost code system to distinguish between different modes of transport (e.g. road, rail, air travel) will provide data to correctly reflect travel patterns and emissions from this area.

- **Improvement of Our Council's Pool Car Fleet**
The acquisition of two electric vehicles for the pool fleet is the newest addition to the list of emission saving projects within fleet services. The introduction in 2009 of the fleet car system removed a significant amount emissions associated with Council staff using their own vehicles for work travel and has facilitated more complete data collection.
- **Policy and Partnerships**
The development and implementation of a transport and travel policy would enhance the carbon savings to be made both in business travel and with regard to the fleet. Furthermore, cooperation with community planning partners may see increased sharing of fleet resources with, for example, NHS Dumfries, who presently use one of the four electric vehicles.

4.2.4 Waste

- **Municipal Solid Waste (MSW) – Reducing waste arisings**
The focus will be on continuing to reduce the amount of MSW generated in the region. This aim will be achieved by waste prevention and communication initiatives to reduce and reuse waste such as home composting, grass cycling, reducing food waste and donating to furniture reuse and charity shops. It will also include monitoring and reducing the amount of commercial waste which is inappropriately disposed of at Household Waste Recycling Centres.
- **Municipal Solid Waste (MSW) – Increasing diversion from landfill**
The amount of waste sent to landfill will be reduced through increasing the performance of the Ecodeco waste treatment facility to recover resources from MSW. Diversion is also increased from improved performance at the Household Waste Recycling Centres and Recycling Points. The Zero Waste investment plan (£2.9 million) is the main programme to increase diversion from landfill.
- **Council Internal Waste Arisings**
 - In September 2011 our Council signed the Waste & Resources Action Programme (WRAP) commitment to halve the amount of construction and demolition waste to landfill. A short life working group has been established to develop a plan to satisfy the commitment and make the necessary improvements to reduce the amount of construction and demolition waste landfilled through increased recycling
 - Waste generated from our Council's parks, burial and garden services is composted or recycled where practical.

- The majority of Council-generated wheeled bin waste is processed through the Ecodeco waste treatment plant to recover resources from the waste and to reduce the amount sent to landfill.
- A reassessment of our Council's internal waste arisings categories accounted for will lead to a more complete picture of the waste arisings associated with Council activities.
- Waste Management will ensure that the Go Green section of the Connect website provides advice to Council staff on waste management procedures for internal waste arisings.

4.2.5 Water

For the purposes of this plan the principle concern in regard to water will be that our Council maximises return on our water costs. Our Council's water contract is determined by a national procurement contract through Scotland Excel and the Energy and Carbon Management (ECM) Team will continue to monitor water usage. Abnormal meter readings will be investigated and the ECM Team will coordinate a fitting response. Not only will this approach ensure optimum return on our water spend, it will also help to manage our Council's carbon footprint from water usage.

There are also a number of distinct water saving projects ongoing around our Council, e.g. grey water recycling in 2A schools, which aim to reduce water usage and thus minimise carbon footprint.

4.2.6 Community Planning Partners

The emissions of Dumfries and Galloway Constabulary as well as Dumfries and Galloway Fire and Rescue services, contained in their own respective Carbon Management Plans, form a part of our baseline. Likewise, their project savings contribute to our Council's emissions savings.

1 Police Projects

A listing of projects was compiled at the inception of the Police CMP (EP1 in 1.8: Table 3, Existing projects above) which would, it was anticipated, deliver a saving of 276.2 tCO_{2E}. The list included initiatives in buildings, technology and building rationalisation. A number of these projects have been finalised but others such as the IT Power Management Software have not. The emissions figures for the Police for year 2010/2011 have been finalised and demonstrate an increase in emissions on the baseline figure by 0.05% (127tCO_{2E}). The reasoning behind this increase is being examined by the Police Carbon Reduction Working Group, and initial findings have highlighted that not all projects have been completed and the harsh winter weather lead to an increase in energy usage. The Group is working towards increasing the frequency of monitoring emissions to a quarterly basis and prioritising of projects.

Near term projects which are awaiting funding include further building improvements and travel plans. These could contribute savings of a total of 220.6 tCO_{2E} or 1.7% of our Council's interim target.

A total of ten further emission-saving projects have been investigated and noted in the Police CMP for consideration. These include lighting retrofits and small-scale renewables.

The baseline year being used by police for their CMP is 2009/10 as opposed to that being used by our Council- 2008/09.

2 Fire and Rescue

Projects in place in 2010 reduced the Service's emissions by 1.25 tonnes and those planned for 2011 reduce it by 24 tCO_{2E}.

More significant savings will come from projects in the category of 'Near Term Projects', mostly in 2012/13. These will reduce service emissions by 86.7 tCO_{2E}. It is important to note that the entire baseline footprint of the Fire Service only amounts to 584 tCO_{2E} (which is less than 1% of our Council's footprint).

4.3 Progress Against Target

Our Council has set a 20% reduction target by 2014/15 from a baseline of 2008/9. This equates to 12,863 tonnes of CO_{2E} against a total footprint of 64,318 tCO_{2E}. These figures include the Police and Fire Services. The projects identified above combine to give savings of 8,448 tCO_{2E} or 66% of the interim 20% target.

Table 8 shows projected emissions by 2014/15 following various scenarios. Table 9 displays the anticipated achievement versus target based on the projects detailed in this plan, represented as a whole and broken down into functional areas. Although Waste are predicted to achieve 292% achievement versus target it will be taken that they have simply fulfilled their target in order that the other functional areas continue to strive to meet their targets. Our Council must acknowledge the overall 34% shortfall in achievement versus target and must investigate further measures to make this up.

It can be seen from table 9 that the areas where further carbon reductions are especially required are street lighting and buildings (energy consumption). Significant policy changes to street lighting particularly with regard to late night switch off may be needed to achieve the carbon savings required in this area. With regards to energy

consumption in buildings, it is proposed in this plan that energy responsibility be devolved to each service within our Council along with the reductions targets requires, the aim being that this new ownership will lead to greater savings. In addition, a comprehensive buildings upgrade programme improving insulation, window condition, heating controls etc to meet national standards is recommended. This would also raise our buildings to the standard needed for eligibility for the Feed In Tariff (FIT) and Renewable Heat Incentive (RHI) schemes if renewable technologies are to be installed in the future. As mentioned previously, this programme would have to be agreed through the Strategic Asset Board who would co-ordinate its development.

Year	Predicted Business as Usual (BAU) emissions (tCO _{2E})	Target emissions (tCO _{2E})	Predicted emissions through projects in CMP2(tCO _{2E})
2008/9	64,318	NA	NA
2014/15	67,067	51,455	58,619

Table 8: Emissions in baseline year 2008/9 and year of the interim 20% reduction target 2014/15.

Reduction in Carbon Reduction Commitment (CRC) Costs

From July 2012 our Council will be obliged to pay £12 per tCO₂ emitted, under CRC. The scheme primarily applies to emissions resulting from energy consumed in buildings. The first payment is expected to amount to between £350,000 and £400,000 for 2011/12. If the 2014/15 reduction target for buildings energy consumption is achieved (6,400 tCO₂), the CRC payment for 2014/15 will be reduced by approximately £80,000. If the 2019/20 buildings energy consumption reduction target (13,441 tCO₂) is achieved the payment will be reduced by approximately £160,000. If plans to increase the rate to £30 per tonne CO₂ by 2020 are implemented, the 2019/20 payment will be reduced by approximately £400,000 per year if we achieve the 2019/20 buildings energy consumption reduction target.

Functional Area	2008/9 baseline (tCO _{2E})	Interim reduction target 2014/15 (%)	Interim reduction target 2014/15 (tCO _{2E})	Anticipated emissions reduction by 2014/15 through projects in CMP2(tCO _{2E})	Anticipated % achievement vs target emissions reduction by 2014/15
Overall	64,318	20 %	12,863	8,448	66%*
Buildings	32,002	20 %	6,400	3,103	48%
Transport	6,612	20 %	1,322	1,014	77%
Street Lighting	3,923	20 %	785	22	3%
Waste	21,542	20 %	4,308	12,576	292%*
Water	240	20 %	48	0	0%

Table 9: Interim 2014/15 target and achievement breakdown per functional area.

*Waste will have exceeded their target by 2014/15 (based on Table 2). However, in order that other functional areas continue to strive to meet reduction targets, the overall achievement versus target has been calculated assuming waste have achieved 100% of target.

5 Implementation

Implementation of emission reduction projects and policies must be a collective and cross-Council endeavour. Carbon management has been dealt with in a fragmented manner by our Council but to date much of the activity has gone unreported. The development of CMP2 has provided an opportunity to draw together a range of activities across our

Council, start to quantify the impact these will have on our carbon emissions and make plans to combat the shortfall in achieving the targets set. CMP2 forms the strategic backbone to the changes which need to be made across our Council to make emissions reduction a priority consideration in all our activities.

5.1 Financing

Assumptions

- The revised baseline year is 2008/2009
- Energy prices have been estimated to increase by an average of 10% per annum from 2008/9 to 2014/15
- Petrol and diesel prices are estimated to increase by 2.5% per annum from 2008/9 to 2014/15
- Landfill tax prices are estimated to increase by £8 per tonne of active waste landfilled per annum from 2008/9 to 2014/15, taking the figure from £32 per tonne in 2008/9 to £80 per tonne in 2014/15.

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Annual cost saving	-£41,706	£108,481	£163,837	£240,986	£245,739	£198,536

Table 10: Anticipated annual cost savings based on the projects in CMP2

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Total annual capital cost	£672,329	£1,174,878	£5,122,254	£689,520	£188,574	£68,714
Total annual operational cost	£58,846	£64,687	£64,341	£119,978	£118,819	£117,671
Total costs	£731,176	£1,239,565	£5,186,595	£809,498	£307,393	£186,385

Table 11: Anticipated annual capital and revenue costs to DGC based on the carbon reducing projects listed in CMP2

Carbon Reduction Commitment (CRC) Costs – please refer to section 4.3



5.2 Governance for Implementation

5.2.1 Embedding Carbon Management

Carbon management is embedded in various key policy and strategy documents throughout our Council.

- Environmental protection, necessarily incorporating carbon reduction was named as a Council Priority in June 2010.
- Dumfries and Galloway Single Outcome Agreement Local Outcomes are currently being revised for extension beyond 2011.

The existing primary Outcomes include 'An environment that is protected and enhanced' and identify

- Use of Public Transport and
 - Megawatts of renewable energy capacity consented
 - These Outcomes are likely to be changed to
 - Carbon Reduction in Buildings
 - Reduction of Business Mileage
- as these would be more effective

- Our Council has been a signatory of Scotland's Climate Change Declaration since 2007. Signatories acknowledge the importance and reality of climate change and pledge to reduce greenhouse gas (GHG) emissions. The first annual report on our Council's work under the Declaration was published in 2010. In October a report is brought to Council on Energy Management, Carbon Reduction Commitment and Climate Change Declaration.

Despite these progressions carbon management still takes a lower priority than should be for many operations and procedures within our Council. This is contrary to the perception of management within our Council, which is illustrated in the diagram in figure 6. The diagram is the output of a Carbon Management Assessment Tool (CMAT) which measures the maturity of carbon management within an organisation. The discrepancy between the perceptions of management and staff illustrate that there is still a long way to go until carbon management reaches the profile warranted by its many drivers and is embedded sufficiently.

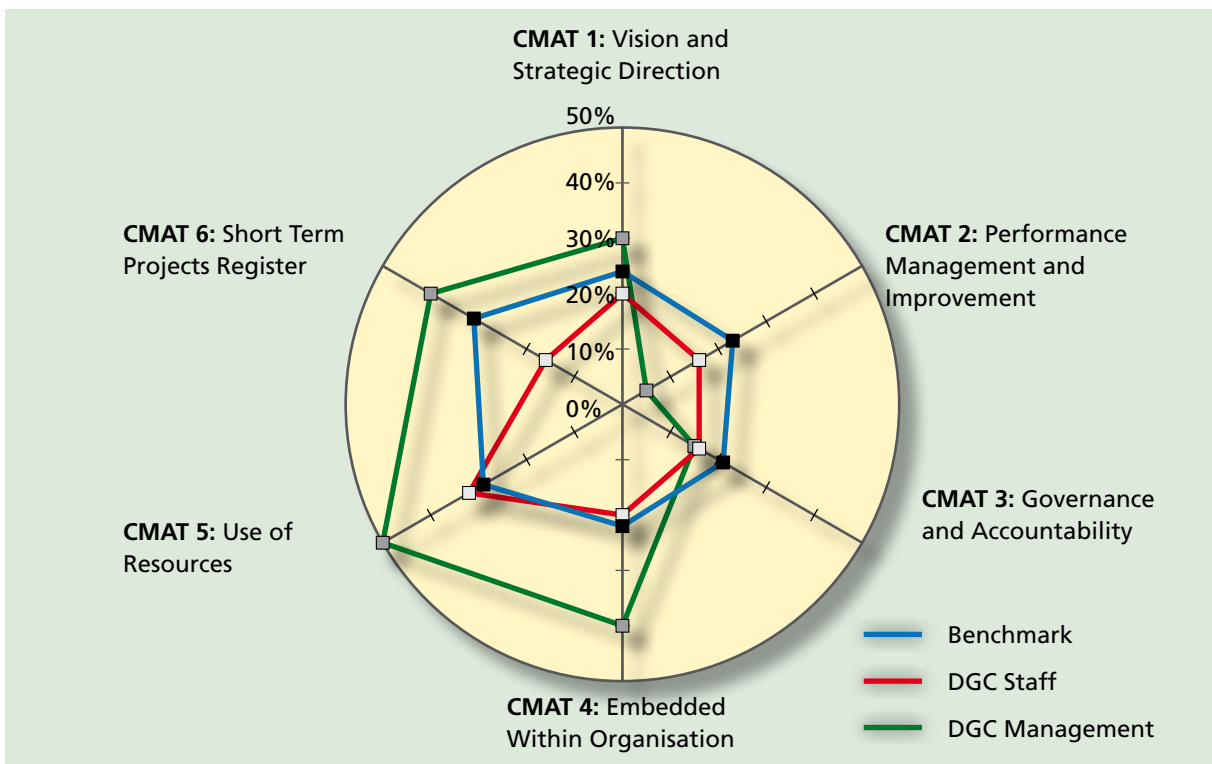


Figure 6: Outcome of the Carbon Management Assessment Tool (CMAT) workshop showing differences in attitudes to the carbon management agenda between the benchmark, DGC staff and DGC management.

To rectify this, a number of measures have been implemented or proposed.

- Devolving Carbon Management**
 In order to improve cross Council accountability for carbon management, it is proposed that responsibility for carbon emissions be devolved to each service who will then be scrutinised at their respective committee on a regular basis to demonstrate a reduction in emissions toward target. Emissions associated with energy consumption will be the first functional area to be devolved in this way. It is envisaged emissions from transport and waste will follow. The emissions will then be collectively reported to Planning, Housing and Environment Services (PHES) Committee and subsequently to Full Council for further scrutiny. Figure 7 outlines the proposed structure for this devolvement.
- Business Planning**
 Carbon management and sustainability issues must become an integral part of Council service planning. The revised Business Planning Guidance will require detailed account to be made for energy consumption data, energy management, carbon reducing projects and sustainability initiatives in service planning. In the early stages of this initiative, the Sustainable

Development team will provide assistance to those compiling business plans to ensure that the comprehensive planning structure is set out for the achievement of targets.

- Impact Assessment**
 The effectiveness of business planning (detailed above) will be monitored by the screening of plans and policies for related content. Content impacting on 'Climate Change', 'Energy and Carbon Management', and 'Sustainable Development' will be assessed and screened, in a similar manner to the current screening under headings such as 'Health and Safety' and 'Gender'.
- Continued High Level Support**
 The process of reviewing the carbon management plan has involved consultation with elected members and senior management at various key stages, and it is intended to build on the support and buy in achieved by this process to ensure success in implementing the plan. Continual visibility for carbon management will be gained as a report on the progress of CMP2 is brought before full Council in the winter of each year concurrently with reports on CRC and energy management.

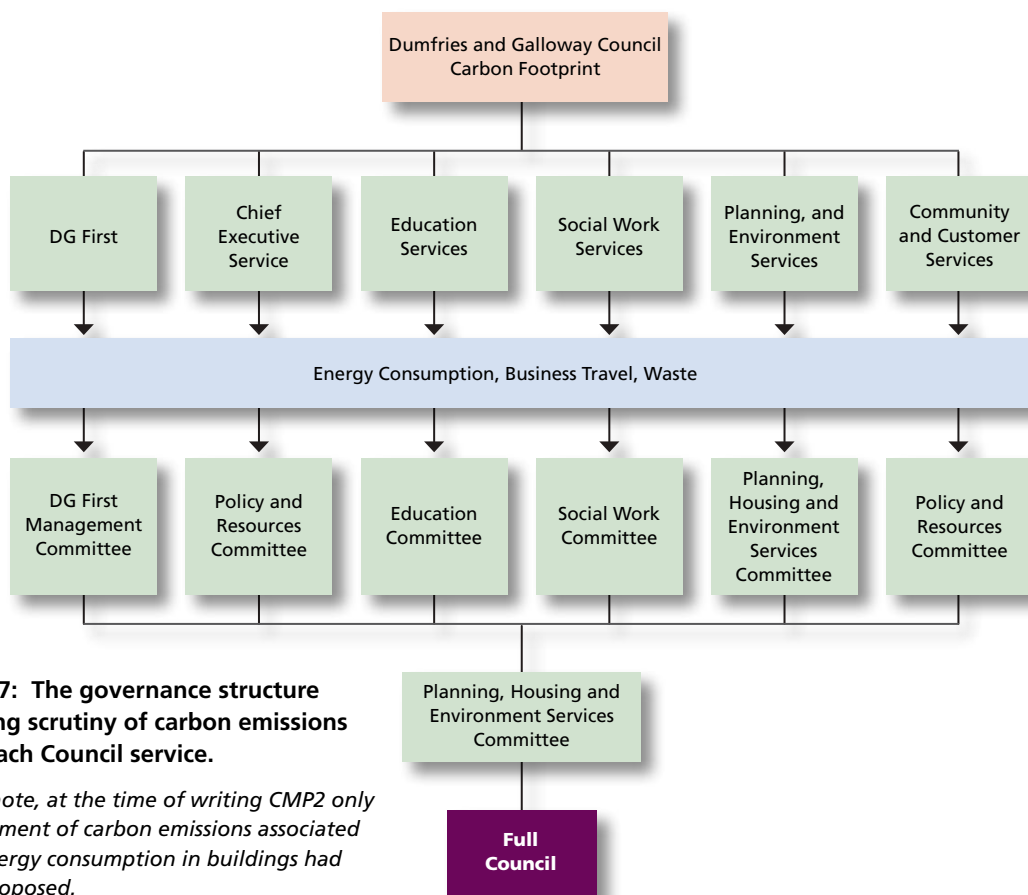


Figure 7: The governance structure detailing scrutiny of carbon emissions from each Council service.

Please note, at the time of writing CMP2 only devolvement of carbon emissions associated with energy consumption in buildings had been proposed.

5.2.2 Data Management – Measuring the Difference, Measuring the Benefit

Basic energy data will be captured and monitored through Systems Link, a proprietary monitoring and targeting data base system. In addition to this, travel mileages, fuel costs and hire charges will be separately sourced through our Council's fleet management service. Utility consumption will be verified against actual meter readings which will be secured at least twice per year to ensure compliance with CRC requirements.

This data will be used to provide an annual update of our Council's footprint on the baseline tool and provide comparative data to monitor progress. In addition all projects will be reviewed on a 6 monthly basis to monitor progress against initial carbon reduction estimates. Procedures will be put in place to identify the carbon savings anticipated from all works across our Council, particularly in relation to buildings and provide a base from which to measure progress and savings.

To assist with the management of transport data in particular it is proposed to provide separate costs codes for air, rail and road transport. Furthermore, a request will be made that length of journey is recorded and collated to allow a more accurate picture of our Council's travel patterns to be built up.

To assist with the management of Council's internally generated waste arisings in particular, it is proposed to establish appropriate cost codes for items such as skip hire and to collate tonnage and destination of waste information centrally. Construction waste will also need to be addressed on a large scale to help meet the Halving Construction Waste to Landfill commitment.

For the formulation of CMP2, many of the carbon calculations were completed by the SDECM team. Once departments are held accountable for carbon this will increasingly be carried out on a devolved basis.

5.3 Resource Commitment

5.3.1 Maintaining Quality over Time

Our Council is conscious of the need to maintain and revise CMP2, lending support to new and emerging projects. The six monthly review process, as detailed elsewhere in this plan, will aid the SDECM team in maintaining an accessible and meaningful document for our Council.

It is crucial to acknowledge at this early stage that CMP2 is only the first step on a much longer road to effective carbon management within our Council. This fits into a national and international political and legal framework, which will necessarily mean that CMP2 should evolve constantly. Far from being a weakness in CMP2, this reflects the reality of a constantly changing landscape of drivers and solutions and developing knowledge in carbon emissions from activities which are undertaken.

5.3.2 Programme Management of the Carbon Management Programme

Best practice amongst organisations with successful carbon management programmes indicates strongly that support and buy-in from senior management sources is crucial to secure long term carbon reduction. While a proportion of the actions detailed in the plan will involve individual behaviour change, meaningful commitment from senior management is absolutely necessary for programme governance.

- In terms of senior and strategic ownership, Roger Grant, Chairman of the Planning, Housing and Environment Services Committee and Alistair Speedie, Director, Planning and Environment Services have leant their full support to the Programme and are our primary project sponsors.
- At a member briefing, Council members proposed that the approval route for the CMP should be through full Council. Key Performance Indicators (KPIs) have now been approved by our Council's Scrutiny Committee in respect of attitudes to climate change and carbon management issues and reduction of carbon in council buildings.
- Plans are in place for carbon management performance indicators to be included in the business planning process for all Council departments. Linking carbon management to performance will facilitate the embedding process and provide an incentive for buy in from staff.



- The Carbon Management Plan Steering Group has met at regular intervals for the duration of the review programme to contribute to the process. This group is comprised of representatives from all Council services, including key technical and policy experts. The steering group ensures that the plan's many diverse projects are brought together for consideration in one forum.
- Throughout the programme, the SDECM team will monitor the progress of the plan and ensure that necessary developments are managed.
- The SDECM team, in their role in overseeing the management and development of the CMP, will carry out a review of projects contained in the Plan on a six-monthly basis. In liaising with departments leading on carbon-saving projects, the team will identify weaknesses which may have become apparent in existing projects. This biannual review, including data retrieval, will allow project amendments to be made so that annual carbon reduction targets can be met. Furthermore, the inter-departmental dialogue will be a useful tool with which to identify potential for new carbon-saving initiatives which can be included in reviewed editions of the Plan.
- Though the SDECM team are situated within Planning and Environment Service, the team must necessarily operate at a Council wide level. It is essential that carbon management be made a priority in all services and departments and that emissions saving projects be generated in all areas.
- In general, an increased devolvement of responsibility to the various Council services in regard to energy and carbon management is aimed for. The natural conclusion of this devolvement will be that services across our Council would be called upon to make annual reports of their progress and strategic arrangement in this regard to Council committee. This devolvement is illustrated in Figure 7.

5.4 Governance and Dedicated Staff Resources

5.4.1 The Programme Board (or other Governance structure) – Strategic Ownership and Oversight

There will be no single Carbon Management Programme Board but the SDECM Team will report progress on the implementation of CMP2 to the PHES Committee in the first instance (with the possibility of this evolving to a report to full Council), Corporate Management Team and strategic leaders at appropriate intervals. This structure will be reviewed periodically. In the event that a need for a separate Carbon Management Board is found, a change to this governance structure will be made.

In addition to bi-annual review of projects by the SDECM Team, the possibility of initiating a specific carbon management subcommittee was mooted at the members' workshop undertaken in the development of CMP2. This group would be a valuable resource in promoting high-level awareness of the carbon management projects and progress ongoing in our Council.

5.4.2 The Sustainable Development and Energy and Carbon Management Team – Delivering the Projects

The SDECM team will continue to pool knowledge and data to monitor progress and delivery of projects.

The team's terms of reference include:

- Liaising with departmental Project Leaders in coordinating the implementation of carbon-saving projects
- Ongoing monitoring and research to capture all projects with potential to save carbon within our Council
- Collection of data from running projects
- Continuing to share expertise with other Councils on best practise to ensure maximum project delivery.

5.4.3 Succession Planning for Key Roles

There are a number of issues associated with succession planning that could have a real impact on progress on the implementation of CMP2. These in part reflect the overall workforce profile in our Council which has a relatively higher number of people over the age of 50. Within the SDECM team are key staff who fit this profile. Careful planning will be required to avoid succession issues having a negative impact on the embedding of carbon management across our Council.

Critical to the successful long term implementation of the carbon management programme in Dumfries and Galloway will be;

- Ensuring that any recruitment processes are undertaken promptly to ensure there are no gaps in staff coverage
- Ensuring that existing key skills are replicated in these replacements of staff
- Setting up effective information systems to ensure that new recruits can rapidly come up to speed with processes and practice
- Consideration of training up/mentoring of potential replacement staff from within the existing workforce with appropriate skill sets to enable a smooth transition.
- Development of data sets for all council buildings to capture detailed knowledge held by key staff on issues such as heating plant, age of plant, renewable plant and size of installation and insulation levels etc. These would then be shared between the SDECM Team, Strategic Property Services and DG design teams.

5.5 Implementation Plan

The SDECM Team plan to review projects contained in CMP2 on a bi-annual basis. The first review will be made in December 2011 when CMP2 will be brought before the PHES Committee for the first time. This will reoccur on an annual basis, at the same time as the Council is being updated on CRC in our Council as well as energy management and the Climate Change Declaration. The second review will be made at the end of the financial year and should be completed by March.

It is anticipated that this review process will ensure that projects are closely monitored and supervised by project leaders and that emissions savings will be delivered as planned. Should additional support or amendments to projects be required, these should not be left unnoticed for more than 6 months.

6 Conclusion

The drive to reduce carbon emissions is a priority which will not lose momentum in the foreseeable future. The pressing need for urgent and sustained action to reduce emissions and mitigate climate change has been underlined by the various legal instruments which have emerged in this area in recent years. These mean that our Council has significant obligations to act and a huge amount to gain if it commits to taking positive and innovative steps to reduce its emissions and invest creatively in renewable technologies.

It is clear that a 'business as usual' approach is not an option in any respect. Far from viewing our Carbon Management Programme as a restrictive

or onerous obligation, our Council should grasp the opportunity to enhance our role as exemplar local authority leaders in this field and to set an example for the wider community in this regard. To be successful, it is crucial that this be a cross Council effort, with leadership and commitment being shown at all levels.

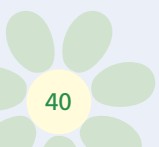
Carbon management is on the agenda of our Council, the government and the international community to stay. CMP2 and the projects outlined present an excellent opportunity to establish a solid platform upon which to build a successful carbon management programme for our Council.



Appendix A: Communications Strategy

Date	Action	Audience	Aim	Duration	Follow Up
Sep-11	Energy Awareness Staff Survey	All Council staff.	To assess attitudes and behaviours in regard to climate change and energy awareness throughout our Council. Results will be compared with baseline survey run in Sept 10 to assess effectiveness of cultural change programme	1 month	Results circulated for staff to see. The same survey carried out every September.
Sept 11 - Feb 12	Energy Awareness training for Council staff	Council staff in high energy use buildings and Services with high staff numbers	To engender more energy efficient behaviour in the work place among staff from across our Council	6 months	Questionnaires to assess behaviour change.
Nov-11	Carbon Trust Workshop - Embedding Carbon Management	Corporate Management Team (CMT)	To brief CMT on the revised Carbon Management Plan and gain high level engagement in the carbon management process.	0.5 days	
Nov-11	Carbon Trust Workshop - Change Management	Operations Managers	To allow our Council to produce a behaviour change plan that embraces effective change leadership and powerful engagement processes to generate committed local sponsors, strong personal connections and sustained behavioural change throughout the organisation with regard to carbon management.	0.5 days	Actions for promoting behaviour change as emerge from this workshop.
Dec-11	Carbon Management Plan reporting to full Council committee	Full Council Committee members	To gain approval for the plan and familiarise committee members with Council status regarding carbon management, actions required and reporting frequency.	0.5 days	Report on progress to full Council committee every October
Jan-12	Carbon Management Plan launch to Council staff	Council employees	To engage with staff from all departments in regard to the Carbon Management Plan to secure buy in for vision and targets, thus initiating the process of embedding carbon management into the ethos of our Council.	From Jan 12	
Jan-12	Energy Representatives allocated for each building.		For one person in every Council building to be responsible for ensuring staff comply with Council policy regarding energy efficiency and general good energy housekeeping.	Ongoing.	Energy Representatives and SDECM team to meet regularly for updates.
Sep-12	Launch of Energy Awareness training course at Cargenbridge Training Centre	Council management staff	To gain buy in from management on the need to reduce energy consumption through staff behaviour change and commitment to cascade training down to teams.	Ongoing.	

Date	Action	Audience	Aim	Duration	Follow Up
Ongoing	Teacher Energy Awareness CPD	Primary and secondary teachers	To promote behavioural change among teaching staff through educating on the need for our Council to become more energy efficient, what is happening in schools outside of behavioural change to improve energy efficiency and the role staff can play.	Ongoing.	Monitor energy use in schools visited to assess for effectiveness of programme.
Ongoing	Frequent reminders and updates on carbon management type issues through the Connect site, Sharepoint, Covalent, Talk Back and our Council's e-newsletter.	All Council staff.	To engage staff in carbon management and promote behavioural change.	Ongoing.	



Appendix B: Waste Management

1 Municipal Solid Waste (MSW) and non MSW

Description of Municipal Solid Waste (MSW) and the non MSW streams included in CMP2 as reported by Dumfries and Galloway Council to the Scottish Environment Protection Agency (SEPA) through the Waste Data Flow reporting system

Municipal Solid Waste (MSW) arisings included in CMP2:

- Household weekly collections
- Commercial premises (including waste from Caravan parks and from Council premises) which use the Council's waste collection service
- Recycling Centre waste
- Recycling Point waste
- Street Sweepings
- White goods & bulky uplifts (from households and Commercial premises which use the Council's waste collection service)
- Fly tipping (from land which is the Council's responsibility)
- Parks and Gardens waste (Grounds Maintenance Waste)
- Non Municipal Solid Waste (non-MSW) from Council activities included in CMP2:
- Roads maintenance waste
- Building Maintenance
- Gully waste

It is noted that the carbon emissions from the operation of the Council's refuse collection vehicles is included in the transport section of CMP2.

2 Carbon Trust method of calculating carbon emissions from waste management activities.

The carbon dioxide equivalent (CO_{2e}) emission values included in CMP2 for our Council's waste activities have been calculated based on the Carbon Trust method. This entails calculating the quantity waste of landfilled and applying the generic landfill factor of 447 kg CO_{2e} for each tonne of waste landfilled. Any reduction on waste landfilled therefore results in a CO_{2e} saving.

3 Council waste management activities not included in CMP2.

CMP2 does not include the following Council waste management activities and their associated carbon emissions:

Waste PFI contract

- Carbon emissions resulting from:
 - energy consumption at the waste treatment facilities in the region (Ecodeco, Waste Transfer Stations, Galdenoch Composting Plant)
 - fuel consumption of PFI vehicles operated by Shanks to transport waste between sites

Internal Council Waste arisings

- Internal Council waste arisings disposed of by private waste management companies (for example Council services using skip hire / wheeled bins for mixed or recycling waste) (Data not available)
- PC Refresh – WEEE recycling waste arisings
- Confidential Waste paper recycling waste arisings
- Printer cartridge waste arisings
- Sanitary waste
- Street lighting bulb recycling
- Battery recycling
- Waste arisings from contracts commissioned by our Council for construction / capital projects (such as new school builds/ construction of leisure facilities such as DG One and so on)
- Road planings which are reused as in fill for roads
- Kerbstones / flags which are reused
- Surface dressing – reuse of chips

Landfill sites

- 5 closed landfill site (including Lochar Moss) carbon equivalent emissions = 40,358 tCO_{2E} in 2008/09,
- Lochar Moss landfill site tCO_{2E} emissions reduced by the gas management plant = 20,148 tCO_{2E} in 2008/09
- Electricity generation at the Lochar Moss Gas Management Plant in 2008/09 = 5,120,883 kWh which is estimated to be equivalent to offsetting 2,202 tCO_{2E}

Contaminated Land waste arisings

- Contaminated Land waste arisings sent to landfill (1,540 tonnes in 2008/09 & 2,856 tonnes in 2009/10)

Other Council activities which result in waste arisings

- Abandoned Vehicles
- Any other waste arisings not currently recorded

Appendix C: Definition of Projects

The following templates give examples of different types of project included within the project list but is not entirely exhaustive.

Project:	Replacement of Oil boiler with Gas in Woodbank
Reference:	EB3
Owner (person)	Keith Rae
Department	Strategic Property Services
Description	Old oil boiler removed from Woodbank and replaced with gas, cutting carbon emissions as less are associated with the latter fuel type.
Benefits	Financial savings: £9,000 saved from reduced energy consumption per annum. Payback: Not applicable CO _{2E} emissions reduction: 25 tonnes per annum
Funding	Project costs: £98,904 Operational costs: £0 Source of funding: Internal
Resources	External firm supplied and fitted boiler.
Ensuring Success	Conduct behavioural change training with staff to educate on most efficient operation of new system.
Measuring Success	Measurement of energy consumption in the building prior to and following the boiler replacement.
Timing	Project completed 2009/10
Project:	Window Draft Proofing in Woodbank
Reference:	EB5
Owner (person)	Angela Lamont
Department	Sustainable Development
Description	Draft proofing of windows in a portion of Woodbank with well established product Quattroseal to improve conditions for staff in winter and reduce need for portable electrical heaters.
Benefits	Financial savings: £397 projected to be saved from reduced energy consumption per annum. Payback: 7 years CO _{2E} emissions reduction: 2.5 tonnes per annum
Funding	Project costs: £2763 Operational costs: £0 Source of funding: Part Central Energy Efficiency Fund (CEEF), part internal from Sustainable Development team budget.
Resources	Company 'The Energy Savers' supplied and fitted Quattroseal.
Ensuring Success	Conduct behavioural change training with staff in draft proofed areas to maximise benefits, particularly in terms of reducing portable heater use.
Measuring Success	Measurement of energy consumption in the building prior to and following the draft proofing.
Timing	Project completed 05/2011

Project:	Estate Rationalisation Phase I April 2009 – March 2011
Reference	EB11
Owner (person)	Peter Nelson
Department	Strategic Property Services
Description	Our Council has disposed of 37 buildings between the end of the Carbon Management Plan baseline year 08/9 and end March 2011. The savings made from this project are shown here.
Benefits	Financial savings: £33,590 saved from energy use. (£16,795 per annum)* Payback period: 11 years CO _{2e} emissions reduction: 220 tonnes (110 tonnes per annum)* *Based on energy consumption figures provided by Strategic Property Services
Funding	Project cost: Approximately £185,000 (£92,500 per annum)** Operational costs: £0 Source of funding: Internal ** Value of one property estimated at £500,000 per building. Costs of disposal estimated at 1% of property value
Resources	All internal, no additional resources required.
Ensuring Success	Not applicable.
Measuring Success	Measurement of energy consumption in the building in the year of disposal.
Timing	Start date: 04/2009 Completion date: 03/2011

Project:	Estate Rationalisation Phase II (2010/11-2014/15) & Phase III (2014/15 – 2019/20)
Reference	MB1#1 & MB1#2
Owner (person)	Peter Nelson
Department	Strategic Property Services
Description	It is projected that 10% of all current Council buildings will be disposed of through the Asset Management Plan Estate Rationalisation programme. This equates to approximately 60 buildings.
Benefits	Financial savings: £6,355 saved from energy use per annum*. £25,420 saved in phase II, £31,775 in phase III Payback period: Not applicable. CO _{2e} emissions reduction: 42 tonnes per annum*. 168 tonnes saved in phase II, 210 in phase III *Based on energy consumption figures provided by Strategic Property Services
Funding	Project cost: £35,000 per annum, £140,000 for phase II, £175,000 for phase III** Operational costs: £0 Source of funding: Internal ** Value of one property estimated at £500,000 per building. Costs of disposal estimated at 1% of property value
Resources	All internal, no additional resources required.
Ensuring Success	Not applicable.
Measuring Success	Measurement of energy consumption in the building in the year of disposal.
Timing	Phase II Start date: 04/2011 Completion date: 03/2015 Phase III Start date: 04/2015 Completion date: 03/2020

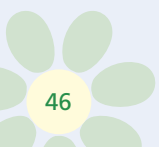
Project:	New Abbey Primary Lighting Upgrade
Reference:	EBS1
Owner (person)	John Currie
Department	Energy Management
Description	Replacement of traditional fluorescent strip light tubes with thinner diameter, low energy ones .
Benefits	Financial savings: £170 saved from reduced energy consumption per annum. Payback: 11.1 years CO _{2e} emissions reduction: 1.1 tonnes per annum
Funding	Project costs: £1890 Operational costs: £0 Source of funding: Central Energy Efficiency Fund (CEEF)
Resources	External suppliers of new lights, fitted by internal staff.
Ensuring Success	Conduct behavioural change training with staff on how to use lighting efficiently and maximise benefits .
Measuring Success	Measurement of energy consumption in the building prior to and following the new lighting installation.
Timing	Project completed 2009/10

Project:	Loft Insulation Penpont Primary School
Reference:	EBS2
Owner (person)	John Currie
Department	Energy Management
Description	Installation of insulation to cover all of the loft floor space in Penpont Primary School.
Benefits	Financial savings: £434 per annum through reduced energy use. Payback: 4.6 years CO _{2e} emissions reduction: 2.1 tonnes per annum
Funding	Project costs: £2019 Operational costs: £0 Source of funding: Internal
Resources	All internal, no additional resources required.
Ensuring Success	Conduct behavioural change training with staff to maximise benefits.
Measuring Success	Measurement of energy consumption in the building before and after insulation installed.
Timing	Project completed 2008/9.

Project:	Window Replacement in Whithorn Primary School
Reference:	EBS8
Owner (person)	Sue Best
Department	DG First
Description	Replacement of 60% of the windows at Whithorn Primary School with double glazed windows
Benefits	Financial savings: £218 per annum through reduced energy use. Payback: Not application, project carried out as essential upgrade of building condition anyway. CO _{2e} emissions reduction: 1 tonne per annum
Funding	Capital Costs: £17,391 Operational Costs: £0 Source of funding: Internal
Resources	Windows supplied and fitted by external firm.
Ensuring Success	Conduct behavioural change training with staff to maximise benefits.
Measuring Success	Measurement of energy consumption in the building before and after new windows installed.
Timing	Project completed 2009/10.

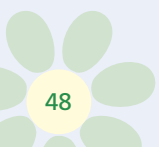
Project :	Insulated Render of External Walls of St. Joseph's Primary
Reference	EBS19
Owner (person)	Peter Nelson
Department	Strategic Property Services
Description	Insulated render applied to external walls of this primary school to reduce the escape of heat from the old school walls.
Benefits	Financial savings: £780 saved from reduced energy consumption per annum. Payback: Not applicable. CO _{2e} emissions reduction: 3.3 tonnes per annum
Funding	Project costs: £148,815 Operational costs: £0 Source of funding: Internal
Resources	External contractors supplied and applied render.
Ensuring Success	Conduct behavioural change training with staff in maximise benefits, particularly in terms of reducing portable heater use.
Measuring Success	Measurement of energy consumption in the building prior to and following the render application.
Timing	Project completed 2010/11

Project:	Solar Thermal Panels on Beattock Primary School
Reference:	EBS24
Owner (person)	Peter Nelson
Department	Strategic Property Services
Description	Solar thermal panels placed on new build Beattock Primary to provide hot water for the school. This project is covered by the Renewable Heat Incentive (RHI)
Benefits	Financial savings: £324 per annum on energy Income: RHI income after 1 year = £459; RHI income after 20 years = £11,152 Payback period: 17 years CO _{2e} emissions reduction: 1 tonne per annum
Funding	Project cost: £9,600 Operational costs: £0 Source of funding: Internal
Resources	Panels supplied and fitted by external contractor.
Ensuring Success	Combine the project with training of staff within the building so they understand the working of the new water heating system.
Measuring Success	Energy consumption of the school measured annually. These panels should provide all the energy for hot water but backup may occasionally be needed from the grid. Monitor this annually.
Timing	Project completed 2010/11



Project:	Solar Photovoltaic Panels on Beattock Primary School
Reference:	EBS26
Owner (person)	Stuart Martin
Department	DF First
Description	Installation of solar photovoltaic panels to provide electricity for the school and benefit from the Feed In Tariff (FIT) incentive scheme. The following benefits and costs are based on a 40kw installation.
Benefits	Financial savings: £2560 per annum on energy per school Income: FIT income after 1 year = £10,528; FIT income after 25 years = £337,215 Payback period: 10.5 years CO _{2e} emissions reduction: 17.2 tonnes per annum
Funding	Project cost: £120,000 Operational costs: £0 Source of funding: Central Energy Efficiency Fund (CEEF)
Resources	Panels supplied and fitted by external firm.
Ensuring Success	Behavioural change programme with the staff of the school to ensure they use energy efficiently and maximise the benefits of this project.
Measuring Success	Electricity consumption of the school provided by the panels and from the grid to be measured annually.
Timing	Project completed 2011/12
Project:	Establishment of Pool Car Fleet
Reference:	ET1
Owner (person)	Shelley Sloan
Department	Fleet Management
Description	A fleet of approximately 100 diesel pool cars was established to provide staff Council vehicles when travelling on Council business and reduce the use of personal cars.
Benefits	Financial savings: £72,337 per annum on saved fuel Payback period: 4.8 years CO _{2e} emissions reduction: 947 tonnes per annum
Funding	Project cost: £344,264.00 Operational costs: £352,169 per annum Source of funding: Internal
Resources	Project delivered by internal staff
Ensuring Success	Continued funding for car maintenance. Continued communication with staff to ensure pool cars used when taking journeys.
Measuring Success	Measure annual pool fleet mileage and grey (staff using own cars) mileage and compare with 08/9, before the pool car fleet was established.
Timing	Start date: 10/09 Completion date: 04/10

Project :	Use of Free Cooling in Server Rooms																		
Reference	ETS1																		
Owner (person)	Graeme McIlorum																		
Department	Technology Solutions																		
Description	Incorporation of free cooling into the design of new air conditioning installations at the new corporate data centre at Monreith House. This has been driven by the need to reduce the energy costs and environmental impact of the new data centre. Free cooling works by allowing electrically driven chillers to be shut down for long periods when the outside ambient temperature is lower than the internal room requirement. In Dumfries and Galloway this occurs 65% of the year. Thus power consumption, running costs and carbon emissions are reduced.																		
Benefits	<p>Financial savings: 25-30%, £20,000 per annum at present energy tariffs Payback period on initial investment: 3.6 years CO_{2e} emissions reduction: 135 tonnes per annum</p> <table border="1"> <caption>Cumulative Cost Comparison</caption> <thead> <tr> <th>Year</th> <th>Conventional DX Units (£)</th> <th>Free Cooling Units (£)</th> </tr> </thead> <tbody> <tr> <td>Year 1</td> <td>300,000</td> <td>200,000</td> </tr> <tr> <td>Year 2</td> <td>350,000</td> <td>280,000</td> </tr> <tr> <td>Year 3</td> <td>400,000</td> <td>360,000</td> </tr> <tr> <td>Year 4</td> <td>450,000</td> <td>440,000</td> </tr> <tr> <td>Year 5</td> <td>550,000</td> <td>580,000</td> </tr> </tbody> </table>	Year	Conventional DX Units (£)	Free Cooling Units (£)	Year 1	300,000	200,000	Year 2	350,000	280,000	Year 3	400,000	360,000	Year 4	450,000	440,000	Year 5	550,000	580,000
Year	Conventional DX Units (£)	Free Cooling Units (£)																	
Year 1	300,000	200,000																	
Year 2	350,000	280,000																	
Year 3	400,000	360,000																	
Year 4	450,000	440,000																	
Year 5	550,000	580,000																	
Funding	<p>Project cost: £155,500 Operational costs: Approximately £60,000 (£20,000 less than without free cooling) per annum Source of funding: Central Energy Efficiency Fund (CEEF)</p>																		
Resources	These will be delivered by the current resource allocated to the project.																		
Ensuring Success	This project is included as part of the Monreith Data Centre Refurbishment Project and success will be governed by the commissioning of the new Data Centre																		
Measuring Success	<p>Success criteria are as follows: The Monreith Data Centre is maintained at an operational temperature The annual power bill for the air conditioning element of the data centre is reduced. Success measured/evaluated by:</p> <ul style="list-style-type: none"> The operational temperature of the Data Centre being continuously monitored. The electrical power bill for the air conditioning being monitored annually <p>Principal risk: 'Free cooling' ambient temperature calculations are not accurate – low risk</p>																		
Timing	Project completed 2008/9																		



Project:	Introduction of Virtual Servers
Reference:	ETS2
Owner (person)	Graeme McIlorum
Department	Technology Solutions
Description	Installation of virtual servers to our Council's main server base greatly reducing the number of physical servers and associated energy use and carbon emissions.
Benefits	Financial savings: £18,370 per annum Payback period: No payback period was determined as this change to the infrastructure was considered as a strategic business need CO _{2e} emissions reduction: 124.4 tonnes per annum
Funding	Project cost £255,000 over 2 years Operational costs Not applicable Source of funding: Capital Infrastructure Expenditure Block
Resources	Internal
Ensuring Success	Tailored maintenance of the new equipment needed to ensure its smooth running. Principal risks: Technical – break downs etc
Measuring Success	Reduced maintenance costs – annual reduction in maintenance Reduced number of hardware installations (number of physical servers) – measured annually Reduced energy consumption – measured annually
Timing	Start date: 10/2009 Completion date: 10/2010

Project:	Implementation of the Corporate Print Strategy
Reference:	ETS3
Owner (person)	Kenny Wallace (Donna Maxwell until 30/6/11)
Department	Print and Graphics Unit
Description	Replacement of existing printers and photocopiers throughout our Council with multi-functional devices (MFDs)
Benefits	Financial savings: £3000-£8000 per building per annum Payback period: Not applicable as no initial outlay required CO _{2e} emissions reduction: 27 tonnes per annum
Funding	Project cost: £0 – devices replacing existing equipment due for replacement Operational costs: £0 How/when funding decision made: Authority to proceed with the project given through the Resources Committee, Feb 2010
Resources	Print and Graphics Unit – managing replacement of devices Supplier – carried out building assessments at no extra cost Technical Solutions (TS)– providing support for installation
Ensuring Success	Communications and support for staff to ensure that there is no loss of service; evidence will be savings without loss of quality, availability or reliability. Principal risks: technical – fit with internal TS work plan and resource, and ensuring enough commitment to drive the project.
Measuring Success	Achievement can be measured by the ratio of equipment removed to equipment installed, and by energy consumption prior to and following the project roll out.
Timing	Start date: 15/02/2010 Completion date: 31/03/2014 (savings will be realised throughout the life of the project) Interim deliverable/decision points: Implementation of Pilot Areas and creation of business process – 15/02/2010 to 30/06/2011; Business as Usual handover for full Project Implementation 01/07/2011 to 31/03/2014

Project:	Zero Waste Investment Plan
Reference:	EW1
Owner (person)	Greig Blayney (Principal Officer, Waste Policy)
Department	Waste Management, Planning and Environment Services
Description	Spend to save in recycling, plant optimisation, increase product standards to move towards zero waste to landfill
Benefits	Financial savings: £643,000 / year. Payback: 10.5 years CO _{2E} emissions reduction: 12,576 tonnes in 2014/15
Funding	Project costs: £6,669,000 [invest in infrastructure to allow spend to save Zero Waste Investment Plan] Operational costs: £0 – through gain share agreement with the Shanks PFI contract. Source of funding: PFI sinking fund and Scottish Government Zero Waste Fund
Resources	Internal – Waste Management, PES
Ensuring Success	Upgrade 8 Household Waste Recycling Centres Build 3 new Household Waste Recycling Centres Enhance and expand Recycling Points Stranraer and Dumfries Zero Waste Parks to include recycling, product refinement, composting and reuse.
Measuring Success	Based on 2015/16 modelled targets Total waste arisings = 96,839 Tonnes of waste sent to landfill = 7% Tonnes of waste (and type) recycled = 63% Tonnes of waste (and type) used for Energy from Waste = 30%
Timing	Project to be completed by 2015/16.

Project:	Waste Prevention and Communications Programme
Reference:	EW2
Owner (person)	Moira Weatherup (Waste Prevention Officer)
Department	Waste Management, Planning and Environment Services
Description	Waste Prevention - Spend to save through increasing waste prevention (reducing and reusing waste) and overall reduction in waste arisings Waste Communication - increasing recycling and overall reduction in amount of waste landfilled
Benefits	Financial savings: £345,000 / year in reduction in waste arisings in 2009 - 2011. Payback: See EW1 CO _{2e} emissions reduction: Part of savings in EW1 (Zero Waste Investment Plan (ZWIP) Savings) (12,576 tonnes)
Funding	Project costs: £0 Operational costs: £50,000 (Waste Prevention budget) Source of funding: Waste Management revenue budget and where available, funding to support additional waste prevention programmes such as Zero Waste Scotland.
Resources	Internal: Waste Management, P&E, DG First, Customer Service Centres, DG Direct, Communications Unit, Graphics Unit, Carbon Management Team, External: Support from Zero Waste Scotland Support from householders to assist with waste prevention of household waste and use of facilities provided in Dumfries and Galloway for recycling at Household Waste Recycling Centres and Recycling Points
Ensuring Success	Communication and support for householders with advice on waste prevention, recycling and recovery of resources from waste. Engagement with Zero Waste Scotland on national communication programmes and initiatives related to waste such as the Recycle for Scotland campaign.
Measuring Success	Linked to measuring success listed in ZWIP outline. Based on 2015/16 modelled targets Total waste arisings = 96,839 Tonnes of waste sent to landfill = 7% Tonnes of waste (and type) recycled = 63% Tonnes of waste (and type) used for Energy from Waste = 30%
Timing	Duration of PFI contract until 2029.

Project:	PC Automatic Shut Down Software	
Reference:	PEIT1	
Owner (person)	John Tait	
Department	Education IT	
Description	Introduction of Altiris automatic shut down software on school computers	
Benefits	Financial savings:	Approximately £5625 per annum
	Payback period:	8.5 years
	CO ₂ e emissions reduction:	Approximately 34 tonnes per annum
Funding	Project cost:	£42,240
	Operational costs:	£9860 per annum
	Source of funding:	Internal GLOW Budget
Resources	Staff resources to i) implement across all schools, and ii) monitor and manage PCs across each school network. This will involve staff in the central Schools Team and the Network Administrators in each secondary school.	
Ensuring Success	Technical staff given necessary training and time to manage the network using the software Principal risk is lack of time and resource to fully implement the solution. Further risk is that external factors prevent full use of the software	
Measuring Success	Monitor electricity consumption prior to and following the installation of the software	
Timing	Start date:	01/06/2011
	Completion date:	01/04/2012

Project:	New Luce Street Light Dimming Project	
Reference:	NSL1	
Owner (person)	Calum Edgar	
Department	Street Lighting	
Description	Bulbs on New Luce street lights replaced with lower wattage ones to reduce energy.	
Benefits	Financial savings:	£326 per annum.
	Payback:	Not applicable
	CO ₂ e emissions reduction:	2 tonnes per annum
	% of 2014/15 interim target:	0.02%
Funding	Project costs:	£0
	Operational costs:	£0 per annum
	Source of funding:	Internal
Resources	Internal	
Ensuring Success	Ensure project goes beyond initial pilot phase and gets implemented permanently.	
Measuring Success	Measure half hourly consumption before and after energy efficiency measures made.	
Timing	2011/12.	

Project:	Summer Heating Shut Down Policy
Reference:	MPO3
Owner (person)	John Currie
Department	Energy Management
Description	Total shut down of heating in all buildings across our Council over the summer period. The figures below are based on average heating energy consumption in the summer period.
Benefits	Financial savings: £1439 per annum. Payback: Not applicable CO _{2e} emissions reduction: 6 tonnes per annum
Funding	Project costs: £0 Operational costs: £0 Source of funding: Not applicable
Resources	All internal, no additional resources required.
Ensuring Success	Enforce without exception.
Measuring Success	Measurement of energy consumption across our Council prior to and following the start of the policy
Timing	Planned to begin 2012/13.

Appendix D: Dumfries and Galloway Council's Energy and Carbon Policy

Our Council aims to achieve and maintain a reduction in energy consumption in its building stock. In support of this aim, our Council will:

- Create and sustain, within the organisation, a high profile and priority for Energy and Carbon management.
- Make express provision within our Council's capital and revenue budgets for an appropriate level of investment in energy conservation measures subject to availability of financial resources.
- Integrate energy efficiency into procurement for supplies, equipment and services.
- Promote good design practice in our Council's capital and revenue programme to reduce energy consumptions.
- Accept that the Building Regulations are a minimum standard and design and construct all new or refurbished Council buildings to perform at least 10% better than the current Building Regulations to reduce energy usage and contribute to a reduction in our Council's carbon footprint.
- Require that, as a matter of course, buildings are designed to include or accommodate renewable technologies with a view to reducing our Council's carbon emissions. It must be noted that use of electricity purchased from a utility supplier using renewable sources will not be considered a substitute for this.
- Equip refurbished Council buildings with suitable renewable technologies, for the same reasons as outlined above.
- Implement programmes of physical and management measures to reduce energy consumption in accordance with our Council's Carbon Management Plan.
- Pursue central energy purchasing strategies which take maximum advantage of market opportunities.
- Progressively devolve responsibility for energy consumption to local managers and fully support by the use of target profiles, monitoring and diagnostic advice.
- Assist local managers to encourage, involve and motivate building users and staff to save energy and reduce carbon emissions by means of training, publicity and where appropriate incentives.
- Agree that that the maximum temperature for heating in all Council building will be 21°C unless there are special needs of the occupants.
- Agree that all supplementary electric heaters are removed from Council buildings and only re-introduced where it is proven that the existing heating system cannot provide an occupancy temperature of 19°C within one hour of staff reporting for work.
- Agree that where a member of staff reports for work considerably earlier than the normal starting time that the heating will not be set to suit that individual(s) starting time.
- Agree that all heating within Council buildings will be turned off during the summer which for this purpose is from 1st June to 15th Sept each year,
- Establish and maintain a comprehensive energy and carbon database, as well as supporting management systems for profiling, targeting and monitoring the energy consumption of buildings.
- Publish annual energy reports.

Policy last updated in October 2011.

