|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | Carbon Management Plan (CM Plan) 20XX/XX | | | Organisation Name | | |
|  | Created by: Organisation Name  Prepared by: Author Name and Date |

**Contents**

1 Executive Summary 4

2 Foreword from the Project Sponsor 5

3 Foreword from Resource Efficient Scotland 5

4 Introduction 6

4.1 General 6

4.2 Background to the Organisation 6

4.3 XX’s Performance on Carbon Management 6

4.4 Plan Structure 7

5 Carbon Management Strategy 9

5.1 Context and Drivers for Carbon Management 9

5.2 XX’s Low Carbon Vision 12

5.3 Strategic Themes 13

5.4 Carbon Reduction: Targets and Objectives 15

6 Emissions Baseline and Projections 16

6.1 Scope 16

6.2 Boundaries 18

6.3 Data Sources 19

6.4 Baseline 20

6.5 Projections and BAU 23

7 Carbon Management Projects 26

7.1 Introduction 26

7.2 Existing Projects 26

7.3 Planned Future Projects 27

7.4 Project Register 27

7.5 Projected Achievement Towards Target 28

7.6 Developing Targets 28

8 Carbon Management Plan Financing 29

8.1 Introduction 29

8.2 Assumptions 29

8.3 Benefits and Savings 29

8.4 Financial Costs, Sources of Funding and Opportunities 30

9 Management and Delivery of the Carbon Management Plan 32

9.1 Introduction 32

9.2 The Carbon Management Committee 32

9.3 Operational Roles and Responsibilities 32

9.4 Resourcing and Ownership 33

9.5 The Internal Delivery Model 34

9.6 Partnership Working Opportunities 34

9.7 Data Collection and Management 34

9.8 Communication and Training 35

10 Progress Reporting 36

10.1 Yearly Updates to the Carbon Management Plan 36

10.2 Data Collection and Management 36

10.3 Standard Operating Procedures 36

10.4 Other Reporting Requirements 37

10.5 Annual Improvement Action Plan 37

10.6 Risk Register 37

# Executive Summary

In the previous Carbon Management Plan (CM Plan) published in 20XX, XXX stated its aspiration to achieve a reduction target of XX%, based on the 20XX carbon footprint baseline, by 20XX. A number of factors have made this a challenging target including: the complexity of the carbon management process; demands for new skills within, and time from, existing staff in the identification, planning, resourcing and tracking of carbon reduction projects/initiatives; a changing legislative and policy framework, and the changing nature of estate and building use increasing energy intensiveness of the building stock.

These factors combined to suggest that a review and revision of the original Carbon Management Plan, including reduction targets, would help XXX move forward constructively.

This Carbon Management Plan (CM Plan) sets out our ambitions for XXX, and a roadmap for progress. Reducing carbon emissions is not just about our commitment to the environment. The same processes we use to identify carbon emissions reduction will also identify and realise financial savings through improved efficiency in the procurement and operation of our buildings and transport. The actions outlined within this Plan form part of our efficiency plan to reduce consumption and provide value for money.

The 20XX carbon footprint was calculated to be xx tonnes of carbon dioxide equivalent (tCO2e) and covered electricity, gas and gas oil consumption, transport (fleet), water and wastewater consumption, and waste disposal to landfill.

XXX has therefore decided to set a target to reduce its total annual carbon footprint by xx tCO2e by the end of financial year 20XX; this continues the aspiration of a XX% reduction but based upon the 20XX footprint and to be delivered by 20XX.

**By 20XX, XX will have reduced it’s carbon emissions by XX% on a baseline of 20XX. This equates to a figure of XX tonnes CO2e in 20XX**

The following graphs detail XX’s 2013/14 baseline carbon footprint and related expenditure:

**Graph showing XX baseline Carbon footprint**

**Graph showing XX baseline Carbon footprint cost**

Reductions will be achieved through a range of projects including energy, fleet and awareness raising initiatives. XXX has capital funding of £xM approved by the Finance Committee for carbon management projects; these funds were released at the start 20XX. In addition, the XX fund has contributed a further £xx to date.

If all identifiable carbon saving projects were to be implemented, the potential cumulative **financial savings** (avoided costs) to the organisation are in the region of **£XX** over the period 20XX to 20XX.

The Project Sponsor for this CM Plan is the [title/ role], who will be assisted in its delivery by XX. XXX has introduced X Green Champions to enhance communication and awareness-raising by actively promoting and monitoring environmental projects both locally and among wider stakeholders.

This CM Plan is viewed as a ‘live’ document and it is envisaged that there may be changes on an annual basis as XX’s estate changes and planning assumptions become a reality. To ensure that it remains ‘fit for purpose’ to deliver targeted carbon savings, this document will be reviewed on an annual basis. This process will be overseen by the Carbon Management Committee (CMC) and coordinated by the Carbon and Energy Manager.

# Foreword from the Project Sponsor

# Foreword from Resource Efficient Scotland

Resource Efficient Scotland are pleased that XX have committed to improving their resource efficiency throughout their operations demonstrated in this Carbon Management Plan. There is an opportunity to save energy, water and money, increase recycling and use fewer resources. Resource Efficient Scotland will be able to provide assistance to implement and deliver on these improved resource efficiency measures through technical support and guidance.

# Introduction

## General

XXX began their Carbon Management Programme in 20XX. A review undertaken indicates that the following were reasonably well established: the original carbon footprint; the process for managing carbon emissions, and project list to achieve carbon savings. However, the review also acknowledged that, strengthening of progress tracking and further project opportunity development would support ongoing efforts.

XXX therefore recognises that it has reached a point in its carbon management maturity where the decisions it makes in this current plan period with respect to future funding of carbon management reduction measures will have a significant impact on the organisation’s ability to meet its stated reduction targets.

## Background to the Organisation

General description of the organisation stating when established, size/scale, current practices. Description of the estate, number and type of buildings.

## XX’s Performance on Carbon Management

Although XXX began their Carbon Management Programme in 20XX, they have been implementing energy saving measures since the early XXXX s. With the organisation’s reporting obligations through the CRC Energy Efficiency Scheme and XX, there is already a reasonably well established process for measuring and monitoring carbon emissions and project list to achieve carbon savings.

The key issues facing the organisation comprise the changes to the built estate, staff/patient/service user/etc throughput and increasing energy consuming equipment and facilities all of which will have significant impacts on future carbon emissions. XX’s Carbon Management Committee will continue to take measures to adapt the CMP to any potentially significant impacts on achieving Carbon Management Plan targets.

A further challenge which is beginning to impact on the organisation is the future of the CRC Energy Efficiency Scheme (CRC EES); this Scheme currently results in additional costs (estimated at over £xx in 20XX) associated with the organisation’s carbon emissions. Implementation of this CMP aims to deliver year-on-year benefits by realising cost savings and minimising future CRC exposure.

One of the key issues in setting a reduction target is the ability to forecast future footprints to enable the setting of a target which is both realistic and achievable. As an example, a 10% reduction on a year 1 footprint of 10,000 tonnes of carbon dioxide equivalent (tCO2e) (1,000 tCO2e saved to achieve the target figure of 9,000 tCO2) is equivalent to a 25% reduction on a year 5 footprint of 12,000 tCO2e (3,000 tCO2e saved to achieve the target figure of 9,000 tCO2e).

As noted, any future footprint forecast needs to reflect anticipated changes in the estate itself (e.g. increases in energy consumption due to refurbished offices) and its use. This Business As Usual (BAU) scenario then provides a clearer picture to allow forecast of a realistic target figure (and hence target) that is achievable, based on a practical project list. Misinterpretation of the BAU case can mask the savings achieved as savings are hidden by an increasing footprint.

The organisation, including senior management, staff and XX, recognises the true value of the carbon management process and hence the development of an accurate BAU and annual carbon footprints that reveal the true savings being achieved and how these are mitigating against a constant flux.

In the previous Carbon Management Plan published in 20XX, the organisation set a reduction target of x% based on a 20XX carbon footprint baseline of xx tCO2e; this equated to a target footprint of xx tCO2e and an overall cumulative reduction of xx tCO2e across the 5 year period to 20XX. The 20XX footprint included emissions from: electricity, gas and oil consumption; transport (fleet and business, including air travel); waste to landfill, and water consumption.

A number of factors have made this a challenging target. In common with their peers and many other public sector organisations at that time, the complexities associated with delivering a comprehensive carbon management programme were new and not fully understood. Despite the organisation’s good history of implementing energy efficiency measures, the increasing demands on staff associated with the identification, planning, resourcing and tracking of carbon reduction projects/initiatives have meant that they were effectively developing new skill sets and increasing their knowledge-base whilst still continuing to perform existing duties.

Furthermore, the changing legislative and policy framework has meant that the drive to meet the stated CMP carbon reduction target has often been overshadowed. Finally, energy intensiveness within buildings is increasing, estate is changing and there is a constant drive to increase service delivery.

These factors have combined to suggest that a review and revision of the original Carbon Management Plan, including targets, would help the organisation move forward constructively.

## Plan Structure

This Carbon Management Plan details the XX’s strategy for reducing carbon emissions over the next five years and sets out a clear timetable as well as identifying the responsibilities and internal resources required to deliver the programme. The main objectives of the plan are:

* To continue to take a whole business approach so that carbon management is adopted as a key objective. Key stakeholders will continue to be appointed to ensure that carbon reduction is fully integrated into the organisation’s culture.
* To adopt revised targets for the measurable reduction of carbon emissions and to deliver these reductions.

In order to ensure that there is effective and ongoing ownership of the programme, it is important to define a governance structure. The [title/ role], as Project Sponsor, will be responsible for implementation of the plan and reporting to XX. The CMP will be regularly reviewed and updated, and information on the organisation’s environmental performance will be published on an annual basis.

This Plan contains the following Sections:

The **Carbon Management Strategy** sets out the context and drivers for carbon management in XX, including the organisation’s own vision and strategic themes.

**Emissions Baseline and Projections** discusses the results from the revised carbon footprint baseline and includes clear definition on the organisation and operational boundaries applied, and data sources and availability. It also discusses the BAU scenario and Value at Stake.

**Carbon Management Projects** outlines the carbon reduction projects currently implemented and planned future projects, and evaluates likely success in achieving targets set out.

**Carbon Management Plan Financing** describes the financial support available for carbon management within the organisation whilst **Management and Delivery of the CMP** defines the management structure in place to ensure the Plan’s success.

The final chapter on **Progress Reporting** outlines how the carbon management progress will be monitored measured and communicated both internally and externally.

# Carbon Management Strategy

## Context and Drivers for Carbon Management

The organisation faces a complex set of drivers which set the context for carbon management. Crucially, the organisation recognises that these cannot and should not be viewed in isolation from each other or the principle goal of continuously minimising its environmental impact whilst maximising its contribution to society and the economy.

Ultimately, a strong performance with respect to carbon emission reduction should deliver financial benefits to the XX by mitigating the risks associated with e.g. increases in energy tariffs and levies such as the CRC EES.

The following represent the key carbon drivers for XXX:

* Scottish Government targets
* UK & European targets
* Climate of reducing financial allocations
* Rising energy costs
* Principle that investments in carbon reduction are generally associated with commensurate reductions in future expenditure
* The need to eliminate waste of resources and to increase efficiency
* The organisation’s own carbon management targets
* Depletion of the world’s finite resources
* It’s the right thing to do

### Climate change

Man-made carbon dioxide (CO2) and other greenhouse gas emissions, also referred to as carbon emissions, are believed by the UK government and the majority of the scientific community to be a major cause of the increase in average global temperatures since the Industrial Revolution. Although some scepticism remains the evidence is very strong and the Precautionary Principle has persuaded successive governments to commit to reducing emissions.

Scotland’s net emissions of carbon dioxide in 2005 were over 54 million tonnes, approximately 0.2% of the World’s carbon dioxide emissions. Scotland has 0.08% of the world’s population and therefore proportionately produces higher carbon emissions per capita.

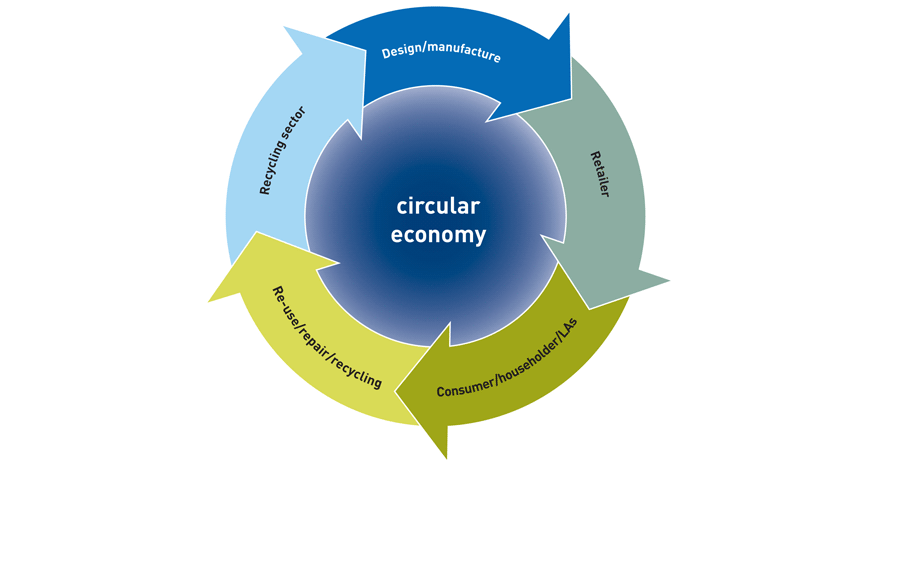
The Scottish Government has sought to address this in the Climate Change (Scotland) Act 2009, setting out a mandatory target to reduce greenhouse gas emissions by 80% by 2050. In the Climate Change Act (2008), the UK Government also committed to similar carbon reduction targets. Significant carbon savings will be required across all sectors in the UK including from Higher Education Institutions.

### Resources

With material scarcity and energy security becoming increasingly important priorities, a circular economy is an alternative to a traditional linear economy of make, use and dispose. In a circular economy we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. This model however is not simple to achieve - it requires product life-cycle thinking across supply chains, production processes and consumers. But by turning the challenges identified into opportunities and then actions, a circular economy can be developed that delivers significant cost and environmental savings.

The most significant circular economic outcomes in each Product Loop involve:

* Keeping products in use for longer (through design for longer life, redeployment, reconditioning etc);
* Ensuring that unwanted products are returned to the economy for re-use; and
* Developing opportunities for closed-loop recycling of materials for high value applications.



### Legislative drivers for carbon management

Over the past 20 years there have been many pieces of legislation enacted at an increasing rate in the UK and Scottish Parliaments which aim to address the issue of climate change, carbon dioxide and greenhouse gas emissions, and sustainability. Many of these stem from European Union Directives which in turn were developed in order to meet the obligations of the Kyoto Protocol, adopted in December 1997 and enforced in 2005. Under Kyoto, ratifying countries agreed to commit to reductions in their carbon emissions by, on average, 5.2% below 1990 levels by 2008-12.

The Agreement was supported in the UK by the findings of the Stern Review[[1]](#footnote-1) on the Economics of Climate Change, published in October 2006, which provides compelling economic reasons to address climate change.

The UK share of the collective Kyoto target assumed by the European Union under the Protocol is a 12.5% reduction in emissions below 1990 levels by 2012. Subsequently the UK Climate Change Programme (launched in 2000) set a target of 20% reduction by 2010 and 60% reduction by 2050. The Climate Change (Scotland) Act 2009 pledges to reduce Scotland’s greenhouse gas (GHG) emissions by 42% by the year 2020 and by 80% by the year 2050. Scottish Ministers are also committed to the promotion of renewable energy in Scotland. They set a target that 80% of the the electricity generated in Scotland (as a proportion of gross consumption) should come from renewable sources by 2020, with an interim target of 31% by 2011. Several of the schemes discussed in Appendix XX aim to promote the uptake of smaller scale renewable energy generating technologies.

The UK Government has placed an emphasis on the public sector setting a leading example. Public sector leadership will be critical to the achievement of the Government’s climate change objectives.

In addition to the EU’s Emissions Trading System (EU ETS), a number of legislative instruments such as the Climate Change Levy (CCL) and Carbon Reduction Commitment – Energy Efficiency Scheme (CRC EES) have been introduced by the UK Government, designed to encourage organisations to reduce emissions. The CRC EES introduces carbon trading to energy intensive organisations not part of the EU ETS. The EU Energy Performance of Buildings Directive (EPBD) was transposed into Scottish law in 2008 and has placed an obligation to evaluate energy usage for inclusion in Energy Performance Certificates to be displayed in all public buildings meeting certain criteria. The 2010 recast Directive also includes provisions include nearly zero energy requirements for new public buildings within 8 years or less while Scottish and UK Sustainable Construction strategies aim for zero energy buildings in the same time-frame. This, allied to recent changes in Buildings Regulations, will require the organisation to be proactive in terms of building design, construction and use.

Legislative drivers for carbon management can take the form of targets (e.g. from UK or Scottish Government), incentive systems, charging schemes, or regulatory compliance requirements. Figure XX (below) shows a timeline of the current and future policy framework showing the main legislative drivers relevant to this project.

In addition, XXX is a member of XXX which commits the organisation to…

This present strategy document will aid the delivery of key sustainability and estate management programmes in a carbon efficient and sustainable manner.

Some of the main legislative drivers affecting the organisation are set out in Appendix XX; however, the list is not definitive.

### Other drivers for carbon management

While reducing the financial and legal risks posed by various legislative requirements is a significant driver behind the XX’s carbon management programme there are other factors supporting the need for improving energy efficiency and reducing carbon emissions.

***Cost saving:*** The case for carbon reduction is strengthened by the financial constraints facing all organisations. Funding cuts provide significant incentive to reduce resource consumption and therefore carbon emissions. A sensitive world economy, limitations on energy supply and a more challenging regime in terms of carbon taxation will drive energy prices above general inflation for the foreseeable future. This is particularly significant given the large proportion of XX’s carbon emissions (xx%) that are derived from gas and electricity usage.

***Reputational benefit:*** Reducing XX’s carbon emissions will demonstrate its commitment to good carbon management and sustainability and will enable the organisation to act as an exemplar to encourage others. In addition, a commitment to sustainability is increasingly linked to an organisation’s reputation with better sustainability credentials and good carbon management enhancing the organisation’s reputation.

***Improved staff satisfaction***: A number of studies have identified a correlation between a focus on sustainability and staff satisfaction (particularly where staff are fully involved) and this can lead to improved ‘productivity’ or morale.

***Improved engagement with key stakeholders:*** The organisation’s key stakeholders, including staff, XX and the local community, are increasingly focusing on sustainability. The organisation’s engagement and enhanced commitment and leadership with this agenda will improve its relationship with these stakeholders. XX will seek to become an exemplar of good practice and so engage others in making a positive contribution to sustainable development.

## XX’s Low Carbon Vision

XX began its commitment to sustainability in the mid xx’s when the Energy Office was set up. This early investment allowed it to become energy efficiency accredited in 20XX and this status has been renewed in 20XX and 20XX.

The organisation has developed a comprehensive Carbon Management Plan with targets and timetables for substantially reducing greenhouse gas emissions and improving its impact on the environment. The core themes within the CMP include:

* Upgrade to Efficiency – continuing upgrading inefficient buildings and replacing inefficient appliances.
* Build Better – all new buildings should be high performance and energy efficient.
* Move to clean power – purchase or generation of electricity from renewable sources.
* Expand Transportation Alternatives – making it easy to get around with less fuel.
* Implement Green Purchasing – procurement of products that use less energy, last longer and are good for the environment.
* Institutional Conservation – create a culture of conservation awareness across the organisation.

Capital funding of £XXM has been approved by the Finance Committee for carbon management projects; these funds were released at the start of 20XX. In addition, the XX fund has contributed a further £xx to date; the savings will continue to be available on a year-on-year basis and equate to approximately £xx per annum.

The objectives listed create a number of opportunities and challenges. Critical to the success of the Carbon Management Plan is the understanding and buy-in of staff across the organisation. An effective communication plan will facilitate this, and is important to maintaining the profile of the CMP throughout the five year lifecycle. The following objectives have been set for this strategy:

* To raise awareness of the CMP.
* To obtain buy-in to the plan from stakeholders.
* To inform staff of progress and key milestones.
* To ensure there is an opportunity to contribute to the project through consultation and feedback.
* To champion a low-carbon approach to the wider community by publicising successes.

A range of communication channels have been defined and will be used as appropriate for the audience/message. The channels used and overall effectiveness of the communications strategy will be reviewed regularly during the project to determine whether the objectives are being attained; the current strategy is outlined in Section XX.

To further enhance communication and awareness raising, the organisation has introduced X Green Champions who will actively promote and monitor environmental projects both locally and across the wider community (Section XX).

## Strategic Themes

There are two primary objectives of the Carbon Management Plan: to achieve a reduction in carbon emissions and to embed carbon management within the culture of the organisation. In order to achieve these objectives, XX will continue to build on the key themes identified in the 20XX Plan. The organisation’s strategy and implementation plan will therefore need to address the following specific areas.

### Energy

Energy use in buildings is by far the most significant source for carbon emissions, contributing xx% of the organisation’s total footprint, as calculated. Rising fuel costs and legislative drivers such as the CRC EES combine to make this a priority area for action.

XX will continue to focus on increasing the energy efficiency of the estate by installing up-to-date technologies, including renewables where practicable, and engaging with staff and other stakeholders.

*Strategic Target:*

* To reduce energy consumption by xx% by 20XX.

### Travel/Transport

The organisation continues to strive to reduce carbon emissions arising from transport and travel. In 20XX, the organisation released its Strategic Travel Plan, the focus of which is the promotion of active travel (walking & cycling) and reduction in business and fleet travel activity.

*Strategic Targets:*

* Reduce the % of business miles by xx% by 20XX
* Increase the use of video conferencing by xx% by 20XX
* Reduce the CO2e associated with Fleet vehicles by xx% by 20XX
* Reduce the % staff travelling alone by car by xx% as their main mode of travel by 20XX

### Waste

The organisation continues its commitment to reducing the quantity of waste going to landfill. At both xxx and xxx, paper, cardboard and glass collection facilities are available for the diversion of these materials from landfill into the recycling stream. Services Management have a responsibility for promoting utilisation of the available recycling facilities.

*Strategic Targets:*

* To comply with the Scottish Government’s targets for recycling and waste reduction strategies.
* To increase our overall figure for waste diverted from landfill to xx% by 20XX
* To achieve xx% paper recycling by 20XX
* To comply with Wrap recycled contents and waste minimisation targets in construction projects
* To move from bottled drinking water to plumbed in dispensing systems by 20 XX

### Water

In addition to Planned Preventive Maintenance which ensures water loss from infrastructure is minimised, the organisation continues to invest in water conservation measures which reduce both consumption and waste water production.

*Strategic Target:*

* To reduce water use by xx% by 20 XX

### Procurement

The prudent use of natural resources is still a cornerstone of carbon management in the organisation. Xx% of the organisation’s power is drawn from its utility suppliers Green Source renewable energy.

Resource efficiency is further supported by the SHEFC requirements for all new builds and refurbishment projects to meet BREEAM ‘excellent’ and ‘very good’ standards respectively.

On the wider procurement front, XX is a member of XX and accesses contracts negotiated by Procurement Scotland[[2]](#footnote-2) and other external bodies for a wide range of goods and services procured on a collaborative basis. All of these bodies have sustainability as a central focus of their procurement process, and increasingly environmental factors are featuring within the evaluation criteria applied in awarding contracts.

“One off” purchases for equipment and tangible goods always takes account of the whole life cost of the goods which ensure a healthy evaluation weighting is given to long warranty and maintenance contracts, ongoing running costs and the use of consumables.

*Strategic Targets:*

* To procure as a minimum xx% of electricity supplies from green sources (current uptake is xx%)
* All new build to aim for a BREEAM Excellent standard
* To aim to bring all buildings up to Energy Performance Certificate ‘C’ standard with ‘B+’ the target for all new builds

### Carbon data management

Good data recording and data management enable the monitoring of progress against targets. Energy management software is used to collect and collate data for monitoring and targeting in relation to energy and water consumption, and provides analysis and reporting facilities. It is proposed to use this as a single platform for handling all energy and water data such as utility invoices, manual reads and smart meters.

In addition, Standard Operating Procedures (SOPs) are being developed to provide a standardised and formalised process for the collection, analyses and reporting of carbon emissions data.

### Communication

The Carbon Management Awareness Campaign (CMAC) is designed to drive awareness of the benefits of carbon reduction; with the objective of changing the behaviour of all staff. This was launched in January 20XX. The branded xx campaign will use print and electronic media, as well as talks and roadshows, to promote the message across the organisation. It is anticipated that the CMAC will contribute by addressing the following:

* Awareness raising amongst staff in relation to basic energy-saving practices in daily life.
* Use of equipment in a sustainable way, preserving the lifespan of our current facilities, reducing our expenditure.
* Concurrent financial benefits of energy saving; financial benefits will further allow improvement of facilities, enhancing the organisation’s reputation.
* Creation of an enduring culture change such that good practice will be easily adopted by all new staff.
* Promote staff feedback about energy saving to widen the debate around carbon management.

Key to the delivery of the carbon management programme is the development of the ‘Green Champion’ network that will ensure that efforts to reduce carbon emissions will be ongoing.

## Carbon Reduction: Targets and Objectives

The crux of the review process is the setting off a carbon reduction target for the lifespan of this CMP.

XXX **will reduce its calculated 20XX baseline carbon footprint by xx tonnes of carbon dioxide equivalent by the end of 20XX.**

This represents a reduction of xx% based on the total carbon footprint of xx tCO2e emissions for the year 20XX. This 20 XX carbon footprint baseline covers electricity, gas and gas oil consumption, transport (fleet), water and waste water consumption and waste disposal to landfill. The xx% target will be based on a range of projects including energy, fleet and awareness raising initiatives.

# Emissions Baseline and Projections

The first step in developing a Carbon Management Plan is to determine the organisation’s current emissions or carbon footprint, facilitating the setting of a realistic reduction target.

The resources to be included in the footprint must be decided (Section 3.1: Scope and Section 3.2: Boundaries) at the outset. The Scope and Boundaries of the carbon footprint will be determined by the extent of the estate, goods and services over which the organisation has operational control, and the availability of good quality data.

Once the scope has been set, a baseline year can be selected and the baseline footprint determined (Section 3.3: Data sources and Section 3.4: Baseline).

The next stage in setting carbon reduction targets is the estimation of projected emissions/ costs if no action were taken (known as Business As Usual or BAU) in conjunction with determination of potential savings with the implementation of carbon management projects identified as achievable and fundable.

Projections for a range of future scenarios can be evaluated. The “gap” between the future BAU emissions and the projected emissions with carbon management projects implemented is known as the Value at Stake (Section 3.5 Projections and Value at Stake). The organisation’s target emissions reduction will be based on this difference (Section 3.6).

## Scope

### Emissions sources

The GHG Protocol[[3]](#footnote-3) categorises carbon emissions as scope 1, 2 or 3 emissions, as defined below and shown in Figure XX.

***Scope 1 Emissions:*** Direct GHG emissions occur from sources that are owned or controlled by the organisation, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.

***Scope 2 Emissions:*** Electricity indirect GHG emissions arise from the generation of purchased electricity consumed by the organisation.

***Scope 3 Emissions:*** An optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the company. Examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services. Scope 3 also includes the Transmission and Distribution (T&D) losses for purchased electricity supplied through the Grid.

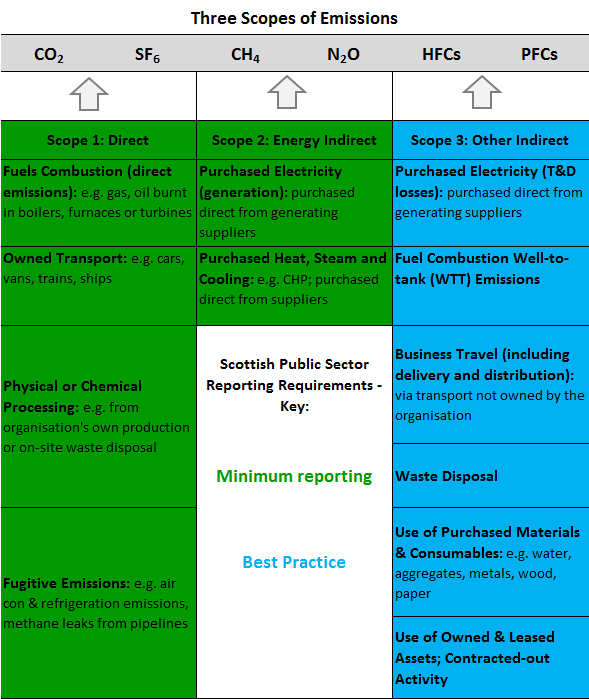


Figure XX: Sources of carbon emissions[[4]](#footnote-4)

## Boundaries

Carbon footprints are generally defined in relation to two boundaries: the organisational boundary and the operational boundary

### Organisational Boundary

The **organisational boundary** sets out which assets are to be included in the footprint and how any shared assets will be accounted for. The organisational boundaries used for the production of the carbon footprint outlined below are shown in Figure XX.

Figure XX: Organisational boundary for XX’s carbon footprint 20XX

Services/Functions include XX and XX.

The **operational boundary** essentially sets out the emission sources included in the footprint. In keeping with good practice, and, in particular, the WRI Guidance for Public Sector Organisations, this should include all Scope 1 and Scope 2 emissions (e.g. on-site fuel combustion, company owned vehicles and purchased electricity consumption). As noted above, Scope 3 emissions (e.g. waste, water, commuting and business travel) are considered discretionary but the following are recommended for inclusion by the above noted guidance:

**Transport:** Specifically transport in non-owned vehicles, such as employee business travel, commuting or transportation of purchased materials/goods and waste. Travel by air, ferry, bus, rail and in employees own vehicles are all classed as Scope 3.

**Waste:** Unless waste is treated on-site, waste management falls under Scope 3. This may cover the treatment of waste generated in the delivery of organisational services or disposal of waste generated in the production of purchased materials and fuels. Waste treatment activities can include disposal in landfill, incineration and composting. Emission factors for recycling are generally negative as a result of emission savings through lower energy requirements and avoided extraction of virgin materials. However, WRI guidance on Scope 3 emissions recommends that states that ‘avoided emissions’ associated with recycling should not be included in, or deducted from, the Scope 3 inventory, but should instead be reported separately.

**Water:** Defra reports different emission factors associated with water supply and wastewater treatment, therefore it is recommended that both are reported.

**Other:**  This may include emissions associated with the procurement of goods and services purchased by the organisation. This category includes all upstream (i.e., well to tank) emissions from the production of products purchased or acquired by the reporting company in the reporting year. Products include both goods (tangible products) and services (intangible products).

The operational boundaries used for the production of the carbon footprint outlined below are shown in Figure XX. Whilst every effort has been made to aggregate full data sets for each category, some data gaps have been identified in the process. Figure XX indicates the level of completeness of data sets.

Figure XX: Operational boundary for XXX’s carbon footprint 20XX

The categories included and excluded from the 20XX carbon footprint baseline for the organisation are shown below in Table XX.

Table XX: Scopes included in XXX’s carbon footprint 20XX

|  |  |  |
| --- | --- | --- |
| Scope | Included in XXX’s carbon footprint | Excluded from XXX’s carbon footprint |
| One (direct) | * Fuel combustion - natural gas consumption in buildings * Fuel combustion – gas oil * Fleet transport – owned vehicles | * Fugitive emissions - refrigerant gas |
| Two (indirect) | * Purchased electricity (generation) – energy consumption in buildings |  |
| Three (indirect) | * Purchased electricity (T&D losses) – energy consumption in buildings * Waste to landfill * Water & wastewater | * Business travel in staff-owned vehicles & public transport (see Section 3.3.1 below) * Staff commuting * Waste to recycling |

## Data Sources

Data required for estimation of the organisation’s carbon footprint comprises, in effect, an inventory of the consumption of goods and services outlined in Table XX above. This information can generally be obtained from the organisation’s own records (Section 3.3.1). These data are then converted to tonnes carbon dioxide equivalent (tCO2e) by the application of emission factors (EFs) which allocate an emissions output per unit of goods/service (Section 3.3.2).

### Organisational data sources

Like all public sector bodies, XX routinely collects data for and reports performance via a number of mechanisms, both mandatory and voluntary. The flow of data through the organisation is discussed in detail in Section XX and Figure XX.

To calculate the total carbon footprint for XX, data for the financial year 20XX was assembled. The data sources used in the calculation of the carbon footprint are detailed in Table XX below.

Table XX: Data sources for XXX’s carbon footprint 20XX

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Subcategory | Main Source/s | Supplementary source/s |
| Buildings Energy Use | Electricity  Natural Gas  Other Fuel | Spreadsheet XX | XX |
| Travel/Transport | Fleet | Spreadsheet XX | XX |
| Waste | Landfill  Recycling | Spreadsheet XX | XX |
| Water | Supply | Spreadsheet XX | XX |
| Waste water | Treatment | Spreadsheet XX | XX |

The following challenges were experienced with the collection of data for the emission sources included in the 20XX footprint. There was some difficulty in obtaining complete data sets for the same time period for all categories as detailed below.

**Energy:** electricity, gas and oil data is collated on a monthly basis. Data is collected through xx channel for all premises. However, due to metering infrastructure, it was only possible to allocate energy consumption values to metered sites, not to the individual departments. In addition, the metering and sub-metering system made the matching of consumption data to Gross Internal Areas (GIAs) complex.

**Travel/Transport:** Fleet data was collected in conjunction with a one-off Survey on a January to December calendar basis.

**Waste:**  Waste data was collated on a monthly basis and is largely comprehensive. An average composition for commercial and industrial waste has been assumed.

**Water:** Water data is collated on a monthly basis. Data was provided as a cumulative figure for the whole organisation; consumption could not therefore be allocated on a site by site basis.

### Emission factor sources

Data on energy use, travel and transport, water supply, wastewater treatment and waste to landfill have been converted into carbon emissions using recognised GHG Protocol consistent emission factors provided by Defra in the 20XX Guidelines to Defra/DECC’s Greenhouse Gas Conversion Factors for Company Reporting.

Carbon factors, particularly the factor for electricity, change over time and this can have a significant impact on the carbon footprint calculation. More details on the emission factors applied are contained in Appendix XX.

For future reporting, SOPs are being developed to formalise the carbon footprinting calculation process and provide signposting to key sources for current carbon emission factors (see Section XX and Appendix XX).

## Baseline

The baseline year for this CMP is the 20XX financial year. Based on the scope outlined above, XX’s total carbon footprint, or carbon footprint baseline, for 20XX was xx tCO2e. The graphs below illustrate the components of that footprint in terms of carbon emissions (Figure 5) and cost (Figure XX). Carbon emission figures for each category are also shown in Table XX.

Figure XX: Breakdown of XXX 's baseline carbon footprint by carbon emission sources

Figure XX shows that by far the greatest contributor to the organisation’s carbon footprint is electricity which accounts for x% of the footprint; this is followed by natural gas which contributes x%. Emissions from energy from gas oil, fleet transport, waste to landfill and water consumption together account for less than x% of the total footprint. Therefore reducing energy consumption in buildings should be seen as a priority area for action. However, reductions achieved in all categories will contribute to an overall decrease in XX’s total carbon footprint.

Figure XX: Breakdown of XX 's baseline carbon footprint by cost

Expressing emissions on a cost basis (Figure XX) increases the relative importance of water and waste, which, respectively, account for x% and x% of the cost of carbon emissions but only x% and x% of the carbon footprint. Therefore, in the context of current costs, reducing emissions from water and waste will have a greater impact on cost reduction than on carbon reduction. However, costs are still dominated by energy consumption which account for x% of total annual costs.

Table XX (below) compares the breakdown of the total carbon footprint by category of emission source between the 20XX and the 20 XX footprints.

Table XX: Comparison between 20XX and20XX carbon footprints

|  |  |  |
| --- | --- | --- |
| Category | 20XX carbon footprint (tCO2e) | 20XX carbon footprint (tCO2e) |
| Electricity | XX (x%) | XX (x%) |
| Gas | XX (x%) | XX (x%) |
| Other | XX (x%) | XX (x%) |
| Travel/Transport | XX (x%) | XX (x%) |
| Waste | XX (x%) | XX (x%) |
| Water | XX (x%) | XX (x%) |
| TOTAL | **XX (x%)** | **XX (x%)** |

Compared to the 20XX footprint, the key difference is the travel element which constitutes x% of the 20XX footprint but only x% of the 20XX footprint. This is a result of the exclusion of staff travel claims for flights and public transport due to data availability; if Travel/Transport is removed altogether from the footprints and the results compared, there has been only marginal change in the proportional contribution of the remaining categories.

Total emissions from electricity have risen in the face of a fluctuating but generally decreasing emission factor for this utility, suggesting overall energy use has increased.

### Carbon and waste: the Carbon Metric

The carbon footprint in this CM Plan has been produced using the inventory or territorial methodology for calculating the direct carbon emissions associated with the organisation’s activities as recommended in the 2014 Defra/DECC guidelines. This means the emissions included are those arising within a defined territorial or geographic boundary; for waste these comprise the onward transportation of the waste and some processing/process emissions as discussed in section XX.

However, carbon emissions can also be calculated using a consumption based approach. This is the method used in the Scottish Government’s Carbon Metric. Based on life cycle analysis or life cycle thinking, this assigns all the life cycle emissions associated with a product to its consumer regardless of where those emissions arise. This means that the emissions associated with extraction of raw materials, manufacture, distribution transportation and disposal are all included. Because virtually the whole life cycle is looked at, the disposal method may increase the total emissions (e.g. landfill) or reduce them (e.g. recycling). Further information is provided in appendix XX and at http://www.zerowastescotland.org.uk/category/subject/carbon-metric.

This approach allows organisations to make informed decisions about their waste management options based on the wider carbon impact of different disposal routes. Organisation XX used this calculator to evaluate the wider impact of the management of their waste using Zero Waste Scotland’s Carbon Metric calculator.

The results are outlined in Table XX below:

Table XX: Carbon Metric: carbon impacts of waste management

|  |  |  |
| --- | --- | --- |
| Headline category | Total impact (tCO2e) | Impact  per tonne (tCO2e per tonne) |
| *Overall carbon impact of waste* | | |
| Baseline year (20XX) | XX |  |
| Reporting year (20XX) | XX |  |
| Difference | XX (xx%) |  |
| *For reporting year* | | |
| Impact from prevention | XX | XX |
| Impact from recycling/composting | XX | XX |
| Impact from incineration | XX | XX |
| Impact from landfill | XX | XX |

Whilst there is currently no mandatory requirement for measuring the carbon impact of waste, the Scottish Government has stated that it “expects that a number of exemplar organisations will be early adopters of the metric as a way of better understanding and reporting the impact of their waste management practices.”[[5]](#footnote-5)

### Future carbon footprinting: organisational processes

XX aims to expand the operational boundary of the carbon footprint in the future to include emission sources currently excluded such as Business Travel by public transport. This will increase the accuracy of the calculated footprint and enable better measurement of progress in emission reduction. Currently, any progress made by the organisation in reducing emissions from excluded sources will not be reflected in a reduced carbon footprint.

XX believes that one of the keys to the successful attainment of its carbon reduction target is recognition of the different drivers and needs that impact on the component parts of the organisation’s carbon footprint. Transparency of responsibility and accountability at a departmental level for the ongoing delivery and monitoring of core activities and carbon reduction projects will be necessary to deliver the targets within this CMP.

The organisation will introduce Standard Operating Procedures to ensure that progress monitoring will be both streamlined and consistent, with key responsibilities for data reporting clearly defined; where required, corrective actions will be implemented in a timely manner. Such an approach will facilitate annual reporting as detailed in Section XX below.

## Projections and BAU

Analysis of projected emissions and the expected impact of BAU allows an evaluation of how the organisation’s carbon emissions will change over time in terms of tCO2e emitted and cost.

Previously, a standard figure of 0.7% annual increase in emissions has been used which did not take into account the specific growth variables which XX were expected to encounter. However, in order to generate future footprint figures which provide greater certainty and allow the setting of a realistic carbon emission reduction target, analysis was conducted to track carbon emissions against various growth variables into the future.

The results of the BAU analysis help to explain what is happening in the short and long term, what is happening to different parts of the footprint e.g. gas and electricity, and the current importance of the grid emission factor forecast, including the level of uncertainty in relation to this beyond a certain point.

Within the next 5 years, the organisation will potentially see xx changes in the 20XX period, with the associated partial or complete closure of a number of buildings; however some of these closures will fall into the CMP period.

Figure XX below shows the expected BAU from 20XX against an ongoing target reduction of x% over 5 years (to 20XX). The area under the two lines (‘BAU’ and ‘target’) represents the savings to be achieved and is called the Value at Stake (VAS); in this CMP, the carbon VAS is approximately xx tCO2e.

Figure XX: Value at Stake - carbon emissions against target

For XX, the equivalent financial Value at Stake equates to £xx over the 5 year lifetime of this CMP (Figure XX). If the costs of CRC are factored in, (based on an estimate of an initial figure of £XX/tCO2e applied to emissions from stationary energy sources in 20XX, rising £XX/yr thereafter) the Value at Stake rises to £xx.

In calculating the CRC impact for the organisation, xx tCO2e have been subtracted from the total tonnage of emissions subject to the CRC to reflect the proportion of emissions already captured in the EU ETS. xx tCO2e are actually covered by the EU ETS however xxx tCO2e require the purchase of allowances by the organisation. Whilst these allowances are currently set at £XX/tCO2e, future actual costs are unavailable; therefore a similar cost to that of CRC has been applied to the remaining xx tCO2e and thus have been included in the above calculation to provide an illustration of likely impact.

A year on year breakdown is also provided in Table XX.

Figure XX: Value at Stake - cost of carbon emissions against target

Table XX: Summary of Value at Stake (financial in £thousands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Units | 20XX | 20XX | 20XX | 20XX | 20XX | Total |
| Carbon VAS | tCO2e | XX | XX | XX | XX | XX | XX |
| Cost VAS | £ | XX | XX | XX | XX | XX | XX |
| Cost (+CRC) VAS | £ | XX | XX | XX | XX | XX | XX |

With predicted changes in the Grid emission factor, even if the organisation does not take action to reduce carbon emissions, they will still gradually fall over time; this is particularly pertinent for XX as a significant proportion of their footprint results from electricity consumption. Changes in estate bring on stream new energy-intensive buildings and replace old stock, particularly in 20XX and 20XX, masking some of the progress made in emission reductions and contributing to the increasing divergence from 20XX onwards; however the trend is still an overall reduction in emissions.

Despite this, it is still predicted that, if all carbon reduction projects are implemented as planned, in 20XX, the organisation will potentially see a reduction in their carbon footprint to xxtCO2e, xx tCO2e marginally in excess of their target of xx tCO2e. Projects included in the project register will account for approximately x% of this reduction in carbon emissions; the change in Grid factor will contribute x%, whilst the remaining x% of the reductions can be attributed to other BAU factors e.g. over the Plan period. Costs are predicted to increase from £xxM in 20XX to £xxM by 20XX; this figure excludes the potential impact of CRC costs.

.

# Carbon Management Projects

## Introduction

In order to continue achieving emissions reductions and avoiding financial exposure, XX is committed to identifying and implementing carbon saving projects. To achieve its emission reduction target, it will need to achieve an absolute reduction of xx tCO2e against its 20XX baseline carbon footprint. Based on the projections of BAU carbon emissions, this will equate to a reduction of xx tCO2e against anticipated emissions in 20XX (which takes into account the expected growth trend in emissions over the plan period).

XX recognises that successful attainment of its carbon reduction targets is contingent upon the following key elements being in place:

* An organisational framework within the organisation that is sufficiently robust to support the financing, delivery and monitoring of carbon reduction projects.
* Clearly identified responsibility and accountability for delivery against carbon reduction targets from the CMP outset.
* Identification of a realistic suite of carbon reduction projects across a range of areas relevant to the carbon footprint; this list must be regularly reviewed and flexible to adapt to emerging needs and opportunities for funding.
* A data collection and collation system that is integrated sufficiently to inform both an annual progress update on the CMP and other Government and associated returns (Section XX).

In this Section, the term “activities” is applied to the full range of interventions that contribute to emissions reductions. These may include traditional ‘projects’ such as the installation of voltage optimisation units or low energy lighting. For projects of this nature it is generally easier to predict and subsequently quantify the carbon savings that will be/have been achieved. However, activities may also include interventions such as staff energy awareness training where carbon savings are much harder to predict and subsequently quantify accurately.

Details of the organisational structure and mechanisms for financing, delivering and monitoring carbon reduction projects are outlined in Sections XX and XX. Standard Operating Procedures (Section XX) have been developed to direct the process of project review and annual reporting.

A full projects list is included in Appendix XX.

## Existing Projects

The following initiatives and projects have already been completed or implemented since the organisations’s initial baseline carbon footprint was calculated. The carbon emission savings achieved by these schemes will therefore have already contributed towards XX’s initial reduction target and corresponding savings are therefore included in the baseline carbon footprint for 20 XX.

### Energy

* Ventilation/Heat recovery – equipment installed in xx Building and xx Building
* etc

### Travel/Transport

* Speed limiters – roll out to all vehicles underway
* etc

### Waste

* Improved recycling

### Water

* Good housekeeping and targeted maintenance across the estate

## Planned Future Projects

The projects identified below are a sample of those that have been selected for implementation within the financial year 20XX because they either generally provide the largest proportion of target figures or were already planned for delivery in that year as part of an ongoing programme of works. In relation to projects that have had their associated potential carbon savings quantified, the sum predicted to be saved over the five year lifespan of the CMP amounts to xx tCO2e.

### Energy

* Fans – air handling unit, variable speed drives, continued roll out across the estate
* etc

### Travel/Transport

* Fleet replacements must be speed limitable
* etc

### Waste

* Continued awareness raising and provision of facilities for recyclable materials

### Water

* Implementation of water conservation measures identified through XX

In addition there are some “enabling” projects which while not directly leading to carbon savings, will “enable” further savings to be achieved through subsequent outcomes/actions. These will also require funding to be identified and allocated.

## Project Register

The Project Register is a tool used to support XX with the recording of carbon reduction project data, calculation, and the analysis and reporting of progress against the carbon reduction target.

The tool was populated with XXX’s 20XX footprint figure, reduction target and project information in order to identify whether the organisation will meet its reduction targets and where applicable the quantity of additional emission savings required to enable reduction targets to be met.

The project register is a ‘live’ tool for the organisation to retain ownership of and continue to update regularly to allow tracking of progress of carbon emission reductions.

## Projected Achievement Towards Target

This CMP aims to achieve a xx tCO2e (x%) reduction on the 20XX carbon footprint by 20XX.

Figure XX below compares the future BAU emissions with the target emissions and the project plan emissions (BAU minus the yearly carbon savings from the projects). The figure illustrates how the projects outlined above will contribute towards achieving the carbon reduction target over the course of the plan timeframe.

This shows that the organisation would be likely to achieve their emission reduction target if all projects within the Project Register with quantified savings were to be implemented in accordance with the intended timescales. In fact the organisation could potentially marginally exceed its savings targets by xx tCO2e.

However the graph also highlights the impact of the commissioning of new buildings in 20XX on the overall carbon emissions. By identifying projects which would deliver savings in excess of the target, the risk of some projects not going ahead and/or carbon savings being more limited in reality will be mitigated.

Figure X: Carbon emissions projections over time

## Developing Targets

The analysis shows that, with the current projects in place, carbon emissions will decrease throughout the duration of the CMP, although progress is slowed by the commissioning of energy-intensive new buildings. The target xx tCO2e (x%) reduction will be achieved as the CMP currently stands.

There are proposed potential major estate changes .....; these will impact on the organisation’s ability to achieve its carbon reduction target if, as is possible, these are brought forward to begin within the remit of this current CMP. However, the strategy going forward is to develop a long term plan for XX’s infrastructure, including heating, cooling, power and water, which focuses on a centralised approach; this is likely to result in rationalisation of estate which will contribute to carbon emission reductions.

Some carbon reduction projects within the Project Register do not as yet have any carbon savings quantified; the majority of XX’s significant proposed projects do, however, have a quantified carbon reduction value, thus it is likely that these few projects remaining un-quantified will not significantly alter the outcomes of this CMP.

The associated cost will increase (significantly with CRC if it is continued). Although the organisation has no control over utility, petrol, waste and water costs (limited through procurement choices), it can control the amount of each used. In order to reduce the VAS financial burden, XX must reduce the amount of carbon emissions.

# Carbon Management Plan Financing

## Introduction

The capital cost of financing the planned Carbon Management Plan over the next XX years (20XX to 20XX inclusive) is £xx in total, producing a potential overall reduction of xx tCO2e against the organisation’s total 20XX carbon footprint. In year 20XX there is a further potential spend of £xx; however, it is important to note that none of the associated savings from projects scheduled for implementation in the final year of this CMP (20XX) will be realised within the scope of this current CMP. There are still pipeline projects which have the potential to further contribute towards the carbon reduction target.

This Section is based on the detailed financial analysis carried out against the projects discussed above and will draw on information inputted into Project Register.

## Assumptions

***Costs:***Actual costs have been used for projects that have already started and supplier quotes for planned projects. Where supplier quotes were not available, quotes for similar projects have been used (e.g. costs for one boiler replacement based on quote for another boiler replacement).

***Cost saving:*** Cost saving were calculated using the utility costs in the organisation’s baseline carbon footprint (i.e. 20XX costs) and assumed energy savings (from supplier quotes, published data sources or XX estimates).

***Carbon saving:*** Calculated carbon savings were derived using assumed energy savings (as outlined above) and Defra’s emission factors.

The key assumptions made in calculating the benefits and savings are:

* The unit price of gas and electricity over the next 5 years.
* Project capital requirements and financial and CO2e savings are been based on feasibility reports and on consultant design teams.
* Default emission factors were used in converting energy kWh to tonnes CO2e emissions.

Utility unit price assumptions are the most critical in determining the project financial savings. Utility supply markets are very volatile which makes prediction of future prices very difficult.

## Benefits and Savings

Under the BAU projected figures, the cost of not implementing this carbon management plan will be £xx, as outlined in Figures XX and XX, and Table XX. The total capital costs for projects contributing to savings within the CMP period is £xx; however in 20XX an additional £xx has been identified, comprising £xx for a CHP plant and £xxk for the final year of BEMS roll-out across the estate. Whilst this which would bring the overall total capital spend to £xx, again, it must be emphasised that the carbon savings associated with these two projects would begin in 20XX, and therefore are not realised or reflected within the period of this CMP.

The quantified benefits of implementing the carbon reduction projects outlined in this plan are set out below in Table XX and Figure XX. In Figure XX the BAU line reflects the financial impacts of changes in estate, including energy intensity, whilst the Project Plan Spend line reflects the financial impacts of these changes and the implementation of all carbon reduction projects as planned. The cumulative savings in costs associated with implementing the projects/activities identified in the Project Register are £xx by 20XX.

Table XX: Quantified financial benefits of CMP implementation (in £thousands)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Units | 20XX | 20XX | 20XX | 20XX | 20XX | Total |
| Projects/Activities Capital Cost (£k) | tCO2e | XX | XX | XX | XX | XX | XX |
| Annual Cost Saving (£k) | £ | XX | XX | XX | XX | XX | XX |
| Cumulative Cost Saving (£k) | £ | XX | XX | XX | XX | XX | XX |

Figure XX: Impact of costs (BAU compared with Project Plan Spend)

As well as improving efficiency and reducing utility costs, implementation of the CMP reduces the legal and financial risks associated with the various national and international regulatory regimes relating to the organisation’s activities and, in particular, the Scottish Government’s and Sustainability and energy efficiency agendas.

In addition to quantified benefits, the successful implementation of the identified projects will offer the organisation further benefits including:

* The creation of an improved, more comfortable and more energy efficient built environment for visitors and staff.
* Enhanced reputation from reducing the organisation’s carbon footprint.
* Improved platform for providing a lead in carbon management and sustainability to other stakeholders and organisations.
* Consolidation of standing within the CRC EES league table.
* Meeting of Government and other targets.
* etc

## Financial Costs, Sources of Funding and Opportunities

The projects included in this CMP require a total capital expenditure of £xx over XX years but give rise to potential annual revenue savings of £xx. In addition, it is projected that this investment will help achieve a x% reduction in the organisation’s carbon footprint over that period.

### Potential funding sources

Internal funding for carbon management will come from the Capital Plan which funds all new build and refurbishment projects. This includes a dedicated fund of £xx over XX years from 20XX to cover specific carbon management projects.

Awareness raising campaigns are being funded through the Corporate Communications controlled budget.

The other project funding sources emanate from ongoing funding allocated to Estates and Buildings for managing utilities, maintenance and capital development projects. As part of the long term maintenance plans, ongoing replacement of building fabric and infrastructure will aim to utilise materials and units producing enhanced building performance with concurrent carbon savings.

Any other potential funding and income sources such as xx Funding and Feed-in Tariffs will continue to be fully explored to support the capital funding within the Capital Plan.

### Additional Resources

The identified projects are predominantly of a built environment/engineering nature. The delivery of these will be the responsibility of the Estates Department. However, responsibility will extend to other departments, where appropriate, e.g. Corporate Communications for awareness, Transport Services for fleet rationalisation, the Travel Planning Officer for travel plans, ICT department for ICT review etc.

The Green Champions will be a lynchpin in delivering the awareness raising campaigns to encourage behavioural change.

Carbon Management is an integral part of the everyday functioning of Estates Operations and Estates Development, with the latter managing all major refurbishment and new-build projects. It is anticipated that Estates will utilise existing resources to carry out these project duties and/ or employ the services of specialist engineering consultants to design the projects where appropriate.

# Management and Delivery of the Carbon Management Plan

## Introduction

In order to ensure that there is effective and ongoing ownership of the Carbon Management Plan, it is important to have a fully defined governance structure. XX will continue to adopt the following structure for management accountability.

## The Carbon Management Committee

The Carbon Management Committee (CMC) has responsibility for the strategic direction and implementation of the CMP. Minutes of the CMC meetings are reported to the Estates Committee which provides feedback as appropriate. The Estates Committee subsequently reports to the Senior Management Group (SMG) convened by the XX. The SMG advises the XX on matters arising through the CMC.

The CMC is convened by the [title/ role] and meets XX times a year. Meetings are scheduled to take place prior to the Estates Committee (EC) meetings to allow the Minutes to be disseminated at the EC meetings.

The composition of the CMC is listed in the Table XX below and comprises a wide range of operational managers and senior technical staff who are committed to driving the carbon reduction agenda forward.

Table XX: Carbon Management Committee membership

|  |  |
| --- | --- |
| Name | Role |
| Person 1 | Role 1 |
| Person 2 | Role 2 |
| Person 3 | Role 3 |

The remit of the CMC includes:

* developing policies for consideration by the Estates Committee
* ensuring effective communication of the organisation's policies to staff and students
* monitoring the organisation's built environment performance against its carbon management targets, and
* raising the profile of built environment carbon management in the community and promoting environmentally sustainable behaviour by staff and visitors.

## Operational Roles and Responsibilities

**Carbon Management Plan/Project Sponsor**

The [title/role] will champion the project and have ultimate responsibility for strategic direction and for agreeing budgets outside those already available to Estates.

**Director of Estates and Buildings**

The Director of Estates and Buildings will oversee the strategic implementation plan, have strategic input into its development, and review progress.

**Carbon and Energy Manager**

The Carbon and Energy Manager will coordinate the implementation of the CMP and report on its progress to the Project Sponsor. Responsibilities of the Carbon and Energy Manager will also include the incorporation of progress into the organisation’s existing sustainable development governance.

**Carbon Management Team**

Estates Operations Team including Building Services, Building Fabric and Building Surveying Teams will work closely with project leaders and manage the technical aspects of projects. The Carbon and Energy Manager will be responsible for data collection and reporting.

**Green Champions**

The Green Champions will work closely with the Carbon and Energy Manager to collect and collate carbon data, raise awareness and engage staff to promote more environmentally conscious behaviour.

## Resourcing and Ownership

The Carbon Management Plan and carbonsaving target will be approved by the XX, providing endorsement and a clear commitment at the highest level, reinforcing the need for action across the organisation. The specific objectives of the CMP will be included in the organisation’s strategic plan and other high level plans. XX approval will continue to provide long-term organisational momentum for embedding the CMP and carbon savings across the organisation. This will primarily be delivered through the governance structure for carbon management described in this Section.

Key stakeholders at all levels of management will provide overall support for promoting a culture of carbon reduction throughout faculties and buildings.

The CMP will be published online, and in pdf format, with a limited number of printed copies available for key stakeholders, thus leading by example and saving paper and distribution costs.

The key to success of this updated CMP is effective engagement with staff and the local communities. Everyone has a role to play in the delivering the CMP and collaborative working is essential to deliver the desired carbon savings.

The key stakeholders in the organisation who will continue to shape and change culture and awareness are:

* Principal
* Senior management
* Heads of services and officers including (Finance, Communications, Estates and Buildings, Procurement, Energy, Waste, Transport, Hospitality etc)
* All staff (key staff including chief technicians, administrators, grounds staff, janitors, cleaners, and security)
* etc

Knowledge transfer is a key performance indicator for the organisation, and the sector has a very important role to play in spreading the sustainability message to the wider community.

XXX will lead by example and make public the high standards it sets in sustainability and carbon management, influencing the local community, [town/city] and contributing to the Scottish economy.

## The Internal Delivery Model

Green Champions have been appointed by XX and will be members of the Carbon Management Committee (CMC). Their task is to encourage good environmental practices amongst colleagues by setting an example in their own work places. They will receive training so that they can answer basic questions about issues such as climate change, energy efficiency and building performance.

Green Champions implement energy saving activities within their area, from educating and encouraging staff to monitoring and evaluating energy usage and identifying opportunities for reduction. The scope covers carbon reduction, energy saving, recycling, travel reduction, and climate impacts. The Carbon Management Team engages with Green Champions on awareness-raising initiatives. These key staff will be given a printed copy of the updated Carbon Management Plan, to serve as their roadmap towards achieving tangible carbon savings across the organisation.

## Partnership Working Opportunities

XX is working, and will continue to work, with a number of partners to deliver the CMP, including: Scottish Enterprise; [town/ city] Council; Scottish Procurement; [town/ city] sustainable travel group; Zero Waste Scotland etc

## Data Collection and Management

XX’s present data collection system affords reasonable data analyses using Energy Management Software. This is used to monitor all energy costs and consumption from invoice data and a selected number of building electricity sub-meters. The organisation intends to make a significant investment in smart metering technology over the next XX financial years. This investment will greatly improve data collection and create the opportunity to carry out a more detailed monitoring of building energy performance and identify carbon saving projects.

Performance data will be communicated to staff to raise their awareness of the implications of their energy use to their unit. This will be done regularly through the Green Champions. There are also plans to exploit existing facilities within the proprietary Energy Management Software to disseminate this information through web-based ‘dash boards’ which will monitor monthly progress in addition to providing data for key performance indicators. The Energy Management Software has the facility to generate energy management reports, invoice management – missing invoices, external reports, internal reports providing feedback to users and Green Champions.

Energy budget performance is reported on a monthly basis. Energy reports are issued to departments on an ad hoc basis. Exception reports are produced when required and follow up action taken if necessary. The system will be required to disseminate usage and costs reports in a variety of methods, including, paper printed copies, web page/computer network and by email.

## Communication and Training

The expansion of Green Champions must be associated with the provision of management information on carbon consumption at department level. This management information would be important to ensuring that the Green Champion role was given sufficient status within the Service Department. The CMC has approved the following future actions:

* To expand the number of Green Champions…

The Corporate Communications team have developed a planned approach to raising carbon reduction awareness through the development of a robust communications and awareness strategy. The Carbon Management Team, based in Estates and Buildings, and the network of Green Champions, will provide support in delivering the low carbon message.

There are many avenues of communication available and these will be fully utilised in promoting the carbon reduction message to all staff and visitors. Effective communication and engagement is the key to success. It is recognised that substantial cultural change will take time to deliver.

Initiatives for building awareness include:

* Publishing the Carbon Management Plan, and ensuring it is accessible and available to all staff, visitors and external stakeholders
* High profile energy and carbon awareness campaigns, on a rolling basis
* Regular communication and reporting through the staff website, staff magazine, formal bi-annual reviews and the current student website
* Featuring the low carbon culture of the organisation in external news releases wherever possible
* Promoting the low carbon culture of the organisation to new staff during staff induction, including providing them with written guidelines
* Training for existing staff – including specific groups such as security staff, cleaners and support staff
* Specific training for Green Champions
* Incorporation of carbon-mitigating targets into staff objectives and discussing progress during annual performance & development reviews
* Consider publishing league tables of departments, or buildings, or specific groups
* Introduction of suggestion schemes
* Creation of an opt-in green network of interested staff
* Provision of interesting workshops.

The Carbon Management Team will regularly monitor progress and formally report to the CMC as described above (see above) ensuring that all major stakeholders are kept informed.

# Progress Reporting

## Yearly Updates to the Carbon Management Plan

The Carbon Management Plan is viewed as a ‘live’ document and it is envisaged this will change on an annual basis as the organisation’s estate changes and planning assumptions become reality. To ensure that the CMP remains ‘fit for purpose’ to deliver targeted carbon savings, the document will be reviewed on an annual basis. This process will be overseen by the CMC and coordinated by the Carbon and Energy Manager.

Specifically, the following areas of the CMP will be subject to annual review:

* Progress towards overall carbon reduction target including CO2e savings against target and quantifiable benefits
* Progress with identified carbon reduction projects (will also be reported separately to the Carbon Management Committee on a quarterly basis)
* Financial savings achieved as a result of carbon reduction projects
* Costs of the programme
* Wider benefits
* Stakeholder engagement, and
* Risk Register

The review will be presented to the SMG through the CMC. The SMG will in turn present this to the XX.

The annual progress review will be placed on the intranet.

## Data Collection and Management

Data measuring the progress of the CMP will be collected quarterly and presented to the various relevant levels of governance.

The data collected will include:

* Progress on specific projects
* Details of the performance of the variables contributing to the emissions in the quarter such as utilities, water, fuel, waste generated.

As noted above, an Annual Carbon Management Plan Review will be completed and presented to the SMG (section XX).

To formalise a structure for ongoing implementation of the CMP, Standard Operating Procedures (SOPs) are being developed (Section XX).

## Standard Operating Procedures

To ensure the approach to reporting progress with the CMP is clear, consistent and embedded across the organisation, SOPs have been developed in the following areas:

1. Annual calculation of XXX’s carbon footprint and subsequent reporting as an ongoing requirement of this CMP
2. Ongoing recording and monitoring of XXX’s carbon reduction projects developed as part of this CMP

The SOPs will require to be endorsed by the XX and will be reviewed on an annual basis. For ease of reference the SOPs will be located on the intranet; draft versions are replicated in Appendix XX of this plan.

## Other Reporting Requirements

XX will continue to fulfil requirements to report on environmental performance through a range of other mechanisms.

**CRC Registry:** The organisation has a mandatory requirement to submit fossil fuel energy consumption to the CRC Registry by the end of XX each year. This requires the collation of invoices from all sites for which the organisation is the bill payer. This data is currently collected using Energy Management software.

Etc

## Annual Improvement Action Plan

Following each Annual Review, an Annual Improvement Action Plan (AIAP) will be compiled in response ensuring that Carbon Management remains on track. This document will highlight the priorities for the forthcoming year and will become a formal addendum to the CMP.

Subsequent Annual Reviews will thereafter require assessing of progress against both the original CMP and the AIAP.

## Risk Register

Appendix XX contains a Risk Register that identifies potential risks to the successful implementation/delivery of the CMP. This will also be updated annually

**Appendix A**

Carbon Management Drivers

1. Scottish Government Targets
2. EU Emissions Trading Scheme (EU-ETS)
3. CRC Energy Efficiency System
4. Zero Waste Plan

* Key policy drivers - the Waste (Scotland) Regulations and the Safeguarding Scotland’s Resources action plan.
* Reduce the carbon impact of waste by 3MtCO2eq.

„The key points outlined in the new Waste (Scotland) Regulations are as follows:

* All businesses and organisations to present key recyclable material for collection from 1 January 2014 - **paper, card, glass, plastic, and metals**
* Food waste businesses producing over 50kg of food waste per week to present it for separate collection from 1 January 2014
* Food waste businesses producing over 5kg of food waste per week to present it for separate collection from 1 January 2016
* A ban on the use of macerators to discharge food waste into the public sewer from 1 January 2016
* Local authorities to provide a basic recycling service to all households by 1 January 2014
* Local Authorities to offer a food waste recycling service in non-rural areas from 1 January 2016
* A ban on material collected for recycling going to landfill or incineration
* A ban on municipal biodegradable waste going to landfill by 1 January 2021

Carbon Metric

* Scotland is the first country to measure the carbon impact of its waste in this way. By giving decision makers a more complete understanding of the impacts of waste, we have a better chance of reducing these impacts.
* **Zero Waste Scotland** tool allows organisations to calculate the carbon impact of their waste in a way that is compatible with the national Carbon Metric approach. Enter data on the waste they produce and how this is managed. The results show the overall carbon impact of their waste and highlights which materials are contributing the most to this. Organisations can use the results to plan how to reduce their carbon impacts from preventing and more sustainable management of waste.
* Uptake of the carbon metric is encouraged (though not mandatory) within the Public sector Sustainability Reporting guidelines ‘early adopters’ = best practice/leaders as applied to internal waste (in conjunction with applic to overall waste management service delivered to whole LA by Council).

1. Renewables Heat Incentive (RHI)
2. Feed in tariffs (FITs) for renewable energy
3. Renewables Obligation Scotland (ROS)
4. etc

**Appendix B**

Carbon Emission Factor Used

The following Emission Factors from Defra’s Guidelines to Defra/DECC’s Greenhouse Gas Conversion Factors for Company Reporting 20XX were applied in the modeling of the 20XX baseline footprint for XXX.

Table XX: Defra emission factors used in the calculation of the 20 XX baseline carbon footprint

|  |  |
| --- | --- |
| Category | Emission Factor |
| Electricity | XX kgCO2/kWh |
| Natural Gas | XX kgCO2/kWh |
| Gas Oil | XX kgCO2/kWh |
| Diesel (retail station biofuel blend) | XX kgCO2/kWh |
| Petrol (retail station biofuel blend) | XX kgCO2/kWh |
| Industrial mobile machinery (gas oil or ‘red diesel’) | XX kgCO2/kWh |
| Average van up to 3.5 tonne | XX kgCO2/kWh |
| Large diesel car, over 2.0 litre | XX kgCO2/kWh |
| Medium petrol car, from 1.4 - 2.0 litres | XX kgCO2/kWh |
| Waste (black stream domestic landfill) | XX kgCO2/kWh |
| Water supply | XX kgCO2/kWh |
| Wastewater supply | XX kgCO2/kWh |

**Appendix C**

Standard Operating Procedures

**Appendix D**

Business As Usual

**What is Business as Usual (BAU)**

Business as usual (BAU) is the normal execution of standard operations within an organisation, particularly in contrast to a project or programme which would introduce change. In the context of carbon management, this means that BAU represents an estimate of what the overall carbon footprint of the organisation (based on the current footprint boundary) is likely to be in future years.

This BAU scenario needs to take into account internal and external growth factors that are likely to affect the carbon footprint over time. Although an overall carbon footprint is a single figure, in reality it is a complex underlying calculation, with different emission sources affected by these factors in different ways. Table XX shows a sample of some of the key factors identified that affect BAU.

Table XX: Examples of key internal and external factors impacting on BAU

| **External factors** | |  | **Internal factors** | |
| --- | --- | --- | --- | --- |
| **Electricity grid carbon factor -the factor applied to convert units of kWh of electricity consumed to a figure of carbon dioxide equivalents emitted.** | Grid factor changes year on year due to a variety of external factors outside of the organisation’s control including relative price of different fuels for power generation. Over a longer period of time, the grid factor changes due to energy policy and the relative contribution of different fuels and sources of generation e.g. renewables. The aim of energy policy is to reduce the carbon intensity of the grid and this will have a large effect on the overall footprint |  | **Energy intensity of service provision** | The energy used per XX is likely to change over time, due to changing nature of services and also changing efficiency of equipment. This is one of the areas that are particularly difficult to model at this point in time and it is likely that this will require further studies to effectively model |
| **Population growth/changing demographics** | The need for the organisation’s services depends on both the size and structure of the population served and therefore changes to this population may need to be incorporated |  | **Estate changes** | Over time organisations build and decommission estate in order to meet the requirements of population served. The more this can be modelled with real data e.g. known floor areas or energy efficiency data, the more accurate this forecast can be. |

**Why is it important to model BAU?**

As carbon management has become more sophisticated, organisations have become aware that the use of a single annual percentage growth to represent BAU is not necessarily accurate. Furthermore, by failing to model BAU, carbon managers cannot clearly demonstrate progress against targets and value for money for the carbon management programme, which in turn has a knock-on effect on internal investment.

If an organisation’s BAU carbon footprint is actually increasing faster than anticipated, the efforts of the carbon management team would be underestimated – this is especially true when the measured footprint appears to be flatlining or even increasing and senior managers might question the impact of investment; however a more accurate model of the BAU could show that without the efforts of the CM team, the footprint would have risen even more steeply.

More sophisticated models of BAU also provide a more depth look at which parts of the footprint are increasing and decreasing over time and this, along with financial models of the costs of fuels and services such as waste and water, can help organisations make better strategic decisions for future investment.

**How has BAU been modelled for XXX?**

In order to more accurately model BAU, a spreadsheet..

**Growth factors**

The following growth factors were applied:

* + - 1. UK grid electricity factor (based on historic DECC figures and future IAG forecast figures)
      2. Estate Changes: based on discussion with XXX. The modelled changes include x new buildings scheduled for commissioning, with complete or partial closure of x buildings in the 20XX and 20XX period. Energy use in the new buildings was based on actual predicted energy consumption bespoke for the building as provided by the organisation where possible, or consumption of similar existing stock.

With this data inputted, the spreadsheet calculates the overall carbon footprint for the organisation in future years. This information has been used in the CMP to forecast ‘Value at Stake’, (re)set targets and determine the scale of carbon saving projects required to be implemented.

**Future modelling of BAU**

BAU models are likely to change over time as organisations understand and incorporate more internal factors in their BAU model, especially in terms of in-depth understanding of future estate changes. There are also likely to be improvements in the available forecasts of external factors, especially grid electricity, which is one of the key determinates of future BAU, affecting a significant proportion of the carbon footprint.

Therefore, BAU forecasts need to be updated on a yearly basis, with improved information to help understand where best to allocate resources and effort in the future.

**Appendix E**

Summary of Projects from the Project Register.

**Appendix F**

Risk Register.

|  | **Description** | **Impact** | | **Probability** | | **Mitigating actions** |
| --- | --- | --- | --- | --- | --- | --- |
| **1** | ***Timing***  If CMP is not completed on time and is not sustainable in its implementation and long term goals then projected carbon savings will not accrue within the expected timescale and could lead to failure of entire exercise | | H | | L | **Liaise with Project Sponsor to ensure sufficient time and resource available** |
| **2** | ***Negative Financial implications***  If finance is not made available as required and there is resistance to the implementation of major schemes then the expected scope for carbon reduction will be greatly minimised | | H | | M | **Ensure projects identified are approved through Capex Committee and Carbon Management Committee** |
| **3** | ***Resistance to Cultural change***  Whilst many staff appear to embrace the general “sustainability” agenda the need to change behaviours with regard to energy efficiency in the workplace needs to be embraced.  If behaviours do not change then the overall reduction in CO2e will be impacted on by 3-5% of the target. | | H | | M | **Liaise/lobby staff, colleagues and XX Departments Awareness Campaign** |
| **4** | ***Legislative Changes***  Forthcoming legislative changes are likely to enhance opportunities both for investment and also technical improvement of buildings and related energy efficiency. If this is delayed or shelved, there may be less leverage with certain departments to ensure change. | | H | | L | **Ensure that legal ramifications of regulatory changes are fed through early in any communication and are understood by all participants** |
| **5** | ***Development Team Interfaces***  If the Estates Development Team fail to incorporate exemplar design business decisions into The Capital Works Programmes the Carbon Plan savings will be compromised. | | M | | L | **Ensure Estates Development Managers embedded the Energy and Carbon management brief into all design for new build and major refurbishments** |
| **6** | ***Continuity of Project Managers***  If the Carbon Plan Management is to be delivered effectively the key personnel involved must be fully engaged and retained on the Project. The most important personnel are the Carbon Management Committee, project sponsor, Carbon and Energy Manager and Carbon Management Team. | | M | | M | **Ensure succession planning is in place. Ensure PDP’s/Objectives reflect the CMT needs. Consider OD input.** |
| **7** | ***Carbon Plan Looses Priority***  There is a risk that the Carbon Management Plan may not always have the level of priority currently assigned to it within the organisation. This will be impacted upon changing national policies andust governance.  If the Plan is considered low priority this will affect the ability to deliver the savings. | | L | | L | **Communicate aims and objectives in sound business terms to gain maximum response in all areas to delivery of the Plan.** |
| **8** | **Etc** | |  | |  |  |

1. Stern Review Report on the Economics of Climate Change. N Stern, 2006. HM Treasury, London. [↑](#footnote-ref-1)
2. <http://www.scotland.gov.uk/Resource/Doc/256155/0076031.pdf> [↑](#footnote-ref-2)
3. The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard Revised Edition, Worlds Resources Institute; World Business Council for Sustainable Development, 2004. [↑](#footnote-ref-3)
4. Source: Adapted from Scottish Government’s Public sector Sustainability reporting Guidance July 2013; in line with 2014 Defra/DECC [↑](#footnote-ref-4)
5. Public Sector Sustainability Reporting Guidance on the Preparation of Annual Sustainability Reports 2012-13 Annex B [↑](#footnote-ref-5)