



Helpu Cymru i leihau
ei Hôl Troed Carbon
Help Wales reduce
its Carbon Footprint



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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Climate Change Strategy for Wales

Delivery Plan for Emission reduction



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The overall picture

Introduction

The Climate Change Strategy Delivery Plan for Emission Reduction sets out the policies and programmes that we expect to help us meet Wales' target to reduce greenhouse gas emissions by 3 % per year in areas of devolved competence.

The Plan sets out the action that the Welsh Assembly Government has planned and already underway and it highlights the key UK and EU policies and wider sectoral contributions, which will play an important part in helping us deliver our greenhouse gas emission reduction target.

The Delivery Plan will be reviewed annually and updated to reflect new actions.

How emission reductions will be delivered in Wales

The responses to both consultations on the Climate Change Strategy asked us to quantify the expected impact of interventions and to be clear about what the Assembly Government was doing and the contribution that others would make towards the target.

This Delivery Plan has been prepared with that request for clear information in mind. It sets out the contribution that different activities are expected to make to achieving the target.

It represents our best estimate and more information about how we have approached the analysis is set out in Annex A. There are limitations to that analysis, in particular because UK data is the starting point for most of our estimates rather than a bottom up calculation. This means that the emission reductions expected from 'UK' policy packages also include some activity actually promoted by action in Wales and Assembly Government actions have only been quantified separately where they are demonstrably additional to emission reduction assumed within the UK package.

For example, the UK base package for domestic energy efficiency assumes a significant level of activity. The Assembly Government component therefore looks relatively modest because it is based only on the additional measures that we are taking over and above that which is already assumed within the UK base package.

Figure 1 highlights the proportion of Welsh emissions covered by the 3 % target. The remainder are traded emissions, mainly from heavy industry and power generation and are excluded from the 3 % target'

Figure 2 highlights the breakdown of how, at this point, we anticipate the balance of contribution towards the delivery of the 3 % target to 2020.

Subject to the caveat in the previous paragraphs, Figure 2 illustrates contributions from Assembly Government, UK Government and wider sectoral contributions to emission reduction.

Figure 1 - Proportion of Welsh emissions covered by 3% target

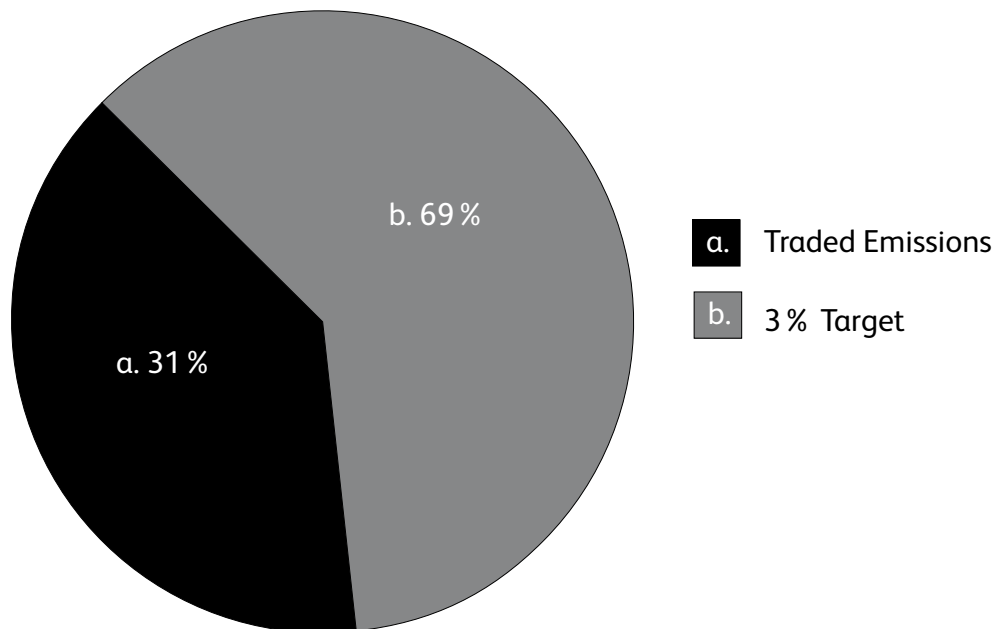


Figure 2 - Contribution to the 3% target (expressed as percentage points) of Welsh Assembly Government, UK Government policies and wider sectoral contributions

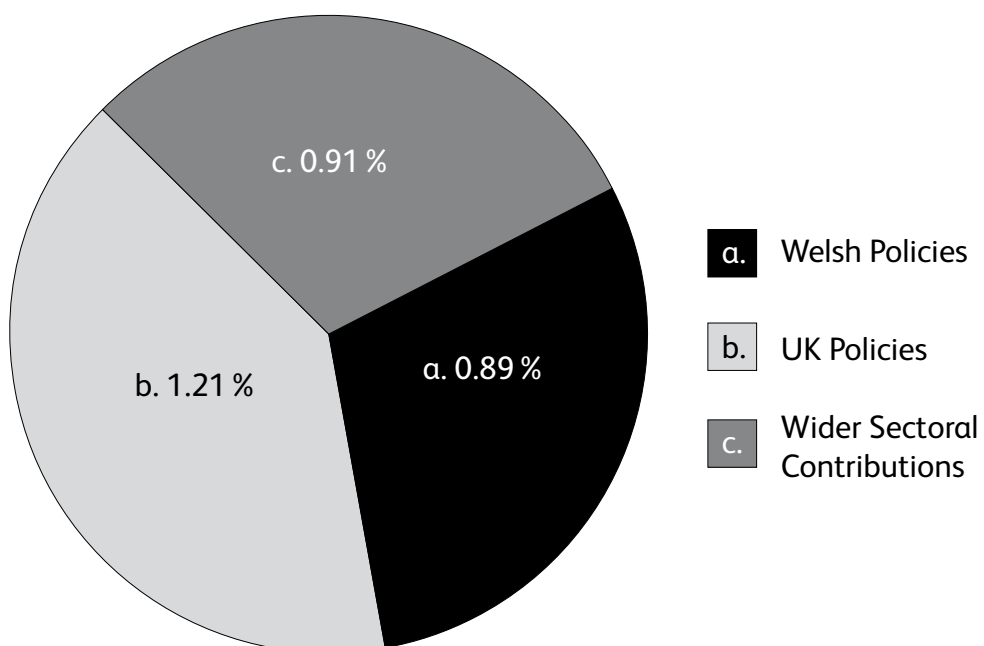
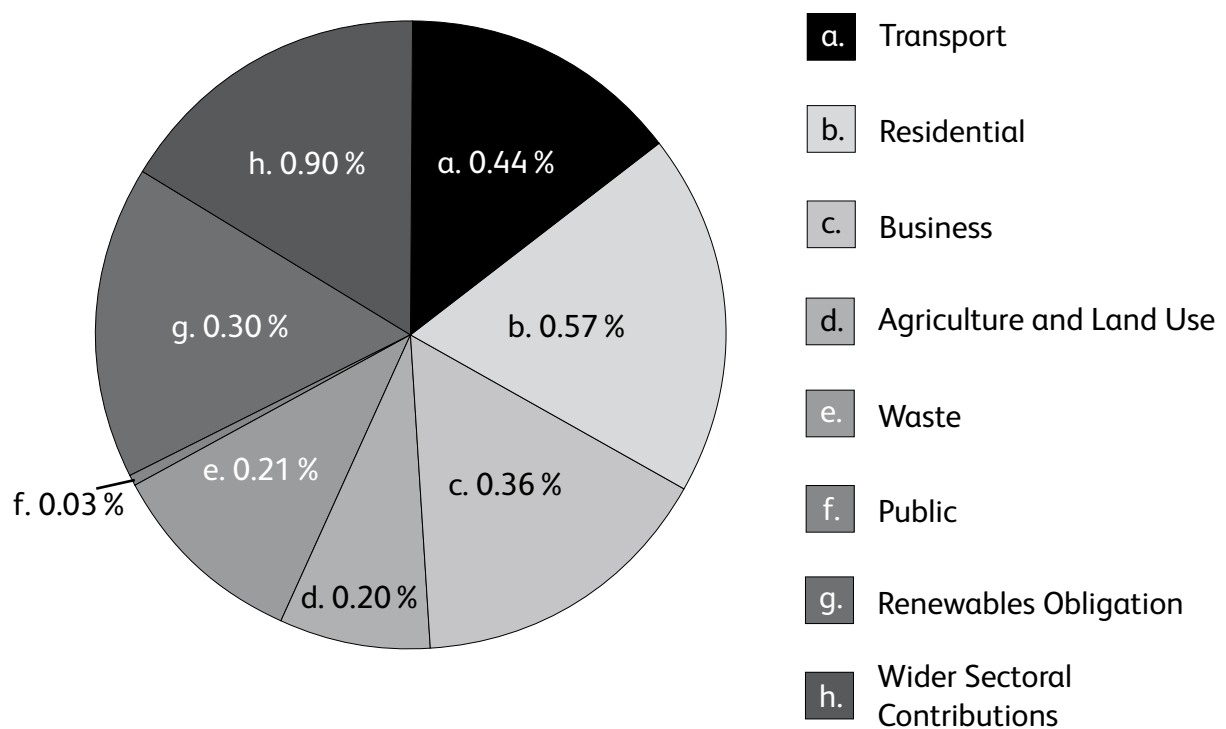


Figure 3 illustrates the anticipated contribution from each sector towards achieving the 3 % target, based on an estimate of the total savings that we would expect to achieve in 2020. An estimate has also been provided for the wider contributions of others in Wales. This includes the contribution of businesses, local government and the wider public sector, the Third Sector and communities and individuals which are critical to the delivery of the climate change targets.

Figure 3 - Sectoral contributions towards the 3% target (expressed as percentage points)



Contribution of Welsh Assembly Government measures

At this point, we anticipate that measures implemented by the Welsh Assembly Government will deliver emissions savings of 2.71 MtCO₂e in 2020. This will contribute 0.89 % towards our 3 % target (or 30 % of the total required emission reductions).

Table 1 highlights the estimates for Sectoral contributions from Welsh measures:

Table 1 - Estimated emissions reductions from Assembly Government action by each sector

Sector	MtCO ₂ e savings in 2020	Contribution to 3% target
Transport	0.29	0.10
Residential	0.54	0.18
Business	0.62	0.20
Agriculture and Land Use	0.60	0.20
Waste	0.66	0.21

Contribution of UK Government measures

We expect UK measures to deliver savings of 3.71 MtCO₂e in 2020. This will contribute 1.21 % towards our 3 % target.

Table 2 highlights the estimates for sectoral contributions from UK measures:

Table 2 - Estimated emissions reductions from UK Government action by each sector

Sector	MtCO ₂ e savings in 2020	Contribution to 3% target
Transport	1.07	0.36
Residential	1.20	0.39
Business	0.50	0.16
Agriculture and Land Use	-	-
Waste	-	-
Public	0.01	0.003
Cross Cutting actions	0.93	0.31

The wider contribution of others in Wales

The wider contribution of businesses, local government and the public sector, the Third Sector, communities and individuals is critical to delivery of our climate change targets.

It is much more difficult to quantify the contribution of these activities to achieving the target, but we do know that they will be significant and will also play an important role in ensuring that Assembly Government and UK Government actions have the anticipated impact.

For now, we have assumed a minimum contribution of 0.9 % towards the target from wider activity. We will seek to develop a more meaningful analysis of specific contributions over time.

More detail

The following sections present the activity being undertaken, in each emission sector in the Climate Change Strategy, by the Assembly Government and UK Government.

The final section describes some of the activities being undertaken by others across Wales that form the wider contribution towards the target. The information in this section is not comprehensive, but gives a flavour of the action being taken by business, the wider public sector, the Third Sector and communities across Wales that contributes towards the 3 % target.

Transport

The transport sector is responsible for approximately a fifth of the emissions covered by the 3 % target.

We estimate that:

- Assembly Government action in the transport sector will deliver 0.29 Mt CO₂e savings in 2020
- UK action in the transport sector will deliver 1.07 Mt CO₂e savings in 2020

The key interventions that will deliver that level of reduction are outlined below.

Assembly Government interventions

We have quantified a number of Assembly Government interventions that support transport emission reduction. However, there is some overlap between Welsh policies and with some policy measures quantified in the UK baseline package. Hence, to avoid any risk of double counting across Welsh policies we have made a single combined estimate of the impact of interventions WT1, WT3 and WT4 below and recorded them under Sustainable Travel Centres.

The main Assembly Government interventions are:

- WT1 - Sustainable Travel Centres.
- WT2 - Smarter Choices.
- WT3 - Travel planning and provision of personalised travel information.
- WT4 - Developing a series of strategic modal interchanges.
- WT5 - Promotion of eco-driving.
- WT6 - Promotion and support for walking and cycling.
- WT7 - Investment in rail services.
- WT8 - Investment in buses.
- WT9 - Improving traffic management on the strategic road network.
- WT10 - Supporting the freight industry to reduce emissions.
- WT11 - Alternative fuels infrastructure.

WT1 - Sustainable Travel Centres

The Sustainable Travel Centre programme involves a tailored approach that uses a range of measures to encourage more sustainable travel choices. This includes better integration at transport interchanges, for example between bus services and railway stations, as well as links to the development of strategic multi-modal interchanges that also support park and ride, park and share and cycling.

In 2009, Cardiff was chosen as the first Sustainable Travel Centre in Wales and more recently the Mon a Menai Sustainable Travel Area was announced. The aim is to establish Sustainable Travel Centres across Wales.

We estimate that Sustainable Travel Centres, alongside other measures which encourage mode transfer, could deliver savings of **0.22 MtCO₂e** in Wales in 2020.

WT2 - Smarter Choices

We will be continuing to promote Smarter Choices which provides guidance for solutions that increase the use of more healthy and sustainable travel, including increasing the provision of safe routes and facilities for cycling.

In order to avoid the possibility of double counting, we have not included any additional savings for WT2.

WT3 - Travel planning and provision of personalised travel information

We will strengthen the role of transport planning, at the national, regional and local levels, during the planning of new policies, schemes and developments. This will help to integrate the impact of travel into wider decision making, with a view to reducing the overall need to travel.

We are also making provision to roll out group and personalised travel planning, which involves the preparation of detailed travel plans prepared to meet a group or individual's needs. Finally we are working to improve the provision of effective travel information through, for example, Traveline Cymru.

In order to avoid the possibility of double counting, we have not included any additional savings for WT3. We assumed such savings are already covered in WT1, Sustainable Travel Towns.

WT4 - Developing a series of strategic modal interchanges

We are developing a series of strategic modal interchanges, which will provide access into city and town centres through 'park and ride' facilities.

These sites will also provide 'park and share' opportunities, which has an important role to play in reducing transport-related greenhouse gas emissions through increasing the levels of vehicle occupancy. There will also be enhanced provision for walking and cycling at the modal interchange sites.

In order to avoid the possibility of double counting, we have not included any additional savings for WT4. We assumed such savings are already covered in WT1, Sustainable Travel Towns.

WT5 - eco-driving and wider best practice programmes

We will support programmes that promote eco-driving, that is driving in a safe and fuel-efficient way. For individual members of the public, advice on eco-driving is available through the Energy Saving Trust.

In addition, we will be focusing on transport behaviours (along with domestic energy use) in our behaviour change programme. To do this we are identifying the groups of behaviours related to transport use which have the greatest potential to yield emissions reduction, and are piloting programmes to encourage people to adopt these more low carbon behaviours. Where we demonstrate success in reducing emissions through these pilots, we will work with communities to encourage the roll out of successful programmes at the local level across Wales.

We estimate that the promotion of eco-driving could deliver savings of **0.03 MtCO₂e** in Wales in 2020.

WT6 - Promoting walking and cycling

We will continue to increase the amount of funding available for walking and cycling schemes. This includes our commitment to maintain our Safe Routes in Communities programme, which seeks to develop safer walking and cycling routes within communities across Wales. We are also committed to developing a larger number of traffic free walking and cycling routes and to deliver the Walking and Cycling Action Plan targets.

The actions under Smarter Choices, travel planning and the Sustainable Travel Centres are also expected to have a significant effect on the level of walking and cycling, reducing carbon emissions further.

At this stage, we have only limited evidence on the contribution of this intervention to transport emission reduction. The current estimate is a reduction of **0.0005 MtCO₂e** in Wales in 2020.

WT7 - Investment in rail services

We are taking forward a wide range of improvements to rail services and stations, which is central to encouraging greater levels of modal transfer. We are also working with the UK Government on the programme for the electrification of the Great Western Main Line, as well as the business case for the electrification of further lines in Wales. We are also investigating opportunities for re-opening disused railway lines in Wales. Other actions, such as the introduction of integrated ticketing for public transport in Wales are also expected to stimulate further growth in rail usage.

We estimate that Assembly Government investment in a number of specific rail services could deliver savings of **0.004 MtCO₂e** in Wales in 2020.

WT8 - Investment in bus services

We are working to improve the quality and integration of local bus services. This includes improvements to the quality, reliability, punctuality and safety of local bus service provision, as well as improvements to the customer experience on public transport services. We are also expanding and improving the quality of the TrawsCambria long-distance coach network.

In addition to more general promotion of public transport outlined above, we estimate that Assembly Government investment in bus services could deliver savings of **0.001 MtCO₂e** in Wales in 2020.

WT9 - Improving traffic management on the strategic road network

We are taking forward a range of measures to improve the management of our road infrastructure. Better traffic management, including variable speed limits on the busiest parts of the network, will help to improve traffic flows and reduce greenhouse emissions. Similarly, we expect to make significant savings as a result of improvements in the way in which we deal with incidents and accidents on the network, which will significantly reduce delays and disruption and help to restore traffic flow.

We estimate that improved traffic management on Wales' most heavily trafficked routes could deliver savings of **0.02 MtCO₂e** in Wales in 2020.

WT10 - Supporting the freight industry to reduce emissions

We are taking forward a range of measures to reduce emissions from the freight sector. We have developed a Freight Best Practice and a Van Best Practice programme, which are aimed at encouraging hauliers and van operators to reduce their fuel consumption and greenhouse gas emissions through the adoption of best practice, for example, in terms of eco-driving techniques and consolidating loads. We have also established a Transport Advice Programme, including Green Fleet Reviews, which aims to reduce emissions from car and van fleet operators.

We are also committed to the development of a freight consolidation centre, which would provide a facility for consolidating deliveries into an urban centre. This will help to reduce lorry miles and hence greenhouse gas emissions.

In addition, we will maintain our Freight Facilities Grant scheme, which supports the transfer of freight from road to rail where this will secure environmental benefits, including reduced greenhouse gas emissions.

We estimate that these measures could deliver emission reductions from the freight industry of **0.01 MtCO₂e** in Wales by 2020.

WT11 - Alternative fuels infrastructure

We are supporting a programme of activities aimed at the production and use of alternative fuels and development of technologies for vehicle and stationary applications, such as fuel cells for buildings.

We are investigating a range of alternative fuels produced from renewable sources. Hydrogen, bio-methane and electric infrastructure can lead to the use of alternative fuelled vehicles that are less carbon intensive particularly when generated from renewable sources.

Wales is a Low Carbon Economic Area (LCEA) for hydrogen energy and is therefore a recognised UK lead. LCEAs are an important UK wide initiative announced as part of the UK Government's Low Carbon Industrial Strategy on 15 July, 2009. Their purpose is to capitalise on distinct local and regional strengths where existing geographic and industrial assets give a location clear strengths that could help the UK secure global advantage.

This intervention supports research and development and the deployment of infrastructure to enable the use of hydrogen bio-methane and electricity as a fuel. At this stage we do not expect it to make a direct contribution to emission reduction, but we will keep progress under review and when the technology is sufficiently developed and in use we will quantify its expected contribution to emission reduction in 2020.

UK Government interventions

We have used Department for Transport's estimates for the emission reduction arising from UK Government interventions. The estimate is based on two main components:

- UKT1 - The Carbon Reduction Strategy for Transport *Low Carbon Transport: A Greener Future*.
- UKT2 - Fuel Duty increases.

UKT1 - Carbon Reduction Strategy for Transport

The aim of the Strategy is to substantially decarbonise the transport system by 2050 and it represents the core UK Government transport emission reduction package.

The Strategy is based on three key themes:

- Supporting a shift to new technologies and cleaner fuels;
- promoting lower carbon transport choices;
- using market-based measures to encourage a shift to lower carbon transport.

The analysis undertaken by the Department for Transport illustrates that a large part of the reduction in emissions in the UK will come about as a result of vehicle emissions standards and greater use of renewable energy sources for transport.

We estimate that the interventions outlined in the Strategy could deliver savings of **0.96 MtCO₂e** in Wales in 2020.

UKT2 - Fuel Duty

Fuel duty is an additional mechanism available to the UK Government to promote emission reduction in the transport sector.

Based on UK Committee on Climate Change analysis for Fuel Duty increases announced in the 2009 Budget (taking Fuel Duty to £0.60 per litre by 2013), we estimate that increases in fuel duty could deliver savings of **0.11 MtCO₂e** in Wales in 2020.

Business

The business sector (not including direct emissions from heavy industry and energy generation) is responsible for approximately a third of the emissions covered by the 3 % target.

We estimate that:

- Assembly Government action in the business sector will deliver **0.62 MtCO₂e** savings in 2020.
- UK action in the business sector will deliver **0.50 MtCO₂e** savings in 2020.

The key interventions that will deliver that level of reduction are outlined in the sections below.

We have also included a separate section providing a brief summary of key interventions aimed at reducing emissions from heavy industry and energy generation. These emissions sit outside the 3 % target but the responses to the consultation on the Programme of Action and discussions in the Commission suggested that we highlight the key activities that we were undertaking in this area.

Assembly Government interventions

We have identified a number of Assembly Government interventions that support business emission reduction. Where they are additional to those actions assumed to be taking place in response to UK policy and regulation we quantified their anticipated impact.

The main Assembly Government interventions are:

- WB1 - Economic Renewal: a new direction.
- WB2 - Carbon Trust.
- WB3 - Enabling more resource efficient business.
- WB4 - Skills for a low carbon economy.
- WB5 - More efficient use of, and regulation of, waste heat and energy.
- WB6 - Low carbon energy.

WB1 - Economic Renewal: a new direction

The 'Economic Renewal: a new direction' establishes a renewed approach to economic development in Wales that is:

- better able to meet the needs of businesses;
- encourage a stronger and more sustainable economy;
- increase the prosperity and long-term well-being of the people of Wales.

Enabling a contribution to tackling climate change is one of the things that the Programme focuses on.

‘Economic Renewal: a new direction’ reflects our commitment to sustainable development as a central organising principle. This means we must give due weight to the role of the economy as one of the three pillars of sustainable development and will require us, for example, to take a whole Government approach to creating a more responsive and efficient planning system that removes unnecessary barriers to making timely decisions that deliver sustainable development.

At this stage, the contribution of this intervention to business emission reduction has not been quantified. We will collect evidence of the impact of the economic renewal programme to reducing emissions and use that to quantify its expected contribution to emission reduction in 2020.

WB2 - Carbon Trust

The Carbon Trust in Wales is responsible for the promotion and delivery of support to business and the public sector organisations in Wales on cutting energy bills and reducing their carbon footprint. In undertaking this, their work falls under five business areas which are:

- Insights - Explaining issues and opportunities.
- Solutions - Delivering practical solutions.
- Innovations - Developing low carbon technologies.
- Enterprises - Creating low carbon enterprises.
- Investments - Financing low carbon businesses.

We estimate that the Carbon Trust’s activities could deliver savings of **0.31 MTCO₂e** in Wales in 2020.

WB3 - Enabling more resource efficient business

We will continue to provide specific programmes that enable companies across Wales to access advice and support on sustainable and cost-effective business practices, and will contribute towards Wales’ ambitions for a sustainable and low-carbon economy.

We estimate that advice on low carbon and resource efficiency for SMEs could deliver savings of **0.17 MtCO₂e** in Wales in 2020.

WB4 - Skills for a low carbon economy

It is critical that Wales is equipped with the skills and expertise to deliver emission reduction in the long term and to ensure that we can get the maximum economic and social benefits from a low carbon economy.

The main components of this intervention are:

- Our green jobs strategy, ‘*Capturing the Potential*’, and our employment and skills strategy, ‘*Skills That Work for Wales*’ which together provide a framework for the identification and delivery of the skills required for the low carbon economy.

- Our continuing work with UK Government and the Sector Skills Councils to develop occupational standards and qualifications in the low carbon economy, and to ensure that the education and training available in Wales through higher and further education and work-based learning providers meets the needs of industry.
- Our ongoing work through the Sector Priority Fund to inform our long term skills planning and funding decisions in partnership with Sector Skills Councils in Wales.
- Our proposal to develop and deliver a detailed plan of action for skills development in the energy efficiency and renewable energy sector.
- Our proposal to combine our energy efficiency and renewable energy investment, in designated regeneration areas, with Targeted Recruitment and Training activity, through initiatives such as the Can Do Toolkit and JobMatch.
- Innovation vouchers which are available to business to help pay for external expertise from the private sector or Universities and Colleges. Each innovation voucher is worth up to £10,000 and funding is provided at 50 % of the cost of a project.

This is an enabling intervention that will ensure that the required skills and expertise for a low carbon economy are in place but it will not lead to direct reductions in emissions itself. As a result its contribution to emission reduction cannot be quantified.

WB5 - More efficient use of, and regulation of, waste heat and energy

Promoting use of waste heat, combined heat and power, improved energy efficiency, renewable energy and low carbon district heating in businesses and other partners has an important role to play.

The intervention in this area will be focused on making use of the heat maps and making proactive contact with businesses and other users in areas where there is potential and the Environment Agency will promote the productive use of waste heat and improved energy efficiency in its engagement with business.

We estimate that more efficient use and regulation of waste heat and energy could deliver savings of **0.14 MtCO₂e** in Wales in 2020.

WB6 - Low carbon energy

As set out in a *Low Carbon Revolution*, the Assembly Government sets out the action that the Assembly Government will take to maximise the energy generated in Wales from low carbon and renewable sources.

It estimates that Wales has the potential to produce more than twice as much renewable electricity than we consume as a nation by 2025. Of this, approximately 40 % will be from marine energy, 40 % from wind (both offshore and onshore), and the remainder mainly from sustainable biomass power or smaller local (including micro) heat and electricity generation projects.

The National Energy Efficiency and Saving Plan brings together action to reduce emissions through reducing energy consumption and improving energy efficiency in all sectors.

Although the Assembly Government action will be important in delivering low carbon energy in Wales, success will also be strongly linked to UK Government interventions and the resultant emission savings are already included in the assumptions for UK emission reduction. In addition, for the purposes of the 3 % target we are dealing with a sub set of total energy emissions in Wales because the target definition included end user consumption not generation.

UK Government interventions

We have used UK Government estimates for the emission reduction arising from UK Government interventions. The estimate is based on four main components:

- UKB1 - Energy intensive business package.
- UKB2 - Carbon Reduction Commitment Energy Efficiency Scheme.
- UKB3 - Enhanced capital allowances.
- UKB4 - Feed in Tariffs.

UKB1 - Energy Intensive Business Package

The UK Government is promoting a range of measures to enable emission reduction in from energy intensive businesses. This package includes the following:

- Extension to Climate Change Agreements.
- Energy Performance Building Directive.
- Smart Meters.
- Products policy.

We estimate that these interventions could deliver savings of **0.20 in MtCO₂e** in Wales in 2020.

UKB2 - Carbon Reduction Commitment Energy Efficiency Scheme

The Carbon Reduction Commitment Energy Efficiency Scheme is a new cap and trade scheme covering the whole of the UK which will drive energy efficiency through behaviour and infrastructure change. Large business, public and Third Sector organisations that used more than 6,000MWh each year of half hourly metered electricity in 2008, are included.

We estimate that the Carbon Reduction Commitment Energy Efficiency Scheme could deliver savings of **0.04 MtCO₂e** in the Business Sector in Wales in 2020.

UKB3 - Enhanced Capital Allowances

The scheme provides a tax incentive to businesses that invest in equipment that meets published energy-saving criteria. The Energy Technology List (ETL) details the criteria for each type of technology, and lists those products in each category that meet them. It is managed by the Carbon Trust on behalf of the UK Government.

We estimate that Enhanced Capital Allowances could deliver savings of **0.01 MtCO₂e** in Wales in 2020.

UKB4 - Feed-In Tariffs

Feed-in Tariffs are a 'clean energy cash back scheme' for businesses, the public sector, communities and individuals that produce their own energy renewably. It enables investment in small scale low carbon electricity, in return for a guaranteed payment both for the electricity generated and exported up to a maximum of 5MW.

We estimate that Feed-in Tariffs could deliver savings of **0.25 MtCO₂e** in Wales in 2020. This estimate relates to total emission reductions from Feed-in Tariffs in the business sector only.

Heavy Industry and energy generation

As noted above, emissions from heavy industry and energy generation are not included in the 3 % target, although energy generation is relevant because we have included energy consumption by end user. We have included a short summary of key interventions relevant to this sector based on the feedback to the consultation and the views of the Climate Change Commission for Wales.

We are working with the CBI on the of a large energy users forum, which will support our work in this area.

In addition to the Climate Change Agreements and the Renewables Obligation, the two key interventions relating to this sector are the EU Emissions Trading Scheme and the Climate Change Levy.

We estimate that UK action in the area of energy generation will deliver **0.93 MtCO₂e** savings in 2020 in Wales. We expect the majority of these savings to be delivered through the Renewables Obligation which impact energy consumption.

Residential

The residential sector is responsible for approximately a fifth of the emissions covered by the 3 % target.

We estimate that:

- Assembly Government action in the residential sector will deliver **0.24MtCO₂e** savings in 2020.
- UK action in the residential sector will deliver **1.20 MtCO₂e** savings in 2020.

The key interventions that will deliver that level of reduction are outlined below.

Assembly Government interventions

We have identified a number of Assembly Government interventions that support residential emission reduction. Where they are additional to those actions assumed to be taking place as part of the UK core package (which is detailed in the subsequent section) we quantified their anticipated impact.

The main Assembly Government interventions are:

- WR1 - Area based domestic energy efficiency programmes.
- WR2 - Demand-led energy efficiency programmes focused on those at risk of fuel poverty.
- WR3 - Supporting community scale energy generation.
- WR4 - Improving the energy performance of social housing.
- WR5 - Behaviour change at home.
- WR6 - Low carbon new build Wales.

WR1 - Area based domestic energy efficiency programmes

Arbed, is the Assembly Government's Strategic Energy Performance Investment Programme. The programme will leverage and coordinate investment into the energy performance of Welsh homes, and is designed to maximise the environmental, social and economic benefits of this investment.

The first phase of the Arbed programme will see investment in projects developed by 21 social housing providers across Wales' Regeneration Areas. The second phase will develop a new portfolio of projects and will be funded via the Structural Funds.

We estimate that arbed could deliver savings of **0.03 MtCO₂e** in Wales in 2020.

WR2 - Demand-led energy efficiency programmes focused on those at risk of fuel poverty

The current Home Energy Efficiency Scheme (HEES), which provides basic measures (loft and cavity insulation and heating) to qualifying households, will be replaced next year by a new all-Wales Fuel Poverty Scheme that offers a wider set of measures, enabling the Assembly Government to provide support to qualifying households in off gas, hard to treat properties.

We estimate that HEES could deliver savings of **0.19 MtCO₂e** in Wales in 2020.

WR3 - Supporting Community Scale Energy Generation

We have developed a programme of support for the development of community scale energy projects, focused on projects below 5MW, and to assist projects up to 50MW looking particularly at business and commercial opportunities at this scale.

This includes funding for development officer support, feasibility studies and capital works through European Structural Funds projects, clear guidance to enable such developments through the planning system and the development of toolkits and other resources to support the development of projects.

We estimate that support for community scale energy generation could deliver savings of **0.03 MtCO₂e** in Wales in 2020.

WR4 - Improving the energy performance of social housing

The Assembly Government uses the Code for Sustainable Homes as the assessment framework for new housing and requires at least Code Level 3 for all new housing that we influence through grant funding, investment and land disposals; moving to higher levels as quickly as possible.

The Welsh Housing Quality Standard (WHQS) for existing social housing provides for the annual energy consumption for space and water heating to be estimated using the SAP (Standard Assessment Procedure) method and specifies a minimum SAP rating of 65 out of a possible 100 to be achieved. A SAP rating of 65 is equivalent to an Energy Performance Certificate rating of D.

At this stage, the contribution of this intervention has not been quantified. We will collect evidence of the impact of the programme to reducing emissions and use that to quantify its expected contribution to emission reduction in 2020.

WR5 - Behaviour change at home

Energy behaviours are one of the two issues we are focusing on as part of our new behaviour change pilots. We are identifying the groups of behaviours related to domestic energy use which have the greatest potential to yield emissions reduction, and are piloting programmes to encourage people to adopt these more low carbon behaviours. Where we demonstrate success in



reducing emissions though these pilots, we will work with communities to encourage the roll out of successful programmes at the local level across Wales.

Based on UK Committee on Climate Change analysis, we estimate that behaviour change associated with energy behaviours in the home could deliver **0.31 MtCO₂e** savings in 2020.

WR6 - Low carbon new build in Wales

The Assembly Government is supporting a range of actions to enable low carbon new build in Wales, these include: recently transferred powers over Building Regulations, land use planning and the low/zero carbon hub.

With the full devolution of Building Regulations from 2012, the Assembly Government will be able to set ambitious standards for new build in Wales and a comprehensive programme to gather the evidence to inform any changes to the legislation and support the construction industry in adopting these new standards is underway. There will also be opportunities to encourage improvements for the existing stock by requiring consequential improvements in energy performance or the resilience of a building to climate change impacts when dealing with applications for extensions and other work.

Land use planning has a critical role to play in ensuring that, for the future, we have low carbon developments that are built in sustainable locations and are resilient to climate change. The recently strengthened planning policy in relation to climate change emphasises the priority the Assembly Government places on tackling climate change and the need for the planning decisions to reflect this. These national planning policies are being reflected in Local Development Plans (LDPs) and will be reflected in the development control decisions made in the context of the LDPs.

Design and Access Statements accompany outline and full planning applications and applications for listed building consent and are intended to ensure the creation and management of well designed, sustainable environments that are useable, inclusive and accessible for all.

The Low/Zero Carbon Hub will act as focal point to coordinate policy and delivery, ensure that the construction industry is aware and involved and set out opportunities for the whole industry.

Although much of the activity to support low carbon new build in Wales is promoted by the Assembly Government, the improvements that investment supports are assumed to be taking place in Wales in the estimates for the UK energy efficiency measures outlined below so cannot be separately quantified.

UK Government interventions

We have used UK Government estimates for the emission reduction arising from UK Government interventions. The estimate is based on two main components:

- UKR1 - Green Deal and Green Investment Bank.
- UKR2 - Carbon Reduction Commitment Energy Efficiency Scheme.

UKR1 - Green Deal and Green Investment Bank

The Green Deal and the Green Investment Bank is the new UK Government's programme for supporting domestic energy efficiency. Details are still being confirmed but it includes:

- New community partnerships with an enhanced role for local authorities in delivering post-2012 supplier obligation and support for district heating.
- Universal standards for the rented sector.
- Invest to save - financing improvements through a new supplier obligation and through pay as you save and the feed in tariff and renewable heat incentive.
- Support for customers through advice services and new standards for installation.

In addition, the UK Government is mandating the roll out of smart meters as a means of focusing the attention of householders in their energy usage, and for them to consider the benefits of installing other measures in their home.

We estimate that the Green Deal and Green Investment Bank could deliver savings of **1.2 MtCO₂e** in Wales in 2020. This total includes the emission reduction expected to be delivered via feed-in tariffs in the residential sector.

UKR2 - Energy Saving Trust

Energy Saving Trust is primarily funded by the UK Government and supports householders and communities to save energy and reduce emissions. The Energy Saving Trust operates a free, impartial advice service for householders and communities and supports local authorities in their role as community leaders, amongst other activities.

The savings arising from Energy Saving Trust activity have been assumed as part of other actions including our estimate of behaviour change associated with energy behaviours in the section above.

Agriculture and Land Use

The agriculture and land use sector is responsible for approximately a sixth of the emissions covered by the 3 % target.

We estimate that Assembly Government action in the Agriculture and Land Use sector will deliver **0.60 MtCO₂e** savings in 2020. There are no specific UK Government interventions covering Wales for this sector.

The key interventions that will deliver that level of reduction are outlined below.

Assembly Government interventions

The main Assembly Government interventions are:

- WA1 - Woodland creation.
- WA2 - Optimal management of current woodland sink.
- WA3 - Glastir.
- WA4 - Supporting behaviour change in farming practice.
- WA5 - Dairy and Red Meat Road Maps.

WA1 - Woodland creation

Increase in woodland cover is set as an outcome for the *Woodlands for Wales* Strategy 2009, with an initial target of 1,500 ha from 2009-2012.

In recent months Glastir has set an annual target from 2010 of 3000 ha of woodland creation over the next 20 years. This subsumes the remaining two years of the initial *Woodlands for Wales* target of 500 ha (based on a three-year target of 1,500 ha).

There are also measures in hand to stimulate additional woodland creation with an aspiration to achieve an annual 5000 ha as per the Land Use Climate Change Group recommendation.

These additional measures include a combination of private carbon related finance assured through the development of the UK Woodland Carbon Code and possibly natural regeneration of woodland on marginal farmland through continued agricultural restructuring supported by CAP reform.

If woodland creation plans were to proceed at a rate of 5000 ha from 2010 then Forest Research modelling indicates that annual sequestration could be of the order of 500 Kt.

WA2 - Optimal management of current woodland sink

Based on current projections the Welsh woodland resource is set to become a net source over the next 10 years, reversing the current significant net annual sink contribution (1.430MtCO₂e **sink** in 2007 to 0.428MtCO₂e **source** in 2020). Although, the addition of the carbon store in Harvested

Wood Products means the annual abatement from Welsh woodlands remains positive beyond 2020, there are a number of measures in place to improve on the projected position.

These include improved modelling linked to inventory, as well as operational measures to 'smooth' felling programmes, increasing the use of homegrown timber for material substitution (securing reduced fossil fuel use and locking up embedded carbon) and promotion of wood energy for instance through the continuation of capital grants in the Wood Energy Business Scheme.

WA3 - Glastir

Glastir is the new land management programme which supports farmers in developing sustainable land management approaches. It includes prescriptions to support the preservation of soil carbon and to encourage on-farm renewable energy generation.

The potential emission savings will depend on the ability of farmers to export renewable electricity via the Grid. In addition, the extent to which anaerobic digestion plants can be installed in the dairy sector will determine the extent that methane emissions can be reduced.

WA4 - Supporting behaviour change in farming practice

We are supporting the roll out of improved mentoring and education of land managers through the existing Farming Connect scheme, including the promotion of best practice on climate change through the Rural Development Plan.

At this stage, the contribution of this intervention to agriculture and land use emission reduction has not been quantified. We will collect evidence of the impact of our advice and support to promote behaviour change to reduce emissions and use that to quantify its expected contribution to emission reduction in 2020.

WA5 - Dairy and Red Meat Road Maps

This action is about putting into practice the Sustainable Development Commission's advice about "road mapping" as a technique for analysing GHG emissions and water use across all stages of the food chain and producing an action plan to cut them.

This is an enabling intervention that will ensure that opportunities to reduce emissions are identified but it will not lead to direct reductions in emissions in and of itself. As a result its contribution to emission reduction cannot be quantified.

Resource efficiency and waste

The waste sector is responsible for a very small proportion of the emissions covered by the 3 % target (less than 5 %). However, the waste sector contributes a high proportion of emissions for sectors where the Assembly Government can take action directly.

We estimate that Assembly Government action in the Waste sector will deliver 0.66 Mt CO₂e savings in 2020. There are no specific UK Government interventions covering Wales for this sector.

Additional savings of 78 kt CO₂e in 2009/10 and 110kt CO₂e (5,200 tonnes of methane at 21xGWP) in 2010/11 have already been achieved through a programme of work to reduce existing greenhouse gas emissions at landfill sites. It can be assumed that should the landfill operators continue with this new regime there will be significant savings in future years.

The key interventions that will deliver that level of reduction are outlined below.

Assembly Government interventions

The key interventions are the policies and actions outlined in the revised waste strategy for Wales: 'Towards Zero Waste', which (along with the supporting sector plans) provides a programme to comply with the EU Framework Directive on Waste.

We expect the majority of these savings to be delivered through the following Welsh measures:

WW1 - Diversion of biodegradable waste from landfill to recycling, composting and anaerobic digestion

- Diversion of all biodegradable municipal waste (collected by local authorities) from landfill by 2020.
- Diversion of other biodegradable waste (from 'other' municipal, commercial, industrial and construction and demolition sectors) from landfill by 2025

WW2 - Programme of work to reduce further existing greenhouse gas emissions at landfills
Programme of work to reduce further existing greenhouse gas emissions at landfills.



These measures are supported by implementation of:

- The Landfill Directive.
- The Packaging Waste Directive.
- Landfill allowances Scheme.
- Landfill Tax.
- Waste Procurement Programme Office.
- Waste and Resource Action programme (WRAP).
- Promoting waste prevention, reuse, anaerobic digestion, composting and recycling.

Other relevant actions that support emission reduction in relation to resource use are set out under the business and residential sections.

Public Sector

The public sector is responsible for a very small proportion of the emissions covered by the 3 % target. It does, however, have a critical leadership role to play.

The key interventions that we are taking are outlined below.

Assembly Government interventions

The main Assembly Government interventions are:

- WPS1 - Embedding action on climate change.
- WPS2 - Reducing the carbon footprint of the Assembly Government estate.
- WPS3 - Reducing the carbon footprint of the NHS.
- WPS4 - Reducing the carbon footprint of education services.
- WPS5 - Enabling wider contributions from others.
- WPS6 - Land use planning.
- WPS7 - Spatial Plan Low Carbon Regions work and Marine Spatial Planning.

WPS1 - Embedding action on climate change

We are developing a number of tools to embed consideration of climate change in the development of key policies and programmes.

This is an enabling intervention that will ensure that opportunities to reduce emissions are identified but it will not lead to direct reductions in emissions in and of itself. As a result its contribution to emission reduction cannot be quantified.

WPS2 - Reducing the carbon footprint of the Assembly Government estate

This action is about reducing the carbon footprint of the Assembly Government estate. These represent an initial set of proposals which will be directed by robust Environmental Management, attainment of the Carbon Trust Standard and development of a Carbon Management Strategy to inform the nature, level and timing of the resource required to make the progress required over the longer term. It will include estate rationalisation and ICT transformation.

This infrastructure investment will be supported by an internal behaviour change programme that deploys training, communication and staff involvement to bring about behavioural change across the organisation.

We will also communicate our emissions reduction actions more widely, as an exemplar for the need for action by all sectors of society.

We will also take action to improve measurement and monitoring of progress, benchmarking and reporting of performance.

At this stage, the contribution of this intervention to public sector emission reduction has not been quantified. We will collect evidence of the impact of supporting embedding action on climate change to reducing emissions and use that to quantify their expected contribution to emission reduction in 2020.

WPS3 - Reducing the carbon footprint of the NHS

The NHS has established a comprehensive programme to reduce its carbon footprint. Progress is being monitored by Welsh Health Estates, which annually analyse the environmental performance of the NHS in Wales through its Estates and Facilities Performance Monitoring System.

Examples of activity include:

- Investment in Combined Heat and Power (CHP) sets, which analysis for 2008/09 suggest provide 9 % of total electricity demand for Welsh hospitals.
- Though the Central Energy Fund (CEF), the NHS All Wales Capital Programme has enabled NHS Trusts in Wales to invest in low to medium cost energy efficiency initiatives and low carbon technologies.
- The Building Research Establishment's Environmental Assessment Method (BREEAM) has been developed by the Building Research Establishment in partnership with the Department of Health and Welsh Health Estates. It has led to the introduction of low and zero carbon technologies on major projects in the NHS in Wales for example particularly with regard to the introduction of biomass boilers at Ysbyty Cwm Rhondda and Ysbyty Alltwen in Porthmadog.

WPS4 - Reducing the carbon footprint of education services

This action is about ensuring that reducing GHG emissions informs decision making in the re-configuration and utilisation of buildings that forms the educational estate. These changes will affect the whole education system with reorganisation, and asset utilisation embedded within the 21st Century Schools and other education capital investment programmes.

At this stage, the contribution of this intervention to public sector emission reduction has not been quantified. We will collect evidence of the impact of supporting embedding action on climate change to reducing emissions and use that to quantify their expected contribution to emission reduction in 2020.

WPS5 - Enabling wider contributions from others

Many of the Assembly Government's actions in relation to the public sector enable wider contributions from the public sector.

We are also establishing a framework to help support local government action on climate change. For example climate change action is embedded in the new Outcome Agreement Framework for local government and should enable progressive improvement.

We are also providing specific support to enable contributions from the Third Sector and communities, for example:

- Providing development worker support, tools and other resources to enable community action.
- Supporting the development of a leadership group of large Third Sector organisations that were not previously engaged on climate change.

The detail of the work underway in these areas is described in the subsequent section on 'the wider contribution of others in Wales', because the outcomes will be delivered by people from a range of sectors working together and the Assembly Government's role is to enable rather than lead.

WPS6 - Land use planning

We have strengthened planning policy in relation to climate change. These national planning policies are being reflected in Local Development Plans (LDPs) and will be reflected in the development control decisions made in the context of the LDPs. Other changes include Technical Advice Note 6 on Sustainable Rural Communities which enables low impact development.

Although this action has been included in the public sector section, it will enable emission reduction across all sectors, particularly transport, business and residential. At this stage, the contribution of this intervention to emission reduction has not been quantified. We will collect evidence of the impact of supporting embedding action on climate change to reducing emissions and use that to quantify their expected contribution to emission reduction in 2020.

WPS7 - Spatial Plan Low Carbon Regions work and Marine Spatial Planning

Through the Wales Spatial Plan, organisations are collaborating to agree and deliver a vision for sustainable development in each part of Wales.

Each Spatial Plan Area is taking forward the Low Carbon Regions work to develop a vision and practical actions to put the low carbon region concept into practice.

The development of a Marine Spatial Plan, under the Marine and Coastal Access Act 2009, will help achieve sustainable development of the Welsh marine area and will look at emission reduction activity, as well as key adaptation challenges.

At this stage, the contribution of this intervention to public sector emission reduction has not been quantified. We will collect evidence of the impact of supporting embedding action on climate change to reducing emissions and use that to quantify their expected contribution to emission reduction in 2020.

UK Government interventions

We estimate that UK action in the public sector will deliver **0.03 MtCO₂e** savings in 2020. We expect the majority of these savings to be delivered through the following measures:

- UKPS1 - Carbon Reduction Commitment Energy Efficiency Scheme.
- UKPS2 - The Energy Service Directive (ESD).
- UKPS3 - Energy Performance of Buildings Directive (EPBD).

UKPS1 - Carbon Reduction Commitment Energy Efficiency Scheme

The Carbon Reduction Commitment Energy Efficiency Scheme is a new cap and trade scheme covering the whole of the UK which will drive energy efficiency through behaviour and infrastructure change. Large business, public and Third Sector organisations that used more than 6,000MWh each year of half hourly metered electricity in 2008, are included.

We estimate that the Carbon Reduction Commitment Energy Efficiency Scheme could deliver savings of **0.01 MtCO₂e** in the Public Sector in Wales in 2020.

UKPS2 - The Energy Service Directive (ESD)

The Energy Services Directive is intended to enhance end-use energy efficiency across the EU and places specific requirements on the public sector.

UKPS3 - Energy Performance of Buildings Directive (EPBD)

The Energy Performance of Buildings Directive introduced requirements for energy performance certificates (EPCs) for properties providing A-G efficiency ratings and recommendations for improvement and requires public buildings to display energy certificates (DECs).

The wider contribution of others in Wales

The wider contribution of businesses, local government and the wider public sector, the Third Sector and communities and individuals is critical to delivery of our climate change targets.

Local authority and public sector leadership on emission reduction

Local authorities

Local authorities are well placed to champion action on climate change, driving emission reduction and costs savings through service delivery and providing local leadership on the issue.

We are developing a range of other tools to support local authorities in reducing emissions and tackling climate change has been embedded in the new Outcome Agreement Framework for local government and will enable progressive improvement. In addition, many local authorities will be covered by the Carbon Reduction Commitment Energy Efficiency Scheme.

A few examples of positive action by individual authorities are highlighted below (these authorities also have a strong focus and specific initiatives on climate change adaptation):

- **Caerphilly County Borough Council**
 - Developed a Climate Change Strategy and Action Plan for the county borough, including a climate change commitment for organisations and individuals to pledge to take action.
 - Continue to promote “living better, using less”, particularly through our use of the Caerphilly Sustainability Index - our online sustainability calculator.
 - Committed to reducing their carbon emissions by 45 % by 2019 as part of their Carbon Reduction Strategy.
 - Ensuring that all 93 schools in the county borough have at least a Bronze award under Eco Schools.
 - Other ongoing work includes renewing their Travel Plan, continuing work with Procurement, staff training and specific projects such as promoting the use of allotments.
- **Denbighshire County Borough Council**
 - Denbighshire County Council has developed a Portfolio-Programme-Project Management approach to Carbon Reduction.
 - The Carbon Reduction Portfolio aims to achieve an annual 3 % reduction in CO₂ emissions 2010 onwards achieving the upper target of 32 % by 2020.
 - The Portfolio has 5 Programme arms: Asset Management, Fleet Management, Waste Management, Behaviour Management and Procurement Management.
 - Under each of these Programme arms a series of projects will be undertaken annually in order to contribute towards the annual target of 3 % reduction.

- City and County of Cardiff Council
 - Developed a Climate Change Action Plan for the city and working towards the aspiration of becoming a Carbon Lite city.
 - This is being delivered in partnership with stakeholders across the city and include both mitigation and adaptation actions.
 - In house, the council is taking part in the Local Authority Carbon Management Programme, with a 60 % CO₂ reduction target by 2018 for Council properties.
 - To engage with external stakeholders a Carbon Lite Working Group has been established and workshops held with the Community Strategy Vision Forum and Partners.
 - Other main pieces of work at present include: Green Dragon, Cardiff Council have corporate registration to level 2 and are piloting some sections to level 3; Sustainability Appraisal and SEA of key strategies, policies and projects, including the Deposit Local Development Plan; and sustainable development training, communications and engagement.
- Neath Port Talbot County borough Council
 - In 2009, formed a new Climate Change Unit tasked with tackling the causes of climate change and adapting to its effects. It brings together teams leading on biodiversity, sustainable access, transport policy, environmental systems, energy and carbon management and environmental change.
 - Developed consumption accounting systems which enable the Council to maintain, monitor, target and reduce its carbon footprint year on year and has been accredited to the Carbon Trust Standard.
 - Established the Neath Port Talbot Environment Awards. Nominees need to demonstrate a positive contribution in one or more of five themes that include reducing carbon emissions, improving use of resources and contributing to sustainable development
 - Organised a series of events to encourage the community to take action on green issues, including a Green Family Fun Day in Margam Park.
- Brecon Beacons National Park Authority
 - The National Park's Corporate Goal 3 Minimise their adverse impacts on and maximise the benefits obtained from and to the local and global environment.
 - Key actions include:
 - Reducing the energy usage and increase renewable energy capacity of the Parks' communities: support for The Green Valleys community CO₂ reduction and micro hydro generation.
 - Retaining and embedding Green Dragon Level 4 : including maintaining and building on 2007/8 30 % CO₂ reduction, further reducing waste and rolling out green travel plan
 - Creating a sustainable visitors' and residents experience.

Local Service Boards

A number of Local Service Board (LSB) have implemented projects aimed at addressing climate change.

Some examples of the action underway include:

- Flintshire LSB - have agreement for a Carbon Reduction and Adaptation Plan with set targets for each partner. All partners have formally signed a pledge to reduce carbon and share good practice and to identify pressures that will arise from a Changing Climate.
- Gwynedd LSB - aims to ensure that Gwynedd achieves a higher % reduction in CO₂ levels than the UK targets by 2020. Initially the project is concentrating on reducing CO₂ emissions by LSB member organisations. These efforts will be concentrated in four areas, namely energy use in non domestic buildings, transport, waste and procurement of goods and services.

The challenge now is to mainstream that learning and see action on the issue across Wales.

NHS emission reduction

Actions to reduce emissions in the NHS are highlighted in the previous section and further actions are planned. These include:

- A carbon footprinting exercise which will be completed by December 2010. This will allow the NHS to focus on areas of priority to reduce emissions in the future;
- The amount of electricity generated by Combined Heat and Power (CHP) units is 9 % of the total requirement for the NHS in Wales. The plan is to increase the number of units used in the NHS estate. Potential savings from CHP at the University Hospital of Wales are estimated in excess of 3000 tonnes of CO₂ per year compared to traditional grid supplied electricity;
- A review of the possible use of renewable energy at NHS sites is being undertaken. The recent introduction of Feed-In tariffs is likely to have an effect on the use of renewable energy as previously only biomass and wind energy were considered viable options at NHS sites;
- Energy performance targets have been set for new and existing buildings. The targets are 35-55GJ/100m³ for new buildings and 55-65GJ/100m³ for existing buildings;
- The Building Research Establishment's Environmental Assessment Method (BREEAM) is integrated into the business case process for the procurement of major capital schemes. This will introduce low and zero carbon technologies into the process. All new build developments have to achieve an "Excellent" rating;
- The NHS is also making increasing use of new technology. There has been an £8.9m investment in telecare medicine. This reduces the distance patients need to travel and reduces carbon output;

- Travel plans have been produced for all acute hospital sites. Plans for selected community hospital sites have also been submitted which are being reviewed. Once these plans have been reviewed a decision on what further actions are necessary will be taken; and
- The NHS will also aim to share its experience and expertise and provide good practice examples that other parts of the public sector can consider.

Action by other public bodies

A wide range of public bodies are grasping the climate change challenge and driving action in their organisations, and some examples of action are set out below. Again, in many cases, these organisations are also developing full programmes relating to adaptation but this section focuses on their contribution towards the 3 % target because this is the Emission Reduction Delivery Plan.

- Environment Agency:
 - The Environment Agency has a key role to play in supporting emission reduction in other sectors. They are the regulator for the EU Emissions Trading Scheme and the Carbon Reduction commitment Energy Efficiency Scheme as well as having the opportunity to promote greater energy efficiency through Environmental Permitting and wider regulation including to promote landfill gas capture.
 - The Environment Agency also has a role in the regulation of a range of low carbon and renewable energy developments and are looking to make the process as streamlined and efficient as possible. They have commissioned a report on *Opportunity and environmental sensitivity mapping for hydropower in England and Wales* and helped to develop the Biomass Environmental Assessment Tool (BEAT), which allows users with a wide range of biomass knowledge to get an understanding of the potential environmental impacts of a proposed development.
 - The Environment Agency has an ambitious Internal Environmental Management programme and, by 2015, they plan to reduce greenhouse emissions by 33 %, against a baseline of 2006/07. These reductions will be delivered through a number of measures including:
 - Energy conservation at their offices, including voltage regulators installed at one office, and planned for three more in 2010.
 - Small scale renewables at their sites including solar photovoltaic installed at two offices, planned for a third in 2010/11, solar heating installed at two offices, a wind turbine installed at one depot, hydropower at one fish hatchery, and one planned at another and photovoltaic panels installed or planned at 44 telemetry outstations.
 - A transport hierarchy for all travel by EA staff.
 - Providing information and support, including training, to all staff so that they can take every opportunity to highlight the importance of taking action on climate change.

- Countryside Council for Wales:
 - The Countryside Council for Wales (CCW) is using 2007/08 as the baseline year for emission reduction and have set a target of 24 % reduction up until 2012. CCW has also signed up to the 10:10 campaign.
 - They have attained Carbon Trust Standard Certification in 2009.
 - Within CCW there is a strong focus on soil/peat carbon conservation which is essential if we are to prevent genuine emission reductions being offset by losses from Welsh soils and ecosystems.

Business and workforce leadership on emission reduction

CBI

In 2007, the CBI climate change task force produced *Climate change: everyone's business* which argued that a much greater sense of urgency was required if the UK was to meet its targets for reducing greenhouse gas and that substantial changes were required in the way the economy works including much higher energy efficiency and a dramatic shift to low-carbon energy sources.

The report recognised that government, business and consumers all have a role to play in making the shift to a low-carbon economy.

The CBI Climate Change Board was set up in 2008 to deliver the commitments set out in *Climate change: everyone's business*.

The board brings together senior business leaders from a range of sectors to demonstrate business commitment to managing the risk of climate change by:

- promoting business-led policy solutions to realise carbon savings;
- showcasing business opportunities for green growth;
- leading by example on corporate commitments to manage carbon footprint;
- monitoring progress by government and business in realising the UK's carbon targets;
- influencing a post-2012 international climate change agreement.

The CBI have developed a climate change tracker that monitors progress towards a low-carbon economy against the actions in the Taskforce report.

Trade Union Congress

The TUC's Greening the Workplace initiative is an example of how unions can champion the green agenda and the Wales TUC is developing a proposal to roll out the project in Wales.

It aims to engage the workforce in tackling climate change through building a network of workplace champions who can act as catalysts for change in both improving resource efficiency within business and enabling behaviour change which can have a wider impact than solely the workplace.

Examples of action by businesses

Many businesses are taking action to reduce emissions and drive that reduction through the supply chain, some examples of action underway in Wales is set out below.

Toyota

Toyota Manufacturing UK employs 535 people at its Deeside manufacturing plant. Over the past 17 years, Toyota Manufacturing UK has reduced energy and water use and carbon emissions per vehicle by 70 % and reduced individual vehicle waste by over 60 %.

Toyota Manufacturing UK employs a three-pillar approach to sustainable manufacturing:

- Leading environmental performance through innovative product technology.
- Increasing its use of renewable wind, solar, biomass and geothermal energy.
- Working in harmony with the natural surroundings by inspiring colleagues to be more eco-aware, engage in local community activity and preserve and promote the local Deeside eco-system.

Recent actions have included:

- Launching a 'carbon footprint calculator' campaign for its workforce.
- Circulating a regular environment-focused newsletter.
- Running the fifth year of the Toyota technology challenge, encouraging school pupils to design, build and race solar-powered model vehicles made from recycled materials.

Dow Corning

Global silicon-based technology specialist Dow Corning is an example of a company developing innovative sustainable solutions to meet the sustainability needs of its customers.

Dow Corning offers around 7,000 products and services and has more than 25,000 customers worldwide. Its 160-acre manufacturing site in Barry, South Wales, employs 600 people and is the largest plant operated by Dow Corning in Europe.

One area of focus for the company is the fast developing arena of 'green' or sustainable construction. Dow Corning has developed a new energy efficient silicone sealant for windows that helps the industry respond to rising energy costs.

Other sustainable innovations made possible with materials manufactured at Dow Corning in Barry include sealants and encapsulants that improve the efficiency of solar panels, additives which enable the production of low temperature household detergents, materials used in low-energy LED lighting and tyre additives to reduce rolling resistance.

Through a ten year programme of technical and operational improvements and targeted capital investments, the Dow Corning site in Barry has reduced the energy used to make one tonne of product by more than 30 %. Annual waste levels have been reduced by a factor of ten for one of its production processes and efficiency in another production plant increased by more than 10 %.

Corus

Steelmaking is necessarily an energy and carbon - intensive industrial operation. Corus, the UK's largest steelmaker, is committed to creating and maintaining a sustainable steel industry here. With an estimated turnover of £2.7bn and over 7,000 employees across multiple sites in Wales alone, the company has a vital part to play and has made significant inroads in meeting carbon reduction challenges and steelmaking now produces half the CO₂ it did just one generation ago.

Corus Strip Products UK (CSP UK), incorporating the integrated steel plant at Port Talbot and the Llanwern rolling mills, is committed to parent company Tata Steel's goal of setting the benchmark in environmental care in worldwide steelmaking and group target carbon emission reduction of at least 20 % per tonne of liquid steel (t/tls) by 2020, compared with 1990 levels.

CSP UK has undertaken a 'journey' to dramatically change the business in a programme based on cultural change. It invited all its employees in Wales, as well as its contractors and suppliers, to define and sign up to a series of values and beliefs that will achieve a sustainable steel industry in Wales. Parts of this included the establishment of a new set of values and beliefs attuned to the complete notion of sustainability. The result is a complete business focused on sustainability for commercial advantage.

Energy optimisation forms a vital part of the Corus carbon emissions reduction strategy. Since 2000 the Corus integrated steel plants' (including Port Talbot) energy intensity has reduced from over 21GJ/tonne to just over 18GJ/tonne. Through continued work and investment Port Talbot Steelworks alone is on track to reduce its annual carbon emissions by 297,000 tonnes.

In May 2010 Corus 'switched on' its £60m Basic Oxygen Steelmaking (BOS) Gas Recovery plant at Port Talbot. The Tata Steel funded investment captures and collects previously flared-off gas which is then re-used to enrich the Blast Furnace Gas supplying the internal power plant. The project's benefits include a reduction of the site's annual carbon emissions by around 240,000 tonnes and an increase in the plant's internal energy generation capacity, thereby reducing the requirement on it to buy-in energy. The project has also been recognised by key stakeholders as a significant step for Wales in meeting its climate change objectives.

CSP UK has also invested £1.2m in creating a Centre of Excellence at Cardiff University's School of Engineering to further Corus' work in energy generation, optimisation and recovery and also in waste reduction.

Corus is developing new products and services to reduce the environmental impact of its products' life cycles to help its customers reduce their carbon footprints. One example of this is Confidex Sustain - a unique cradle-to-grave carbon neutral building envelope system developed by Corus Colours business unit based at Shotton in Flintshire. For every kilogram of CO₂ emitted by the pre-finished steel, cladding, fixings and insulation, Corus will offset a kilogram in climate friendly projects overseas through The Carbon Neutral Company. To date, 54 Confidex Sustain projects have been completed which equates to over 23,000 tonnes of CO₂.

Third Sector and community action on emission reduction

Cynnal Cymru-Sustain Wales

Cynnal Cymru-Sustain Wales aims to help deliver the ambitions of the Sustainable Development Scheme and all policy that supports its ambitions, including the Climate Change Strategy. In all of their work they seek to address climate change by presenting it within the context of sustainable development.

Cynnal Cymru will continue to support and encourage action within their sector by, for example:

- facilitating knowledge transfer of:
 - best practice case studies of practical action
 - latest research on how to achieve engagement and behaviour change
 - funding and financing options for the future
- recognising and celebrating individuals' efforts by:
 - promoting their work through their website and newsletter
 - organising the Wales Green List

In addition to supporting the work of their members and partners - who are already 'engaged and active' - Cynnal Cymru are also undertaking projects which seek to encourage new audiences to take action to promote sustainable development and reduce emissions. These projects are targeted engagement campaigns currently focussing on the following three sectors:

- social enterprise (in collaboration with the Wales Cooperative Centre)
- Community and Town Councils (in collaboration One Voice Wales)
- Creative arts (in collaboration with the British Council and other partners).

Wales Council for Voluntary Action

Wales Council for Voluntary Action (WCVA) has an expanding programme of actions aimed at engaging the sector in taking action on climate change. We see the engagement of the whole sector with the climate change agenda as an essential step in realising a more sustainable Wales.

External actions to promote action on climate change include:

- Green News in their e-Briefing and regular updates in Network Wales is now focused on developments in the climate change agenda.
- Committed to a permanent presence of climate change issues in the sector press.
- Support the Climate Change Leadership Cohort which seeks to promote action by the non-environmental Third Sector.
- Real Time Electricity Monitoring Device Evaluation, supported by the Assembly Government, purchased wireless electricity monitors to lend to groups to help encourage more energy efficient behaviour.

- Host the Millennium Development Goals Taskforce and its initiatives, which includes the Gold Star Communities initiative and the Rainforest Size of Wales conservation project.
- The Environment Wales Climate Change Fund, supported by the Assembly Government, offered up to £2000 to Third Sector groups who have yet engage in the climate change agenda. The evaluation will inform future plans.
- Introduction to Sustainable Development is an introductory course delivered by Cynnal Cymru aimed at teaching the fundamental principles associated with sustainable development.
- Change our charitable objects - examining if climate change can be embedded as a core object. As this is a new kind of charitable object, this is being explored in consultation with the Charity Commission for England or Wales to gauge how it can be used after they have established its status.
- Age of Stupid Grant, supported by the Assembly Government, closed earlier this year. It funded screenings of 'the Age of Stupid' to help promote the urgency of the climate change message. This has led to 50 screenings of the film across Wales.

A Cross Cluster Staff Group is looking at how to embed sustainable development principles across WCVA's work and services such as training, grants, trustees, conferences, events and its general operations. Many of the internal actions that have been taken are as a result of recommendations from this group.

Internal Actions to promote action on climate change include:

- Committed to using all-staff days to engage all staff in debate and action, this year their staff day was themed around making links between the green and lean agendas.
- Continue to achieve Green Dragon - They have achieved level two of the environmental management system and aim to be innovative with their environmental management requirements rather than just compiling.
- Taken forward a range of practical measures such as installing light sensors in all toilets, installed video-conference facilities at all WCVA sites and increased rate for bicycle travel on WCVA business to 20p per mile.

Third Sector Climate Change Leadership Cohort

The WCVA's Climate Change Leadership Cohort involves a wide section of organisations (both environmental and non-environmental) from across sector looking at:

- Reducing the impact on the environment.
- Understanding the impact climate change will have on users and communities.
- Developing climate change strategies and guidance to help groups adapt.
- Encouraging leadership in their own areas.

This group is producing guidance for both ends of the spectrum in the sector. The members of the group will establish their own programmes and use this example coupled with the guidance to provide leadership to groups in their own networks. The hope is to create a model for engagement that can be expanded to involve the whole sector.

Examples of Third Sector and community action

Communities and Third Sector organisations across Wales are taking practical action to tackle climate change.

Centre for Alternative Technology (CAT)

CAT is concerned with the search for globally sustainable, whole and ecologically sound technologies and ways of life.

Within this search the role of CAT is to explore and demonstrate a wide range of alternatives, communicating to other people the options for them to achieve positive change in their own lives.

This communication involves:

- Inspiring - instilling the desire to change by practical example.
- Informing - feeding the desire to change by providing the most appropriate information.
- Enabling - providing effective and continuing support to put the change into practice.
- CAT has a holistic approach to its work, integrating ideas and practice relating to land use, shelter, energy conservation and use, diet and health, waste management and recycling.

Through its resident community and work organisation, CAT is also committed to the implementation of co-operative principles and best achievable environmental practices. On November 19 2009 CAT won 'Best Social Enterprise (turnover of £1 million plus)' at the inaugural Welsh Social Enterprise Awards.

CAT has also produced a series of Zero Carbon Britain and Zero Carbon Wales that map out how to deliver radical emission reduction.

Green Valleys

Established in May 2009, Green Valleys is a not-for-profit Community Interest Company based in the Brecon Beacons National Park. The organisation's objective is to establish the region as a net exporter of energy, via the development of community renewable energy schemes and the delivery of support to communities determined to reduce their carbon emissions. All revenue from community-owned installations is to be reinvested in specific community-based carbon reduction projects, such as electric bike infrastructure or community woodlands that provide sustainably-managed wood fuel.

The organisation works with statutory agencies across Wales to support communities to develop the capacity, skills and expertise needed to undertake similar initiatives. A full-time coordinator has been appointed to build links and networks with a range of other communities and agencies, leaving the steering group to focus on project development and the planning of future activity.

Green Valleys has delivered a 20 % reduction in carbon dioxide across 155 households and four community buildings. Thirteen active community groups have been established focusing on a variety of activities, including the establishment of allotments.

It was announced on 13 January 2010, that Green Valleys was one of three winners of the NESTA Big Green Challenge and were awarded £300,000.

Low Carbon Communities Challenge

Four communities in Wales are taking part in the Low Carbon Communities Challenge, a project to support and learn from community initiatives:

- Awel Aman Tawe in the Upper Amman and Swansea Valley
- Cwmclydach, in Rhondda Cynon Taff
- Cwm Arian in North Pembrokeshire
- Lammas project in Pembrokeshire

One of these projects is in a Community's First area.

Wider behaviour change

People, communities and organisations making different choices in order to reduce their greenhouse gas emissions will be critical to our climate change targets being achieved and the Assembly Government is taking significant practical action to support people in making those different choices.

The Climate Change Strategy outlines our approach to behaviour change and many of the earlier sections in this plan highlight specific initiatives aimed at promoting behaviour change, the following sections provide some additional examples.

Behaviour change programme

The Assembly Government's approach is a nationally-led, locally implemented programme of campaigns based on a social marketing approach.

The initial focus will be on domestic energy and transport and on those behaviours with the greatest carbon saving potential and the greatest likelihood of being adopted within the current infrastructure.

Our aim is to establish effective models for intervention to address a specific behaviour or group of behaviours, and to make these models available across Wales for communities to implement. Having established the effectiveness of this methodology, we will also provide access to support in order to enable this delivery, through provision of advice, access to resources and some modest funding.

As part of our leadership role, and in order to facilitate the delivery of such behavioural change programmes across Wales, we have established a framework contract for services to support such programmes. The contract will provide delivery support to design, deliver and evaluate interventions designed to promote behaviour change. As it has the widest definition of the principles of sustainability as its basis, the framework is open to use for a wide variety of other areas such as health, transport and community development.

We will use the framework contract to deliver capacity development to all sectors of society, in order to develop a strong and sustainable skills base in creating effective interventions to promote low carbon and sustainable behaviours.

Pathfinder Project

We are putting in place support, including development capacity, to trial different community based approaches to action. This is in response to the community identified need for local, trusted advisors who can “hand hold” the development of new work, support projects to be more robust and link them to resources, expertise and advocate on their behalf. The officers will support all different approaches to action (such as Transition Towns, low carbon groups, behaviour change programmes, transport and food related groups) but do so armed with evidence of what works that can inform local choices. They will work in partnership with the range of local advisors and co-ordinators of sustainable development work and also with existing relevant national organisations.

It would be the intention of the development officers to develop the work into mainstream communities over time including offering support to the Community Strategy development, Local Service Board projects and the Spatial Plan Area Groups.

Scaling up what works

We are also looking to scale up three community led initiatives, based on the social marketing approach to changing behaviour, which have demonstrated a track record for reducing community carbon foot prints:

- one approach will be designed to be usable by all communities across Wales
- the second will focus on encouraging action in urban areas, where there is less activity at present
- the third will build on Arbed and area-based whole house approaches.

Networks and sharing good practice

We have collaborated with Cynnal Cymru, WCVA, Environment Wales and locally placed organisation like Llangollen and Ymlaen Ceredigion to host biannual Community Action for Climate Change events across Wales.

The events offer a space for exchange of interesting work by groups in Wales and beyond, motivate individuals to reach higher and enable them to meet as a regional and Wales wide community. They also allow us to share Government direction and policy and offer the evidence base for different approaches and methods for undertaking action.

We already know that a number of new groups have emerged as a result of the Networks, different alliances and partnerships have formed and new skills learnt. A formal evaluation of the impact of these events is being prepared.



The networks are supplemented by other training events for example seminars from experts on the social marketing approach to changing community behaviour in environment related work.

Cynnal Cymru will be taking on responsibility for developing and delivering the networks from the end of this year.

Explanation of approach to quantification

Transport - Quantification

Emission reductions for the transport sector have been quantified using a combination of Welsh specific and UK Government agency analyses. Specifically the Welsh policy of implementing Sustainable Travel Towns has been quantified by applying UK quantification to specific Welsh urban areas.

The largest UK policy included in the quantification assessment for this sector was the DfT (Department of Transport) Transport package, this had been quantified at a UK level, as part of the Impact Assessment of the Carbon Reduction Strategy for Transport (DfT, 2009), and was disaggregated to a Welsh level using vehicle kilometers statistics.

Air travel and associated emissions are not included in the Welsh 3 % target. The drivers for air travel and therefore for any reductions occur at an international level and it is currently unfeasible to disaggregate emissions from air traffic down to a Welsh level. From 2012 aviation emissions will be included in the EU ETS.

Business - Quantification

Policies for the business sector have been quantified using a combination of Welsh specific and UK government agency analyses. UK policies have been quantified using data from UK Regulatory Impact Assessments (undertaken by the agency implementing the policy) combined with a population based disaggregation methodology.

Residential - Quantification

The Welsh policies in the residential sector have been quantified as part of this assessment using information provided by and assisted by the Energy Savings Trust (EST). UK policies have been quantified using data from UK government agencies disaggregated for Wales using population statistics.

The largest UK policy for this sector was the Green Deal and Green Investment Bank which is a policy instrument deployed and quantified by DECC, it aims to give suppliers and consumers a shared incentive to reduce carbon emissions from homes.

Agriculture and land use - Quantification

Proposals for climate change mitigation relating to agriculture and land use have been quantified “in-house” by the Welsh Assembly Government from various information sources. These include a report by AEA Technology on Policy Options and Appraisal for reducing GHG emissions in Wales (AEA, 2008) and a report of the UK Climate Change Committee on Building a Low-Carbon Economy (UKCCC, 2008). Other research reports from DEFRA have also been used.

Agriculture and Land-Use is almost completely devolved to the Assembly Government and as a result there are significant levers that can and have been applied to this sector at a national level. For this reason, it was not necessary to assess UK or EU policies for their potential as mitigation measures within this sector.

Waste - Quantification

Greenhouse gas emissions in the waste management sector are almost all covered by the EU Framework on Waste and have been quantified under this policy. The Welsh Assembly Government is working closely with the Environment Agency Wales in this policy area; both organisations have responsibilities in this sector and are striving to go beyond the already ambitious EU requirements.

Public sector - Quantification

Greenhouse gas emissions in the public sector are almost all covered by the Carbon Reduction Commitments policy and have been quantified under this policy. Any further reductions above and beyond those encouraged by the CRC scheme will be assessed and quantified individually as part of the actions underway to produce a Carbon Footprint for the Public Sector in Wales.