Gloucestershire

NI 186 Delivery Plan

Reducing per-capita CO_2 emissions across the county

Gloucestershire Environment Partnership

May 2009

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This plan has been drafted by Severn Wye Energy Agency on behalf of the Executive Working Group of the Gloucestershire Environment Partnership Board. The detailed work has been undertaken through sector task groups.

Abbreviations and units

ALMO	Arms Length Management Organisation
BRE	Building Research Establishment
BSSP	Business Support Simplification Programme
CBC	Cheltenham Borough Council
CERT	Carbon Emission Reduction Target
CESP	Community Energy Saving Programme
CO_2	carbon dioxide
CDC	Cotswold District Council
CCC	Committee on Climate Change
CDM	Clean Development Mechanism
CIL	Community Infrastructure Levy
CSV	Central Severn Vale
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EEC	Energy Efficiency Commitment
EPC	Energy Performance Certificate
EST	Energy Saving Trust
ESTAC	Energy Saving Trust Advice Centre
ETS	Emissions Trading Scheme
EU	European Union
FOD	Forest of Dean District Council
GEP	Gloucestershire Environment Partnership
GHG	greenhouse gas
GCC	Gloucester City Council
GOSW	Government Office South West
HEED	Home Energy efficiency Database
ICT	information and communications technology
IYRE	Improving Your Resource Efficiency
JI	Joint Implementation
LI	Local Indicator
LTP	Local Transport Plan
kt CO_2	kilo-tonnes of carbon dioxide
LA	Local Authority
LAA	Local Area Agreement
LCBP	Low Carbon Buildings Programme
LCP	Low Carbon Partnership
LED	light emitting diode
LTP	Local Transport Plan
Mt CO_2	Mega (million)-tonnes of carbon dioxide
NHS	National Health Service
NI	National Indicator
PV	photovoltaics
RSL	Registered Social Landlord
SDC	Stroud District Council
SHARE	Social Housing Action to Reduce Energy Consumption
SLA	Service Level Agreement
SME	Small or Medium Enterprise
SWEA	Severn Wye Energy Agency
SWRDA	South West Regional Development Agency
t CO_2	tonnes of carbon dioxide
TBC	Tewkesbury District Council

1 Introduction

Climate change is predicted to have potentially huge impacts globally and locally on people's well-being, the economy and our environment. Warmer, wetter winters and hotter, drier summers, with more droughts, flash floods, severe storms and other weather anomalies mean we have to review how we can adapt to cope with a changing climate, while at the same time taking action to mitigate future climate change.

1.1 International and national targets

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. It sets binding targets for 37 industrialised countries and the European Union (EU) for reducing greenhouse gas (GHG) emissions. These amount to an average of five per cent against 1990 levels over the five-year period 2008-2012.

The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. 184 Parties of the Convention have ratified its Protocol to date.

The Protocol recognises that developed nations are principally responsible for the current high levels of GHGs in the atmosphere, which result from more than 150 years of industrial activity. Consequently, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities".

The EU signed the Kyoto Protocol on 29th April 1998. The Protocol committed the EU to GHG emission reductions of 8% for the period 2008 – 2012, based upon 1990 emissions levels. Within the EU, a Burden Sharing Agreement was established, which allocated member states individual targets. The UK's target is to reduce emissions by 12.5% by 2012. This target allows for investments leading to emission reductions in other countries through the Protocol's 'Flexible Mechanisms': the EU Emissions Trading Scheme, Joint Implementation (JI) and Clean Development Mechanism (CDM) projects. However, it is recognised that the majority of savings must be in emissions from activities within the UK, and this is reflected in the Climate Change Act 2008 described below.

Within the UK, the agenda has moved forward since these agreements were made, alongside increasingly alarming predictions from climate change scientists. In November 2008 the Climate Change Act was passed, introducing the world's first long term legally binding framework to tackle the risks of climate change.

Key provisions of the Act include:

- Legally binding targets for GHG emission reductions of at least 80% by 2050, and reductions in CO_2 emissions of at least 26% by 2020, set against a 1990 baseline. The 2020 target will be reviewed soon after Royal Assent to reflect the move to consider *all* greenhouse gases and the increase in the 2050 target from a 60% cut to an 80% cut.
- A carbon budgeting system which caps emissions over five year periods, with three budgets set at a time, to set out the UK's trajectory to 2050. The first three carbon budgets will run from 2008-12, 2013-17 and 2018-22, and were implemented in the budget of April 2009.
- The creation of the Committee on Climate Change (CCC), a new independent, expert body to advise Government on the level of carbon budgets and where cost effective

savings could be made, and to submit annual reports to Parliament on the UK's progress towards targets.

- Government is required to "have regard to the need for UK domestic action on climate change" when considering how to meet the UK's GHG emission targets and carbon budgets. The CCC has a duty to advise on the appropriate balance between action at domestic, European and international level, for each carbon budget, and the Government is required to set a limit on the purchase of credits for each budgetary period by secondary legislation requiring debate in both Houses of Parliament, and taking into account the CCC's advice.
- A requirement for the Government to issue guidance on the way companies should report their GHG emissions, and to review the contribution reporting could make to emissions reductions by 1st December 2010.

Taking a simplistic approach, a reduction in emissions of 80% over 60 years represents an average annual reduction of 1.33%. However, between 1990 and 2006 the reduction achieved was only 6.4%, leaving 73.6% to achieve over 44 years – an average of 1.67% per annum.

1.2 Local commitments and targets

Nottingham Declaration
All Gloucestershire Councils have signed up to the Nottingham Declaration on Climate Change, which includes commitments to:

- Within the next two years develop plans with our partners and local communities to progressively address the causes and the impacts of climate change, according to our local priorities, securing maximum benefit for our communities.
- Assess the risk associated with climate change and the implications for our services and our communities of climate change impacts and adapt accordingly.
- Encourage all sectors in our local community to take the opportunity to adapt to the impacts of climate change, to reduce their own greenhouse gas emissions and to make public their commitment to action.

Sustainable Communities Strategy
Climate Change is a priority of the Sustainable Communities Strategy, and is the overarching priority of the Gloucestershire Environment Partnership. This is reflected in the range of targets within both the 2007-10 and 2008-11 Local Area Agreements (LAAs), and in particular by the priority selection of National Indicator 186: per capita reduction in CO_2 emissions in the local authority (LA) area.

National Indicator 186
National Indicator 186 (NI 186) is one of the new set of performance indicators for the local government performance framework, designed to measure progress against agreed national priority outcomes in LAAs. It is a wide-ranging indicator, which has been made possible by the provision for the first time of statistics for emissions by local authority area. These are published annually by Government and can be found on the relevant government website, together with a summary of the methodology used:

http://www.defra.gov.uk/environment/statistics/globatmos/galocalghg.htm

At the start of the 2008-11 LAA period, Government statisticians classified the data as 'experimental'. It was amended and released as a full 'National Statistic' in September 2008, comprising data for calendar year 2006, and revised estimated data for the 2005 baseline year. It is anticipated that data release will continue to occur annually with a two year time

lag (2007 data will be provided in 2009 and so on). This means that at the end of the current LAA (March 2011), National Statistics will be available up to the end of 2008.

The indicator being assessed will comprise an annual amount of end user CO_2 emissions across an agreed set of sectors (housing, road transport and business) measured as a percentage reduction (or increase) of the per capita CO_2 emission from the 2005 baseline year.

Details of the three sectors into which the data is broken down are:

- ***Domestic:*** All housing in the LA area, including Arms Length Management Organisation (ALMOs), privately owned and leased.

- ***Industrial & Commercial:*** All industry (both public and private sector) in the area, but excluding that which is included in the EU Emissions Trading Scheme (ETS).

- ***Road Traffic:*** All road traffic except motorways. This is modelled using a series of assumptions such that the number of vehicle kilometres by vehicle type at a local level is multiplied by appropriate emissions factors. The Department for Transport (DfT) collect average annual daily flow statistics by vehicle type at thousands of census points along major routes.

Gas and electricity data for the domestic and industrial/commercial sectors are obtained by aggregating meter-point consumption figures provided by energy suppliers. The use of other fuels such as oil and solid fuel is estimated. For example, in the domestic sector this is done by using Building Research Establishment (BRE) data on the total amount of energy different types of dwellings tend to use, and the typical fuel mix – and applying this to the shortfall between expected total energy use in the area and the gas and electricity data.

Electricity use by rail travel cannot currently be separated out from the industrial and commercial electricity use covered earlier, and as such is included in that total. Emissions associated with diesel use are modelled using data on the number of vehicle kilometres broken down by location and type (freight, intercity and regional), which are then multiplied by an appropriate emissions factor. The spatial element of the vehicle kilometres data is then used to assign the emissions to the appropriate LAs.

The data is based on 'end user' calculations, which allocate emissions from fuel *producers* to fuel *users*. This means, for example, that emissions from power stations are included in end user electricity consumption, rather than allocated to the LA in which the power station is located. This is done to avoid penalising one area for emissions relating to energy which is exported for use elsewhere.

Air travel, fishing, oil and gas extraction and shipping are excluded, as it was considered that these could not be satisfactorily spatially disaggregated to local areas.

The indicator measures the percentage reduction in per capita CO_2 emissions, where per capita carbon emissions are calculated as shown in Box 1:

$$\frac{\text{domestic emissions + business emissions + road traffic emissions}}{\text{population}} = \text{kt } CO_2 \text{ per capita}$$

Box 1: Calculation of per capita CO_2 emissions

National Indicator 188: Climate Change Adaptation

Gloucestershire's response to climate change is to address the challenges of both mitigation and adaptation. As such, activity under National Indicator 188 is regarded as complementary to 186.The overall aim of NI188 is to embed the management of climate risks and opportunities across the local authority and partners services, plans and estates and to take appropriate adaptive actions where and when required.

NI188 is a process based indicator, based on a recognition that our understanding of the adaptation agenda is not yet sufficient to specify outcomes. It also recognises that climate impacts are local and it is impossible to have a generic outcome indicator at the moment which is applicable to all areas.

The impacts of climate change will often be specific to individual sectors or areas thus making some sectors and areas more vulnerable than others.

Our most vulnerable sectors in Gloucestershire are likely to be:

- Agriculture - includes cropping and livestock sectors
- Biodiversity - includes national reserves, species diversity, ecosystems
- Settlements and business - includes infrastructure, local government, planning, human health, transport, energy, emergency services
- Water - includes drought, water quality, water supplies

The overall aim of NI188 is to embed the management of climate risks and opportunities across the local authority and partners services, plans and estates and to take action. Local authorities will report the level of preparedness they have reached against the levels of performance, graded 0 to 4. A higher number represents further progress made in planning to adapt. The levels are:

Level 0 Getting Started
Level 1 Public Commitment and impacts assessment
Level 2 Comprehensive risk assessment
Level 3 Comprehensive action plan
Level 4 Implementation, monitoring and continuous review

The seven Gloucestershire Councils have committed themselves, within the Gloucestershire LAA, to achieve Level 3 by the end of 2011/12. To achieve the target, the partners have put together a programme of collective activities that will help each individual organisation embed the management of climate risks over time. Information is updated on the website: http://www.stroud.gov.uk/docs/community/climate_change_glos.asp

2 Gloucestershire's carbon footprint

The CO_2 emissions data presented in Table 1 is taken from the national government statistics released in September 2008. The data reveals an overall increase in Gloucestershire's per capita CO_2 emissions from 2005 to 2006 of 2.1%.

2005

Local authority	Industrial & commercial	Domestic	Road Transport	Total	Population, 1,000s	CO_2 per capita (t)
Cheltenham	270	267	94	631	112	5.65
Cotswold	239	263	350	853	83	10.26
Forest of Dean	278	215	144	637	81	7.87
Gloucester	305	254	107	666	111	5.98
Stroud	312	296	164	773	110	7.02
Tewkesbury	334	210	181	724	78	9.23
Gloucestershire	***1,738***	***1,505***	***1,040***	***4,284***	***575***	***7.45***
UK total (1000s)	**191.6**	**151.3**	**104.7**	**447.6**	**60.2**	**7.43**

2006

Local authority	Industrial & commercial	Domestic	Road Transport	Total	Population 1,000s	CO_2 per capita (t)
Cheltenham	284	273	91	649	112	5.79
Cotswold	249	268	343	861	83	10.37
Forest of Dean	293	217	139	648	82	7.90
Gloucester	312	262	104	679	113	6.01
Stroud	336	300	161	797	110	7.25
Tewkesbury	381	216	176	772	79	9.77
Gloucestershire	***1,855***	***1,536***	***1,014***	***4,406***	***579***	***7.61***
UK total (1000s)	**194.9**	**153.6**	**102.8**	**451.3**	**60.6**	**7.45**

Table 1: Gloucestershire's CO_2 emissions (kt CO_2) in 2005 and 2006 by local authority district

At the district level, total CO_2 emissions increased by between 0.3% (Gloucester) and 6.2% (Tewkesbury) (Fig. 1). Per capita emissions showed similar increases, despite considerable differences in absolute values (Fig. 2). For example, 2006 CO_2 emissions in Cotswold were above 10 tonnes per capita, while those in Cheltenham remained below 6 tonnes per capita.

Of the three sectors, the Industrial and Commercial sector was the biggest emitter, accounting for around 42% of emissions across the county. Road transport was the only sector to show a decrease in emissions, recording a drop of 2.5% (Fig. 3).

Nationally, there was a (0.8%) increase in total emissions from 447 million tonnes in 2005 to 451 million tonnes in 2006. During this period the population increased from 60.2 million to 60.6 million (0.6%), giving an increase in per capita CO_2 emissions of about 0.2%.

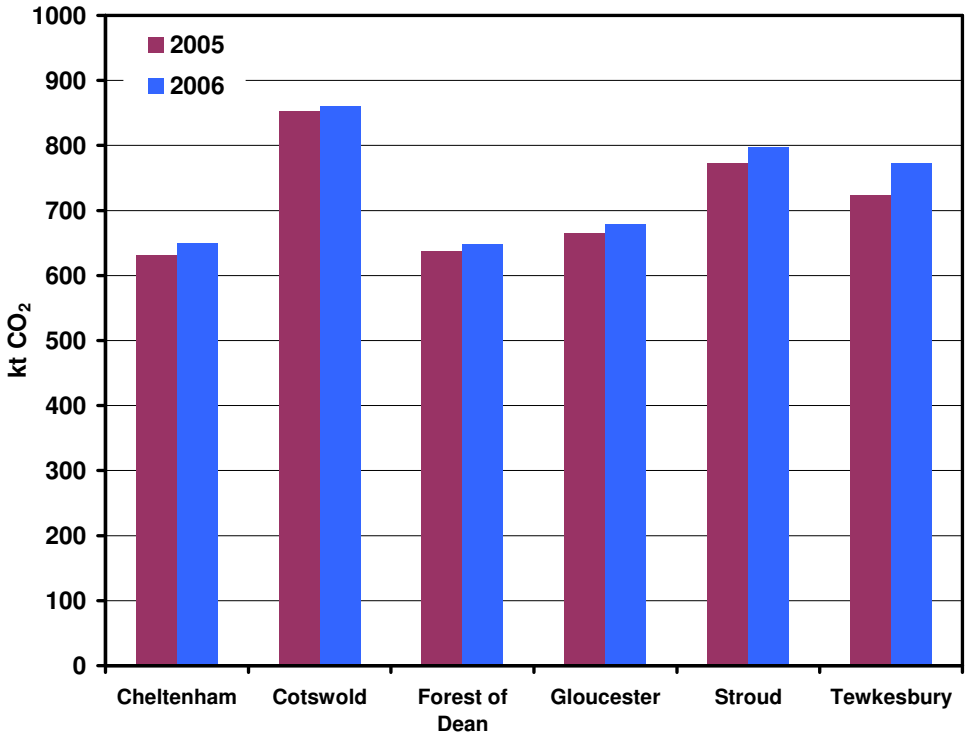

Figure 1: Total CO_2 emissions across Gloucestershire by local authority district

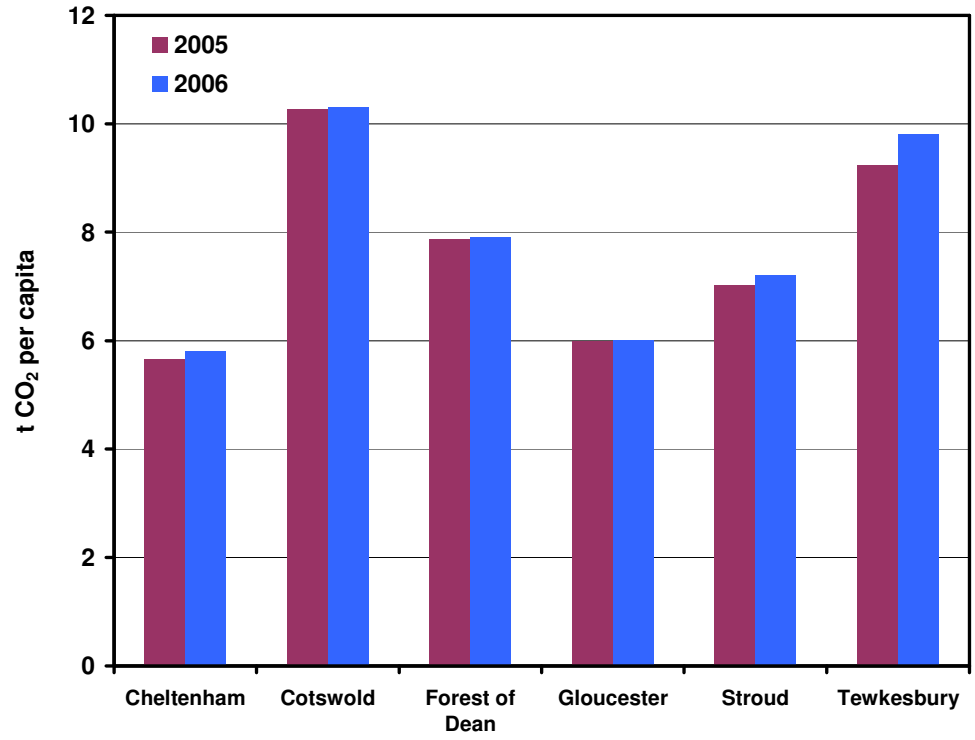

Figure 2: Mean per capita CO_2 emissions across Gloucestershire by local authority district

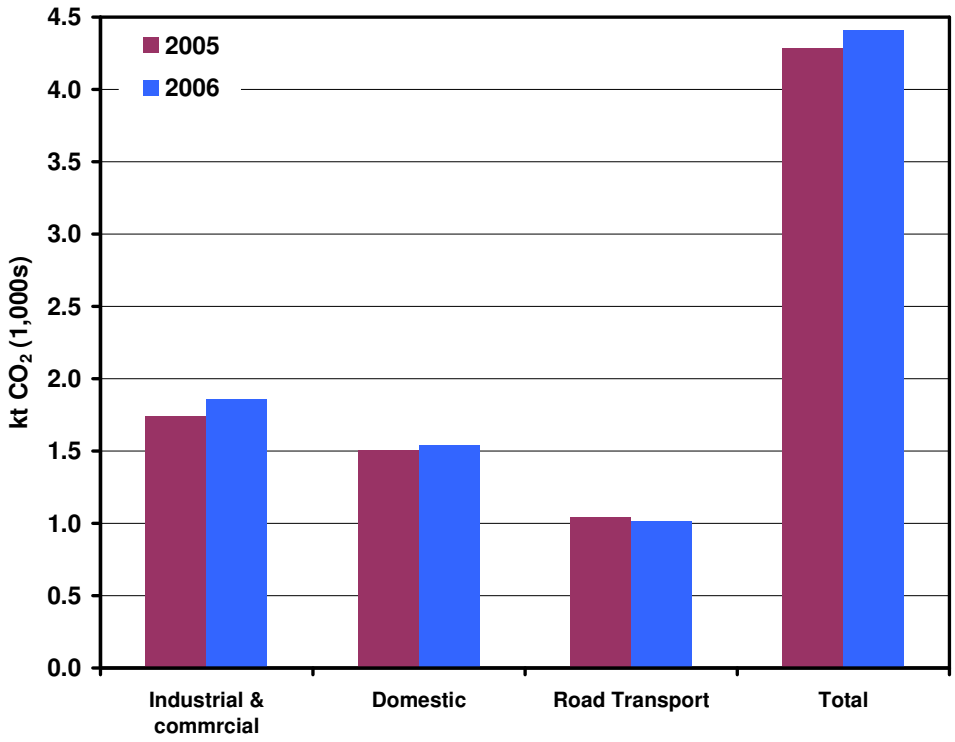

Figure 3: CO_2 emissions across Gloucestershire by sector

Gloucestershire's 2005/2006 percentage increase in per capita emissions is similar to that of nearby Wiltshire, Somerset, Warwickshire, and Worcestershire (Table 2). It is the second highest amongst the group of local authorities to which it is statistically similar. Only 4 of the 16 authorities in this group show a reduction in this indicator for this period: West Sussex, Bedfordshire, Hampshire and Cheshire.

It is difficult to draw conclusions from these statistics without being able to break this information down further, and this is attempted within the sectors.

Local authority	2005	2006	2005/6 change	2005/6 %change
Bedfordshire	6.35	6.33	- 0.02	- 0.3%
Cambridgeshire	8.85	8.87	+ 0.02	+ 0.2%
Cheshire	8.88	8.73	- 0.15	- 1.7%
Essex	6.60	6.60	0.00	0
Hampshire	6.96	6.90	- 0.06	- 0.9%
Leicestershire	7.94	8.00	+ 0.06	+ 0.8%
Northamptonshire	8.36	8.40	+ 0.04	+ 0.5%
North Yorkshire	10.08	10.08	0.00	0
Oxfordshire	8.33	8.39	+ 0.06	+ 0.7%
Shropshire	8.80	8.86	+ 0.06	+ 0.7%
Somerset	7.76	7.92	+ 0.17	+ 2.1%
Warwickshire	7.83	7.98	+ 0.15	+ 1.9%
West Sussex	6.95	6.92	- 0.02	- 0.3%
Worcestershire	7.07	7.28	0.21	+ 3%
Wiltshire	7.87	8.03	+ 0.16	+ 2%
Gloucestershire	***7.45***	***7.61***	***+ 0.16***	***+ 2.2%***
National	**7.43**	**7.45**	**+0.02**	**+ 0.2%**

Table 2: Per capita CO_2 emissions (tonnes CO_2 per annum) compared with statistically most similar local authorities

3 Gloucestershire's NI 186 targets

The NI 186 targets for Gloucestershire were agreed in mid 2008, and were based on the emissions baseline estimated at that time from experimental statistics for 2005 and 2006. The estimated savings potential of national measures and 'national measures with local influence' were taken into account.

The targets were agreed as a percentage reduction in per capita CO_2 emissions set against the 2005 baseline. For the three year duration of the LAA, these were set as 6.5, 7.8 and 9.1%. Details are given in the table below.

Historical data 2005	Baseline 2007/8	Target 2008/9	Target 2009/10	Target 2010/11
9.1 tonnes CO_2 per capita	Data available Nov 2009	6.5% reduction in per capita emissions	7.8% reduction in per capita emissions	9.1% reduction in per capita emissions
5,142 kt CO_2		4,217 kt CO_2	4,164 kt CO_2	4,111 kt CO_2

Table 3: Gloucestershire's NI 186 target

It is unclear exactly how achievement of the target will ultimately be assessed as there are several complicating factors. These include:

- As the LAA started in April 2007, there is an implied (but as yet unconfirmed) 2007 baseline against which the actual achievement within the LAA will need to be assessed. The *actual* baseline for action within the LAA period (emissions for the year 2007) will not be known until the second half of 2009

- At the end of the 3 year LAA period (March 2010), *real* CO_2 emissions data will still only be available up to the end of 2008, which is just 9 months into the LAA period.

- The emissions data are given on a calendar year basis while the emissions targets are set against financial years

- When the data for 2006 emissions was released in September 2008, revised figures for 2005 were also released. These figures revealed that 2005 emissions were actually *lower* than had previously been estimated. This had a knock-on effect on LAA targets; 2006 emissions now showed an *increase* compared with 2005 emissions, the opposite to what had been predicted by Government Office South West (GOSW) when initially setting the targets. This meant that a bigger *absolute* reduction in CO_2 emissions would now be needed during the LAA period in order to achieve the same percentage reduction target set against a 2005 baseline.

Discussions with GOSW have confirmed that the focus on the headline indicator will be maintained despite these complications, but that the local partnership should be prepared to show evidence of increased activity levels, including proxy indicators where possible.

A mid-term refresh of the target may be necessary, but Gloucestershire LAA has been discouraged from revising the target at this stage in view of the urgency of action on climate change, plus the fact that precise assessment of achievement of the headline target will not, in any case, be possible at the end of the LAA period due to the time lag in data.

The original emissions reduction target is therefore maintained in order to motivate action. The figures have been re-calculated, using the new 2005 and 2006 data and the same percentage reductions, together with future estimates of population, to calculate target per capita and total emissions. Emission targets for Gloucestershire were calculated according to the method shown in Box 2:

Box 2: A method for calculating the per capita CO_2 emissions target in Gloucestershire

Using the revised figures for 2005, per capita emissions were:
4,284 kt CO_2 / 575,400 = 7.445 tonnes CO_2 per capita

To achieve a reduction of 9.1% against 2005 for 2010, the revised figure is:
7.445 x (100-9.1)/100 = 6.768 tonnes CO_2 per capita

The total absolute emissions are calculated by working backwards, using the 2010/2011 population estimate:
586,400 x 6.768 = 3.969 million tonnes CO_2 (Mt CO_2)

The same calculation is carried out for the 2009 and 2008 percentage reduction targets

Year	Population estimate (1,000s)	Total emissions (kt CO_2)	Per capita CO_2 emissions	% change (NI 186)
2005	575.4	4,284	7.4	0
2006	579.0	4,406	7.6	+ 2.2%
2007				
2008	581.8	4,050	7.0	- 6.5%
2009	584.1	4,009	6.9	- 7.8%
2010	586.4	3,969	6.8	- 9.1%

Figures in red are National Statistics (Defra)
Figures in purple are targets
Figures in green are predictions
Figures in blue have been calculated from the other figures

Table 4: per capita CO_2 emissions targets in Gloucestershire

According to the current figures and targets, the reduction in per capita emissions from 2006 to 2010 would need to be 10.5%, or an average annual reduction of 2.63%.

This indicates that Gloucestershire needs to save annual emissions of 4,406 -3,969 = 437kt from 2006 to 2010.

Policy making and resource allocation decisions in the UK are mainly centralised, limiting the scale and scope of what can be determined at local level. This is reflected in the analysis to

support the Defra emissions data which indicates the savings anticipated from national measures and those from national measures with local influence.

The Gloucestershire NI 186 delivery plan deals with local measures and national measures with local influence. As such an estimate of the savings anticipated from national measures is subtracted from the GOSW negotiated target in order to arrive at the target for savings to be achieved by the actions detailed in the plan. National savings for the 5 year period from 2005 to 2010 are estimated at 320kt annually for Gloucestershire.

If, as a starting point, we apportion 4/5^{ths} of these savings to the four year period 2006-2010, this amounts to 256kt savings from national measures, leaving 181kt to be achieved from local measures and national measures with local influence. 2007 data will not be available until later in 2009, but if 3/4 of these savings are to be achieved during the LAA period of 2007-10, ***the target figure for our delivery plan can be estimated as 136 kt CO_2.***

It should be noted, however, that this is a very imprecise approach. In addition to the uncertainties that remain around the 2007 baseline, the estimates for national measures are clearly very approximate and subject to many unknowns and variables. For example in the domestic sector:

- Many of the measures indicated are indirect (policy measures designed to stimulate a certain response which in turn will result in actions to achieve savings)
- Major national programmes have been established with private market delivery, and the results and data are subject to commercial and data protection restrictions (both real and perceived) – so that data available on current activities is incomplete and out of date. Examples are the energy supplier obligation Carbon Emissions Reduction Target (CERT) and home Energy Performance Certificates (EPCs).

Some government programmes in this sector are themselves in a state of development, namely the Community Energy Saving Programme (CESP) and CERT Plus, announced in the autumn of 2008, and subject to consultation during spring 2009.

4 Achieving the target

Gloucestershire's NI 186 delivery plan sets out how the Gloucestershire LAA, through the Gloucestershire Environment Partnership (GEP), aims to address achievement of this target.

The GEP Board established an Executive Working Group, to lead the development of the plan. Sector task groups were established, within the domestic, business, public and transport sectors, to map activity and identify priorities for action, including the development of sector specific action plans, and proxy indicators to evidence progress.

The task groups will need to continue to oversee implementation of the action plans, and adapt the plans to further changes. It is recognised that these groups themselves are likely to change over time, to reflect shifting priorities, and structural changes within the local authorities and other partner organisations.

At the start of the development process GOSW facilitated a 'Turning Curve' workshop for the GEP, which helped to engage partners in understanding the change in thinking required to achieve the 186 targets, and to initiate the development process. The need to change direction and 'turn the curve' is presented in Figure 4, which illustrates future per capita CO_2 emissions under two scenarios: a 'business as usual' scenario and a carbon emissions reduction scenario ('LAA target).

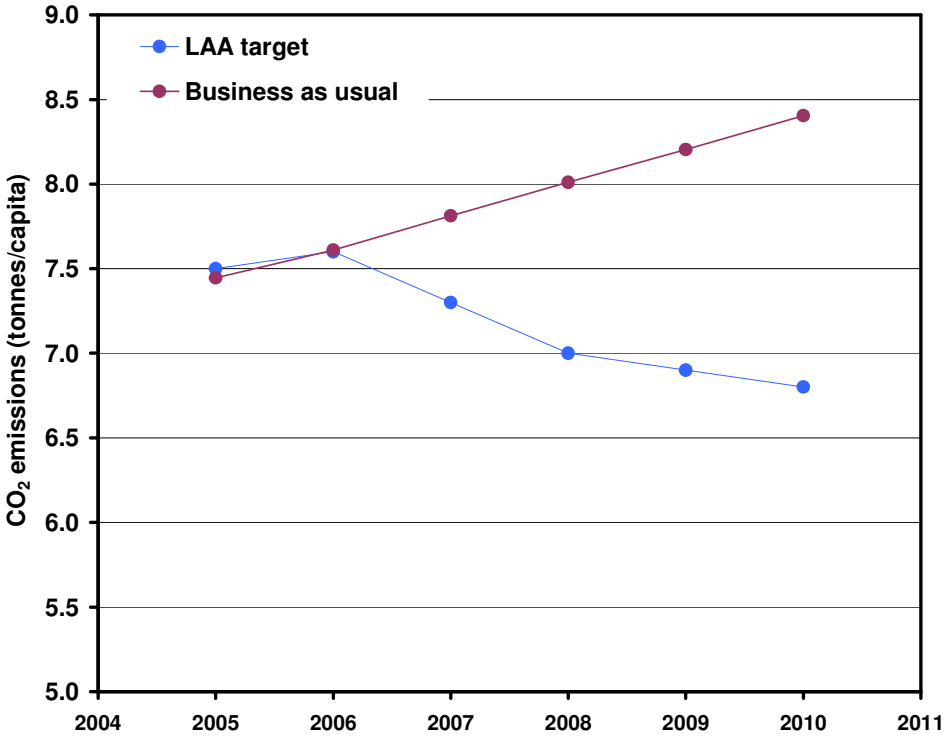

Figure 4: The Challenge: turning the Curve. Business as usual plotted against the LAA target

Viewing the agreed emission reduction targets against those embedded into national policy (i.e. 80% by 2050) confirms the validity of attempting in the first instance to keep to the

original targets, difficult though these may be to achieve. While the impact of recession may also assist a downturn, this may only be temporary, and applying an estimate for the impact shows that even as a temporary downturn this would be insufficient to achieve the reductions needed (Fig. 5).

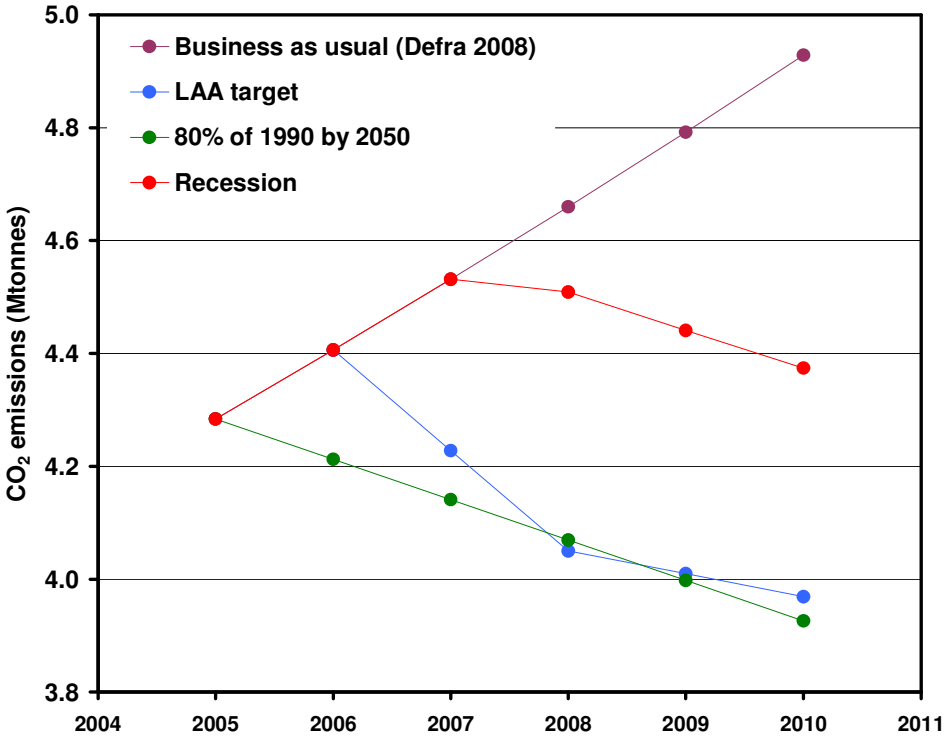

Figure 5: CO_2 emissions projections under differing scenarios

In order to establish a perspective on the challenge ahead, our starting point for the sector task groups was that a minimum savings target should be a proportion of the total according to the percentage of emissions that a particular sector is responsible for according to the most recent data. On this basis, the minimum targets are as shown in Table 5:

	Industry, commercial and public	Domestic	Road transport	All
2006 emissions, kt CO_2	1,855	1,536	1,014	4,406
% of total	42	35	23	100
Target savings 2007-10, kt CO_2	**57**	**48**	**31**	**136**

Table 5: CO_2 emissions and emissions targets from the different sectors

It was recognised in practice, however, that the capacity to achieve savings may vary widely between sectors, and that this approach may need to be re-addressed in future.

5 Domestic sector

5.1 Housing in Gloucestershire

Local government responsibility for housing lies with the six District Councils in Gloucestershire. As a result, the data available is not a coherent set, as much of it is derived from the private sector house condition surveys carried out independently by each District in different years and with some differences in methodology.

The data can however be used to give a general picture of the local housing stock. The year of survey given in the Table 6 is the same for Tables 7-9.

Local Authority	Year of survey
Cheltenham Borough Council (CBC)	2006
Cotswold District Council (CDC)	2008
Forest of Dean District Council (FOD)	2004
Gloucester City Council (GCC)	2005
Stroud District Council (SDC)	2007
Tewkesbury Borough Council (TBC)	2008
English House Condition Survey	2006

Table 6: Year of most recent private sector housing survey

	Owner occupied	Private rented	RSL	Local authority	Unknown or vacant	Other rental	Total
CBC	36,700	6,100	1,700	4,950	-	-	49,450
CDC	26,125	5,770	5,185	-	1,422	-	38,502
FOD	26,979	2,023	881	-	215	672	30,770
GCC	36,148	3,293	2,315	-	2,310	161	44,227
SDC	35,500	5,200	1,200	5,300	-	-	47,200
TBC	26,563	3,629	3,759	-	1,046	-	35,093
All Glos	**188,015**	**26,015**	**15,040**	**10,250**	**4,993**	**833**	**245,242**

Table 7: Tenure of Gloucestershire Housing

From Table 7 we can calculate that the majority (around 77%) of housing in Gloucestershire is owner-occupied, and around 11% of housing in Gloucestershire is privately rented.

Social housing (around 10%) is mainly provided by Housing Associations and local authorities: four of the Districts have carried out Large Scale Voluntary Transfer of stock to

Housing Associations, one has established an Arm's Length Management Organisation and one still manages the stock directly.

	Pre-1919	1919-1944	1945-1964	Post-1964	1965-1974	1965-1980	1975-1980	Post-1980	Total
CBC	13,302	4,846	10,879	20,422					49,449
CDC	7,754	3,796	6,096		5,083		5,467	10,306	38,502
FOD	9,731	2,469	4,638			7,156		6,776	30,770
GCC	8,104	7,451	4,725		7,560		4,840	11,546	44,226
SDC	12,036	4,154	6,749			10,809		13,499	47,247
TBC	2,644	2,929	8,425		7,086		5,125	8,884	35,093
All Glos	**53,571**	**25,645**	**41,512**	**20,422**	**19,729**	**17,965**	**15,432**	**51,011**	**245,287**

Table 8: The age of Gloucestershire's housing stock

The 2001 census gives us data regarding the built form of housing in the county which is summarised in Table 9.

Built form	Number of dwellings
Detached	76,787
Semi-detached	85,935
Terraced	48,825
Other	35,285
Total	**246,832**
Vacant	**6,657**

Table 9: The build form of Gloucestershire's housing stock

The energy efficiency of housing in Gloucestershire

Data on the thermal properties of the local housing stock is incomplete. When the 1985 Home Energy Conservation Act introduced the requirement to assess this, most local authorities chose the lower cost option of deriving approximations from sample surveys, and only one of the six Districts (Stroud) set up a property database, which they have gradually populated over the years, and which contains details of around half of private sector homes.

Government and fuel company energy efficiency programmes have not linked up in terms of data collection, and attempts to do so have typically been met with barriers regarding data protection and/or commercial interest in protecting data. The problem stems from the fact that data cannot effectively be 'added' without sharing specific property addresses.

The most complete source of data on this sector is the Energy Saving Trust's Home Energy Efficiency Database (HEED), which has gained agreement for input of several national data sources, and thus far contains details from:

- Warm Front
- Low Carbon Buildings Programme (and the predecessor Clear Skies)
- Energy Saving Trust advice programme Home Energy Checks
- Corgi data on boilers
- CIGA data on cavity wall insulation

Note that data is provided monthly, quarterly or annually by the different sources. Unfortunately HEED is not yet receiving the data from Energy Performance Certificates, nor the fuel company CERT (Carbon Emission Reduction Target) programmes. An even more serious flaw is that the data from the previous programme EEC2 (2005-8) has not yet been included – although it is hoped that both the EEC and CERT data issues will be resolved during 2009.

This means that the installations carried out under the Warm and Well programme will not have been included for 2005-8: this data has been provided to the HEED manager who has agreed to include it, but this has not yet been carried out.

Users of HEED can interrogate fields and obtain output down to a resolution of 100-150 homes, but property addresses are not revealed. Interrogation of the HEED database gave the data presented in Table 10 for April 2008 (the start of the LAA period) which is of relevance to priorities for energy efficiency improvements.

	CBC	CDC	FOD	GCC	SDC	TBC	All Glos.	Extrapolation to 100%
Unfilled cavities	2003	1140	1312	2145	2760	1493	10,853	30,147
Lofts, uninsulated	573	409	402	645	917	347	3293	9,096
Lofts, 0-150mm	4059	3098	3587	5102	8174	3622	27642	76,359
Solid walls	3020	2879	2913	3947	5878	2142	20779	57,400
Single glazing	1231	1098	1031	1579	2159	700	7098	19,607
% properties with data	37.8	28.1	31.4	33.5	49.5	33	36.2	
Total homes in location	50505	38418	34968	50479	48496	35006	257872	
Total homes with data	19095	10796	10989	16890	24015	11536	93321	

Table 10: Data from EST HEED database April 2008 showing the thermal properties of homes in Gloucestershire. Note that data which has been extrapolated is likely to be biased - samples are likely to be skewed in favour of homes that have received advice and grants.

A domestic sector task group was established to develop the action plan, consisting of representatives from the District Councils, Severn Wye Energy Agency (SWEA) and the Gloucestershire and South Gloucestershire Affordable Warmth Partnership. All six Districts

have contributed information and five of the six participated in a development session for the NI 186 Delivery Plan.

Development of the action plan included a review of the following issues:

- What do we need to achieve – carbon savings/measures?
- What are we expecting to achieve with current programmes?
- What do we need to do more of?
- What else do we need to do?
- How can we improve monitoring of achievement at local level?

5.2 Domestic sector carbon emissions

The National Statistics compiled by Defra provide information on each county's domestic CO_2 emissions for 2005 and 2006, broken down by LA. Table 11 presents this data, along with mid-year LA population. For the purposes of comparison, an additional column has been added to illustrate domestic carbon emissions per capita.

2005

Local authority	Domestic emissions	Total emissions	Population, 1,000s	Domestic per capita, t CO_2
Cheltenham	267	631	112	2.39
Cotswold	263	853	83	3.16
Forest of Dean	215	637	81	2.66
Gloucester	254	666	111	2.28
Stroud	296	773	110	2.69
Tewkesbury	210	724	78	2.68
Gloucestershire	***1,505***	***4,284***	***575***	***2.62***
UK total	**151,278**	**447,583**	**60,210**	**2.51**

2006

Local authority	Domestic emissions	Total emissions	Population, 1,000s	Domestic per capita, t CO_2
Cheltenham	273	649	112	2.44
Cotswold	268	861	83	3.22
Forest of Dean	217	648	82	2.65
Gloucester	262	679	113	2.32
Stroud	300	797	110	2.73
Tewkesbury	216	772	79	2.73
Gloucestershire	***1,536***	***4,406***	***579***	***2.65***
UK total	**153,605**	**451,305**	**60,588**	**2.54**

Table 11: Gloucestershire's domestic sector CO_2 emissions (kt CO_2) in 2005 and 2006 by local authority district

Local authority	2005			2006		
	Emissions, kt CO_2	Pop 1,000s	Per capita emissions, t CO_2	Emissions, kt CO_2	Pop 1,000s	Per capita emissions, t CO_2
Bedfordshire	966	398	2.43	990	404	2.45
Cambridgeshire	1408	589	2.39	1452	590	2.46
Cheshire	1813	680	2.67	1836	687	2.67
Essex	3392	1340	2.53	3445	1363	2.53
Hampshire	3242	1259	2.57	3313	1267	2.62
Leicestershire	1553	628	2.47	1574	636	2.48
Northamptonshire	1631	652	2.50	1643	670	2.45
North Yorkshire	1616	582	2.78	1620	592	2.74
Oxfordshire	1642	627	2.62	1672	631	2.65
Shropshire	730	289	2.53	746	290	2.57
Somerset	1338	516	2.60	1363	518	2.63
Warwickshire	1315	534	2.46	1342	522	2.57
West Sussex	1941	764	2.54	1978	771	2.57
Worcestershire	1402	556	2.52	1432	553	2.59
Wiltshire	1209	447	2.71	1231	448	2.75
Gloucestershire	***1505***	***575***	***2.62***	***1536***	***579***	***2.65***

Table 12: Gloucestershire's domestic CO_2 emissions (kt CO_2 per annum) compared with statistically most similar local authorities

Between 2005 to 2006, Gloucestershire's domestic CO_2 emissions increased, both in total and per capita. This pattern is reflected in the national figures.

CO_2 emissions from housing can be reduced in three ways:

- reducing energy consumption
- using lower carbon fuels for heating and hot water
- reducing the carbon intensity of electricity generation

The data for NI 186 is collected through gas and electricity metering, and using assumptions for homes which use oil or solid fuel. Local electricity generation which is exported to the grid will not therefore result in an improvement in CO_2 emission figures (neither would local fossil fuel generation have a negative result). Local action can only achieve a result in terms of this indicator by:

a) reducing energy consumption
b) replacing metered energy consumption by micro-generation

Commentators on national trends in domestic energy consumption point out that domestic energy consumption is continuing to rise, due mainly to:

- An increase in the number of households, both because of the increase in population and reduction in the number of people per household.

- UK households demanding a higher level of energy services (warmth, hot water, space, appliances etc)

Energy consumption per household does not appear to be increasing or reducing significantly. This seems to be because reductions brought about by improvements in thermal efficiency are counterbalanced by increases brought about by heating more space per person to higher temperatures. Additionally, improvements in the energy efficiency of appliances is offset by the increase in the number and size of appliances.

An example given in 'Home Truths' (Environmental Change Institute, November 2007) is the replacement of small, inefficient refrigerators with larger more efficient ones which use more electricity. The same situation is reported as occurring with washing machines, cars and houses. Furthermore, recent trends have shown an increase in the use of electricity for lights and appliances, while energy use for cooking and hot water has declined.

A particular problem highlighted by the Energy Saving Trust in their publication 'The Ampere Strikes Back' (June 2007) is the huge growth in consumer electronics. They predict that by 2020 computers, entertainment and gadgets will account for 45% of home electricity use in the UK and will require the equivalent of 14 average sized power stations just to power them.

5.3 The domestic sector target

As explained in the introduction to this chapter, given the uncertainties and lack of precision in the various data available, (for example in terms of savings anticipated from national measures) we have applied a relatively simplistic approach to establish a starting point for the sector task groups.

This approach requires that the minimum CO_2 emissions savings target per sector should be proportionate to the total emissions attributable to that sector, according to the most recent data. The results are presented in Table 5 and indicate that:

The target for the local delivery plan for the domestic sector is a minimum saving in annual emissions of 48 kt CO_2.

5.4 Domestic sector carbon action plan

In 2006 energy use in homes in the UK was divided approximately into:

- 65% for space heating
- 22% for hot water
- 13% for lights and appliances

Carbon emissions from housing can be reduced by:

- reducing energy consumption, through:
  - more efficient heating, hot water and electrical appliances and controls
  - improvements in thermal insulation levels
  - changes in personal attitudes and behaviour in relation to energy use
- using lower carbon fuels for heating and hot water
- reducing the carbon intensity of electricity generation

While thermal efficiency standards for new build homes are set to improve rapidly, leading to a policy target of 'zero carbon' new homes by 2016, the rate of house building in the UK is extremely slow. A positive and proactive approach to this will be important in order to

achieve longer term targets for carbon emissions and housing provision. However this is unlikely to have an impact within the duration of the LAA.

In order to move quickly towards carbon emission reductions in the residential sector within the next three years, local action will need to focus on the existing housing stock.

In the short term (unless and until the zero carbon emission standard is achieved) new homes will add to the total carbon emissions in the area. However, if they are built to house a growing population, the impact upon domestic *per capita* CO_2 emissions can be assumed to be positive since they will be significantly more energy efficient than the existing housing stock. However, the growth of smaller households has the opposite effect – so for example a household of 5 occupants which splits into two of 3 and 2 occupants will tend to produce more CO_2 emissions per capita.

At the start of the LAA period (April 2008) there were approximately 258,000 homes in Gloucestershire.

Potential carbon savings in existing homes
A simple estimate can be made of potential carbon savings from retrofit measures in this sector by using estimates of:

a) annual savings from each measure based on standardised assumptions

b) the number of homes for which the measure is suitable and has not yet been applied

A similar approximation can be applied to behavioural measures, but it should be noted that this is not based on any quantitative knowledge of actual practice. There exists a body of research, in the UK and elsewhere, on achieving behavioural change in relation to energy consumption, and although the quantitative evidence for savings achievable is not robust, the qualitative conclusions as to what is needed to support the achievement of savings offer helpful guidance for designing advice and behavioural change programmes. Key factors emerging include the importance of:

- the provision from trusted sources of credible advice which is specific to the context in which the household finds itself (such as building characteristics of the home, fuels available and financial situation)
- feedback on consumption and savings from actions
- goal setting and making commitments to achieving savings
- sense of collective 'agency' as well as individual empowerment
- the ability to focus advice and information on specific items in order to unfreeze, reform and refreeze habits

The following action plan was developed by the task group.

An Action Plan, comprising 13 separate Actions was developed. These are detailed in Table 13 below . Estimates of CO_2 emission savings which are predicted to result from the actions are summarised in Tables 14 and 15.

Table 13: Domestic carbon action plan

A. Actions with measurable quantifiable targets that can be used as proxy indicators

1	Action	Target	
5.4.1.1	Sustainable energy advice to Gloucestershire residents through targeted programmes to reach all sectors, including: - provision of freephone, home energy check reports and outreach through the SW ESTAC (delivered by SWEA from Swindon office, with regional management based in Exeter) - local outreach, home visits and fuel poverty oriented activity provided by SWEA through SLAs with the Districts - energy awareness and advice programmes for social housing staff and tenants, including events, home visits and training sessions, provided by SWEA through SLAs with RSLs	a) Number of households advised	b) Number of home visits
	MILESTONES		
2008-9	Establishment of SW ESTAC to replace Glos EEAC. Agreement of work plan for 2008-9. Development of draft work plan for 2009-10.	10,000	100
2009-10	Agreement of work plan for 2009-10, and confirmation of continued DECC funding via EST. Development of draft work plan for 2010-11.	12,500	120
2010-11	Agreement of work plan for 2010-11 and confirmation of continued DECC funding via EST. Next stage planning.	17,500	150

Delivery partners	Monitoring procedures	Resource Implications
SWEA Energy Advice South West EST District Councils RSLs, including: Fosseway Housing, Cheltenham Borough Homes, Two Rivers Housing, Gloucester City Homes, Stroud District Council	Total activities monitored and reported by provider under contract agreements. Carbon emission savings based on estimates against activities.	Dependent on continued funding at least at similar levels by EST, RSLs and District Councils

2	Action	Target
5.4.1.2	Install energy efficiency retrofit measures through locally managed and monitored programmes (e.g. via Gloucestershire's Warm and Well scheme)	Number of main* measures installed (LI 19)
	MILESTONES	
2008-9	Quarterly monitoring of LI19 targets. Run tender for contractors and confirm funding for 2009-10	2,900
2009-10	Quarterly monitoring of LI19 targets. Establish funding and agree criteria and contracts for 2010-11	2,929
2010-11	Continue quarterly monitoring. Plan next stage strategy.	3,500

Delivery partners	**Monitoring procedures**	**Resource Implications**
Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council Stroud District Council SWEA Tewkesbury Borough Council (South Gloucestershire Council is also a partner in this programme)	Installations monitored and reported by SWEA, who manage the programme on behalf of the local authorities.	The programme is dependent on allocation of capital funds for private sector housing grants by the local authorities on an annual basis, which is drawn from the Regional Housing Pot. This levers in CERT funds from fuel suppliers.

* wall or loft insulation, replacement boilers

3	Action	Target
5.4.1.3	Encourage and enable vulnerable households to take up measures to improve energy efficiency and reduce the risk of fuel poverty, through targeted advice, awareness and partnership with other frontline agencies, including local authorities, PCT, and voluntary sector.	Number of vulnerable households referred to relevant programmes such as Warm and Well, Warm Front and CERT (priority group)
	MILESTONES	
2008-09	Improve feedback on referrals from Warm Front.	2,000
2009-10		2,500
2010-11		3,000

Delivery partners	Monitoring procedures	Resource Implications
Cheltenham Borough Council Citizens Advice Bureaux Cotswold District Council Families Centres Forest of Dean District Council Gloucestershire and South Gloucestershire Affordable Warmth Partnership Gloucester City Council Gloucester Welfare Benefits Steering Group Gloucestershire Age Concern Gloucestershire Primary Care Trust NHS Gloucestershire Stroud District Council SWEA South West ESTAC Tewkesbury Borough Council Eaga /Warm Front	Number of referrals from the area can be obtained from Warm Front, but not from CERT providers. SWEA can provide details of numbers referred through energy advice processes.	Links to Action 1. Where additional resources can be obtained, the results are marked – as in SWEA's CEEF (Community Energy Efficiency Fund) programme in 2008-9. NHS Glos support for this activity set at £30,000 for 2009-10 Intelligent Energy Europe programme 'Energy Ambassadors' will enter operational phase 2010 Further resources will be sought.

4	Action	Target	
5.4.1.4	Raise profile and quantity of renewable energy generation in county through supporting and enabling installations in domestic, public sector and community buildings	a) number of new renewable energy installations (LI 20)	b) capacity of new renewable energy installations (LI 21)
	MILESTONES		
2008-09	Provision of advisory service, grants programme and monitoring	120	0.7MW
2009-10	Provision of advisory service, grants programme and monitoring; Develop next phase support in response to details of Heat and Energy Saving Strategy implementation plans Develop guidance and exit strategy for LI 20/21 activity to include advice and finance packages as appropriate Develop guidance on feed-in tariffs for consumers	120	0.7MW
2010-11	Provision of advisory service, finance packages (if appropriate) and monitoring system	200	1.2MW

Delivery partners
Cheltenham Borough Council
Cotswold District Council
Forest of Dean District Council
Gloucester City Council
South West ESTAC
Stroud District Council
SWEA
Tewkesbury Borough Council
Cheltenham Borough Homes
Gloucester City Homes
Fosseway Housing
Two Rivers Housing
Gloucestershire County Council

Monitoring procedures
Programme managed and monitored by SWEA, including number, details and capacity of installations. Quarterly reporting to LAA Performance Management during years 1 and 2.

Resource Implications
Funds allocated from area-based grant and District Councils sufficient to ensure achievement of years 1 and 2 targets. Stroud District Council have committed additional funds and obtained support from fuel supplier for heat pump installations in social housing.

Options for year 3 under review, and heavily dependent on outcomes of government review of microgeneration support mechanisms (still underway).

5	Action	Target
5.4.1.5	Gear up level of activity on retrofit for significant reduction in carbon emissions from existing homes, through:	50 exemplars identified and initiated
5.4.1.6	a) Developing exemplars for significant carbon reduction in existing homes, to include hard to treat and non standard measures, and reflect the range of housing and households in the county.	
5.4.1.7	b) Maximising opportunities to raise capital for retrofit, for example through CESP, ESCOs, loans schemes and small scale area-based initiatives	
	MILESTONES	
2008-09	Pilot programme of 20 exemplars established in Stroud District	20
2009-10	Review outcomes of pilot in SDC and plan next stage roll-out to rest of county.	10
2010-11	Produce and disseminate case studies. Identify and initiate extended exemplar programme	20

Delivery partners	Monitoring procedures	Resource Implications
Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council Stroud District Council SWEA Tewkesbury Borough Council	Exemplar homes programme managed and reported by SWEA, with monitoring through household meter readings. Exemplars will be written up as case studies.	Funding for 20 exemplars provided by Stroud District Council. Further funding will be needed to expand programme to a further 30: ideally to expand programme to other Districts.

6	Action	Target
5.4.1.8	Develop and implement community behavioural change programmes	Active engagement of minimum of 500 households in behavioural change programmes aimed at reducing carbon emissions
	MILESTONES	
2008-09	initiate pilots for 3 programmes: Carbon Watchers: energy, water and waste, 40 households Energy Neighbourhoods: gas and electricity use, 6 month competition to save 20%, 180 households Target 2050: 20 households, 2 year programme within theme of saving 60% carbon (with measures), feedback, monthly items, social events	Minimum of 200 households engaged in 3 levels of pilot
2009-10	Complete and assess pilots	
2010-11	Develop and initiate next stage programme	Minimum of 300 further households engaged in next phase

Delivery partners	Monitoring procedures	Resource Implications
Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council Stroud District Council SWEA Tewkesbury Borough Council Gloucestershire County Council	All three programmes delivered by SWEA. Savings data will be collected from household meter readings.	Carbon watchers funded by EST and County Council. Energy Neighbourhood funded by Intelligent Energy Europe and several local partners in relevant neighbourhoods. Further funding sought for expansion of programme for 2010-11

B. Supporting actions with qualitative outcomes

7	Action
5.4.1.9	Develop and support a network for local installers of sustainable energy retrofit measures, to facilitate communication with supply chain, planning and advice agencies, improve access to measures for consumers and maximise sustainability and potential benefits to local economy
	MILESTONES
2008-09	Develop core network of installers and agree actions of mutual benefit.
2009-10	Assess progress and develop ongoing programme in light of changes to grants and incentives through Heat and Energy Saving Strategy
2010-11	Maintain network ensuring ongoing regular communication and co-operation
Delivery partners Installers on the Local Installer Network List SWEA Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council Stroud District Council Tewkesbury Borough Council Gloucestershire County Council	

8	Action
5.4.1.10	Raise awareness of range and sources of products for low energy lighting
	MILESTONES
2008-09	Update knowledge of advice staff of full range of low energy lighting solutions Include examples of 'non-standard' low energy lighting on displays and stands Develop training course around energy efficient lighting
2009-10	Develop and implement awareness campaign, to include offer of training to residents groups, LA and HA officers etc, and 'light bulb library' for use at events and surgeries.
2010-11	Develop partnerships with manufacturers and suppliers to improve availability of range
Delivery partners Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council South West ESTAC Stroud District Council SWEA South West ESTAC Tewkesbury Borough Council Cheltenham Borough Homes Gloucester City Homes Fosseway Housing Two Rivers Housing Gloucestershire County Council Megaman	

9	Action
Develop and implement monitoring plan to ask householders about measures installed in their property (insulation and micro-generation). This may include mailings via Council tax demand, random surveys and installer liaison.	
	MILESTONES
2008-09	Measures recorded via existing schemes such as Warm and Well, the Low Carbon Buildings Programme, Gloucestershire Renewable Energy Grant scheme (GREG), as well as via installer network feedback, RSLs and planning permission records
2009-10	Development of mail outs and promotional campaigns to collect data directly from the households in pilot areas (in anticipation of cessation of grant schemes)
2010-11	Roll out of successful data collection campaigns county wide
Delivery partners Cheltenham Borough Council Cotswold District Council Forest of Dean District Council Gloucester City Council South West ESTAC Stroud District Council SWEA Tewkesbury Borough Council Gloucestershire County Council	

10	Action
Take up all relevant support services offered by SW ESTAC, such as opportunity to work with the EST 1-2-1 programme to ensure maximisation of sharing actions and best practice across the region	
	MILESTONES
2008-09	Applications to EST for 121 support
2009-10	Gloucester City and Tewkesbury Borough 121 support; apply for further support if available
2010-11	
Delivery partners SWEA/SW ESTAC EST	

11	Action
5.4.1.11 Communicate objectives of NI 186 Domestic Sector objectives to relevant audiences including elected members, social landlords and the business community.	
	MILESTONES
2008-09	
2009-10	
2010-11	
Delivery partners: Gloucestershire Environment Partnership Board	

12	Action
5.4.1.12	Raise awareness of energy consumption and usage of ICT in the home
	MILESTONES
2008-09	
2009-10	Review available information and develop awareness campaign
2010-11	Implement awareness campaign
Delivery partners **SWEA / ESTAC** **District Councils and RSLs**	

13	Action
5.4.1.13	Maximise impact of EPCs through programme of awareness-raising of availability, benefits and advice on taking action
	MILESTONES
2008-09	Run a workshop (via the SHARE forum) on EPC regulations and processes relevant to social landlords
2009-10	Review knowledge on current response to EPCs and develop programme of awareness-raising targeting landlords, estate agents and buyers
2010-11	Deliver programme through local partnerships
Delivery partners	

Estimate of savings from national measures with local influence

The South West ESTAC delivers advice to Gloucestershire households through targeted marketing and response, and is complemented by more locally focused and fuel poverty oriented advice activities by SWEA in partnership with the six Districts and major local RSLs.

This advice provides local influence on take-up of CERT, Warm Front and Low Carbon Buildings Programme (LCBP) measures, as well as householder own investment and behaviour. We have not attempted to quantify the latter here, and do not have precise data about the level of activity within CERT, which is the most significant energy efficiency programme. In order to derive estimates for the level of activity in Gloucestershire we have had to use very broad estimates based in turn on national estimates. The carbon savings as based on the CERT illustrative mix are as follows.

Table 14: Estimate of carbon savings from national measures with local influence in the domestic sector

Initiative	Savings from activities over whole LAA (2008-11), t CO_2 per annum
CERT CWI	30,000 CWI x 0.63436 = 19,030
CERT lofts (full)	22,000 lofts x 0.31336 = 6,894
CERT SWI external	515 x 2.21016 = 1,138
CERT SWI internal	1,030 x 2.08976 = 2,153
Warm Front/CERT priority[1]	Included in above[1]
CERT+	Not known yet: estimate of 5,843 based on 20% uplift on above
CESP	Not known yet
Total	**35,058**

1. Warm Front mainly funded through CERT, so inclusion of figures in total might be double counting

Table 15: Estimate of carbon savings from local measures in the domestic sector

Action area	Action number	Per annum t CO_2	LAA (2008-11) t CO_2
Warm and Well	2	1,600 per year's installations[2]	x 3yrs = 4,800
LAA RES advice and grants (LI21/21)	4	111 per year's installations	x 3 yrs = 333
Energy Neighbourhood	6	120 (200 homes)	x 1 yr = 120
Carbon Watchers	6	12-24 (40 homes)	x 1 yr = 20
Extension of county wide behavioural change activity	6	180 (300 homes)	x 2 yrs = 360
T2050 exemplars	5	3 per exemplar	x 50 = 150
T2050 enhanced advice	1	320	x 2 yrs = 640
Total			**6,423**

2. based on 2007-8 level of activity

6 Business sector

6.1 The business sector in Gloucestershire

Businesses in Gloucestershire comprise predominantly small and medium sized enterprises (SMEs). There are approximately 26,700 businesses within the County according to data made available by the Labour Market Unit at Gloucestershire County Council and shown in table 16 below:

Broad industrial sector	CBC	CDC	FODDC	GCC	SDC	TBC	Glos
Agriculture and fishing, Energy and water & Manufacturing	300	500	400	300	600	300	**2,400**
Construction	400	500	400	400	600	300	**2,600**
Distribution, hotels and restaurants	1,500	1,400	900	1,300	1,300	900	**7,300**
Transport and communications	100	200	200	200	200	200	**1,100**
Banking, finance, insurance, etc	2,100	1,800	900	1,000	1,700	1,200	**8,700**
Public administration, education & health	400	400	400	600	500	300	**2,600**
Other services	400	500	300	300	400	300	**2,100**
Total	**5,200**	**5,200**	**3,400**	**4,100**	**5,300**	**3,400**	**26,700**

Table 16: Business in Gloucestershire

The breakdown of business by number of employees has been identified and provided by Business Link and shows the following:

Number of employees	% of businesses in Gloucestershire
1 – 4	74%
5 – 10	16%
11 – 250	10%
250+	<1%

Table 17: Employee numbers in Gloucestershire businesses

Whilst this information does not provide a breakdown of emissions by business sector or size of business, it is useful to understand the "make-up" of the business sector within the County so as to be able to identify suitable support programmes, either from existing or new programmes.

It should also be noted that the majority of businesses are eligible for only limited Carbon Trust support - this focuses mainly on larger and more energy consuming businesses. This highlights the importance of a more tailored approach at local level.

The Government is streamlining the portfolio of business support products under the banner of 'Solutions for Business' following consultation that highlighted that due to the multitude of the sources of advice, businesses were confused and discouraged from seeking the advice on offer. The South West Regional Development Agency (SWRDA) leads the simplification of business support in the South West, working closely with local authorities, Government Office South West, Business Link and other partners. A new Business Support Simplification Programme (BSSP) is to be accessed through Business Link in the near future. One of the products available regionally will be the **'Improving Your Resource Efficiency (IYRE).** The Government Office for the South West (GOSW) is actively promoting BSSP to Local Authorities and their partners and encouraging them, as part of the Local Area Agreement discussions, to simplify their support in line with BSSP principles.

Work streams detailed in Gloucestershire's delivery plan for business emissions will seek to work in support of BSSP principles and supply and signpost businesses to the appropriate energy efficiency services available.

6.2 Business sector carbon emissions

National statistics provided by Defra (2008) provide the following information about Gloucestershire's Industry and Commercial carbon emissions (which includes public). This is shown against the total carbon emissions for the six local authority territories, for 2005 and 2006.

The population figures are not as directly relevant to this sector as they are to domestic emissions, as residents may commute in and out of the area for work.

2005

Local authority	Industrial and Commercial	Total emissions	Population, 1,000s
Cheltenham	270	631	112
Cotswold	239	853	83
Forest of Dean	278	637	81
Gloucester	305	666	111
Stroud	312	773	110
Tewkesbury	334	724	78
Gloucestershire	**1,739**	**4,284**	**575**

Table 18: Gloucestershire's industrial and commercial sector CO_2 emissions (kt CO_2) in 2005 and 2006 by local authority district

2006

Local authority	Industrial and Commercial	Total emissions	Population, 1,000s
Cheltenham	284	649	112
Cotswold	249	861	83
Forest of Dean	293	648	82
Gloucester	312	679	113
Stroud	336	797	110
Tewkesbury	381	772	79
Gloucestershire	**1,855**	**4,406**	**579**

Table 18 (continued): Gloucestershire's industrial and commercial sector CO_2 emissions (kt CO_2) in 2005 and 2006 by local authority district

Business sector emissions (including public) represent 42% of total emissions in 2006 . The recession may contribute to a reduction in CO_2 emissions for the sector in the short term.

6.3 Business sector target

As explained in the introduction, given the uncertainties and lack of precision in the various figures available, (for example in terms of savings anticipated from national measures) we have applied a relatively simplistic approach to establish a starting point for the sector task groups.

This approach requires that the minimum CO_2 emissions savings target per sector should be proportionate to the total emissions attributable to that sector, according to the most recent data. The results are presented in Table 5 and indicate that:

The target for the local delivery plan for the industrial, commercial and public sector is a minimum saving in annual emissions of 57 kt CO_2.

6.4 Business sector carbon action plan

The delivery plan has been developed by the NI186 Business Sector Task Group. The group has met 4 times. Those who have attended task group meetings or have been included in the circulation of notes from the meetings include representatives from Business Link SW, SWRDA, Cheltenham Borough Council, Stroud District Council, University of Gloucestershire, Gloucestershire First, Carbon Data and Severn Wye Energy Agency.

The group is aware that there are number of potential partners that have not been part of the task group. In developing the work plan the task group has included potential partners it believes are key to the delivery plan. One of the initial tasks will therefore be to forge new partnerships in efforts to combat business sector emissions.

Having assessed the present array of services available to businesses, the task group identified those services most effective in reducing business CO_2 emissions for inclusion in the Delivery Plan. In addition to this, the increased awareness of the quantity of micro businesses across the County has led to several new action points being added to the Plan.

The detailed plan for this sector is set out in Table 19 below.

Table 19: Business Sector Carbon Action Plan

1	Action	Target	
Regional Resource efficiency business support programme / 'Improving Your Resource Efficiency (IYRE)' **The Gloucestershire Environment Partnership (GEP) will work with Business Link South West in the delivery of the SW Regional Development Agency's (SWRDA) 'IYRE' service** 1.1 To identify priority sectors (high carbon users, construction and businesses that would thrive in a low carbon economy); 1.2 To stimulate demand for IYRE through joint marketing initiatives ; 1.3 To ensure that all current LA projects providing advice to SMEs are signposted to the IYRE service. 1.4 To work with SWRDA to collect data and estimated savings from the 2008-09 delivery of the Envision Gloucestershire.		To deliver the service to 88 businesses in Gloucestershire by Mar 2011	
	MILESTONES	Start	Finish
2008-09	Develop understanding on how IYRE would work for Gloucestershire businesses.	October 2008	March 2009
2008-09	Collect data and estimated savings from the 2008-09 delivery of the Envision Gloucestershire programme	Dec 2008	March 2009
2009-10	Agreement of milestones for 2009-10. Development of work plan for 2010/2011	April 2009 Dec 2009	May 2009 March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011
Delivery partners SWRDA Business Link SW Gloucestershire First University of Gloucestershire Gloucestershire County Council Glos District Councils SWEA	**Monitoring Procedures** Total activities delivered will be monitored by Business Link, and reported to SWRDA within contract agreement. The carbon emission savings are based on the savings achieved within a similar previous programme (Envision) and have been apportioned to the County based on the expected percentage of service to be delivered in Gloucestershire	**Resources Implications** Funding for the programme has been provided by SWRDA, and this programme is funded until 2013. Business Link are presently considering employing 10 Environmental specialists to assist delivery.	

2	Action	Target	
	Business Carbon Reduction Programme **In support of the Integrated Economic Strategy for Gloucestershire,, GEP will develop a county wide business carbon reduction programme;** 2.1 Identify the top 100 business energy users; 2.2 Developing awareness of and commitment to tackling climate change amongst senior business executives 2.3 Encourage the establishment of carbon management plans by these 100; 2.4 Seek funds to provide training for energy managers in business; 2.5 Establish a county wide target of the top 100 energy users.	To identify and engage the 100 top business energy users by Mar 2010 To establish and commence delivery of the county wide target for the 100 businesses by Mar 2011	
	MILESTONES	Start	Finish
2009-10	Agree milestones and timescales with delivery partners	April 2009	June 2009
2009-10	Development of workplan and timescales for 2010/2011	Dec 2009	March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners
Gloucestershire First
Business Link SW
Gloucestershire Chamber of Commerce
University of Gloucestershire
Gloucestershire County Council
Glos District Councils
SWEA

Monitoring Procedures
A new initiative to be fully developed. Monitoring of progress will be provided by the delivery agents

Resources Implications
Funding has not been identified for this programme of work. It is anticipated that staff time of up to 0.5FTE will be required for successful delivery

3	Action	Target	
Low Carbon Partnerships **Establish Low Carbon Partnerships (LCPs) on a district level** 3.1 Develop awareness of, and commitment to tackling climate change amongst business executives and representatives 3.2 Organise LCPs meetings quarterly 3.3 Encourage the establishment of carbon management plans 3.4 Seek funds to provide training for energy managers in business 3.5 Establish a shared target for the district Low Carbon Partnership		Each of the 6 District Authorities to establish LCPs comprising at least 10 local businesses each	
	MILESTONES	Start	Finish
2008-09	Learn lessons from Pilot Low Carbon Partnership in Cheltenham	September 2008	March 2009
2009-10	Agree milestones and timescales	April 2009	June 2009
2009-10	Development of workplan and timescales for 2010/2011	April 2009 Dec 2009	June 2009 March 2010
2010-11	Agreement of work plan for 2010-11	April 2010	March 2011

Delivery partners	**Monitoring Procedures**	**Resources Implications**
Gloucestershire First Glos Districts Chambers of Commerce Business Link South West University of Gloucestershire Gloucestershire County Council District Councils SWEA	Monitoring of the impact of this programme will be through reporting on measures installed by the relevant businesses via those District Authorities participating in the programme and fed back through the Business Sector Task Group	There is no guaranteed funding in place to support this action point presently. It is anticipated that funding will be identified from District Authorities with the support of Gloucestershire First

4	Action	Target	
Energy Efficiency Advice to SMEs **Develop with districts and the county council projects targeting businesses that do not qualify for on site Carbon Trust assistance to highlight potential energy savings and provide a means for businesses to realise them. This will build on the existing Target 2050 – Countdown to a low carbon business programme that has been established for businesses in Gloucestershire.** 4.1 An energy survey, recommendations report (including assistance with implementation of recommendations) and accompanying support (staff training etc.) will be available to participating businesses 4.2 Development of a staff awareness campaign to effect change in the workplace and at the employees home 4.3 Ongoing support available over the telephone. 4.4 Signpost businesses to other environmental business support organisations that will be able to provide advice in areas such as waste minimisation, recycling and water efficiency 4.5 Promoting the SME advice service through Business Link's Business Simplification Programme and the IYRE service and other existing business support organizations.		To work with 180 businesses delivering on site energy surveys and follow up support by March 2011	
	MILESTONES	Start	Finish
2008-09	Work with 30 businesses in Stroud	September 2008	March 2010
2008-10	Work with 30 businesses in the hospitality sector, Cheltenham		
2008-10	Work with 50 businesses across Gloucestershire		
2009-11	Work with 70 businesses in Stroud	April 2009	June 2009
2009-10	Development of workplan and timescales for 2010/2011	Dec 2009	March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011
Delivery partners SWEA	**Monitoring Procedures** This programme will be delivered by SWEA. As	**Resources Implications** The funding for the level of service indicated	

Business Link South West Gloucestershire First Gloucestershire County Council Glos District Councils Glos Districts Chambers of Commerce	such a system for monitoring of results is in place, using national CO_2 savings from measures installed. Provisional savings are identified from action plans that recipients sign as an intention to deliver. This is then adjusted based on actual measures installed.	above has been allocated within existing contract agreements between SWEA and the Local Authorities supporting the initiative.

5	Action	Target	
Business Resource Efficiency Clubs To work with Parklife Environmental Business Management Programme to prioritise and promote carbon management schemes. 5.1 To source carbon management trainers where necessary for the Park life EBMP programme. 5.2 To capture carbon saved data through the EBMP programme.		To train a minimum of 65 businesses	
	MILESTONES	Start	Finish
2008-09			
2009-10	Agree milestones and timescales	April 2009	June 2009
2009-10	Development of workplan and timescales for 2010/2011	Dec 2009	March 2010
2010-11	Agreement of work plan for 2010-11	April 2010	March 2011

Delivery partners	**Monitoring Procedures**	**Resources Implications**
Parklife/Gloucestershire First Business Link University of Gloucestershire Gloucestershire County Council District Councils SWEA Glos Districts Chambers of Commerce	Progress towards the stated target is monitored by Parklife. The Business Sector Task Group will work with Parklife to exchange information and support to feedback the details of progress.	The programme of work is currently funded to deliver the anticipated targets

6	Action	Target	
Micro Businesses **To develop and deliver a programme of energy advice to the smallest category of micro businesses, many of which are home-based. The businesses will be targeted based on Business Link SW data that shows 74% of business in Gloucestershire employing between 1-4 people.** 6.1 To engage 500 micro -business with energy efficiency advice with promotion through Business Link, Federation of Small Business, Chamber of Commerce etc. 6.2 Host one annual 'webinar' aimed at the target market as an additional route to market.		Promote energy efficiency advice and support to 500 micro-businesses	
	MILESTONES	Start	Finish
2008-09			
2009-10	To secure funding and agree milestones and timescales	April 2009	Sept 2009
2009-10	Development of workplan and timescales for 2010/2011	Dec 2009	March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners	**Monitoring Procedures**	**Resources Implications**
Business Link SW District Councils SWEA Energy Savings Trust Advice Centre SW	Reporting on number of businesses advised via delivery agent.	Funding has been identified from Business Link to develop and deliver the webinar, however ongoing resources need to be secured for engagement with 500 micro businesses.

7	Action	Target	
Sector Development: Construction Industry **Establish a programme that engages and stimulates the construction industry in Gloucestershire to be 'fit for purpose' in a low carbon economy.** 7.1 Undertake research to understand the mix of skills, technologies and infrastructure required for a local construction industry that would serve a low carbon economy. 7.2 Hold a expert symposium on the findings of the research 7.3 Undertake a feasibility study on establishing a Sustainable Construction Skills Centre (SCSC)		To research present mix of skills and identify infrastructure requirements Hold expert symposium Conduct feasibility for establishing the SCSC	
	MILESTONES	Start	Finish
2008-09	Organise exploratory meeting of partners	Feb 2009	March 2009
2009-10	Undertake research	April 2009	May 2009
2009-10	Organise expert symposium	April 2009	June 2009
2009-10	feasibility study on establishing a Sustainable Construction Skills Centre	July 2009	March 2010
2010-11	Agreement of work plan for 2010-11	Dec 2009	March 2010
Delivery partners Stroud College Stroud District Council SWEA Stroud Chamber of Commerce Constructing Excellence (Gloucestershire)	**Monitoring Procedures** Business Sector Task Group to monitor and feedback all activities against the target within this action	**Resources Implications** Initial funding for research and seminar has been identified. Resources for the development of a Sustainable Construction Skills Centre to be identified.	

8	Action	Target	
Business Renewables Encourage where appropriate the take up of renewable energy systems by business. 7.1 Map existing renewable energy capacity in the business sector 7.2 Provide advice on renewable energy potential for business 7.3 Supporting businesses that supply and install energy efficiency and microgen solutions		To map existing renewable energy capacity in the sector To provide advice to at least 15 businesses on renewable energy potential Develop a sustainable energy installers network for businesses to access.	
	MILESTONES	Start	Finish
2008-09	Mapping renewable energy capacity	April 2008	March 2008
2008-09	Provide advice on renewable energy potential to business	April 2008	Mach 2009
2008-09	Develop installers network	April 2008	March 2011
2009-11	Mapping renewable energy capacity	April 2009	March 2011
2009-11	Provide advice on renewable energy potential to business	April 2009	March 2011
2009-11	Maintaining an installers network	April 2009	March 2011

Delivery partners	**Monitoring Procedures**	**Resources Implications**
SWEA Glos District Councils Glos Chamber of Commerce	Through the existing Local Area Agreement monitoring system for renewable energy installations in the domestic sector – maintained by SWEA. The installers network will be monitored through the Target 2050 programme managed by SWEA	There are no specific resources available to this action point, although the target will be delivered in line with the delivery of action point 4

Action Plan – Estimated CO_2 Savings

Further to the proxy targets outlined within the Action Plan above, the following table brings together each action point and shows the estimated carbon saving that each point will achieve. Not every action point has specific CO_2 targets, these have been highlighted. The points that do contain estimated CO_2 savings have been calculated on the basis of previous available data provided by those organisations that have been involved in previous business energy support services.

Table 20: Estimate of savings from local measures in the business sector

Ref	Action	Estimated CO_2 savings (tonnes)
1	Environmental Performance in Business	9,311
2	Business Carbon Reduction Programme	20,000
3	Low Carbon Partnerships	12,000
4	Energy Efficiency Advice to SMEs – Target 2050	8,900
5	Business Resource Efficiency Clubs	Training target only
6	Micro Businesses	1,630
7	Sector Development: Construction industry	Developmental
8	Business Renewables	Advice target only
Total		**51,841**

7 Public sector

7.1 The public sector in Gloucestershire

There are a wide range of public sector organisations in Gloucestershire, including local authorities, education establishments, health and social care organisations and the emergency services.

All of the Gloucestershire Councils recognise the importance of their leadership role in reducing community carbon emissions, including by managing and reducing their own CO2 emissions, and working with other public sector organisations to do the same.

The Public Sector Task Group was established in 2008, and includes:

- Cheltenham Borough Council;
- Cotswold District Council;
- Forest of Dean District Council;
- Gloucester City Council;
- Gloucestershire County Council;
- NHS Gloucestershire (formerly Gloucestershire Primary Care Trust);
- Stroud District Council;
- Tewkesbury Borough Council; and
- University of Gloucestershire.

The role of this group is to:

- Identify opportunities for joint working to support public sector organisations in managing and reducing emissions, contributing to reducing emissions from the Industrial and Commercial sector under National Indicator 186; and
- Co-ordinate reporting of local authority carbon dioxide (CO_2), particulate (PM_{10}) and nitrous oxides (NO_x) emissions to Government, as required by National Indicators 185 and 194.

7.2 Public sector carbon emissions

It is not possible to disaggregate public sector emissions from the Government's Industrial & Commercial Sector data published under NI186. This sector accounted for 40% of emissions in 2005. In keeping with the overall Local Area Agreement (LAA) target, emissions from the sector need to be reduced by 9.1% by the end of 2010/11, against the 2005 baseline. This is in line with the Government target of reducing UK CO_2 emissions by 80% by 2050 (against 1990 levels).

Each member organisation has made varying progress to date in managing and reducing CO_2 emissions.

Cheltenham and Stroud Councils have been through the Energy Saving Trust's Key Account Management scheme, to manage council and community emissions. Gloucestershire County Council, and Cotswold, Forest of Dean, and Stroud District Councils have all developed Carbon Management Plans with the Carbon Trust. The University of Gloucestershire has worked with the Carbon Trust to manage emissions. Gloucester City has adopted an energy management strategy in 2003 and a climate change strategy in 2007

and along with Tewkesbury Council will be taking part in the Energy Saving Trust's 1-2-1 programme in 2009/10 to produce an action plan to further address climate change, which will run from April 2009-2011.

The following CO_2 baselines have been calculated:

Organisation	Baseline Year	Baseline CO_2 emissions (tonnes)
Cheltenham Borough Council	2005/06	4,250 (buildings and fleet)
Cotswold District Council	Calendar year 2007	4,220 (buildings, fleet, business mileage, outsourced waste services mileage)
Forest of Dean District Council	2007/08	1,265 (buildings, fleet, business mileage)
Gloucester City Council	2002/03	1,247 tonnes (all sources)
Gloucestershire County Council	2006/07	61,000 (buildings, schools, street lighting, fleet, business travel)
NHS Gloucestershire	2007/08	4,300 tonnes (primary energy from buildings within estate)
Stroud District Council	2007/08	2,266 (buildings, fleet, business mileage)
Tewkesbury Borough Council	2006	1,885 (main offices, leisure centre, water, transport, staff commuting and business mileage)
University of Gloucestershire	2003/04 (Aug-Jul)	4,742 (buildings: Scope 1[1] 2,012; Scope 2 2,730)
Total		**85,175**

Table 21: Public sector baseline emissions

[1] **Scope 1** Green House Gas (GHG) emissions are those directly occurring "from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution owned/controlled vehicles; and "fugitive" emissions. Fugitive emissions result from intentional or unintentional releases of GHGs, including the leakage of HFCs from refrigeration and air conditioning equipment as well as the release of CH4 from institution-owned farm animals." (ACUPCC Implementation Guide [1] p. 11). **Scope 2** emissions are "indirect emissions generated in the production of electricity consumed by the institution." (ACUPCC Implementation Guide [1] p. 11). **Scope 3** emissions are all the other indirect emissions that are "a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution" such as commuting, air travel for university activities, waste disposal; embodied emissions from extraction, production, and transportation of purchased goods; outsourced activities; contractor owned-vehicles; and line loss from electricity transmission and distribution" (ACUPCC Implementation Guide [1] p. 11-12).

7.3 Public sector carbon target

Gloucestershire signed up to NI 186 in the spirit of striving to lead on community emissions reduction, and as such will seek for each Public Sector Task Group member to reduce its own emissions by at least 9.1% by the end of 2010/11, in line with the LAA target.

A 9.1% reduction on baseline CO_2 emissions from these public sector organisations would reduce their combined annual emissions by 7,750 tonnes by March 2011. The majority of organisations in the Task Group have adopted individual CO_2 emission reduction targets.

Table 22: Public Sector Organisation Targets

Organisation	CO_2 Reduction Targets
Cheltenham Borough Council	15% reduction by 2010 on 2005/06 levels and 20% reduction in energy consumption over the same period. Also agreed 3% reduction with Cheltenham Low Carbon Partnership from January to December 2009
Cotswold District Council	25% reduction from service provision activities against 2007 baseline by Dec 2015
Forest of Dean District Council	25% reduction in direct carbon emissions by 2012/13 based on a 2007/08 baseline
Gloucester City Council	Increase amount of electricity generated in Gloucester from low carbon or renewable sources to a minimum of 11% by 2010; Reduce CO_2 emissions from principal buildings owned by the City Council by 20% by 2010
Gloucestershire County Council	2.5% pa with milestone reduction targets against the 2006/07 baseline of 10% by 2012; 30% by 2020; and 60% by 2050 (being reviewed).
NHS Gloucestershire	Working towards NHS Carbon Reduction Strategy target of 10% reduction by 2015 based on 2007 levels
Stroud District Council	Reduce CO_2 emissions from its' direct operations by at least 35% by the end of the 2010/11 financial year based on a 2007/08 baseline
Tewkesbury Borough Council	10% decrease in energy use by 2010 (from 2006), looking at mileage data
University of Gloucestershire	21% reduction in consumption and emissions by 2010/11 on a 2003/04 baseline (being reviewed)

7.4 Public sector carbon action plan

Table 23: Individual organisational actions planned for 2009/10

Financial Year/ Actions	Estimated Annual Savings	
	£	CO_2 (tonnes)
Cheltenham Borough Council		
Energy management training for building managers		
£10k set aside for building managers to fund efficiency measures		
Site assessments for energy efficiency and renewable energy potential in council buildings	Potentially £27,000	Ca. 10-15% of current bills (no/low cost measures)
Crematorium refurbishment		
Replacement of Christmas lights with 1W LEDs	5,000	15.5
PC's replaced with 'Thin Client'		
Funding set aside for PV		
Staff awareness campaign		
Train staff in ecodriving		
Rationalisation work at waste depot		Potentially 50
Total Savings	**£32,000**	**65.5**
Cotswold District Council		
Awareness campaign – All sites	13,200	117
Building Energy Management System	2,050	17.9
Pool Cover	2,120	19.1
Voltage Optimisation	14,000	107.4
Printer rationalisation	2,000	15.3
Vending machine timer	1,680	13
Lighting ballasts	3,489	26.5
Total Savings	**£38,539**	**316.2**
Forest of Dean District Council		
Reduction of pest control service	1,000	4
Evening meeting rationalisation	800	7
Voltage optimisation	4,000	28
Server virtualisation	6,000	46
Asset management plan	11,000	72
Total Savings	**£22,800**	**157**

Table 23 (continued): Individual organisational actions planned for 2009/10

Financial Year/ Actions	Estimated Annual Savings	
	£	CO_2 (tonnes)
Gloucestershire County Council		
Travel plan to reduce staff travel 2.5% pa	85,100	38
Secondary schools energy action (electricity)	70,500	172
Secondary schools energy action (gas)	63,000	200
Street lighting: Switch off	110,000	513.65
Street lighting: Dimming	127,000	600
Lighting review: Shire Hall	19,576	105.12
Hot water	2,000	10.74
Staff awareness	23,232	114
Total Savings	**£500,408**	**1,752**
Stroud District Council		
Hand drier upgrade	2,726	33
VSD	4,308	51
Update fleet vehicles	-	7
Lease review	847	14
Lighting management	868	6
PC's replaced with Thin Client	8,661	103
Voltage optimisation	4,308	51
Total Savings	**£21,718**	**265**
Gloucester City Council		
Install a turbine on Alney Island that has gained public acceptance by 2010		
Achieve 20 renewable energy installations per year by 2010 in line with LAA targets		
Tewkesbury Borough Council (draft action plan)		
Printers and fax machines put on timers		
More PIRs installed throughout offices		
Ceilings lowered throughout offices		
High usage offices identified and energy saving options recognized		
Improvements to heating systems		
Awareness raising with staff		
TOTAL identified estimated savings for 2009/10 actions	**£615,465**	**2,556**

Table 24: Public sector carbon action plan (2007-10)

1	Action	Target	Estimated CO_2 savings (tonnes)
Reviewing the effectiveness of existing actions		9.1% reduction on baseline emissions by Mar 2011	7,600 by Mar 2011 2,558 in 2009/10
	Member organisations to review planned actions and identify organisation and joint opportunities to reduce public sector emissions		
1.1	Member organisations to seek to adopt the public sector target of 9.1% reduction by the end of 2010/11, against 2005 levels, where this is greater than their current target;		
1.2	Map existing emissions reduction activity to understand the gap between the sector target and organisational targets and action within the group;		
1.3	Agree an absolute emissions reduction target across the member organisations;		
1.4	Develop organisation annual action plans to reduce emissions, with quarterly monitoring of progress towards achieving agreed targets;		
1.5	Build on the developing awareness of and commitment to tackling climate change amongst senior staff and local authority councillors, especially those who have taken strong leadership positions;		
1.6	Raise the awareness and commitment of staff, including awareness campaigns and staff initiatives;		
1.7	Develop appropriate collaborative actions, including information exchange and access to funding/ support programmes;		
1.8	Report to Government on local authority emissions, as required by NI185 and 194.		
	MILESTONES	Start	Finish
2009-10	Agreement of milestones for 2009-10 Development of workplan for 2010/2011	April 2009 Dec 2009	Jun 2009 March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners
Carbon Trust
Energy Saving Trust

Monitoring procedures
- Quarterly monitoring of progress towards achieving agreed targets;

Glos District Councils Gloucestershire County Council NHS Gloucestershire Severn Wye Energy Agency University of Gloucestershire	• Annual report to Government on local authority emissions, as required by National Indicators 185 and 194. **Resource Implications** Estimated annual savings from implementing organisational plans for 2009/10, £615,500, funded by the respective organisations

2	Action	Target	Estimated CO_2 savings (tonnes)
Facilities Managers Training **Provide training to all facilities staff (sports centres, museums, etc) responsible for energy management** 2.1 Facilities Management training workshops, Severn Wye Energy Agency (ENGINE training programme, http://www.swea.co.uk/proj_ENGINE.shtml)		Two 4-day courses, 50 participants total 2009/10	Unknown – this will contribute directly to savings under Action 1
	MILESTONES	Start	Finish
2009-10	Agreement of milestones for 2009-10 Development of workplan for 2010/2011	April 2009 Dec 2009	Jun 2009 March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners Glos District Councils Gloucestershire County Council NHS Gloucestershire Severn Wye Energy Agency University of Gloucestershire	**Monitoring procedures** • Quarterly monitoring of progress towards achieving agreed targets; • End of year report. **Resource Implications** Training cost £7,000 funded by Glos Environment Partnership

3	Action	Target	Estimated CO_2 savings (tonnes)
Engaging the wider Public Sector **Engage additional public sector organisations** 3.1 Seek to secure participation in the Carbon Trust LA Carbon Management Programme for NHS Gloucestershire, Gloucestershire Hospitals NHS Foundation Trust in 2009/10; 3.2 Seek to secure participation in the Carbon Trust HE (Higher Education) Carbon Management Programme for all Glos Further Education (FE) Colleges with the University of Glos in 2010/11; 3.3 Seek to secure participation in the Carbon Trust LA Carbon Management Programme for Glos Constabulary in 2010/11; 3.4 Investigate the potential for engaging the Ambulance Trust and Mental Health Trust.		To be set in 2010/11	Unknown; to be estimated in 2010/11
	MILESTONES	Start	Finish
2009-10	Agreement of milestones for 2009-10 Development of workplan for 2010/2011	April 2009 Dec 2009	Jun 2009 March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners
Carbon Trust
FE Colleges
Gloucestershire Ambulance Trust
Gloucestershire County Council
Gloucestershire Mental Health Trust
Gloucestershire Police Authority
Gloucestershire Hospitals NHS Foundation Trust
NHS Gloucestershire
University of Gloucestershire

Monitoring procedures
- Quarterly monitoring of progress towards achieving agreed targets;
- End of year report.

Resource Implications
No financial implications

4	Action	Target	Estimated CO_2 savings (tonnes)
Public Sector Procurement **To work with the Gloucestershire Procurement Partnership to maximise opportunities for ensuring that suppliers have carbon management plans** 4.1 Engage the Gloucestershire Procurement Partnership (GPP); 4.2 Map GPP Member existing procurement processes to determine if current procurement guidelines include taking account of suppliers' carbon management policies; 4.3 Investigate how a collaborative approach to carbon procurement might enhance the GPP, drawing on knowledge of established procurement models nationally and locally, particularly the other non-local authority members of GPP such as University of Gloucestershire, NHS Gloucestershire and Gloucestershire Hospitals NHS Foundation Trust, and Gloucestershire Constabulary, and the carbon reduction procurement programmes already in progress within each authority		To be set in 2010/11	Unknown
	MILESTONES	Start	Finish
2009-10	Agreement of milestones for 2009-10 Development of workplan for 2010/2011	April 2009 Dec 2009	Jun 2009 March 2010
2010-11	Implement work plan for 2010-11	April 2010	March 2011

Delivery partners
Gloucestershire County Council
Gloucestershire Procurement Partnership

Monitoring procedures
- Quarterly monitoring of progress towards achieving agreed targets;
- End of year report.

Resource Implications
No immediate financial implications, but potential savings

8 Road transport

8.1 The road transport sector in Gloucestershire

The main delivery mechanism the contribution of transport to achieving the targets to be contained in NI186 will be Gloucestershire's Local Transport Plan (3) (to be known as LTP3). It is envisaged that LTP3 will be steered by the Transport sub group of the Environment Partnership, one of the themed partnerships under the Local Area Agreement.

The current LTP2 runs to April 2011, at which point LTP3 will succeed it. LTP3 will cover the period 2011 to 2026.

This poses a problem in terms of the road transport contribution to this 186 delivery plan, which focuses upon the current LAA period of 2008-11, in that those responsible for this area of activity within the County Council do not see any major changes as practically possible within the LTP2 period. Plans have been set and available resources committed.

In LTP2 there was no target specifically for CO_2 reduction, but it is recognised that this will be a focus for LTP3.

A second barrier is that this there is not as yet a substantial partnership approach to this issue (although the County Council are able to benefit from the expertise of consultants), and although a Transport group has now been established, it is not yet operational.

GCC will produce the next LTP2 Progress report in the summer of 2009. This will contain the performance figures for area wide vehicle mileage for 2008/9. The related CO_2 figure can then be reported.

The target for CO_2 output from transport in Gloucestershire within the control of GCC for the period 2011 onwards will be set as part of the development of LTP3.

It should be noted that Gloucestershire County Council do have some control over the highway network and promoting schemes such as car-sharing, park & ride and public transport improvements that can help reduce vehicle mileage, they do not have any duties or control over engine design or efficiency.

8.2 Road transport carbon emissions

The overarching gauge of transport's impact on CO_2 levels is the change in area wide vehicle kilometres on local authority managed roads in Gloucestershire. This is covered and monitored under the Local Transport Plan (currently LTP2 and LTP3 in future) and is monitored under target LTP2.

The national statistics provided by Defra give us the following information about Gloucestershire road transport carbon emissions for 2005 and 2006. A column has been added for carbon emissions per capita, for the purposes of comparison.

2005

Local authority	Road transport	Total emissions	Population 1,000s	Road transport t CO_2 per capita
Cheltenham	94	631	111.7	0.84
Cotswold	350	853	83.1	4.21
Forest of Dean	144	637	80.9	1.78
Gloucester	107	666	111.3	0.96
Stroud	164	773	110.0	1.49
Tewkesbury	181	724	78.4	2.31
Gloucestershire	***1040***	***4284***	***575.4***	***1.81***
UK total	**104,651**	**447,583**	**60,210**	**1.74**

2006

Local authority	Road transport	Total emissions	Population 1,000s	Road transport t CO_2 per capita
Cheltenham	91	**649**	112	0.81
Cotswold	343	**861**	83	4.13
Forest of Dean	139	**648**	82	1.70
Gloucester	104	**679**	113	0.92
Stroud	161	**797**	110	1.46
Tewkesbury	176	**772**	79	2.23
Gloucestershire	***1014***	***4406***	***579***	***1.75***
UK total	**102,840**	**451,305**	**60,588**	**1.70**

Table 25: Gloucestershire's road transport sector CO_2 emissions (kt CO_2) in 2005 and 2006 by local authority district

These figures indicate that from 2005 to 2006 road transport emissions in Gloucestershire fell by 26 kt CO_2.This is a 2.5% reduction in total emissions.

The table below shows that a drop in emissions during this period was typical, despite population increases. Per capita figures are potentially misleading here due to commuting across local authority territories. However for the UK as a whole it is interesting to note that the road transport emissions per capita fell from 1.74 in 2005 to 1.70 in 2006.

Local authority	2005		2006	
	Road transport	Population, 1,000s	Road transport	Population, 1,000s
Bedfordshire	742	397.7	732	404
Cambridgeshire	1,719	588.9	1,704	590
Cheshire	1,414	679.7	1,391	687
Essex	2,450	1340	2,405	1363
Hampshire	2,375	1259.4	2,327	1267
Leicestershire	1,218	627.8	1,199	636
Northamptonshire	1,675	651.8	1,676	670
North Yorkshire	2,184	582	2,164	592
Oxfordshire	1,503	626.9	1,461	631
Shropshire	930	289.1	915	290
Somerset	1,062	515.6	1,032	518
Warwickshire	1,084	533.9	1,056	522
West Sussex	1,541	764.3	1,496	771
Worcestershire	985	555.9	962	553
Wiltshire	942	446.7	926	448
Gloucestershire	***1,040***	***575.4***	***1,014***	***579***
UK total	**104,651**	**60,210**	**102,840**	**60,588**

Table 26: Gloucestershire's road transport CO_2 emissions (kt CO_2) compared with statistically most similar local authorities.

8.3 Road transport target

According to our initial proposition that the same level of reduction be applied across all sectors, and taking into account anticipated estimated savings from national measures (as set out in the introduction), the local delivery plan, containing local measures and 'national measures with local influence' would need to achieve a reduction in annual carbon emissions of around 31kt.

However, the target in LTP2 is one of constraint rather than reduction, and is that the change in area wide road traffic should increase by less than 1.4% per year. In LTP2 there was no target specifically for CO_2 reduction.

National Road Traffic Survey data from the DfT is used to monitor this and showed that in 2007 the increase was 0.5% (in 2006 6152 million km, in 2007, 6185 million km, an increase of 33 million km).

In order to translate the area wide road traffic mileage figure and target into a CO_2 target, the average new car CO_2 emissions for the year 2007 (164.9g/km) as reported by the Society of Motor Manufacturers and Traders (SMMT)[2] has been used as this is from a recognised source and would be representative of an average car on the roads of Gloucestershire in 2009.

Therefore, with a two year time-lag, the LTP2 targets are shown in Table 27, and are based on the LTP2 target to restrain the increase in vehicle km to 1.4% per annum.

Year	Area Wide km target (millions)	CO_2 target, kilo-tonnes	CO_2 target, kilo-tonnes, with 2 year time-lag
2007/08	6,185 (actual)	1,020 (actual)	
2008/09	6,272	1,034	
2009/10	6,359	1,049	1,020
2010/11	6,448	1,063	1,034

Table 27: LTP2 targets

This shows an anticipated increase in emissions of around 43.4 tonnes.

Beyond 2011/12 falls into the LTP3 period. CO_2 targets for the LTP3 period will be set in consultation with the Transport subgroup of the Environment Partnership

The figure for CO_2 emissions calculated by Defra relate to the recorded fuel sales in each County and district level. It is possible that as vehicles become more efficient in terms of fuel consumption that fuel sales could reduce but vehicle mileage remain static or increase.

8.4 Road transport action plan

In order to reach the target mentioned in the introduction of 2.63% annual reduction, a much greater emphasis and resource will need to be placed towards achieving modal shift from single occupancy car use to non-motorised forms of travel, such as walking and cycling. This may be feasible in the urban areas, but for longer distance travel, especially in the rural

[2] From www.smmt.co.uk

areas, solutions such as promotion of car-sharing, rail and bus travel will need to be promoted along with smarter working practices such as home-working.

Current projects include:

- Development of LTP3
- Monitoring NI186 km & CO_2 targets within LTP2
- School Travel Plans, Bike-It and cycle training in schools, cycle links to schools
- Workplace and residential travel plans
- Promotion of carsharegloucestershire.com
- GCC Shire Hall travel plan
- Working with bus operators to improve quality and frequency of public transport provision
- Ensuring new developments meet accessibility requirements to reduce the need for travel by car
- J9 Travel Planning and Healthy Towns (Tewkesbury)

Details of these projects are shown in the following pages.

Many of the above mentioned projects are revenue dependent and staff intensive and continuation of these will require funding and resource commitment.

Local Transport Plan 3 and longer term projects

The current LTP2 runs to April 2011, at which point LTP3 will succeed it. LTP3 will cover the period 2011 to 2026. Following Government Guidance, LTP3 will need to address five goals, these being to:

- Tackle climate change;
- Support economic growth;
- Promote equality of opportunity;
- Contribute to better safety, security and health;
- Improve quality of life.

Under this headline target, the individual contributions of specific schemes and initiatives will also be monitored, such as Elmbridge Transport, West of Severn P&R and other projects such as carsharegloucestershire.com car share scheme will have their own CO_2 targets and monitoring regime. Much greater emphasis on promotion of cycling will need to be considered.

The following projects in the future will also help contribute to reduction in CO_2 levels from transport in the longer term:

- Swindon Kemble redoubling - reducing car journeys between the Central Severn Vale (CSV) and Swindon (possibly 2011/12)
- Elmbridge Transport (possibly 2014 – 16)
- West of Severn P&R (possibly 2012/13)
- Improvements to PT services on other corridors in the CSV (to be outlined in the CSV Transport Strategy (draft expected August 2009) (implementation possibly between 2012-2019)

These projects are likely to be put forward to the DfT as major scheme bids. As part of the business case and bid submissions, the impact and potential CO_2 savings will be identified.

With the level of data available it is not possible to assess whether a reduction in transport emissions will in fact be achievable during the LAA period. On the one hand there are indications that emissions may have already 'turned the curve' and be falling, according to the statistics for 2005 and 2006 – however it is not clear what exactly the causes are and whether this trend is continuing. It is possible that improvements in fuel efficiency may lead to a reduction in emissions even if the desired reduction in vehicle kilometers is not achieved. This is also an area in which recession is likely to have an impact, but again the scale and duration is unknown at present.

Table 28: Local transport carbon action plan

1	Action	Target	
Development of LTP3 LTP3 will be based upon 5 goals as set down by DfT, one of which is climate change. Carbon reduction will therefore be a main theme.		To be set	
	MILESTONES	Start	Finish
2009-11	Issues and Options Consultations	April 2009 Dec 2009	May 2009 March 2010
2010-11	Consultation on Draft LTP3 Submission of LTP3 to GOSW	March 2010 March 2011	June 2010 April 2011
Delivery partners Gloucestershire Environment Partnership, Gloucestershire First, Gloucestershire Highways, Health Sector, Highways Agency, Transport Operating Companies, Network Rail, Glos County Council, Glos Chamber of Trades, Glos District Councils			
Monitoring Procedures LTP3 will be monitored annually with the production of an annual progress report**.**			
Resource Implications			
Risks Funding restraints, especially revenue.			

2	Action	Target	
Monitoring NI186 KM & CO_2 Targets within LTP2		LPT2 target to restrain the increase in vehicle kms to 1.4% per annum	
	MILESTONES	Start	Finish
2008-11	To maintain the 2004 baseline of number of cycling trips (index of 100)	April 2008	March 2011
2008-11	To reduce the percentage of CSV residents travelling to work in Gloucester or Cheltenham by single occupancy car mode to less than 50% by 2011	April 2008	March 2011
2009-10	LTP 2 Delivery Report 2010	May 2009	Sept 2009
2010-11	LTP 2 Delivery Report 2010	May 2010	Sept 2010
Delivery partners Gloucestershire Environment Partnership, Gloucestershire First, Gloucestershire Highways, Health Sector, Highways Agency, Transport Operating Companies, Network Rail, Glos County Council, Glos Chamber of Trades, Glos District Councils			
Monitoring Procedures LTP2 will be monitored annually with the production of an annual progress report**.**			
Resource Implications Staff time within Transport Planning Unit and Gloucestershire Highways			
Risks Current LTP2 programme does not deliver expected reductions in vehicle kms and related CO_2 emissions			

3	Action	Target
School Travel Plan Programme (LTP2 project)		315 (100%) schools in Gloucestershire to have a travel plan in place by 2010. (216 in place in March 2008) Reduce by at least 5%, the number of children travelling to school by car by 2010 from 2005 base year 35%. (in 2007/8 the figure was 29.3%)
	MILESTONES ONGOING WORK WITH SCHOOLS	Start Already started Finish 2010
Delivery partners GCC, Gloucestershire Highways, Children & Young Peoples Directorate, DfT		
Monitoring Procedures Annual surveys of children in primary schools		
Resource Implications Staff time within Transport Planning Unit and Gloucestershire Highways, currently funded through Area Based Grant via LAA		
Risks Current funding through LAA Area Based Grant runs out in 2010. The school travel plan programme will be cut unless funding levels are maintained.		

4	Action	Target
Workplace and Residential Travel Plans secured through the planning process		No specific target in terms of numbers as responsive to planning applications being submitted.
	MILESTONES ONGOING.	Start Already started Finish 2010
Delivery partners GCC, Gloucestershire Highways, District Council's as planning authorities, Developers, businesses and residents.		
Monitoring Procedures Annual surveys to be conducted by occupiers of developments when these are built GCC is in the process of monitoring the number of development sites where a travel plan has been requested.		
Resource Implications Staff time within Transport Planning Unit. Ideally, we would have the resources to approach and help existing businesses and residential areas to promote travel planning. This is a programme of work that could potentially be funded through the GEP.		
Risks The success of workplace and residential travel plans is dependent on co-operation from the developers and the businesses and residents who occupy the sites once constructed.		

5	Action	Target
Promotion of carsharegloucestershire.com		Increase car sharing via carsharegloucestershire
	MILESTONES	Start Already started Finish 2010
Delivery partners GCC, Gloucestershire Highways, Highway Agency		
Monitoring Procedures Carsharegloucestershire.com database/website provides data on numbers of people registered and potential CO_2 savings if these people car-shared		
Resource Implications Staff time within Transport Planning Unit £5K per annum software licence fee Revenue required for marketing		
Risks Due to revenue funding constraints, marketing of carsharegloucestershire.com is limited to press releases and roadside signs.		

6	Action	Target	
Gloucestershire County Council Shire Hall Travel Plan (including commuter travel), reduction in business mileage and fleet review The travel plan also includes a discount bus ticket scheme, incentives to encourage cycling, travel information leaflets and on staffnet		5% reduction in business mileage by 2010 on 2006/7 levels (7 million miles).	
	MILESTONES Business Mileage Review Vehicle fleet review	Start Already started	Finish 2010 (ongoing afterwards)
Delivery partners GCC (all GCC Directorates), Gloucestershire Highways.			
Monitoring Procedures Business mileage to be monitored on an annual basis by performance teams.			
Resource Implications Staff time within GCC Directorates.			
Risks As the GCC Staff Travel Plan has no specific resource allocated to it (other than to the process of conducting the reviews) the level of promotion and monitoring activity related to staff commuter and business travel is limited.			

7	Action	Target	
Working with bus operators to improve quality and frequency of public transport and to increase the number of public transport journeys. (LTP2 project).		Increase number of public transport journeys by 23% by 2010/11 from a base year of 2003/4.	
		Start	Finish
	MILESTONES Ongoing work with bus operators LTP Progress Report due September 2009	April 2008	2010
Delivery partners GCC, Gloucestershire Highways, Highway Agency, Public transport operators.			
Monitoring Procedures Bus patronage data supplied by the bus operators.			
Resource Implications Revenue support required for bus services on non-commercial routes or times. S106 monies sought from developers to support services may be more difficult to come by due to recession.			
Risks Due to revenue funding constraints, the ability of GCC to continue to fund certain services may result in service reductions.			

8	Action	Target	
Ensuring new developments meet accessibility requirements to reduce the need for travel by car.		Maintain the level of 88% of households to be within 30 minutes of a GP surgery without the need to travel by car.	
	MILESTONES LTP APR to report latest figures by September 2009 Review of S106 and CIL contributions based on accessibility	**Start** April 2008 May 09	**Finish** 2010 Sept 09
Delivery partners GCC, Gloucestershire Highways, Highway Agency, Developers, Planning Authorities, Service providers			
Monitoring Procedures			
Resource Implications S106 monies sought from developers to support services may be more difficult to come by due to recession.			
Risks .Although planning & highway authorities have some control over facilities at new developments, existing service provision and future service provision, e.g. health facilities, post offices etc are subject to other pressures and local centres may close, leaving residents further to travel. Public transport services which are poorly used may also face withdrawal. Closer partnership working through GEP should mitigate this risk to a certain extent.			

9	Action	Target	
J9 Business Group Travel Planning and Tewkesbury Healthy Towns Initiative.		To increase levels of walking, cycling and public transport use in Tewkesbury. Targets to be set	
		Start	**Finish**
	MILESTONES Quarterly reports on project progress Each workstream has its own schedule and milestones Project completion by 2010/11	April 2009	2010/11
Delivery partners Gloucestershire County Council, Gloucestershire PCT, Department for Health, Tewkesbury Borough Council, Highway Agency, Public transport operators			
Monitoring Procedures Project monitored on a Quarterly basis by Tewkesbury Borough Council			
Resource Implications £400K bid for and allocated to GCC from project funds to lead on transport and travel related projects. Considerable staff time provided as match funding by GCC.			
Risks Due to tight timescales, some workstreams may fall behind schedule due to the number of partners involved in delivery.			

9 Summary of actions and targets

Delivery plan	Domestic	Business	Public	Road Transport	All
Savings from national measures with local influence	35.06	9.3			
Savings from local measures	6.4	42.5	7.6	- 43.4	
Total savings	**41.46**	**51.8**	**7.6**	**- 43.4**	**57.46**
Target	48	57 (Business & Public)		31	136
Shortfall (surplus)	6.54	(2.4) (Business & Public)		75.3	78.54

Table 29: Overview of emissions targets and estimated savings in kt CO_2 for the period 2007 - 2010. 'Target' and 'Shortfall' data for the Business and Public sectors are combined.

The data presented in Table 29 highlights the contrast in progress made by the GEP in tackling CO_2 emissions across the sectors, based upon estimated emissions savings for the LAA period 2007 - 2010. Good progress is predicted for the Domestic, Business and Public sectors, with savings totalling around 100 kt CO_2. The Road Transport sector fares less well, however, with savings estimated at around -43 kt CO_2 (i.e. an increase in emissions). The predicted poor performance of the Road Transport sector is largely a reflection of the fact that the GEP are limited by the constraints of the existing LTP2, which is operational until the end of the current LAA period.

This leaves a potential shortfall in savings overall, although it may be that external factors will operate to drive emissions down in the transport sector, such as the economic downturn or new national measures. Efforts will also be made to gear up action further within the domestic and business sectors, where the partnerships are well developed and showing early successes. The scale of action that is possible is however resource dependent.

Table 30: Summary of action plans for LAA period

Sector	Action number	Action	Proxy targets
Domestic	1	advice	40,000 households advised
			370 home visits
	2	Local programme of installations	9,329 main measures installed
	3	Support to vulnerable households	7,500 referred for installation grants
	4	Supporting and enabling renewables installations	440 new installations
			2.6 MW new capacity
	5	Retrofit for deep cuts in existing homes	50 exemplars

	6	Community behavioural change programmes	500 households engaged
	7	Installers network	-
	8	Low energy lighting awareness campaign	-
	9	Monitoring plan	-
	10	strategic support programme	-
	11	Communication of 186	-
	12	ICT awareness campaign	-
	13	EPC awareness campaign	-
Business	1	Regional resource efficiency business support	88 Businesses advised
	2	Support to 100 top business energy consumers, developing agreed action plans	100 businesses engaged
	3	Creation of low carbon partnerships in each district	1 LCP per district 10 members per LCP
	4	Business energy surveys and follow up support	180 businesses received surveys
	5	Provision of training in Carbon Management to businesses	65 businesses to receive training
	6	Micro business advice	500 micro businesses supported
		Webinar to promote micro business energy efficiency	1 webinar delivered
	7	Expert Construction Symposium	To hold 1 symposium, and conduct feasibility for establishing a Sustainable Construction Skills Centre
	8	Promotion of renewable energy solutions to businesses	Support 15 businesses in identifying appropriate renewable energy systems.
		Installer network	Maintain a sustainable energy installer network available for businesses
Public	1	Member organisations internal carbon management programmes : 7 LAs,NHS, Glos University.	Review existing carbon reduction plans
	2	Training of facilities staff	50 facilities staff trained
	3	Engaging wider public sector	-
	4	Public sector procurement	-

Transport	1	Develop LTP3	-
	2	Maintain number of cycling trips	Indexed of 100
	2	Reduce single occupancy car travel	Less than 50% by 2011
	3	Reduce number of children travelling to school by car	At least 5% by 2011
	4	Use planning process to secure workplace and residential travel plans	-
	5	Promoting car sharing	Promote carsharegloucestershire website
	6	County Council travel plan	5% reduction in business mileage
	7	Increase public transport journeys	Increase by 23% by 2011
	8	Increase non – car accessibility to community facilities	88% of households to be within 30 min of a GP surgery
	9	Increase non-car modes of transport in Tewkesbury	-