



South Gloucestershire

# Climate Change Strategy

**Low Carbon**  
**South Gloucestershire**

2013-2015

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# Low Carbon South Gloucestershire





# Our commitment and ambition

Climate change is the greatest environmental challenge facing the world today and we are committed to playing our part in limiting the dangerous effects of climate change. We recognise that we can have a significant influence over carbon emissions in the area and that our vision and leadership is critical to the local achievement of the UK Government's climate change objectives.

Ensuring natural resources are used wisely, reducing carbon emissions, preventing pollution and waste and conserving and enhancing the natural environment are cross cutting values in the South Gloucestershire Community Strategy 2012. Reducing carbon emissions is given a high priority in our place theme.

Substantially improving our energy security and reducing our carbon dioxide emissions presents great challenges and great opportunities. As energy prices rise and the cost of carbon emissions becomes a significant factor in decision making, the efficiency improvements we make in the coming years will pay dividends. They will make our businesses more competitive and our communities fairer and more resilient as well as improving our quality of life. The shift towards less energy intensive and more environmentally sustainable technologies will present significant opportunities for local economic growth.

Much work is already underway and for some issues the solutions are evident but this is a complex and challenging agenda and will require us to transform our current ways of thinking and operating. We recognise that we still have a lot to learn and we aim to work with our partners in the public, private, voluntary and community sector to support and enable the development and delivery of local solutions to address these global problems.

This strategy framework and supporting action plans set out our plans for delivering the transition to a low carbon South Gloucestershire and an energy system that is more secure. We are also assessing the risks associated with the changing climate and our climate change adaptation plan, to manage those risks, will be published later in 2013. This will form part 2 of our Climate Change Strategy.



# About South Gloucestershire

South Gloucestershire is in the West of England between Gloucestershire and Bristol, the Severn Estuary and the Cotswolds. South Gloucestershire is a mix of long-established urban communities, market towns, small villages, extensive rural landscapes and substantial new development. Around 264,800 people live in South Gloucestershire and there are around 109,500 homes. Provision is being made to accommodate another 28,355 homes by 2026 along with commercial and industrial development. The resulting pressure on infrastructure and increase in carbon emissions present significant challenges but also bring opportunities for creative and innovative solutions.





# Introduction and policy context

The changes in the climate that we have seen over recent years are thought to be largely a result of human behaviour rather than natural changes in the atmosphere. Global average temperature increases have been directly linked to human activity, and predictions are for temperatures to continue to rise over the coming century (Intergovernmental Panel on Climate Change, 2007). These increases in temperatures are predicted to have devastating effects around the world including sea level rises and an increase in the frequency and severity of extreme weather events. Severe health, social and economic impacts are predicted around the world and in the UK.

The International Panel on Climate Change has called for strong action by all Governments to reduce emissions of greenhouse gases and parties to the United Nations Framework Convention have agreed to stabilise greenhouse gas concentrations in the atmosphere. The UK Government response to this is the Climate Change Act 2008 which sets a legally binding target to reduce UK greenhouse gas emissions by at least 80% by 2050, compared to 1990 levels.

The Climate Change Act introduced a system of 'carbon budgets' which set legally binding limits on the amount of emissions that may be produced in the UK during successive five-year periods, beginning in 2008. The first three carbon budgets covering the period 2008 to 2022 were set in law in May 2009. The fourth carbon budget, covering the period 2023–27, was set in law in June 2011.

The Carbon Plan 2011 sets out how the UK will achieve decarbonisation whilst maintaining energy security, and minimising costs to consumers. Achieving the targets will require major changes in how we use and generate energy. The plan sets out short term and long term proposals for achieving this.

The report by the Committee on Climate Change (May 2012) identifies the crucial role for local authorities in meeting national carbon budgets and demonstrates that emissions reductions without local action will be insufficient. It recommends that all local authority areas should develop a low-carbon plan that includes a high level of ambition for emissions reductions and focuses on emissions drivers over which local authorities have influence in buildings, transport, waste, renewable power generation and their own estates.

The UK has also signed up to achieve a legally binding EU target that 15% of total energy consumed will come from renewable sources by 2020. Plans for unlocking the renewable energy resource potential in the UK are set out in the Renewable Energy Road Map to 2020. Under the National Planning Policy Framework local authorities are required to help increase the use and supply of renewable and low carbon energy and to recognise the responsibility on all communities to contribute to energy generation from renewable or low carbon sources.

## Local context and our approach

This document sets out our strategic framework and short term action plans for reducing carbon emissions in South Gloucestershire. It has been developed over the last eighteen months in consultation with a wide range of stakeholders. Part 2 of our Climate Change Strategy will address managing the risks associated with a changing climate and will be published later in 2013.

In South Gloucestershire we spend about £650million each year on energy for our homes, businesses and transport, and energy prices are rising. Most of the energy we use is produced from the burning of fossil fuels which emit greenhouse gases that contribute to climate change. Carbon Dioxide (CO<sub>2</sub>) accounts for the greatest proportion of these gases.

We recognise that we have a crucial role to play in leading energy efficiency initiatives, in maximising opportunities to stimulate jobs and green growth and in enabling the development of low carbon and secure supplies of energy. This Strategy provides a local framework for delivery and our proposals on carbon reduction involve taking a more strategic approach to energy planning and aim to address energy security issues as well as carbon reduction.

Action plans have been produced for each of the six priority areas. The action plans include a summary of the issues and key actions for the next 2 years. Where possible we have included outcome based actions with interim measures of performance but for some issues we are still learning about the solutions and interventions required and cannot be so specific. The action plans are presented under priority themes for ease of communication but much of the work is of a crosscutting nature and action in one area will link to or benefit from action in another.

The priorities and actions have been selected following an assessment of issues that can be controlled and influenced locally. Many of the actions will deliver significant health, economic and social benefits and this has also been taken into account. There is a significant overlap with the local health and economic agenda and we will seek to integrate our delivery programmes. Much of the work will be delivered in partnership with other organisations and those involved in delivery are outlined for each priority area. This is not an exclusive list and as the work develops we hope that more organisations and groups will get involved.

During the consultation many suggestions for new actions and approaches were received, in particular the need to focus on behaviour change activities. Where resources are available and delivery partners have been identified, these actions have been included. Other suggestions will be explored as we continue to develop and implement the Strategy over the next twelve months.







## Our aims

To reduce the demand for energy - Power Down

To increase the generation of renewable and low carbon energy - Power Up

To lead, influence and enable the change to a low carbon South Gloucestershire

## Our priorities for action

### Low Carbon Council

Reduce carbon emissions across the council estate and operations

### Low Carbon Homes

Reduce carbon emissions and energy consumption in our homes

### Low Carbon Travel

Reduce transport energy use and carbon emissions from transport

### Low Carbon Economy

Promote business resource efficiency and help low carbon and local businesses grow in South Gloucestershire

### Low Carbon Energy

Enable the development of secure supplies of renewable and low carbon energy

### Low Carbon Communities

Support and promote neighbourhood energy planning and community action for low carbon living

# Our targets

We have set local targets on carbon reduction and renewable energy which have been derived from the legally binding UK targets and from an assessment of local renewable energy resources.

## Carbon reduction

### 2050

To reduce CO<sub>2</sub> emissions in South Gloucestershire by 80% by 2050 on a 1990 baseline to 414.6Kt in line with the UK Target (Total saving of 1,658.7 Kt since 1990 and of 1,280.9 Kt since 2008)

### 2025

To reduce CO<sub>2</sub> emissions in South Gloucestershire by 50% by 2025 on a 1990 baseline to 1036.7Kt (Total saving of 1,036.7 Kt since 1990 and of 658.8 Kt since 2008)

### 2020

To reduce CO<sub>2</sub> emissions in South Gloucestershire by 35% by 2020 on a 1990 baseline to 1347.7Kt (Total saving of 725.7 Kt since 1990 and of 347.8 Kt since 2008)

### 2015

To reduce CO<sub>2</sub> emissions in South Gloucestershire by 29% by 2015 on a 1990 baseline to 1472.1Kt (Total saving of 601.3 Kt since 1990 and of 223.4 Kt since 2008)

### Per capita emissions

The reduction in per capita emissions required to keep pace with the target reductions in absolute emissions has been calculated using ONS 2010 Sub National Population Estimates. These estimates are forecast using past trends (based on births, deaths and migration over the last four years) and do not take into account new housing allocated in the Core Strategy. It is likely that work will be commissioned during 2013 to provide population projections which reflect the Core Strategy housing allocations, but this is not yet available. If the ONS 2010 estimates were accurate, per capita emissions would need to reduce from 6.5 tonnes in 2008 to 5.3 tonnes in 2015, 4.7 tonnes in 2020, and 3.5 tonnes in 2025 in order to keep pace with the targets set out above. This equates to 2.7% a year.

## Renewable energy

For the equivalent of 7.5% of South Gloucestershire's total energy demand (or 508GWh) to be generated from renewable energy installations located within South Gloucestershire by 2020 in line with the UK Target.

This is equal to 23% of electricity and 8% of heat.







# Rational for the targets

## Carbon reduction

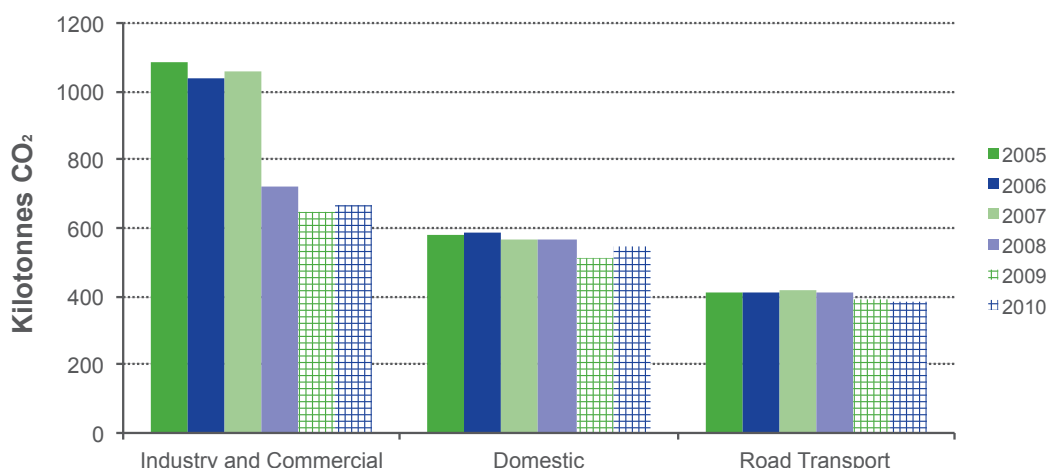
Carbon emissions data are published annually by the Department of Energy and Climate Change (DECC) and are available going back to 2005. Two data sets are produced and the data that we will be using to monitor this Strategy exclude emissions from sources that are considered by Government to be beyond the scope of local control and influence (motorway traffic, large industrial processes that are classed as European Union Emissions Trading Scheme sites, diesel railways and net emissions from land use, land use change, and forestry<sup>1</sup>). It includes CO<sub>2</sub> emissions from domestic, industrial and commercial (including the public sector), and road transport (excluding motorway) sources. A summary of the methodology used for compiling this information is set out in the Background Information section at the end of this document.

CO<sub>2</sub> is not the only GHG but it accounts for about 83% of GHG emissions in South Gloucestershire. Given that DECC's annual Local Authority Emissions Estimates include CO<sub>2</sub> only; we will be using the CO<sub>2</sub> data as our proxy for reporting total GHG emissions.

The energy we consume in our homes, businesses and road transport (excluding motorways) produced 1,601 Kilotonnes (Kt) CO<sub>2</sub> in 2010. This is equal to 6 tonnes for each resident (DECC). In 2010, 42% of emissions came from industry and commercial sources, 34% from domestic sources, and 24% from road transport (excluding motorways).

The graph below shows trends in CO<sub>2</sub> emissions by sector for the six years for which data have been available:

**CO<sub>2</sub> Emissions Estimates for South Gloucestershire by Sector 2005-2010 (DECC)**



<sup>1</sup> Net Land Use, Land Use Change and Forestry (LULUCF) emissions account for approximately 0.7% of the total emissions within South Gloucestershire. Although not included within our analyses, these emissions will be addressed through policies and work on green infrastructure.

Total emissions fell from 2,077 (Kt) in 2005 to 1,601 Kt in 2010, a decline of 23% over 6 years. Per capita emissions fell from 8.1 tonnes per person in 2005 to 6.0 tonnes per person in 2010. Commercial and industrial emissions fell by 38%, domestic emissions by 6.5% and transport emissions by 6% between 2005 and 2010. This was despite an increase in population of 9,400 to 264,800 in 2010.

The most dramatic reduction (17% in one year) was between 2007 and 2008, with the majority of this reduction resulting from the closure of one major industrial operation (Terra Nitrogen) in the Severnside area in early 2008. Other influencing factors are thought to be energy efficiency improvements and the economic downturn.

The latest figures show an increase in emissions of 3% between 2009 and 2010 with increases from commerce and industry and the domestic sector which is consistent with national trends, and is thought to be predominantly a result of increased gas use for space heating (2010 being the coldest year since 1987).

### The scale of the challenge – setting a local target

To plan for the emissions reduction 'journey' to 2050 in South Gloucestershire, we need interim targets to gauge progress along the way.

As reliable emissions data have only been available at a local authority level since 2005 it is necessary to project backwards to determine the 1990 baseline. It is proposed that this is done from the 2008 baseline so as to align with the national carbon budgets and to avoid the impact of the skew in the data caused by the closure of Terra Nitrogen in 2007. Nationally an 18% saving was achieved between 1990 and 2008 and for the purpose of this plan it has been assumed that this has been reflected locally. This gives a baseline for 1990 of 2073.3 Kt CO<sub>2</sub> for South Gloucestershire. The table below shows the reduction in Kt required for each target year.

Year	Target reduction on 1990 baseline (%)	South Gloucestershire emissions (Kt CO <sub>2</sub> )
1990	0	2073.3 (estimated baseline)
2008	18%	1695.5 (actual DECC data)
2015	29%	1472.1 (target)
2020	35%	1347.7 (target)
2025	50%	1036.7 (target)

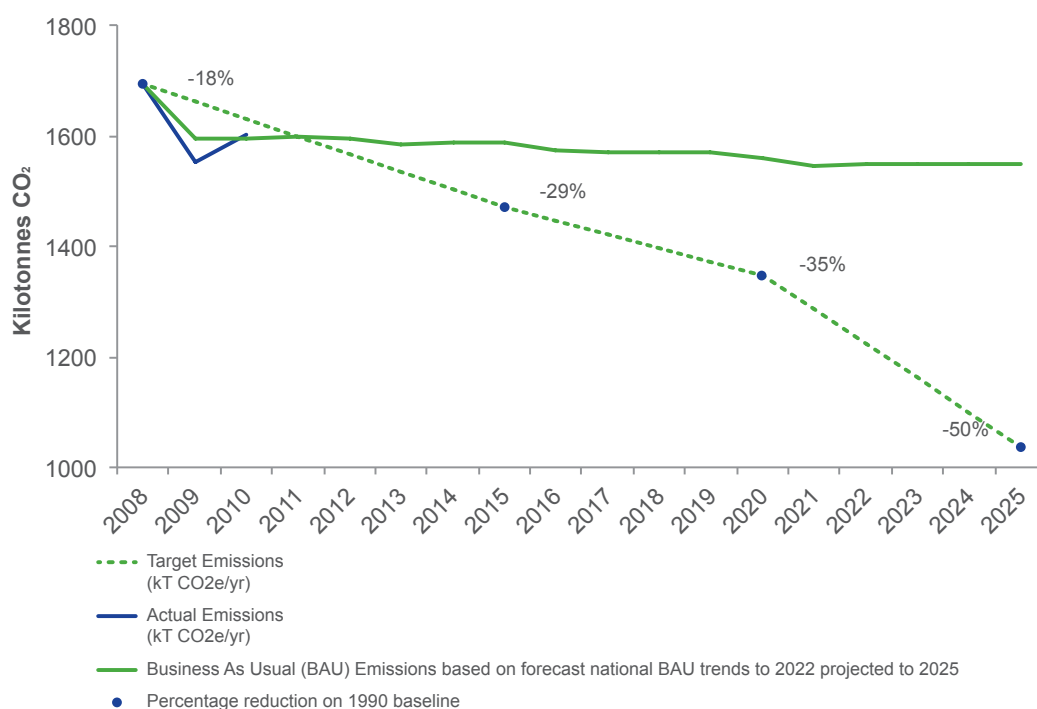
Assuming there is a steady decline in emissions from one carbon budget mid year to the next, the graph below shows the target CO<sub>2</sub> reduction journey for South Gloucestershire from 2008 to 2025.

The graph also provides an indication of what would happen if no additional interventions were taken beyond those already planned. This is called Business as Usual Emissions and has been based on the national 'Business as Usual' forecast<sup>1</sup> to 2022 and projected to 2025 as shown on the graph.





## Target CO<sub>2</sub> Emissions Reduction Journey to 2025 compared with Business as Usual and Actual Emissions



The actual emissions data for 2008 to 2010 has also been shown on the graph. In the first year, it can be seen that emissions declined more quickly than the target 'journey' to 2025. However emissions increased in 2010 compared with 2009. This is consistent with national and regional trends.

The policies and measures set out in the national Carbon Plan set the framework for how GHG emissions in South Gloucestershire will be reduced over time. Some of the national measures, such as legal standards for increasing the energy efficiency of appliances and fuel efficiency of vehicles, will cascade into local savings with no or little need for local intervention. Other national measures such as financial incentives for improving the energy efficiency of dwellings and investing in renewable energy projects are much more dependent on local involvement to enable and promote local delivery.

The extent of measures proposed in the national Carbon Plan has been designed to ensure that the UK Carbon Budget targets are met. Assuming that the national measures are successfully implemented (including those requiring local intervention for delivery) – this will set us well on our way to reducing emissions. However, because of the high levels of forecast growth in South Gloucestershire, we will need to move faster than most to ensure we keep pace with the national carbon reduction journey. Concerted and coordinated local action will therefore be required, with every opportunity taken to set us on track to a low carbon future

# Renewable energy

## The case for renewable energy

Much of the electricity supplied via the national grid is produced using fossil fuels such as coal, which results in significant GHG emissions. Energy supplied to the national grid from renewable or other low carbon sources reduces the overall carbon intensity of grid supplied electricity. The greater the amount of renewable and low carbon energy that supplies the grid the lower the carbon intensity of grid supplied electricity.

Although much of the action required to achieve decarbonisation of the grid will take place at the national level (through proposed new nuclear, carbon capture and storage, and national renewable energy projects such as offshore wind), grid connected onshore renewable electricity projects will also make a significant contribution, and there is considerable local influence over the development of onshore renewable electricity. Grid-connected renewable energy installations in South Gloucestershire will help reduce the carbon intensity of the grid and, along with all other on and off shore renewable energy installations in the UK, will contribute to reductions in the local carbon emissions data for South Gloucestershire.

Existing renewable energy installations in South Gloucestershire provide enough energy to supply about 0.35% of South Gloucestershire's energy demand. Assuming the consented but not yet built Alveston wind park, Warburtons wind turbine, Severnside energy from waste plant and Hallen anaerobic digestion plant are developed, this will provide sufficient renewable energy generation capacity to supply an estimated additional 3.0% of South Gloucestershire's energy demand. Further proposals for ground mounted solar PV and a large scale wind project are under consideration (March 2013) and others may come forward in the near future.

## The renewable energy resource in South Gloucestershire – setting a local target

An updated assessment of available renewable energy resources in South Gloucestershire has been carried out using the information in the 2010 AECOM resource assessment report and using updated information provided by DECC and Regen SW (the regional independent renewable energy advice organisation). The assessment includes onshore wind, biomass from energy crops, biomass from wood, energy from waste, anaerobic digestion, ground mounted solar PV, roof mounted solar PV, solar thermal, heat pumps, landfill gas and hydropower.

Off shore wind and tidal energy are excluded from the resource assessment as these technologies would be counted as national infrastructure projects. Nuclear power is also excluded as the energy source is not renewable and it is also classed as a national infrastructure project. However the proposed new nuclear power plant at Oldbury on Severn will if it is consented and developed make a significant contribution to the Government's plans to deliver a diverse mix of low carbon energy. The Council and community will have a role in responding to proposals for national infrastructure projects and this is reflected in the action plans.





The resource assessment indicates that the theoretical maximum renewable energy generation based on South Gloucestershire's indigenous renewable energy resources could deliver approximately 11.2% of South Gloucestershire's energy demand. The resource assessment 'counts' energy that could be generated from South Gloucestershire's resources, no matter where the energy gets generated (e.g. energy generated in an anaerobic digestion plant outside of the council area using South Gloucestershire's food waste has still been counted towards South Gloucestershire renewables contribution).

Assessing the renewable energy resource potential is a good theoretical basis for developing a target but presents problems in terms of monitoring, as available monitoring data are derived from installed capacity of renewable energy infrastructure (ie counting energy generated in South Gloucestershire no matter where the resources or fuel come from).

For the purposes of setting a target, potential renewable energy generation based on installed capacity of renewable energy infrastructure in South Gloucestershire has therefore been considered.

Delivering the maximum theoretical capacity would be unrealistic as there are many environmental, social and economic constraints and influences. The Government's Renewable Energy Roadmap indicates that approximately half of their 15% renewable energy target (7.5%) will be met from 'National' level deployment with little or no local influence and that approximately half will be met from technologies and resources over which there is local control and influence. We therefore consulted on setting a target to deliver 7.5% of South Gloucestershire's total projected 2020 energy demand from renewable sources and on an indicative mix of technologies that would need to be deployed to deliver it.

Most respondents to the consultation thought the proposed renewable energy target was about right. A few people said it was too challenging and a few said it was not challenging enough and there was some disagreement on the desirable/expected mix of technologies that can be deployed in the time scale to deliver the target.

Adjusted scenarios have been produced to reflect the different combination of technologies that could be deployed to deliver 7.5% of our energy from renewable sources. The estimates of energy generated have been derived using assumptions about available resources and efficiency of renewable power and heat conversion at the current time as advised by Regen SW. More detailed information is available in the South Gloucestershire Renewable Energy Resource Assessment Summary and Update report and accompanying Technical Appendix (see references and links on page 35).

It is not possible to accurately predict the type, size and location of technologies that will be installed by 2020 as this will be reliant on the individual planning applications and projects that are brought forward by developers, individuals and communities, and these projects being granted planning consent. Deployment levels will also be influenced by advances in technology which may result in more efficient systems or new technologies being available.

The proposed renewable energy supplementary planning document (SPD) will set out local planning guidance on renewable energy and may influence the location of development.

We have considered all the views submitted and consider that a 7.5% target is challenging but achievable and can be met in a variety of ways that will satisfy social, economic and environmental requirements. We have also expressed the target in terms of proportion of electricity produced and heat generated so as to make it more meaningful.

Four scenarios are included to show how a varying mix of technologies could meet the 7.5% target:

**Scenario 1** - This is the original 7.5% scenario presented in the consultation

**Scenario 2** - This is the same as Scenario 1, with technical adjustments based on more accurate information provided by the developers during the consultation period. The number of large wind turbines has been reduced to account for the increased energy from the SITA EfW plant

**Scenario 3** - This is a reduced wind scenario. The capacity of ground mounted solar PV is almost doubled, and 4 farm scale AD plants are included. This allows a significant reduction in large and medium scale wind; there are 5 large and 5 medium turbines in this scenario

**Scenario 4** - In this scenario wind capacity stays as per the original scenario, and ground mounted Solar PV is reduced to account for the increased capacity of the EfW plant compared to the original scenario (Scenario 1)

**Please note:** These are indicative scenarios. They do not represent preferred solutions or the only solutions.





**Renewable energy deployment potential in South Gloucestershire by 2020 (indicative scenarios) - GWh production by resource**

Technology	Unit	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
		Number of units	Total energy output (GWh)	Number of units	Total energy output (GWh)	Number of units	Total energy output (GWh)	Number of units	Total energy output (GWh)
Energy from Waste - SITA	MWe (renewable) installed	11.2	132.5	15.8	150.0	15.8	150.0	15.8	150.0
Wind Turbines - Large	2MW turbine	15	71.0	11	52.1	5	23.7	15	71.0
Wood <sup>1</sup>	equivalent no 20kW boilers	1777	62.3	1777	62.3	1777	62.3	1777	62.3
Solar PV (ground mounted)	equivalent no 5MW systems	10	61.3	10	61.3	17	104.2	7	42.9
Solar PV (roof mounted)	equivalent no 2kW systems	25,642	44.9	25,642	44.9	25,642	44.9	25,642	44.9
Solar Thermal	equivalent no 2kW systems	22,242	39.0	22,242	39.0	22,242	39.0	22,242	39.0
Anaerobic Digestion - NES Hallen Plant	MWe (renewable) installed	3	28.0	3	28.0	3	28.0	3	28.0
Anaerobic Digestion - Farm Scale	equivalent no 250kW systems	2	8.7	2	8.7	4	17.3	2	8.7
Heat Pumps	equivalent no 5kW systems	8,318	22.4	8,318	22.4	8,318	22.4	8,318	22.4
Wind Turbines - Medium (900kW)	900kW turbine	10	21.4	10	21.4	0	0.0	10	21.4
Wind Turbines - Medium (500kW)	500kW turbine	5	8.3	5	8.3	5	8.3	5	8.3
Landfill Gas	MWe installed	1.05	5.5	1.05	5.5	1.05	5.5	1.05	5.5
Wind Turbines - Small	50kW turbine	10	1.5	10	1.5	0	0.0	10	1.5
Energy Crops	MWe installed	0.15	1.2	0.15	1.2	0.15	1.2	0.15	1.2
Hydropower	equivalent no 10kW systems	6	0.3	6	0.3	6	0.3	6	0.3
<b>Total Energy Output (GWh)</b>			<b>508</b>		<b>506.8</b>		<b>507.1</b>		<b>507.3</b>
<b>% of total projected 2020 energy demand</b>			<b>7.5</b>		<b>7.5</b>		<b>7.5</b>		<b>7.5</b>

<sup>1</sup> Forestry residues and clean arboricultural and construction waste

# Management, implementation and monitoring arrangements

South Gloucestershire Council and the South Gloucestershire Strategic Partnership are responsible for leading driving and monitoring action on Climate Change in South Gloucestershire.

Within South Gloucestershire Council the Policy and Resources Committee has overall responsibility for the strategy and the lead committee for co-ordination, monitoring and management is the Planning Transportation and Strategic Environment Committee

All members, managers and staff are responsible for implementing the strategy and ensuring that Council policies, decisions, projects and procurement are delivered in line with the priorities in the Strategy.

South Gloucestershire Council provides the resource for co-ordinating the Strategy. The lead officer for co-ordination and management of the Strategy is the Director of Environment and Community Services supported by the Strategic Environment and Climate Change team.

Climate Change Action Plans provide a summary of the key actions for each of the priorities. Many of the actions appear in more detail in other strategies and plans and these are listed at the end of each section. The Council Committees and delivery partners who are responsible for delivering and monitoring actions in each section are listed for each action plan.

The overall targets and targets for each priority area provide the performance management framework for the strategy. Progress will be monitored bi-annually by the Planning Transportation and Strategic Environment Committee and the Local Strategic Partnership. Any problems with delivery will be reported to the Policy and Resources Committee and the Local Strategic Partnership.

Further work to quantify projected carbon savings from the proposed actions will be carried out to inform future planning and we will continuously review and develop the Strategy to overcome blockages, develop opportunities and secure local benefits

A Low Carbon South Gloucestershire advisory group comprising representatives of key delivery organisations, action owners and experts will be set up to advise the council and the Strategic Partnership on the development and implementation of the Strategy. A formal annual review will be undertaken by this group to monitor progress, assess lessons learnt and improve targeting and resourcing of the plan. The report will be submitted to the Planning Transportation and Strategic Environment Committee and the Local Strategic Partnership

The South Gloucestershire Environment Forum provides the mechanism for wider community engagement and involvement.





# Action Plans

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Our action plans are presented under priority themes for ease of communication but much of the work is of a crosscutting nature and action in one area will link to or benefit from action in another. These are partnership action plans and we are grateful to all the organisations and individuals who are involved in their development and delivery some of whom are acknowledged on this page. The action plans will be reviewed and updated annually to reflect our responses to new opportunities, issues and challenges.

## Low Carbon Council

**Priority:** Reduce carbon emissions across the council estate and operations, and across the wider Public Sector in South Gloucestershire

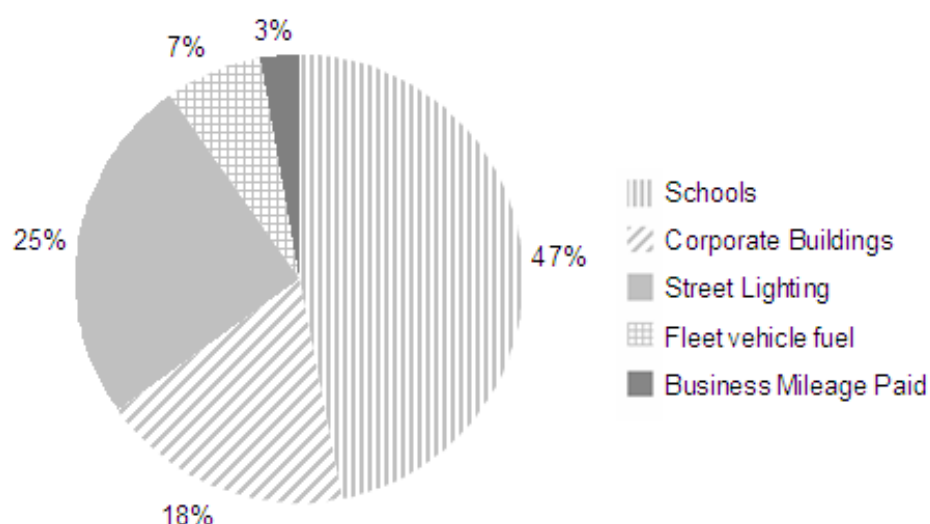
**Target:** 3% per annum reduction in the council's greenhouse gas emissions

### Issues

The Carbon Management Plan is the main document setting out the council's ambition and plans for the management and reduction of greenhouse gas (GHG) emissions from its own estate and activities. Emissions within scope for the Carbon Management Plan and target are from energy consumption in buildings (including schools), electricity consumption in street lighting (including lighting for signs, bollard etc), fuel use in fleet vehicles, and business mileage paid (excludes commuter mileage which is subtracted from claims for journeys starting or ending at home).

In 2011/12, GHG emissions from these sources totaled 29,346 tonnes CO<sub>2</sub>(e) - a 7.8% reduction in emissions compared with the previous year. The breakdown of emissions in 2011/12 is shown in the graph below:

### Greenhouse gas emissions by source 2011/12



Other GHG emissions that result from the council delivering its functions include the emissions associated with outsourced services, such as domestic waste collection and processing, and the emissions 'embedded' in the products and services that we procure. These emissions are less easily measured and controlled by the council, but can still be influenced.

The council works closely with its public sector partners to deliver services throughout South Gloucestershire and these organisations are also taking action to reduce emissions across their estates. Actions from some of these organisations are summarised below.

### Improve the energy efficiency of our assets and operations; rationalise and share assets where appropriate

Action	Measure	Timescale	Who
Consolidate and rationalise the council estate, make better use of space and share/lease surplus space	Accommodation strategy implemented achieving an estimated saving of 25% of emissions from corporate buildings (which account for about 18% of the council's total emissions)	2009/10-2014/15	Property Services
Monitor energy consumption and implement behaviour change and energy management programmes to deliver more efficient use of corporate buildings and schools	Minimum of one energy campaign a year	Annual	Property Services Corporate Sustainability
£1 million revolving Invest to Save fund to be made available to schools for lighting, heating control and draught proofing improvements	Estimated saving of 837 tonnes CO <sub>2</sub> per annum or 2.7% of total (2010/11) council emissions after full implementation	3 year programme (commenced 2012)	Property Services Adults and Childrens Services
Invest £200,000 capital annually on energy improvements to the non schools estate where a satisfactory pay back is demonstrated	Annual programme delivered	Annual	Property Services
Improve the energy efficiency of council ICT servers and communications equipment	Consolidation/ virtualisation, use of more efficient servers, sending servers into sleep mode when not in use.	Ongoing programme	ICT
Review and rationalise the street lighting and road signage stock and consider and further develop the case for LED bulb replacement	Column numbers rationalised and agreed improvement programme implemented	2013 - 2015	Street Care
Use the planning process to reduce extent of growth in external lighting and continue to roll out the part night lighting programme	Part night lighting rolled out across South Gloucestershire	October 2013	Street Care / Planning
Continue to review the potential to streamline and green the council's vehicle fleet and fleet operations	Reduction in emissions from fleet vehicles, 5% reduction in fleet size	Ongoing programme	Street Care
Reduce the number of car journeys to and between offices through the implementation of the green travel plan and smarter working policies enabling staff to work remotely	Reduction in business mileage	Ongoing programme	All Directorates

**Develop renewable energy in council buildings and on council land where appropriate**

Action	Measure	Timescale	Who
Use Invest-to-Save fund to meet the over and above costs of installing biomass boilers rather than gas boilers in schools whose boilers require replacement through the Invest to Save fund	Installation of biomass boilers with associated CO <sub>2</sub> savings. Estimated saving of 122 tonnes CO <sub>2</sub> per annum	2013/2014	Property Services
Review potential for development of community led wind energy projects on council owned land	Potential sites identified. Communities interested in community led energy projects informed of potential.	2013	Property Services and Corporate Sustainability
Review costs and incentives for renewable and low carbon energy solutions, assess viability for inclusion in refurbishment, building and maintenance programmes, and seek to access funding for viable projects	Energy generation potential and carbon saving will depend on schemes developed	2013/14	Property Services
Explore potential for use of waste wood from council owned land and operations	Review completed and recommendations produced	2013/14	Corporate Sustainability / Community Spaces

**Leadership and decision making**

Action	Measure	Timescale	Who
Revise the sustainability appraisal process for use in procurement and decision making	Revised appraisal process agreed and member and officer training carried out	2013/14	Corporate Sustainability
Improve our understanding of the greenhouse gas emissions arising from outsourced products and services and use our influence to reduce them	Recommendations of carbon footprint study of waste management service implemented Other reviews undertaken as appropriate	2013/14	Waste Management All Services
Publicise the actions being taken by the council to mitigate climate change, why they are important and the effects of these actions in terms of money and CO <sub>2</sub> saved	Information posted on SGC website	Ongoing	Corporate Sustainability / Corporate Communications



**Reduce carbon emissions across the wider public sector**

Action	Measure	Timescale	Who
Implement a programme of carbon saving measures across Avon Fire & Rescue Service to including the following elements: <ul style="list-style-type: none"> <li>▪ Low Carbon Buildings</li> <li>▪ Low Carbon Working</li> <li>▪ Low Carbon Fleet and Travel</li> <li>▪ Low Carbon Decisions</li> <li>▪ Low Carbon Communication</li> </ul>	Achieve a reduction in CO <sub>2</sub> emissions of 30% from a baseline year of 2008/9 by 31/3/2014.	On-going to 2014	Avon Fire and Rescue Service <b>Further Information:</b>  Avon Fire & Rescue Service Carbon Management Plan
Implement a programme of carbon saving measures across the Avon and Somerset Constabulary service including: <ul style="list-style-type: none"> <li>▪ Energy efficiency improvements and refurbishments</li> <li>▪ Energy management systems</li> <li>▪ Renewable energy projects</li> <li>▪ 4 new buildings built to BREEAM excellent standard</li> <li>▪ Computer upgrades</li> <li>▪ Sustainable procurement</li> <li>▪ Greening the fleet and green travel</li> <li>▪ Communication and awareness raising</li> </ul>	Achieve a reduction in CO <sub>2</sub> emissions of 30% from a baseline year of 2009/10 to 2016 from 19,126 tonnes to 13,388 tonnes	Ongoing to 2016	Avon and Somerset Constabulary Championed by Director of Finance and Sustainability Board
<ul style="list-style-type: none"> <li>• Conserve energy and water through infrastructure improvement and behavioural changes.</li> <li>• Minimise the amount we travel, especially by air and road</li> <li>• Ensure new facilities and equipment meet high standards for sustainability and energy efficiency</li> </ul>	Emissions from the estate and UK business travel reduced by 25%	By 2014/15 from 2009/10 baseline	MOD Filton Abbey Wood
Continual reduction in the carbon footprint of the University of the West of England (UWE) in line with the Carbon Management Plan (CMP). The CMP includes Scope 1 & 2 emissions and is due to include Scope 3 emissions by 2014.  The CMP addresses the following aspects of University's carbon footprint: <ul style="list-style-type: none"> <li>• Space planning policy.</li> <li>• Equipment procurement.</li> <li>• Refurbishment policy</li> <li>• Energy saving measures in academic and residential premises.</li> <li>• Longer term strategic actions.</li> </ul>	Absolute reduction from 2005/6 – 2020/21: •1.5% annual reduction •2016 interim target: 16.5% total reduction •Equating to 22.5% total reduction by 2020/21 Relative reduction from 2001/2 - 2020/21: •2016 interim target: 38% relative reduction •50% relative reduction (based on kgCO <sub>2</sub> per m <sup>2</sup> and average weather)	Ongoing to 2021	For Hyperlink to <b>UWE's</b> Carbon Management Plan see References Section

## Funding

Annual carbon management capital fund of £200,000 per year (until 2015/16).

£1.36 million Invest to Save Fund available to schools from April 2012 - 2015 to enable investment in projects to reduce schools' energy costs and CO<sub>2</sub> emissions.

Leadership and support for the delivery of the Carbon Management Plan will be provided within the council through elected representatives and senior managers.

Key strategies and plans	Delivery arrangements
South Gloucestershire Council: <ul style="list-style-type: none"><li>• Asset Management Plan</li><li>• Accommodation Strategy</li><li>• Carbon Management Plan</li><li>• Avon Fire and Rescue Service and Avon and Somerset Constabulary Carbon Management Plans</li></ul>	South Gloucestershire Council, Policy and Resources Committee  Deputy Chief Executive  All Directorates  Avon Fire and Rescue Service  Avon and Somerset Constabulary

## Low Carbon Homes

**Priority:** Reduce carbon emissions and energy consumption in our homes

**Target:** 4% per annum reduction in CO<sub>2</sub> emissions

### Issues

Just over a third of CO<sub>2</sub> emissions (34%) come from the domestic sector. Total emissions fell by 6% between 2005 and 2010, from 583 Kt to 545.1Kt whilst total population has risen slightly over the same period from 255,400 to 264,800.

There are 109,500 domestic dwellings in South Gloucestershire of which 77% are owner occupied, 13% are privately rented and 10% are owned by housing associations. Of the privately owned homes 6330 dwellings need loft insulation and 32410 dwellings need cavity wall insulation (Private Sector Housing Stock Condition Survey 2011). 22-25,000 homes have solid walls and are harder to insulate. For these hard to treat homes, improving the fabric of the building is costly and disruptive and involves long pay back periods.

Provision is being made in the South Gloucestershire Core Strategy to accommodate another 26,400 homes by 2026. These will bring a corresponding increase in energy use and associated CO<sub>2</sub> emissions. However, changes to the Building Regulations and policies within the Core Strategy will result in increasingly high standards of energy efficiency in new homes. It is crucial that developers work to secure the highest standards in new developments.

Nationally, the domestic sector is expected to deliver the greatest proportion of CO<sub>2</sub> emissions savings in the period prior to 2022. Some savings will come from national programmes to decarbonise electricity supplied through the National Grid and improved energy efficiency standards in new appliances. However the majority of savings are expected to come from energy efficiency improvements to existing homes along with some savings from self generation of energy using micro renewables.

Assuming all unfilled cavity walls and lofts are filled, there will be a saving of approximately 20,838 tonnes of CO<sub>2</sub> by 2022. This equates to a 3.70% saving in domestic emissions (on a 2008 baseline). This demonstrates the scale of the challenge in devising a programme of interventions and measures to achieve the expected savings from energy use in our homes.

The government is introducing the Green Deal, Energy Companies Obligation and other incentives to drive the improvement programme. The Green Deal is a Government scheme where residents will be able to take up loans that will be repaid from savings on their energy bills. Co-ordinated and targeted local interventions are required for effective delivery of the Green Deal locally. A regional scheme called 'Warm and Well' has been developed for South Gloucestershire in partnership with

### Severn Wye Energy Agency and a number of other authorities

Many people live in sub-standard, energy-inefficient housing and are classed as being in fuel poverty (i.e. they spend more than 10% of their income on heating the home). Cold damp homes increase the risk of ill health. There is concern that the new incentives may have less impact on fuel poverty and for this reason we will be working with our partners and energy companies to find ways to continue to help improve housing conditions for people on low incomes.

### Enable the installation of energy efficiency measures and improvements in existing homes

Action	Measure	Timescale	Who
Review and analyse available data to provide a record of the energy condition of the housing stock and to enable targeting and monitoring of the plan including people in fuel poverty, vulnerable people, high energy users and hard to treat homes	Data set produced and maintained	2013	SGC with support from DECC Green Deal Pioneers funding and Affordable Warmth Partnership
Make preparations and arrangements for the delivery of the Green Deal and Energy Company Obligation in South Gloucestershire and make sure local arrangements are in place for delivery	Partnership(s) with local green deal providers established Strategy for targeting and marketing green deal in place	Ongoing	SGC SWEA West of England Local Authorities
Develop a low interest loan pilot scheme, 'Countdown' for funding housing retrofit measures (including renewable energy as an alternative Green Deal funding mechanism).	Pilot programme delivered and evaluated	2013	SGC Housing Team SWEA Wessex Reinvestment Trust
Market all home energy efficiency improvement schemes and incentives under the Warm and Well brand. Make information on energy efficiency widely available eg how to use heating controls Implement an annual marketing plan including targeted local events, workshops, talks, mail shots and literature.	Annual marketing plan agreed and implemented	Annual	SGC plus SWEA
Promote and provide energy efficiency information and advice	Provide a free local energy efficiency advice service and dedicated line available and published  Deliver annual marketing plan	Ongoing	SGC and SWEA

Develop work that will reduce barriers to retrofitting existing homes	Installers Network – Link to Energy Project established  Approach to retrofitting in conservation areas and listed buildings	2013 and ongoing  2013/14	SWEA/SGC Explore additional work with West of England Authorities SGC
Work with social housing providers to identify potential local schemes	Seek to include actions from social landlords in the next plan	By 2014	South Gloucestershire Housing Partnership
Include energy efficiency in annual appraisal with social housing providers	Annual assessment of average SAP rating for social housing	Annual	SGC Housing
Develop a programme to bring the private rented housing stock up to the legal energy efficiency standard	Programme agreed and delivered	2014 – 2015	SGC Housing
Work with community groups and Parish and Town Councils to help them deliver local community energy projects	Increased ownership and delivery of low carbon projects and wider roll out of Green Deal	(See Low Carbon Communities section)	

### Enable the installation of micro renewables in existing homes

Action	Measure	Timescale	Who
Review energy needs and issues in off gas areas and promote renewable energy solutions where viable	Review carried out and plan for implementation agreed	2013/2014	SGC – commission project
Disseminate information on Government and Industry incentives	Targeted information delivered according to communications plan	Ongoing	SWEA/SGC
Provide free planning advice for householders and apply permitted development rules	Free reliable advice available	Ongoing	SGC – Development Control Team
Provide independent advice on domestic installation of renewables, run installers network and administer the low interest loan scheme (via Severn Wye Energy Agency)	Trusted information and suppliers available	Ongoing	SWEA Wessex Reinvestment Trust SGC

### Enable the development of low carbon new communities

Action	Measure	Timescale	Who
Adopt the Core Strategy and implement the policies in the Local Development Framework for all developments	Policy framework in place for delivering low carbon communities	Adoption expected early 2013	SGC- Strategic Planning

Work with development partners through master planning, planning application and delivery process to achieve low carbon new communities in the growth areas	Low carbon solutions included in master plans for major schemes Low carbon assessments included in design statement for planning applications	Ongoing	SGC – Strategic Planning
Adopt Supplementary Planning Documents (SPD's) for the growth areas that include low carbon communities criteria	SPD's produced for Cribbs Patchway and Harry Stoke and formally adopt once the Core Strategy is in place	2013 TBC	SGC Major Sites team and PTSE Committee
Investigate the creation of an 'allowable/off site solutions' fund to assist developers meeting their CO2 reduction obligations and to deliver local renewable energy solutions	South Gloucestershire Community Energy Fund set up Pilot carried out in Hanham	2013	SGC Barrat Homes Homes and Communities Agency

## Funding

Investment of £0.5 million by SGC to enable delivery of Green Deal in South Gloucestershire

Potential funding from Allowable Solutions Community Energy Fund and Community Infrastructure Levy

Green Deal Pioneer Project Funding and potential funding from Energy Company Obligation (ECO)

We will seek to secure additional funding to deliver improvements to our housing stock.

Key strategies and plans	Delivery arrangements, partners and partnerships
South Gloucestershire Housing Strategy	South Gloucestershire Council, Adults and Housing Committee
South Gloucestershire Core Strategy	South Gloucestershire Council, Planning Transportation and Strategic Environment Committee and Development Control Committees
South Gloucestershire Health and well Being Strategy	South Gloucestershire Housing Partnership
Gloucestershire and South Gloucestershire Affordable Warmth Strategy	Severn Wye Energy Agency Centre for Sustainable Energy Gloucestershire Affordable Warmth Partnership Merlin Housing Association Social Housing Providers Private Sector Landlord's Association Developers



## Low Carbon Travel

**Priority:** Reduce transport energy use and carbon emissions from transport

**Target:** 16% reduction in CO<sub>2</sub> emissions between 2006 and 2020 across the West of England

### Issues

During 2010, 24% of reported CO<sub>2</sub> emissions in South Gloucestershire came from road transport (excluding motorways). CO<sub>2</sub> emissions from road transport have fallen by 6% between 2005 and 2010, and the majority of this reduction took place between 2008 and 2009. Influencing factors are thought to be improved fuel efficiency of vehicles, as well as a decrease in vehicle miles as a result of the economic downturn.

The Government's Carbon Plan expects average emissions of new cars to fall by around a third over the next decade as a result of increasing EU vehicle emission standards, alongside a planned increase in the use of biofuels and the emerging hydrogen technology. According to the Joint Local Transport Plan Carbon Impact Assessment<sup>11</sup>, much or all of the decrease in emissions from improved vehicle efficiency and fuels will be offset by growth in road transport resulting from new development in the West of England. Reducing CO<sub>2</sub> emissions from transport locally is therefore a challenge, and reinforces the need for concerted local action to manage travel demand and to promote a modal shift away from the private car.

In order to achieve declining CO<sub>2</sub> emissions from traffic flow, we will seek to deliver behavioural change through direct mentoring, engagement and education and also appropriate physical infrastructure provision. Central to this aim is the Local Sustainable Transport Fund (LSTF) secured in December 2010 which alongside other time limited bid led schemes, provides funding for the promotion of modal shift from single car occupancy to low carbon alternatives. This modal shift is achieved through a series of infrastructure projects for example cycle parking and public transport service upgrades (e.g. extended service provision for UWE), collaboration with large employers and education, as well as behaviour change programmes.

Long term our approach reflects the strategy set out in the Joint Local Transport Plan 3 (JLTP3) (2011-2026) which focuses upon the five transport goals – to reduce carbon emissions, support economic growth, promote accessibility, contribute to better safety, security and health and improve quality of life and a healthy natural environment. The strategic consideration of these goals and the 'modal hierarchy' (pedestrians, cyclists, public transport and other traffic) will drive the delivery of the capital programme, with the immediate aims of delivering the North Fringe to Hengrove bus rapid transit major transport package, followed by the future focus upon electrification of the main rail line, the four tracking of Filton Bank and the eventual delivery of the Greater Bristol Metro.

To support these strategic goals, we will promote walking and cycling for local journeys and car sharing and home working to reduce journeys to work. SMART ticketing will be introduced for bus trips which will speed up boarding processes and reduce pollution.

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<sup>1</sup> West of England JLTP3 Carbon Impact Assessment Study (Delivering a Sustainable Transport System (DaSTS)) 2010

**Promote and support cycling and walking**

Action	Measure:	Timescale	Who
Continue to support and promote Community Based Walks to improve health and car borne trips	The continued annual retention of circa. 40 volunteers and 400 walkers and the attraction of 200 further walkers annually.	Ongoing	Children, Adults & Health
Through Bikeability DfT match funding, LSTF, School Sports Partnerships, council and volunteer resourcing, promote and advance the education of young bike riders to enhance future and current modal shift towards cycling.	<p>Bikeability: Train 2000 children per annum</p> <p>LSTF: Train to Level 1 600+children per annum; Level 2 100 children; Level 3 100 children</p> <p>School Sports Partnership: Work alongside The Grange Community School and John Cabot Academy to enhance bike awareness to level 3.</p>	Ongoing	Road Safety Team in Streetcare
Implement walking and cycling infrastructure schemes through the Local Transport capital programme and the Local Sustainable Transport Fund (LSTF).	76% increase in journeys by bike (2008 baseline to 2015/2016) <sup>2</sup> (West of England target)	By 2016	Strategic Transport Policy Team

**Promote and support bus and rail use and accessibility**

Install ITSO compliant ticket machines on buses to enable ITSO based 'Smart' ticketing on all registered bus services throughout South Gloucestershire.	All buses equipped with ITSO compliant ticket machines.	May/June 2013	Major Projects Unit
Provide bus infrastructure improvements, through the introduction of raised bus boarders, shelters, public transport timetable information and real time information both on site and through mobile technology.	11% increase in bus passenger journeys across the West of England (2008 baseline)	2015/16	Strategic Transport Policy

Develop and implement the North Fringe to Hengrove bus rapid transit scheme.	Full approval for the scheme secured Increase in bus patronage of 11% by 2015/16 from 2008/09 baseline	2014	Strategic Transport Policy
Secure funding for rail improvements, including Bristol metro, to increase the rail network and improve multi-modal access to local stations and journeys by train	Investment secured 41% increase in journeys by train (2008 baseline)	2019	Strategic Transport Policy
Support development and implementation of electrification of the railways and other clean technology infrastructure projects	Electrification of mainline railway	2017	Strategic Transport Policy Network Rail

### Promote low carbon travel – Local Sustainable Transport Fund package

<p>Promote low carbon commuting through the Local Sustainable Transport Fund:</p> <ul style="list-style-type: none"> <li>Expand low carbon commuting programme working with employers on key commuter routes to equip staff with information and facilities to enable sustainable travel choices</li> <li>Equip people with information and knowledge on low carbon travel choices at key transition points</li> <li>Support low carbon travel choices in priority neighbourhoods</li> <li>Implement relevant infrastructure to support low carbon travel</li> </ul>	<p>Reduction in single occupancy commuter journeys (annual snapshot travel survey) Reduce to 49% by March 2015 (amongst sustainable commuter club members)</p> <p>12 sustainable travel schemes agreed and delivered by 2015</p> <p>Network of 20 electric vehicle charging points installed</p>	2012-2015 (3 year programme)	LSTF Team
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**Reduce the need to travel**

Implement policies in the Core Strategy that locate new homes, work and community facilities close together and provide for low carbon transport infrastructure	Appropriate sustainable travel measures are included in concept statements and master plans for new developments.	Ongoing	Strategic Planning
Improve access to broadband for residents and businesses in South Gloucestershire by gap funding and project managing the installation of a wholesale broadband network, from which internet service providers can sell faster broadband services	100% of premises within South Gloucestershire to have a minimum access line speed of 2 Mbps by 2015  90% of premises within South Gloucestershire to have a minimum access line speed of 24 Mbps by 2015	2013-2015	Chief Executive's Office
Work with employers to encourage a shift to smarter working	Outcome measure to reflect LSTF target when agreed (TBA)	Ongoing	LSTF Team
Support and promote the success of town and neighbourhood centres	(See Low Carbon Economy Action Plan)		Economic Development Team

**Low Carbon Development**

Work with developers to secure transport infrastructure that maximise sustainable transport modes, through implementation of on and off-site footway and cycleway links and public transport interchanges and routes.	All planning applications to be considered against the modal (user) hierarchy, as proposed within DfT's Manual for Streets; i.e. Pedestrians, Cyclists, Public Transport Users, Specialist service vehicles (e.g. emergency services, waste etc), other motor traffic.	Ongoing	Transport Development Control  Major Sites Team
Secure appropriate mitigation in the form of Section 106 works, travel planning or funding, or Community Infrastructure Levy, to offset traffic generation impact against modal shift.	Mitigation secured from all relevant planning applications, in accordance with the CIL Regulations 2010 and local policy direction.	Ongoing	Transport Development Control

## Funding

Capital funding will continue to come from our annual LTP Integrated Transport grant from Government and major scheme funding. The Integrated Transport block for 2013/14 is confirmed as £1.466 million with a further £2.061 million in 2014/15.

The Local Sustainable Transport Fund (LSTF) WEST provides capital and revenue funding to March 2015 of £6.127 million.

Bus revenue support budgets of:

- LSTF-related services - £2.25M total over the 3 years 2012/13- 2014/15
- Total 'mainstream' support budget £2.6M per annum
- The Better Bus Area Fund to 2013 of £1.25 million

Developer contributions through Section 106 agreements and future Community Infrastructure Levy will be sought and there will be potential for funding schemes through City Deal

South Gloucestershire Council will further seek to secure funding through the submission of bids as relevant funding opportunities arise.

Key strategies and plans	Delivery arrangements, partners and partnerships
South Gloucestershire's Core Strategy	South Gloucestershire Council Planning Transportation and Strategic Environment Committee
Joint Local Transport Plan 3 (2011-2026)	West of England joint delivery arrangements.
South Gloucestershire, Health and Well Being Strategy	Working in partnership with public transport providers, developers, local employers, schools, colleges, UWE; priority neighbourhoods, parish and town councils. South Gloucestershire NHS and health improvement team

## Low Carbon Economy

<b>Priority:</b>	Promote business resource efficiency and help low carbon and local businesses grow in South Gloucestershire
<b>Target:</b>	An overall target has not been set – further work will be carried out in 2013 to determine appropriate targets.

### Issues

Despite the challenges brought by the economic downturn, South Gloucestershire has retained a relatively high level of economic prosperity and approximately 42% of CO<sub>2</sub> emissions arise from the commercial and industrial sector (2010 data). Emissions from commercial and industrial sources fell considerably (by 38%) between 2005 and 2010 mainly as a result of the closure of one large industrial operation in the Severnside area and the impact of the economic downturn.

With increasing energy costs it makes business sense for all organisations to actively improve resource efficiency and reduce their energy costs. A number of programmes have been put in place nationally (and at an EU level) to incentivise this (such as the EU Emissions Trading Scheme and the Carbon Reduction Commitment). Over time, their influence will result in some further reductions in emissions from the industrial and commercial sector in South Gloucestershire, without the need for significant local intervention.

These programmes are aimed predominantly at energy intensive sectors and large organisations. Less energy intensive sectors (such as retail and business services) and SMEs are also vulnerable to energy price rises (directly and via their supply chains), and together comprise a high proportion of South Gloucestershire's Industrial and Commercial sector emissions. The actions set out under the first objective below have been developed to provide support and information to these local businesses in reducing their energy consumption.

In reducing emissions from industrial and commercial sources, the focus should be on improving the resource efficiency of business and industrial operations, rather than seeking to restructure the local economy in favour of less energy intensive sectors – as this can result in exporting emissions elsewhere, creating an imbalance in the economy, and reducing competitiveness in the transition to a low carbon economy.

The transition to a low carbon economy and low carbon sustainable lifestyles brings many business opportunities including the development and marketing of low carbon technologies and environmental support industries. The low carbon sector has the potential to create significant employment opportunities in South Gloucestershire, providing that proper training and learning opportunities are created to develop the sector in response to evolving demand. In addition the high levels of growth expected in South Gloucestershire over the next 15 years bring significant opportunities for creating innovative low carbon solutions.



Efforts to localise sourcing of low carbon products and services will be crucial to ensure that the local economic benefits are realised, and the public sector will have a leadership role in this. Local production and consumption of products and services close to where people live and work are important for local economic vibrancy and diversity, as well as reducing the need to travel to access products and services, and reducing the emissions 'embedded' in the products we consume (for example from food miles). Sustainable management of land and woodlands creates both economic and environmental opportunities.

### **To influence resource-efficiency improvements in South Gloucestershire business premises and operations**

<b>Action</b>	<b>Measure</b>	<b>Timescale</b>	<b>Who</b>
Deliver the West of England Carbon Challenge in South Gloucestershire (delivered by Forum for the Future)	Number of businesses signed up to the Challenge and setting an annual carbon reduction target of 2%	Annual programme – subject to funding	Forum for the Future
Promote the Improving Your Resource Efficiency (IYRE) programme to SMEs in South Gloucestershire	Number of businesses receiving support (overall programme target 134 a year across Business West area)	Annual programme - subject to funding	Business West
Explore possibilities to run waste exchange events in as part of National Symbiosis Programme (NISP)	Two waste exchange events in South Gloucestershire (subject to NISP support)	2013/14	SGC
Maximise support to South Gloucestershire businesses via Local Sustainable Transport Fund support on green travel planning	Number of businesses receiving support a year	2012 – 2015	SGC
Provide climate change advice and project development support to farmers and rural businesses in the Cotswolds AONB and provide financial support through the Climate Change Project Demonstration Fund	Supported businesses more self-sufficient in terms of their energy and resource requirements and overall resilience to the impacts of climate change.	2012 – 2014	Cotswolds Conservation Board
Use planning influence to deliver new buildings with high standards of energy efficiency	Number of commercial buildings achieving BREAM excellent	Ongoing	SGC
Promote Green Deal to businesses to improve energy efficiency of existing commercial buildings	To be agreed once scheme is introduced	TBA	TBA
Implement Nighthawks project – out of hours energy switch off project for retail parks and shopping centres	Outputs include training sessions, energy audits and site specific action plans and PR campaign	April 2013 – Oct 2015	Funded by Intelligent Energy Europe – Lead Agency SWEA Support from SGC

**To help low carbon businesses grow in South Gloucestershire by increasing demand for goods and services, improving skills and creating the right environment for investment**

Action	Measure	Timescale	Who
Support the delivery of the low carbon skills training programme (funded through Regional Growth Fund)	Training programme delivered by local colleges in conjunction with Local Enterprise Partnership.	From Autumn 2012	Lead college – City of Bristol
Support the delivery of the environmental technologies growth plan for the Avonmouth/Sevenside enterprise area	New industries and businesses attracted to Sevenside	Ongoing	Low Carbon South West
Develop Smart City Approach to Growth Areas – ensuring appropriate digital infrastructure and smart energy, water and transport infrastructure deployment	Multi-utilities Study for North Fringe planned and undertaken	2013/14	SGC commission report and work with utilities and developers to implement recommendations
Run workshops for local businesses including public sector suppliers to support local green business supply chain development.	Two workshops	2013	Low Carbon South West
Deliver the Environmental Technologies i-Net business plan & work with other i-Nets to integrate low carbon objectives (£2million project over 3 years)	Business plan objectives delivered	South West targets over 3 years ending September 2013	UWE, Regen SW, University of Bristol and University of Exeter
Enable the development of secure low carbon energy supplies, retrofit of buildings and develop and support the local supply chain	Energy efficiency and renewable energy installers network established	Ongoing development	SWEA and Regen SW retrofit project
Review Total Place Low Carbon Project recommendations for the West of England	Future actions agreed by Local Enterprise Partnership	2013	Local Enterprise Partnership – Lead authority B&NES

## Support and promote local production and consumption of goods and services

Use planning influence to encourage local patterns of production and consumption	Policies in Core Strategy implemented	Ongoing	SGC
Strengthen local supply chains and promote the use of local goods (including food) and services within the parameters of procurement legislation	Criteria included in specifications for contracts	As appropriate	SGC and Public Sector Organisations
Incorporate the Local Food 'Taste' festival into the new South Gloucestershire Discover Festival.	Local food events included in Discover festival	Annual event	SGC
Protect high quality land for food production and enable dialogue on opportunities for increasing productivity of land for food production in South Gloucestershire	At least one event held	TBA	Lead organisation to be identified
Support an increase in productive woodland and the preservation and enhancement of existing woodland for biodiversity and wood fuel	To be developed	2013/14	Area for development in discussion with key delivery partners – Forestry Commission, Woodland Trust, Forest of Avon, NFU
Support and promote the success of town and neighbourhood centres and village shops and post offices	Vacancy rates in ten main centres Level of membership of local chambers of trade and commerce Footfall of Yate, Kingswood, Thornbury and Bradley Stoke town centres	Annual monitoring proposed	

## Funding

Potential funding through City Deal

Key strategies and plans	Delivery arrangements, partners and partnerships
Local Enterprise Partnership Business Plan 2011-2013 South Gloucestershire Economic Development Strategy South Gloucestershire Core Strategy Joint Local Transport Plan 3 Priority Neighbourhood action plans Parish Plans	West of England Local Enterprise Partnership South Gloucestershire Economic Partnership Forum for the Future Low Carbon South West Local Trade Associations Parish and town councils Business West Cotswolds Conservation Board

## Low Carbon Energy

**Priority:** Enable the development of secure supplies of renewable and low carbon energy

**Target:** For the equivalent of 7.5% of South Gloucestershire's total energy demand (or 508 GWh) to be generated from renewable energy installations located within South Gloucestershire by 2020

### Issues

Increasing the amount of energy that is generated from renewable sources will help make the UK more energy secure, protect consumers from fossil fuel price fluctuations, drive investment in new jobs and businesses in the renewable energy sector as well as contributing to our carbon reduction targets. Renewable energy will play a key part in the decarbonisation of the energy sector alongside nuclear, carbon capture and storage and improvements in energy efficiency.

Existing renewable energy installations in South Gloucestershire generate enough energy to supply about 0.35% of South Gloucestershire's energy needs. Assuming the consented but not yet built Alveston wind park, Warburtons wind turbine, Severnside energy from waste plant and Hallen anaerobic digestion plant are developed, this will provide sufficient renewable energy generation capacity to supply an estimated additional 3.0% of South Gloucestershire's energy demand. There are indications that further proposals for ground mounted solar photovoltaic and large scale wind projects will also be put forward for consideration in the near future.

We recognise that we have a significant role to play in enabling suitable local deployment of renewable and low carbon energy. We want to see more renewable and low carbon energy projects coming forward and are particularly keen to enable community led projects and projects that deliver benefits for the local community. We want to maximize use of our available resource whilst protecting the local environment and want to see sustainable energy strategies for all our growth areas so that communities have clean, secure and affordable energy into the future.

Production of electricity produces a certain amount of heat as a by-product, which is often lost to the environment. Combined Heat and Power (CHP) captures some or all of the heat for use for heating purposes or for conversion for cooling and can be a more efficient way of capturing energy from the fuel source. If the CHP plant is powered by biomass or waste this is classed as renewable energy. If it is powered by gas it is classified as low carbon energy, because the carbon emissions from the process are reduced.

### Increase decentralised heat and power production and develop heat networks where viable

Action	Measure	Timescale	Who
Publish results of heat network viability study for the Bristol North Fringe and North Yate and explore further opportunities for financially viable networks as part of new developments	CHP and District Heating considered as an option in new developments and energy reviews of existing estates	Ongoing	SGC and developers through the planning process
Produce Heat Network study for Avonmouth and Severnside to maximise use of waste heat from industrial operations and energy from waste plants	Report published recommendations considered and actions agreed	Within 6 months of publication of report – expected mid 2013	Low Carbon South West

### Optimise the use of local renewable energy resources and maximise benefits for local communities

Action	Measure	Timescale	Who
Continue to send municipal solid waste to the mechanical and biological treatment facility at Avonmouth for materials recovery and generation of energy from the residual refuse derived fuel	MWh energy generated per annum from South Gloucestershire's refuse derived fuel (estimated to be 9,065MWh/ year at the present time)	Ongoing to 2020	SGC Waste Management Team
Increase the proportion of food waste recovered from municipal waste and sent for anaerobic digestion.	Tonnage of municipal food waste sent for AD.  Target to increase tonnage by 2,700 tonnes from 2012 to 2014.	Ongoing to 2020	SGC Waste Management Team
Explore opportunities for increasing energy generated from anaerobic digestion of commercial food waste and agricultural slurries produced in South Gloucestershire, and for increasing energy recovery from non recyclable commercial waste	Meet with Environment Agency and agree approach	2013	SGC Sustainability Team
Utilise local wood resources for production of energy in biomass boilers Explore the potential for new woodlands through green infrastructure policies	Review potential for waste wood / forestry residues from council owned land and operations carried out  Potential for managing private woodlands, and recovering waste wood explored	2013  2014	SGC Street Care and Sustainability Team

Keep under review the potential for growing biomass crops in South Gloucestershire – not at the detriment of food production	No market at present time – keep under review	Annually	SGC
Investigate potential for community led renewable energy projects on council owned land and support the development of community led projects if potentially viable	Sites with potential identified and follow up actions agreed	2013	SGC Property Services and Sustainability Team
Enable the installation of micro renewables in existing homes	(See Low Carbon Homes Action Plan)		
Enable the development of low carbon communities projects and energy projects for community benefit	(See Low Carbon Communities Action Plan)		

### Implement planning policies on low carbon and renewable energy

Action	Measure	Timescale	Who
Adopt the Core Strategy and implement the policies in the Local Development Framework for all developments	Policy framework in place for delivering low carbon communities	Adoption expected early 2013	SGC Strategic Planning
Work with development partners through master planning, planning application and delivery process to achieve low carbon new communities in the growth areas	Low carbon solutions included in masterplans for major schemes  Low carbon assessments included in design statement for planning applications	Ongoing	SGC Strategic Planning
Develop Smart City Approach to Growth Areas – ensuring appropriate digital infrastructure and smart energy, water and transport infrastructure deployment	Multi-utilities Study for North Fringe completed	2013	SGC Strategic Planning
Adopt renewable energy Supplementary Planning Document to guide renewable energy planning decisions	Renewable Energy SPD adopted	2013	SGC PTSE Committee
Provide free planning advice for householders and apply permitted development rules	Free reliable advice available	Ongoing	SGC Development Control
Set up an 'allowable / offsite solutions' Community Energy fund to assist developers meeting their CO <sub>2</sub> reduction obligations and to deliver local renewable energy solutions.	Pilot project carried out in Hanham and Community Energy Fund established	2013	SGC

**Respond to applications for National Energy Infrastructure Projects**

Action	Measure	Timescale	Who
Support the development of tidal energy technologies that are not detrimental to the ecological value of the Severn Estuary ecosystem and viability of Bristol Port	Fully considered responses submitted to tidal energy proposals	As required	SGC Members
Respond to an application for the development of a new nuclear power plant at Oldbury on Severn, secure significant community benefit from this and any other significant energy infrastructure project and request developers to explore potential for utilising waste heat.	Response to proposals submitted and community benefits secured	As required	SGC Members

**Funding**

Explore models for local Energy Services Companies

Investigate sources of funding to enable development and submit bids where appropriate

Key strategies and plans	Delivery arrangements, partners and partnerships
South Gloucestershire Core Strategy and Renewable Energy Evidence Base West of England Renewable Energy Study Local Enterprise Partnership Business Plan	Lead Committee – South Gloucestershire Council Planning Transportation and Strategic Environment Committee West Of England Local Enterprise Partnership Westwoods Developers Local groups Severn Wye Energy Agency Centre for Sustainable Energy Bath and West Community Energy Gloucestershire Renewable Energy Installers Network South Gloucestershire Council Regen SW



## Low Carbon Communities

<b>Priority:</b>	Support and promote neighbourhood energy planning and community action for low carbon living
<b>Target:</b>	Number of community energy plans and projects completed. Energy and carbon reduction targets set for each plan.

### Issues

More and more people are concerned about the harmful effects of climate change, the need to reduce carbon emissions and the need to plan for a time when cheap oil is no longer readily available. Local people are getting together to explore the issues and drive and influence change in their local communities. Local views and action also stimulate and drive strategic action and it is important that the two are connected.

Neighbourhood energy planning provides the opportunity for communities to come together and understand and plan for their future energy needs. This would include demand reduction measures and could also include community owned renewable energy projects.

There are a number of groups taking co-ordinated action in South Gloucestershire through work on parish plans, the Transition Town movement, their own sustainability projects or individual local environmental projects. Level of interest is likely to increase as the localism and the neighbourhood planning agenda develops.

In South Gloucestershire we have a strong history of local community action and see this as a key way of delivering and promoting projects and behaviour change messages from all the priority themes. This approach will be particularly important for achieving improvements to our homes and community buildings. Energy efficiency savings and income generation from community renewable energy projects are attractive to local groups and town and parish councils and can provide a new source of income.

Collaborative local action and community projects make new ways of doing things more attractive and acceptable and are important in influencing a shift to low carbon and more sustainable lifestyles.

## Enable the development of neighbourhood energy plans and low carbon community projects

Action	Measure	Timescale	Who
Develop and implement a strategic approach to neighbourhood energy planning so that communities can understand and plan for their future energy needs and so that the best energy efficiency and renewable energy solutions are delivered	Energy profiles produced for all parishes and non parished areas and targeted programme of support agreed  Pilot project carried out in Thornbury	2013/2014	Sustainability Team will develop plan and signpost support
Promote the availability of energy audit schemes for village halls and community buildings	Number of community halls and buildings improved	Ongoing	SGC SWEA
Provide networking, learning, influencing and project development opportunities through the Environment Forum, appropriate events and activities.	At least three events a year	Ongoing	SGC Sustainability Team
Provide a focus for action and dialogue through the local promotion of and participation in national and regional low carbon and sustainability events and campaigns	Annual low carbon communications plan agreed and implemented. Minimum of two events/campaigns a year	Annually	SGC

## Funding

The Marshfield Community Energy Project received £70,000 funding from DECC's Local Energy Assessment Fund (LEAF).

Once the ambition for projects is set out bids for external funding will need to be developed

Proposed Community Energy Fund may provide opportunities for funding low carbon energy projects (Low Carbon Energy section)

There is likely to be some funding available in 2013 for renewable heat pilot projects

Key strategies and plans	Delivery arrangements, partners and partnerships
Voluntary and Community Sector Compact South Gloucestershire Community Strategy Parish Plans	Local groups Parish and town councils South Gloucestershire Environment Forum South Gloucestershire CVS CSE Severn Wye Energy Agency Converging World Climate Works Bath and West Community Energy Bristol Energy Co-operative Regen SW Plus others to be identified

## Background information and references

### Data on local area emissions – methodology

A summary of the methodology used by the DECC to compile data on carbon dioxide emissions for local authority areas is set out below. Further details can be found in DECC's Local Authority CO<sub>2</sub> emissions estimates 2010 Methodology Summary, August 2012<sup>3</sup>.

#### *Emissions from electricity use*

Electricity consumption data is compiled using meter point consumption data which is accurate to the level of an address.

Industrial and commercial meter data is reported by energy suppliers separately from domestic data.

To convert the electricity use into estimates of CO<sub>2</sub> emissions, an emissions factor (CO<sub>2</sub> per GWh) is applied. This varies from year to year and is based on the proportion of electricity produced using different fuel types for that year at the national level.

#### *Emissions from gas use*

Gas consumption data is compiled using meter point consumption data which is accurate to the level of an address.

Industrial and commercial gas use is distinguished from domestic gas use by classifying all users consuming over 73,200kWh/annum as industrial and commercial. This means that some small and medium businesses with usage below this threshold are incorrectly included in the domestic sector.

To convert the gas use into estimates of CO<sub>2</sub> emissions, an emissions factor (CO<sub>2</sub> per GWh) is applied.

#### *Emissions from 'other fuels' (oil and other solid fuels)*

Oil and solid fuel use cannot be attributed to fixed meter points and have to be estimated.

For the industry and commercial sector, this is undertaken using average fuel use or 'fuel intensity' per employee for each different type of economic activity and for each solid and liquid fuel. Information about the number of employees who work in each economic sector is available from the Inter-Departmental Business Register (IDBR) for every 1km<sup>2</sup> area, and by extension to the relevant local authority using boundary information. The number of employees working in each economic sector in the local authority area is multiplied by the 'fuel intensity' for each fuel type, and finally multiplied by the relevant CO<sub>2</sub> emissions factor.

<sup>3</sup> <http://www.decc.gov.uk/assets/decc/11/stats/climate-change/6218-local-authority-co2-emissions-estimates-2010-meth.pdf>

A limitation of this modelling approach is that it assumes the same fuel intensity per economic sector is present uniformly across the whole country, which may not be the case in practice.

For the domestic sector, census data is used to calculate percentages of dwelling types within each local authority area. Building Research Establishment data on average energy use by dwelling type and fuel type is then applied to generate the domestic solid and liquid fuels consumption for each local authority area. Burning of coal is assumed to occur only outside of Smoke Control Areas, and use of smokeless fuels is assumed to occur only within Smoke Control Areas. It is assumed that oil is only burned outside cities with a population larger than 100,000 (where gas supply makes use of oil unlikely).

To convert the fuel use into estimates of CO<sub>2</sub> emissions, an emissions factor (CO<sub>2</sub> per unit of fuel) is applied.

#### *Emissions from agricultural combustion*

Emissions from use of agricultural oil, solid fuel, off-road machinery and pesticide use are estimated at the local level using IDBR employment data.

#### *Emissions from road transport*

The Department for Transport (DfT) collects average annual daily flow statistics by vehicle type at thousands of census points on roads throughout Great Britain. Fuel consumption and emission factors are available for each vehicle type and age. These emission factors are applied to mapped traffic movements, with the vehicle kilometres for each road link (using regional averages for minor roads) being multiplied by the appropriate emissions factors according to the vehicle types and average speed per vehicle type recorded there.

Once emissions have been modelled to the road network, it is split out into 1km<sup>2</sup> grids that can be overlaid with local authority boundaries to distribute the emissions.

#### *Emissions from railways*

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 rail 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 local authority.

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## Low Carbon South Gloucestershire

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