





### South Gloucestershire Council

# Carbon Management Plan





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## Low Carbon South Gloucestershire

# Commitment

Climate change has continued to rise steeply up international, national and local agendas. To help avoid the potentially devastating effects of climate change, the UK government has established that we need to cut greenhouse gas (GHG) emissions by 80 per cent by 2050 against a 1990 baseline.

The council remains committed to reducing its GHG emissions to contribute towards the national targets, and to play its part in limiting the extent of dangerous climate change.

Financial imperatives to reduce energy consumption have also increased (with energy price rises and the introduction of the Carbon Reduction Commitment) and are expected to continue to do so. Consequently it is now more important than ever that the councils functions are delivered in an energy and carbon efficient way.

This Carbon Management Plan replaces the previous Carbon Management Strategy and Implementation Plan, which was developed during 2006 – 2007 with the support of the Carbon Trust.

#### Objective

To reduce energy consumption and associated costs and greenhouse gas emissions in the council estate and council activities.

#### **Overall target**

To reduce greenhouse gas emissions <sup>1</sup> by 3 per cent per annum.

#### Scope

Emissions in 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, bollards etc)
- fuel use in fleet vehicles
- business mileage paid (excludes commuter mileage which is subtracted from claims for journeys starting or ending at home)<sup>2</sup>

<sup>1</sup> GHG Emissions are measured in CO<sub>2</sub> equivalent, or 'CO2e'. Defra and DECC publish GHG conversion factors which enable organisations to calculate emissions from a range of greenhouse gases. Different greenhouse gases have a different impact on climate change (their 'global warming potential'). CO<sub>2</sub>e is a universal measurement used to indicate the global warming potential of one unit of carbon dioxide. It enables the global warming potential of different greenhouse gases to be expressed using a common metric.

<sup>2</sup> It is recognised that the council causes additional GHG emissions in delivering its functions. This includes the emissions associated with supply and treatment of potable water and collection and treatment of waste from council buildings; outsourced services, such as domestic waste collection and processing; and the GHG emissions 'embedded' in the products and services that we procure. Emissions from these activities are less easily controlled and measured by the council. Consequently, they are not included within the scope of this Carbon Management Plan. Nonetheless, it is important that we build upon existing good practice to use our influence to reduce emissions from outsourced / procured products and services.



2012



### **Current situation**

Emissions from the council estate and operations arise from the sources shown in the diagram below:

#### Greenhouse gas emissions by source 2010/11



The base year for greenhouse gas reporting was 1 April 2009 – 1 April 2010 (set to align with Government's new local GHG reporting requirements <sup>3</sup>).



The council's overall target to reduce its GHG emissions by 3 per cent per annum has been met between 2009/10 and 2010/11 with a reduction of 3.58 per cent. There have been some good reductions in emissions in gas and heating oil consumption, business mileage and fleet vehicle fuel. Electricity consumption has gone up by 0.85 per cent overall with a 5.60 per cent increase in schools (thought to be mainly a result of the increased use of ICT and greater use of school facilities outside the traditional school day) partially offset by a 5.04 per cent decrease in other buildings and a 1.12 per cent decrease in street lighting.

<sup>3</sup> http://www.decc.gov.uk/en/content/cms/statistics/indicators/ni185/ni185.aspx

The table below provides a breakdown of where GHG emissions from the council's estate and activities currently come from, and the per cent change in emissions for each component from 2009/10 to 2010/11:

	<b></b>		
	Tonnes		
	2010/11	2009/10 (Base Year)	% Change
Total GHG emissions	31,056.01	32,210.53	-3.58
Gas in schools	5,990.67	6,072.59	-1.35
Gas in all non school buildings	1,926.94	2,177.16	-11.49
Heating oil in schools	964.09	1,694.13	-43.09
Heating oil in all non school buildings	230.11	225.15	2.20
Electricity in schools	8,078.07	7,650.02	5.60
Electricity in all non school buildings	3,504.72	3,690.53	-5.04
Electricity in street lighting	7,364.49	7,848.47	-1.12
Fleet vehicle fuel	2,028.17	2,113.29	-4.03
Business mileage paid	968.74	1,139.82	-15.01

#### GHG emissions data for period 1 April 2009 to 31 March 2011

### Carbon Management Plan delivery arrangements

#### **Action plans**

This framework document is accompanied by an action plan. The action plan sets out initiatives which are in progress or are proposed to reduce energy consumption and emissions from the corporate estate, schools, ICT, street lighting and transport.

Projects in the action plans fall into four different categories:

 Reducing emissions by rationalising the council estate and sharing assets

This category considers what assets the council has whether we need them all, or whether there are options to rationalise / share council assets to deliver efficiencies. It includes projects which are not necessarily being driven from an energy / carbon saving perspective, but that have implications for energy and carbon which need to be factored into decision making.

#### 2 Improving the energy efficiency of existing assets through behaviour / management / policy

This category includes initiatives which aim to use the assets we have in energy efficient ways - encouraging energy efficient behaviour, but without incurring capital costs.

#### 3 Improving the energy efficiency of assets through capital works

This category includes initiatives which require capital investment, e.g. to improve the energy efficiency of built fabric / fittings, to install equipment in street lamps which allows them to be lit for only part of the night, or to buy fuel efficient vehicles.

#### 4 Developing renewable energy in council buildings and on council land

This category involves improving our understanding of the potential for renewable energy projects in council buildings / on council land, and exploiting the potential where appropriate. Renewable energy projects do not reduce the amount of energy that we use. However they reduce the amount of energy we are required to buy from the national grid (and associated GHG emissions), and / or they can provide revenue from selling surplus energy and from government tariffs per unit of energy generated.

In addition to identifying and implementing projects aimed specifically at reducing CO<sub>2</sub> emissions, a simple carbon assessment methodology is to be developed and disseminated during 2012 for application to all significant council decisions / projects / policies and strategies.

#### Leadership

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

- The executive member for corporate affairs has overall responsibility for the implementation of the plan.
   The other executive members are responsible for implementing the plan within their portfolio.
- The corporate coordination select committee is responsible for scrutinising the plan and reviewing progress.
- The director of corporate resources supported by the corporate sustainability and property services teams is responsible for coordinating the implementation of the plan. The other chief officers are responsible for ensuring the policy is integrated into the work of their department.
- Responsibility for the provision of data for monitoring progress is split between property services (buildings), street care (street lighting and fleet vehicle fuel), and exchequer services (business mileage).
- All service directors are responsible for helping minimise use of energy (including transport fuel) in the work of their teams, and for the implementation of identified service specific action plan initiatives.

#### Monitoring and review

Greenhouse gas reporting will be carried out annually to meet Government requirements. The action plan will be monitored, reviewed and updated annually.

# Action plan 2011 to 2013

This action plan sets out initiatives which are in progress or proposed to reduce energy consumption and emissions from the corporate estate, schools, ICT, street lighting, transport, and to increase generation of renewable energy.

For each initiative, the tables include:

- a summary of the initiative
- any known issues to be dealt with in implementing it
- the proposed timescale for implementation
- the lead responsibility for delivering the initiative
- costs either capital or revenue, where possible quantified
- anticipated savings energy costs and CO<sub>2</sub> where possible quantified

In addition, the following overarching action is proposed:

### Carbon assessment of council decisions

It is proposed that a simple carbon assessment methodology will be developed and disseminated during 2012 for application to significant council decisions / projects / policies and strategies. The aim would be to determine whether the proposal would increase or decrease the amount of energy used (electricity, gas, transport fuel), or energy use incurred in the supply chain for procurement decisions – so that this can be taken into account alongside other considerations.







#### Corporate estate (not including schools and street lighting)

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>

Reducing emissions by rationalising the council estate and sharing assets

Implementation of the council's accommodation Strategy and better services for older people programme		In progress Due for completion 2014/15	Property services / CC&H	Within existing resources	Energy / emission savings in the region of 25% from non school buildings
<ul> <li>Make better use of space:</li> <li>Combine more uses within buildings to further rationalise the estate</li> <li>Actively seek partners to share/lease surplus space</li> </ul>		Ongoing Identify further opportunities as part of the accommodation review	Property services	Within existing resources	Not yet quantified
Review options for inefficient corporate buildings that are beyond their life span, transfer of assets to the community and further consolidation of the council estate.	No capital available to replace buildings that are beyond their life span	Include process for reviewing opportunities in revised asset management plan (December 2011)	Property services	Unknown at present	Not yet quantified
Behaviour / management / policy					
Restrict opening hours of corporate offices to reduce associated heating and lighting requirements	May require adjustments to staff contracts	Property services to review options and consult staff during 2012	COMT	Within existing resources	Assuming restriction of opening hours of office buildings - Badminton Road, Kingswood and Thornbury by 1 hour (open at 7.30am and close at 6.30 pm) and office buildings only open on Sat for essential work) - estimated energy cost saving £12,000 per annum, $CO_2$ saving 40 tonnes per annum

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>
Where SGC-owned buildings are shared with external organisations, ensure the energy / CRC costs are included in (and visible in) the charge for the space	To encourage energy efficient behaviour and recover some costs	Ongoing	Property services	Within existing resources	e.g. Annual electrical consumption at Vinney Green Secure Unit ~700,000kWh ( $380tCO_2$ ) and gas ~ 1,700,000kWh ( $310tCO_2$ ) – equates to CRC tax in year 1 of around £8,400
Make energy costs visible		Property services to develop options for recharging during 2012	COMT	Within existing resources	To be determined
Monitor energy consumption to identify issues and enable targeted reduction activities in conjunction with switch off campaigns		2012	Property services / corporate sustainability	Requires additional resources	To be determined
Improving the energy efficiency of existing ass reviews)	ets through capital wo	orks – example project	s (exact schemes ma	y change as a res	sult of service
Relamp schemes at Hanham, Fromeside and Littlestoke Youth Centres (replace existing lamps with more efficient type, reduce number of fittings where possible, and install presence detectors)	Replacement of T12, T8 and incandescent lighting with new T5 fluorescent type - reduces energy consumption by 30 – 50%. Payback 6-8 years	Schemes designed and costed but implementation subject to availability of funding – timescale not known	Property services	£16.5k	6.3t / CO <sub>2</sub> per annum
Draught proofing windows and doors at Thornbury Office, Fromeside Youth Centre and Old School Youth Centre	Simple payback - Thornbury 5 years, Fromeside 5 years, Old School 3 years	Schemes designed and costed but implementation subject to availability of funding – timescale not known	Property services	£17.3k	21t / CO <sub>2</sub> per annum



Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & $\rm CO_2$
Heating controls replacement for Hanham and Fromeside Youth Centres and for Park Centre and sub metering for Park Centre	Payback 8 - 9 years Sub metering at Park Centre will enable us to charge the various users for their energy use	Park Centre is progressing during 2011/12 No funding currently for the other two buildings	Property services	Park Centre approx £5k Another £10k (approx) for Hanham and Fromeside	Approx 15% anticipated energy saving at Park Centre
Downend Day Centre – replace boiler with more efficient type and replace heating controls	Needs to pay back within expected future life of building	Unknown. Review options when future of building is decided	Property services	£30k	Annual CO <sub>2</sub> saving approx 10 tonnes

#### Renewable Energy

Roof-mounted solar electric PV systems on corporate buildings (Badminton Road and Leisure Centres)	Simple pay back method is around 8 years Procurement in progress October 2011	2011/12	Property services	£133k - to be funded from the existing carbon management budget	Total benefit of £640k over 25 years (from FIT, energy exported to the grid, and savings on energy bills)
Further investigate potential for community-led development of wind turbines on council land	A full feasibility study would be required to confirm the viability of the identified sites. This would involve the erection of a meteorological mast to further investigate the wind speed	Further investigate and consult on options during 2012	Corporate sustainability and property services leading on the initial investigations and consultation	One 2MW onshore wind turbine would cost in the region of £3.2 - 4.1 million (depending on the number of turbines per site) to develop	Net annual revenue of £300-400k per 2MW turbine over 20-25 years About 2,500 tonnes of CO <sub>2</sub> offset per turbine per annum
Investigate use and processing of wood waste from Council operations for use in council owned biomass boilers		2012/13	Corporate sustainability and street care		To be determined

#### Schools

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Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>

Reducing emissions by rationalising the council estate and sharing assets

Review options for inefficient school buildings that are beyond their life span		Ongoing but no current plans / funding. Need to review opportunities as they arise - to be reflected in asset management plan/schools capital programme	Members / CYP asset management		Not yet quantified
Behaviour / management / policy					
Support schools in making plans to implement the recommendations of the 34 schools energy surveys Evaluate effectiveness of this approach and prepare options for future action	Surveys identified both behaviour change and capital works – funding is required for capital works (see capital works proposals)		CYP asset management	Within existing resources except for captal works (see capital works proposals)	Scale of impact will be dependent on extent of implementation
Continue to encourage schools to develop energy action plans / teams etc Develop pilot work with The Converging World to provide 1:1 support for schools		Pilot work with The Converging World to be taken forward during 2011/12	CYP asset management	Officer time, and potentially cost to commission 1:1 support	Not known
<ul> <li>Include discussion on energy advice in every regular asset management meeting with schools. Encourage schools to undertake monitoring of half hourly energy consumption to:</li> <li>identify issues such as higher than expected base load to enable targeting of reduction activities</li> <li>identify out of hours energy consumption and potential for charging to users (including CRC Tax)</li> </ul>		Ongoing	CYP asset management	Within existing resources	Not known



Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>
Ensure new assets are designed to be energy efficient	Uncertainties about future of new build for schools	Unknown	CYP asset management; property services	Not known	Not known

#### Improving the energy efficiency of existing assets through capital works

Set up Spend to Save fund to enable capital works	Costs of administration	2012/13	CYP	£1.5m investment	Saving of £164k per annum on schools'
to improve the efficiency of their buildings to be	and project		asset management;	paid back over	energy bills and 837 tonnes CO <sub>2</sub> per annum
undertaken in schools	management built into		property services	7-10 years with	-
	the funding proposal			4% interest rate	

#### Renewable energy

Invest £360,000 through Spend to Save fund to cover the over and above costs of installing biomass heating instead of gas heating for 3 schools during 2012/13 Investigate potential for future years (subject to CYP programme for replacement of heating systems in schools using R&M budgets)	Costs of administration and project management built into the funding proposal	2012/13	CYP asset management, and property services	£360,000 paid back over 12 years with an annual interest rate of 4%	Net revenue and savings of $\pounds50k$ per annum, and savings of 122 tonnes of $CO_2$ per annum
Keep costs and incentives for solar PV under review and develop a proposal for a loan fund for solar PV in schools if it becomes financially viable.		Ongoing	Corporate sustainability and property services		

#### ICT

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Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>			
Reducing emissions by rationalising the council estate and sharing assets								
Investigate potential for more shared use of servers with schools and others	Need ability to segregate information. Would also need to look at network integration which could increase the revenue savings	Assessment and possible implementation 2012	ICT	No cost	Potentially medium -cannot quantify until a detailed inventory and assessment has taken place			
Behaviour / management / policy								
Reduce stand by times of monitors in SGC offices (currently set at 20 mins)	ICT already receive complaints about the speed that stand by kicks in - could generate additional helpdesk calls Could have implications for home working (shorter standby times result in logging out from Citrix / VPN)	Review options and trial during 2012	ICT	Officer time	Small			
Switch off cooling in the secondary IT equipment rooms at Badminton Road	As long as temperature stays within reasonable range, no major issues for ICT resilience. If not – possible impact on ICT equipment. Need to monitor temperature impact	Will do one room during 2011/12. The remainder will be subject to results of the first room.	ICT	Officer time	Small			

2012



Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>
Improving the energy efficiency of existing asso	ets through capital wo	orks			
Consolidating / virtualising servers Already progressed to an extent but more can be done in particular to move physical servers to virtual servers. Consolidated SQL server available but some applications cannot yet use consolidated servers. As upgrades get done we will specify the requirement for compliance	Some servers, software or services still require stand alone servers but this will change over time. Needs business downtime to migrate existing databases across	In Progress This will be done as a replacement for existing servers where a virtual server can be used – completed by March 2014	ICT	Within existing costs if to be delivered by March 2014 £16,000 if a quick solution required, or £8,000 for medium	Medium Could save 50% per server
Switch to thin client for staff ICT Server works as big PC for a number of devices	Also being considered as part of procurement savings Requires acceptance of increased standardisation.	2014	ICT	Cost will depend on degree of roll out	Low, and more servers will be required offsetting some of the savings
Complete the move from desk top printers to multi function devices. Majority already completed but still some at Emersons Green	Emersons Green being planned	2011/12	ICT	Being funded from existing budgets	Low for remainder of replacements
Procuring more energy efficient 'blade servers' as standard	Blade uses 40% less energy than traditional	Ongoing 50% complete The remainder will be rolled out as a replacement for existing servers where a virtual server can be used – completed by March 2014	ICT	£12,000 for blade chassis £5,000 extra if accelerated rollout required	Medium 25-30% per server
Consider reducing the number of server rooms, with downgrade or removal of server room	High risks associated with moving equipment and services	Assessment during 2011/12. Implementation the following year, subject to results of the assessment	ICT	£10,000 for network equipment where this cannot be reused	Potentially large Up to 20% of our server room utilisation

2012

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>
Send some servers into sleep mode when there is less use Servers can sense when PCs being used and power up and down to match the demand	Unknown technology so risk to ICT resilience	Technology for this is in early releases. Need to monitor development. Risk of immature software too high to implement before 2012/13	ICT	Software costs unknown likely to be around £200 per server = £20,000	10-20%
Consider buying server space elsewhere. Assuming the host company is not a CRC participant, this would remove the need to buy CRC allowances for server energy use	This would have larger implications as we would need to assess security, CRB checks for certain data, SLA's and support	Future	ICT	Potentially significant annual costs to increase communication links	Potentially large





#### Street lighting

Summary of initiative Issues / comments Timescale	Lead responsibility Costs	Anticipated savings energy costs & CO <sub>2</sub>
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#### Reducing emissions by rationalising the council estate and sharing assets

Review, rationalise and reduce street lighting stock (ie remove columns) For example - consider removing street lights from some minor roads	undertaken	Likely to commence review of potential during 2012/13	StreetCare		Would save £50 - £135 in energy costs and 0.06-0.40 tonnes CO <sub>2</sub> per annum per column removed
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#### Behaviour / management / policy

Use planning process to reduce extent of growth in external lighting Encourage smart design to ensure appropriate lighting in the right locations with part night lighting as standard (and potentially not installing lighting in some areas)	Lack of existing planning policy to encourage this	Ongoing	Spatial planning team / development control StreetCare	Officer time	Saves £50 - £135 in energy costs and 0.06- 0.40 tonnes CO <sub>2</sub> per annum per column not installed
Smart design for signage. Move nationally to decrease sign clutter but requires culture shift	Review approach post- transportation services team restructure	Review opportunities during Autumn / Winter 2012	StreetCare	Officer time	Possibly 10-20% of current annual energy spend for signage (£65k)
Like for like replacement of columns rather than increasing number/ lumination to comply with the british standard	Already happening	Ongoing	StreetCare		Saves $\pounds$ 50 - $\pounds$ 135 and 0.06-0.40 tonnes $CO_2$ per annum per additional column not installed
Link road hierarchy to lighting levels more closely	Not known if savings available	Ongoing examination by StreetCare	StreetCare	Staff time (existing resource)	Unknown at this time

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>

Improving the energy efficiency of existing assets through capital works

Part night street lighting - StreetCare is supporting the design and implementation of part night street lighting schemes to switch off street lights between midnight and 5am approx, as well as part night lighting schemes on the Ring Road and other main roads.	Officer time required to support scheme design	Programme is over three years to switch off all feasible lights Approx 5,000 lights planned to be switched off in 2011/12. This is one sixth of all lights	StreetCare	£100k capital cost to switch 5,000 lights off (£20 / unit average)	Saves £15 - £40 and 0.04 - 0.23 tonnes CO <sub>2</sub> per annum per column (greater savings for higher wattage lamps)
Only use traffic lights at certain times during day and night Should be considered now as part of any new design brief	Legal advice required, but same idea as part night lighting Requires some design changes and extra sign installation for retrofit. Culture change required	Now for new development Review options for retrofit during 2012/13	Traffic management team (ECS) currently but responsibility will transfer to StreetCare post review	Not known	Not known but anticipated to be 20-30% of pedestrian crossing energy usage





#### Transport - Fleet vehicles and business mileage

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>

Reducing emissions by rationalising the council estate and sharing assets

Continue to review potential to streamline the vehicle fleet and consequently reduce fuel usage and emissions		Ongoing	StreetCare	Should result in savings	
Behaviour / management / policy					
Implementation of Kingswood Civic Centre green travel plan	Focus will be on car sharing to reduce solo car driver rate	Upon occupation	Transport policy	Within existing budgets	Not known
Consider need to develop Thornbury green travel Plan	May be more of a challenge with level of free parking nearby	Ongoing	Transport policy	Within existing budgets	Not known
<ul> <li>Continued promotion of smarter working, eg:</li> <li>Additional training for staff to use video conferencing</li> <li>Review extent and effectiveness of PDA use</li> </ul>	Accommodation working group now that smarter working project has ended	Ongoing	Responsibility needs to be clarified	Within existing budgets	
GPS tracking of fleet vehicles Continue to monitor driver performance and MPG in order to target additional training needs, highlight uneconomical vehicles, assist with route optimisation and audit vehicle usage		Ongoing	StreetCare	Within existing budgets	
Fuel efficient driver training	Further training is booked throughout 2011 / 2012	Ongoing	StreetCare	Within existing budgets	

Summary of initiative	Issues / comments	Timescale	Lead responsibility	Costs	Anticipated savings energy costs & CO <sub>2</sub>
Improving the energy efficiency of existing ass	ets through capital wo	orks			
Continue to procure fuel efficient vehicles: All HGVs purchased are Euro 5 Cars purchased are mostly tax band A or B Investigate DfT's low carbon vehicle procurement programme		Ongoing	StreetCare	Within existing budgets	
Procurement of electric or hybrid cars	Several vehicles have been trialled to-date. The distance range of electric vehicles is currently limited to about 80 miles Would need to provide a business case to justify additional up- front costs	Unknown Technological advances will continue to be monitored	StreetCare		

