



National Galleries of Scotland

Public Sector Sustainability Report 2013 - 14

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Introduction

In 2012, the Scottish Government issued guidance on Sustainability Reporting to all public sector bodies in Scotland. The purpose of the reporting is to improve performance management in relation to sustainability, through greater accountability and transparency. This is the National Galleries of Scotland's third Sustainability Report.

The National Galleries of Scotland comprises three galleries in Edinburgh and two partner galleries in the North and South of Scotland. Our collection of fine art is amongst the best in the world.

The three Edinburgh galleries are:

- Scottish National Gallery, including the Royal Scottish Academy Building
- Scottish National Portrait Gallery
- Scottish National Gallery of Modern Art, comprising of buildings Modern One and Modern Two

In addition, the National Galleries of Scotland owns the Granton Centre for Art, a purpose-built storage facility located at the Granton foreshore in Edinburgh.

The National Galleries of Scotland aims to be recognised locally and internationally as a world-class institution at the forefront of sustainable care of the collection, the historic buildings and the environment.

In 2009 the NGS produced a Carbon Management Plan with the help of the Carbon Trust. This plan sets out our objectives and targets for the coming years with the main target being a 20% reduction in or Carbon Emissions by the end of 2014 from our baseline year of 2008.

We also produce an annual Environmental Management Plan which covers carbon emissions, biodiversity, waste management, water consumption and the contributions made by our shops and cafes in good environmental care.

In accordance with the guidance, this report highlights our high level performance for the financial years 2008-09, 2009-10, 2010-11, 2011-12 and 2012-13 in a number of key areas: energy use, waste management, water consumption, and actions on the environment and carbon management, biodiversity and sustainable procurement.

Performance Overview

The following table provides a summary of the progress we have made since the financial year 2008/09 (1st April to 31st March). This is not the same as our Corporate Target which uses the Carbon Management Plan and has the baseline as the calendar year 2008.

Area	2008/09	2013/14	% Change	On Target
Carbon from Energy	3,690	2,780	-33%	Yes
Total Energy Expenditure	£645,939	£546,964	-18%	
Carbon from Transport¹	8.45	13.16	+34%	No
Total Transport Expenditure¹	£10,205	£26,582	+62%	
Carbon from Waste	28	4	-600%	Yes
Total Waste Expenditure	£18,553	£19,356	+4%	
Carbon from Water	20	17	-6%	No
Total Water Expenditure	£86,157	£38,421	-124%	
Total Carbon Emissions	3,745	2,814	-33%	Yes

The Corporate Target is for a 20% reduction in our carbon emissions by the end of 2014 from 2008 levels. We do not have specific targets for each element of this but Carbon from Transport has increased due to a larger fleet size and transporting visitors between galleries. Carbon from Water has not reduced as much as we had hoped due to larger consumption at the Portrait Gallery.

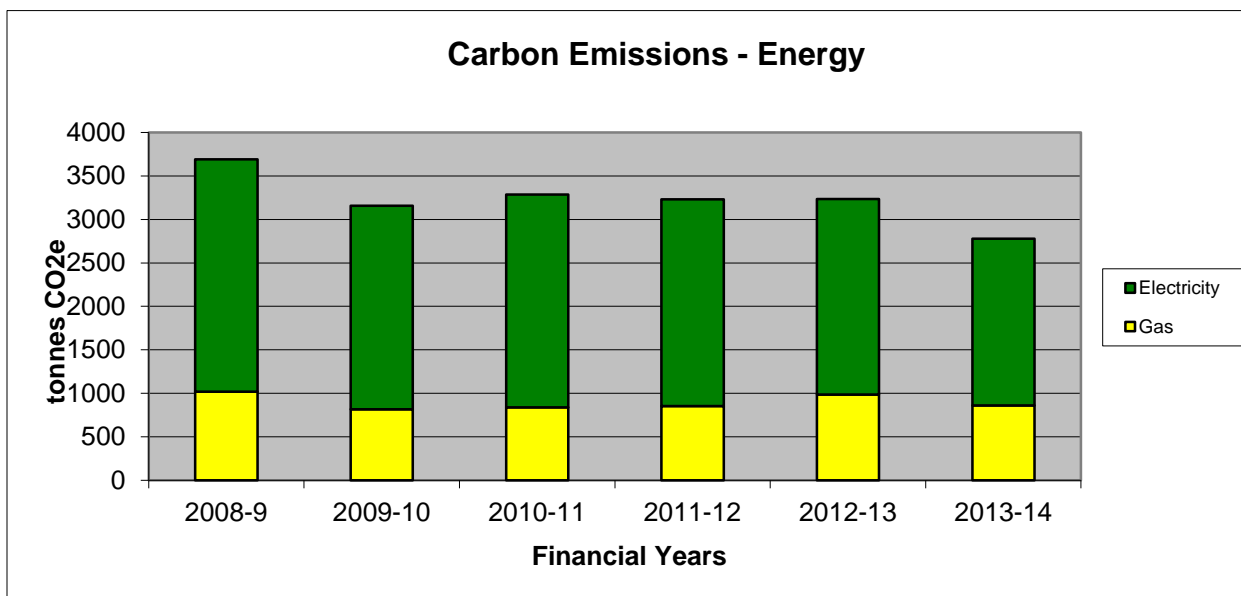
¹ From own fleet only

Energy Use

The following tables show emissions and expenditure from gas and electricity. The chart displays the changes in carbon emissions over the last six years.

	GREENHOUSE GAS (GHG) EMISSIONS	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Gross Emissions (Tonnes Co2e)	Scope 1 : Direct (gas)	1,021	816	840	852	985	863
	Scope 2 : Indirect (electricity)	2,669	2,342	2445	2,380	2,248	1,917
	Total	3,690	3,158	3,285	3,232	3,233	2,780

	FINANCIAL INFORMATION	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Expenditure	Scope 1 : Direct (gas)	£147,852	£128,932	£83,462	£104,302	£144,196	£135,341
	Scope 2 : Indirect (electricity)	£498,087	£421,521	£322,539	£416,826	£337,093	£355,463
	Total	£645,939	£550,453	£406,001	£521,128	£481,289	£490,804



Commentary

The large reduction in 2009 this was due to the temporary closure of the Scottish National Portrait Gallery during refurbishment work. The gallery reopened in 2011. This building accounts for about 17% of our total energy consumption.

The newly refurbished Portrait Gallery has now been operating for more than two years and the reductions in energy use have exceeded the projections. Compared with 2008 prior to the refurbishment electricity consumption has gone down by 25% and gas 40%. The Portrait Gallery has been recognised by winning the Carbon Trust Scotland Award 2013 for a Refurbished Building.

The replacement of the glass cupolas at the National Gallery and upgrading of the lighting has also had a very positive effect on the energy consumption of that building. Compared with 2008 prior to the cupola and lighting replacement electricity consumption has gone down by 30% and gas 14%.

Across the estate gas consumption has been falling in the last year with a milder winter than in 2012/13. Gas consumption is 12% lower compared with the previous year.

Electricity consumption has seen the largest reduction by nearly 13% in the last year. Lighting has been a significant part of this.

Exhibition lighting has now been changed in the National Gallery, Portrait Gallery and Modern One & Two. The new lighting is manufactured locally by a company called Mike Stoane Lighting using LED chips from Xicato from California. The fittings produce a very good quality light and consume about a fifth of the energy that conventional exhibition lights do. The final gallery yet to have new lighting is the Royal Scottish Academy.

We have a programme of changing the back of house lighting to LED type fittings with sensors that operate with movement, light and sound. The advantage of this lighting is the low energy consumption and the reduced maintenance costs due to long lamp life. The lighting in Modern One and the Modern One Lodge has been changed to this new lighting. It does take time for people to get used to the different light quality and the sensors

We have also fitted timers to the pathway and building feature lighting so that the lights are not on when they are not seen or required.

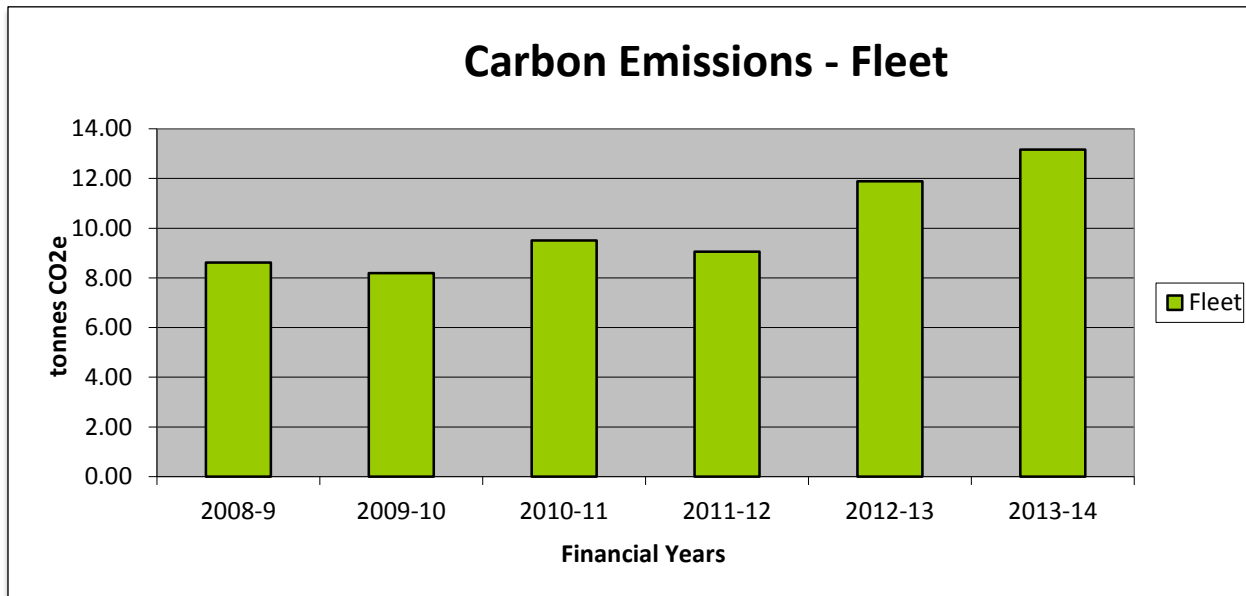
The Carbon Management Plan below gives further details of other energy reduction measures that we have undertaken in the last year.

Vehicle Fleet & Business Travel

The following table and chart shows the emissions and expenditure from our vehicle fleet.

GREENHOUSE GAS (GHG) EMISSIONS		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Gross Emissions (Tonnes Co2e)	Scope 1 : Direct (vehicle fleet)	8.62	8.19	9.51	9.05	11.89	13.16
	Scope 3 : Business Travel	-	-	-	-	-	

FINANCIAL INFORMATION		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Expenditure	Fleet Fuel	£2,473	£4,786	£3,908	£3,431	£7,966	£8,045
	Fleet Maintenance & Repairs	£4,295	£5,566	£5,648	£4,425	£8,651	£12,180
	Fleet Insurance	£3,436	£3,708	£2,974	£2,755	£5,940	£6,356
	Business Travel	Not Known	Not Known	Not Known	Not Known	Not Known	Not Known
	Total	£10,205	£14,061	£12,531	£10,612	£22,558	£26,582



Commentary

The fleet has increased in size to six vehicles with the addition of a mini bus in the last two years. The mini bus is used to transport visitors and staff between the buildings and hence it is reducing business and visitor emissions. The mileage covered by the vehicles is low as they are primarily used for transport between our buildings in the centre of Edinburgh. The total mile covered by all vehicles in the last year was 31,179 down from 31,253 the previous year. The emissions have though increased with the Handling Team's lorry and mini bus doing more miles while the more fuel efficient car and messengers van doing fewer miles.

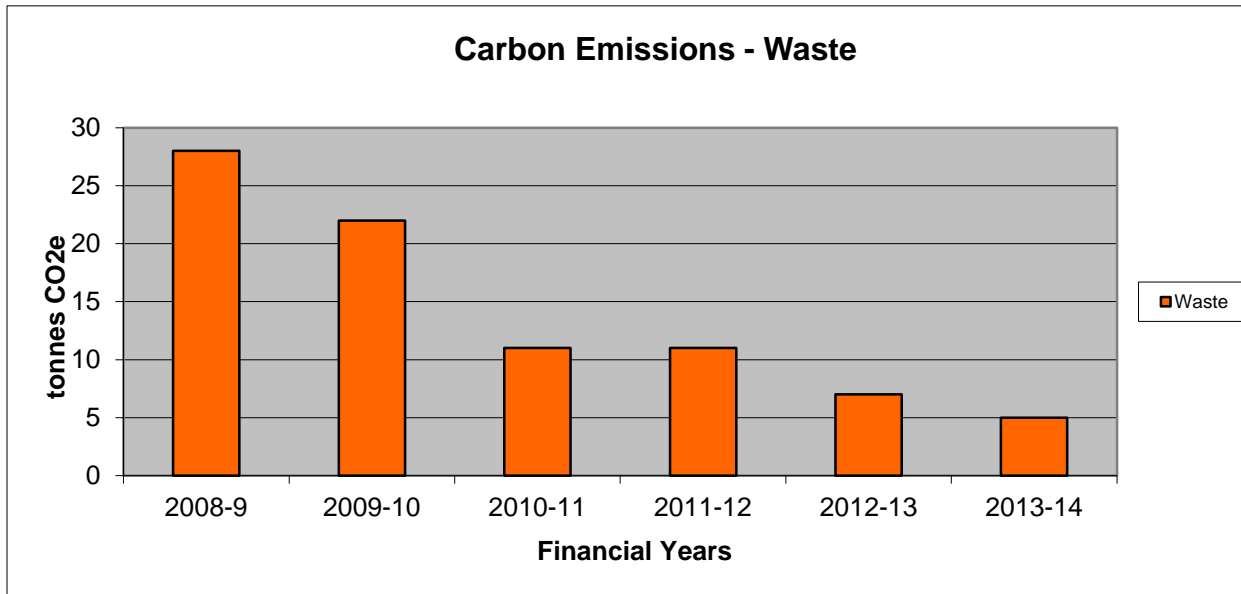
It has not been possible for us to quantify all carbon emissions or financial data from Business Travel at this stage. We are now getting carbon emissions data from Expotel, who provide travel management services. Unfortunately not all travel is booked through them so the information is of limited value. Further work will need to be carried out to establish a full system of data gathering for future reports.

Waste Management

The following table and chart shows the emissions and expenditure from our waste.

GREENHOUSE GAS (GHG) EMISSIONS		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Waste	Waste Total (tonnes)	117	153	83	125	181	185
	Waste Recycled (tonnes)	16	76	42	62	115	115
	Waste to Anaerobic Digestion (tonnes)	0	0	0	21	41	43
	Waste to Refuse Derived Fuel (tonnes)	0	0	0	0	5	23
	Waste to Landfill (tonnes)	97	70	33	32	11	4
	Waste to Landfill (Co2e)	28	23	11	11	7	4

FINANCIAL INFORMATION		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Expenditure	Waste	£18,553	£20,437	£14,760	£21,085	£19,891	£19,356



Commentary

Improved waste management has resulted in a large increase in the quantity and types of waste which are now recycled, composted or sent to an Anaerobic Digestion Plant for energy generation. In the last year we have included green waste in our figures which is uplifted for composting off site. We continue to compost leaves for mulch on site. We separate out most of our waste avoiding landfill but the remaining waste is further sorted by our waste management company extracting more recyclables. Only 2% of our waste now goes to landfill down from 6% last year.

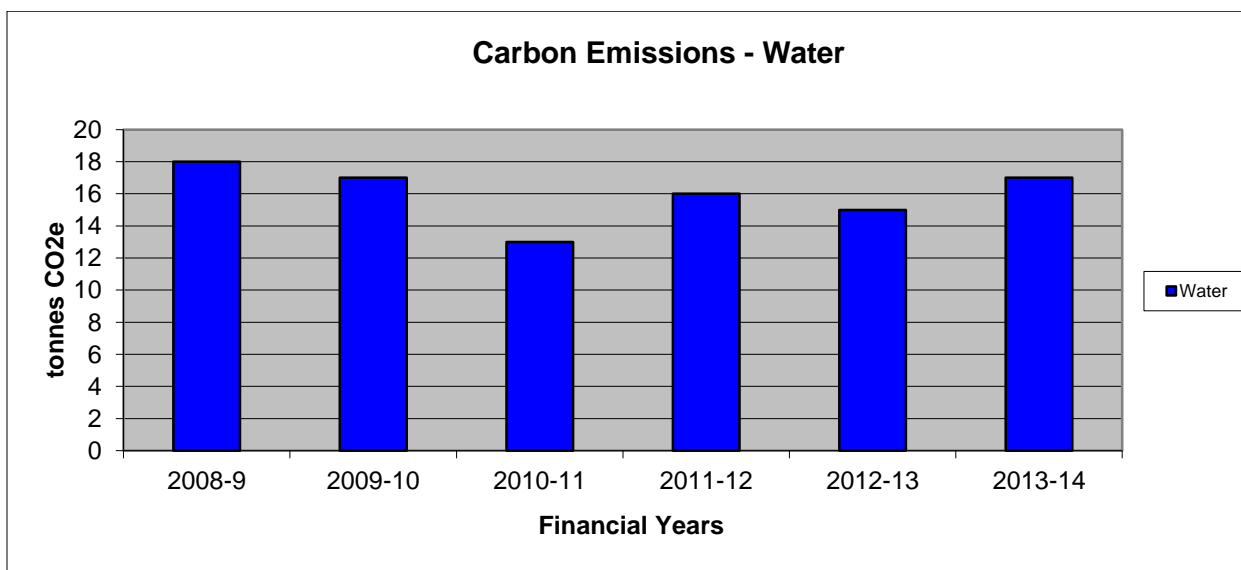
Our efforts have been recognised by achieving a Gold Award in the National Recycling Star Award Scheme.

Water

The following table and chart shows the emissions and expenditure from our water.

GREENHOUSE GAS (GHG) EMISSIONS		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Water	Water m3	20,639	19,479	15,284	17,560	14,183	16,989
	Water tonnes (CO2e)	18	17	13	16	15	17

FINANCIAL INFORMATION		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Expenditure	Water	£86,157	£68,575	£79,464	£62,895	£57,445	£38,421



Commentary

Water consumption continues to be high due to the demands of visitors visiting our galleries plus café kitchens, air conditioning plant and the Jencks Landform ponds, which are topped up. In the last year our water consumption increased by 19% this was mainly caused by the Portrait Gallery which had an increase of 75%. The exact cause of this is under investigation but the consumption is now dropping down again. Measures have been taken to reduce water consumption by repairing leaks quickly, fitting water saving devices and recirculation water from land drains under the landform. We now have sensor taps in all public toilets across the estate. We will continue to explore new technologies and the possibilities of water harvesting.

Carbon Targets

The Carbon Management Plan has been produced with the aim of reduction our emissions through identified sustainable projects. This plan is reviewed annually taking into account progress made, funding of projects and any further projects identified.

Our target is to achieve a 20% reduction in our carbon emissions by the end of 2014. The reductions in the first couple of years were largely due to the temporary closure of the Portrait Gallery during its refurbishment. We have though made steady progress over the years with a large number of carbon reducing projects against a background of increased use of the facilities and systems installed.

The chart below shows our reduction in emissions against the target of 20% in six years. The bottom line shows that we are now over 9% ahead of target.

	EMISSIONS	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Targets	Total Carbon (CO ₂ e)	3,747	3,209	3,320	3,270	3,266	2,814
	Reduction from Baseline	-2.42%	-16.43%	-13.54%	-14.85%	-14.89%	-26.67%
	Reduction Target	-0.83%	-4.17%	-7.50%	-10.83%	-14.17%	-17.50%
	Difference	+1.59%	+12.26%	+6.04%	+4.01%	+0.73%	+9.17

Commentary

A number of very significant projects have taken place this year and this has resulted in large reductions in our energy consumption.

The Cupola Project involved the replacement of large single glazed roof lights above the galleries in the Scottish National Gallery with double glazed airtight units. The glazing on the roof accounts for about a third of the total roof area. Some of the original glazing was of a double glazed type and it has been retained but solar reflective film applied. Blinds have been added to the underside of the glazing and they will be used to stop direct sunlight and limit daylight during closed hours. Heriot-Watt University was involved in a study into the performance of the original cupolas and they will now continue to study the galleries environmental performance as part of a three year Energy Technology Partnership Study. They will also study the performance of the Portrait Gallery. This study will also investigate the opportunities to optimise the plant to reduce energy consumption yet providing the best possible environmental conditions for the collection. The study is partly funded by Resource Efficient Scotland.

Lighting upgrades detailed above under energy use has also been a major element of the Carbon Management Plan.

Modern Two air conditioning is now fully operational after problems with pipework blockages and the controls settings. The controls are current set for the stricter BS5454 standard but it is possible to switch to the low energy Bizot Standard when instructed by the Conservation Department.

A trial is going to be carried out at our Newbridge store using Hemcrete. This material seems to have very good thermal and humidity buffering qualities and is possibly ideal for low carbon storage facilities. We will build an enclosed box from Hemcrete to house antique furniture and monitor its performance. Heriot-Watt University are interested in studying this material.

Feasibility Studies are being carried out into water harvesting and the use of ground source heat pumps at the Gallery of Modern Art. The funding for these studies is coming from Resource Efficient Scotland.

Various other smaller projects have taken place over the year including the application of heat retaining window film, draught proofing, increased recycling, Building Management Systems improvements, and insulation.

We have reached the target of a 20% reduction in our carbon emissions, over a year ahead of time, but I believe we can continue to make even greater improvements. Technology is making further advancements and we are getting a better understanding of our historic buildings and how to control the environment within. Information is also a very valuable tool and it is important to make use of other organisation experiences. To this end we have contact with many bodies including Resource Efficient Scotland, Sustainable Scotland Network, Edinburgh Centre for Carbon Innovation and Historic Scotland.

Action on Biodiversity

All polluting activities contribute to a global effect on biodiversity. However we have specific responsibilities to the flora and fauna on our own grounds, principally at the Gallery of Modern Art where we have land around our buildings. We have implemented management policies which include encouragement of different plant species, providing natural spaces with wild plants, providing animal habitats, lightly managed woods with fallen tree retention, composting of leaf and grass waste and the fitting of nest boxes.

We have developed a kitchen garden with the caterer and the gardener at Modern One which will produce fruit, soft fruit, vegetables and herbs for use within the café. The new kitchen garden has five areas of important ecological systems. The orchard, the composting system, the raised beds, the fruit patches and the insect hotel. The garden will be open to the public so that they can see it in its development and understand the link of produce from the earth to the table and how it can operate in harmony with nature.

Bees have been under threat in recent years with a large decline in their numbers. We have identified an area of the grounds of Gallery of Modern Art where we could locate bee hives. We also intend to plant a wildflower meadow surrounding the hives. This would again be of interest to the general public and we would be able to sell the honey in the café's and shops.

Sustainable Procurement

Sustainable Procurement is a process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment. The NGS is following Scottish Government guidance in this area and implementing policies and procedures to encourage procurers to understand life cycle impact at the early stages of the procurement process. Training on the Marrakech approach to procurement has taken place and we have attended Ready for Business seminars on community benefits in procurement. NGS are also signatories to the Suppliers Charter which aims to give businesses access to public contracts. We have placed orders through the Framework Agreement for Supported Factories and Businesses which was set up by Scottish Procurement. We have also used the Flexible Framework which is an assessment tool which asks a series of questions on sustainable procurement and gives guidance on improvements.

Conversion Factors

The conversion factors used in this report are from 2014 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. These conversion factors allow activity data (e.g. litres of fuel used, number of miles driven, tonnes of waste sent to landfill) to be converted into kilograms of carbon dioxide equivalent (CO₂e). CO₂e is a universal unit of measurement that allows the global warming potential of different GHGs to be compared.

Conversion Factors used to convert data into Carbon Dioxide equivalent (CO₂e)

	2008	2009	2010	2011	2012	2013	2014
Electricity (kWh)	0.53465	0.53291	0.52439	0.49068	0.49636	0.48357	0.49426
Gas (kWh)	0.18500	0.18500	0.18500	0.18360	0.18521	0.18404	0.184973
Water – Supply (m ³)	0.30000	0.34000	0.34410	0.34410	0.34410	0.34410	0.34410
Water – Treatment (m ³)	0.75000	0.70000	0.70850	0.70850	0.70850	0.70850	0.70850
Waste to Landfill (tonne)	290	290	290	290	290	290	289.835514
Waste Recycled (tonne)	21	21	21	21	21	21	21
Fleet - Small diesel van (≤1.7ltr) (Km)	0.153464	0.153464	0.153464	0.153464	0.153464	0.153464	0.153464
Fleet - Medium diesel van, (>1.7 ≤2.0ltr) (Km)	0.226977	0.226977	0.226977	0.226977	0.226977	0.226977	0.226977
Fleet - Medium petrol car, (>1.4 ≤2.0ltr) (Km)	0.2049	0.2049	0.2049	0.2049	0.2049	0.2049	0.20088
Fleet - HGV Rigid >3.5-7.5t (Km)	0.59115	0.59115	0.59115	0.59115	0.59115	0.59115	0.594271
Diesel (Litre)						2.6008	2.6024
Petrol (Litre)						2.2144	2.1914

Scope Definitions

Scope 1 : Direct – This includes directly consumption of gas and oil. Emissions from NGS owned fleet vehicles are included.

Scope 2 : Indirect – This is for emissions which result from energy consumed which is supplied by another party. This is electricity as we do not receive heat, steam or cooling from another party.

Scope 3 : Travel – This is for emissions relating to official business travel directly paid for by the organisation.