



Glasgow Caledonian University Environmental Facts & Figures for 2012-2013



GCU's Environmental Facts & Figures for 2012-2013

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Introduction

GCU's Environmental Facts & Figures, our first environmental statement, complements our emissions report for 2012-2013 by offering additional insight into the activities included in our emissions report.

Similar to the emission report, where data is available, comparisons are made with 2008-2009, the earliest academic year for which we have a comprehensive set of environmental data.

GCU's Environmental Facts & Figures also informs the review of GCU's Environmental Policy and its commitment to continuously improving its environmental performance by mitigating potentially adverse environmental impacts.

Finally, GCU's Environmental Facts & Figures provides an opportunity to highlight good practice and opportunities for further improvements in GCU's environmental performance.

Environmental Commitments

GCU is a thriving and dynamic University employing around 1,550 staff to provide teaching, learning and research opportunities to a community of over 17,000 students through almost 400 courses.

Our motto, "For the Common Weal" (For the Common Good), reflects GCU's commitment to using its wealth of teaching and research skills, facilities and knowledge to make a positive contribution to society. This commitment is intrinsically aligned with the principles of sustainable development and in 2012 GCU stated its commitment to sustainability by becoming a signatory to the United Nations' [Commitment to Sustainable Practices of Higher Education Institutions on the Occasion of the United Nations Conference on Sustainable Development](http://tinyurl.com/kz6t37n)¹ and an active participant and proponent of the [Principles for Responsible Management Education](http://tinyurl.com/l93jxuo)².

GCU's Sustainability Strategy outlines our overall approach to adopting the principles of sustainable development throughout our operations, whilst our [Environmental Policy](http://tinyurl.com/l2x8qqn)³ details our aspirations to reducing environmental impacts potentially associated with our operations. To help realise these aspirations, GCU is at an advance stage in the implementation of the EcoCampus Environmental Management System, which is based on ISO14001 and was developed specifically for Higher Education Institutions.

¹ <http://tinyurl.com/kz6t37n>

² <http://tinyurl.com/l93jxuo>

³ <http://tinyurl.com/l2x8qqn>

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Through EcoCampus we have adopted a well-established, robust methodology to identify and evaluate our environmental performance, put in place appropriate measures to minimize environmental impacts and comply with environmental legislation.

These Environmental Facts & Figures are a result of our first wholesale review of our environmental performance and highlight opportunities for delivering improvements in a number of key areas.

Carbon Footprint

We measure our carbon footprint because it enables us to better understand our environmental impacts and compare them on an equitable basis.

In 2010, the Carbon Trust produced GCU's first Carbon Management Plan (CMP), which included its first emission inventory and reported emissions. The CMP set a 20% carbon reduction target for 2014 and suggested a number of interventions to help achieve it.

GCU's reported emissions for 2012-2013 were 25,803 tonnes CO₂e, with travel and energy use responsible for a significant proportion of reported emissions (as illustrated by Figure 1 and detailed in Table 2).

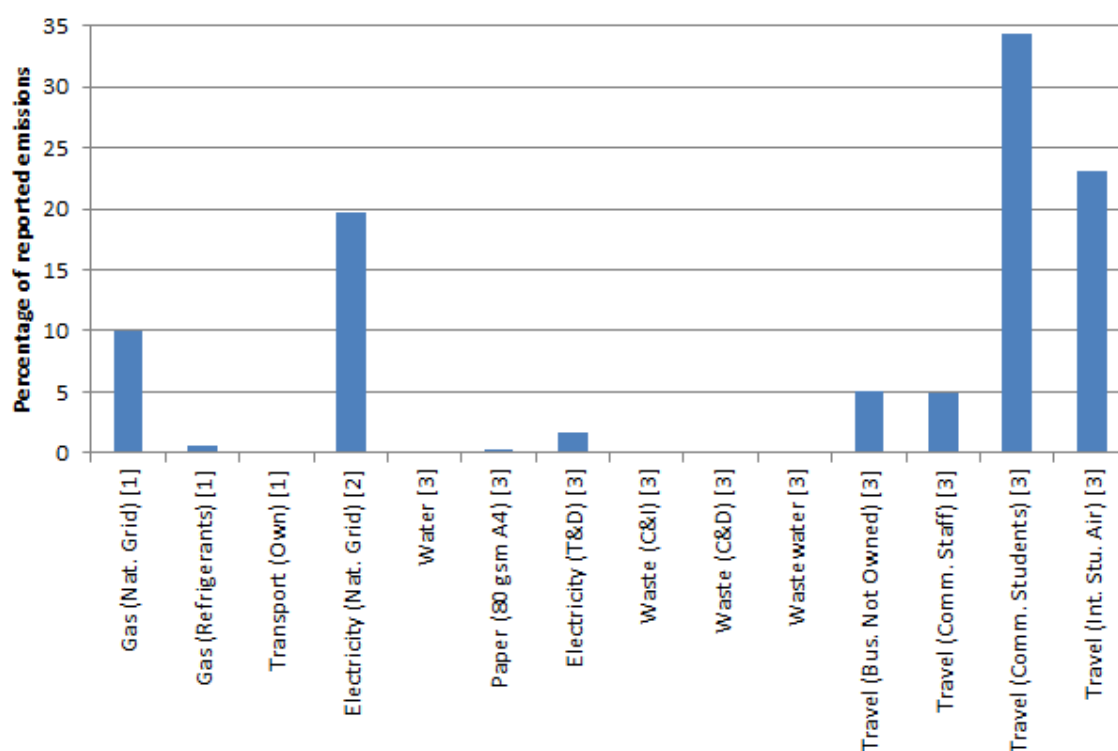


Figure 1 Distribution of GCU's reported greenhouse gas emissions for 2012-2013.

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Emission Category	Scope	Emission Activity	TCO ₂ e
Organisation's buildings	1	Gas consumption	2,572
	1	Refrigerant Gases	152
Organisation's vehicles	1	Business travel (own fleet)	11
Purchased electricity	2	Electricity (Nat. Grid) Total	5,087
Purchased Goods & Services	3	Water	18
	3	Paper (80 gsm A4)	71
Other fuel & energy related activities	3	Electricity (transmission & distribution losses)	435
Waste Generated in Operations	3	General Waste & Recycling	41
	3	Construction & Demolition Waste	1.4
	3	Wastewater	36
Business travel	3	Travel (business – not owned)	1,298
Employee commuting	3	Travel (commuting – staff)	1,281
	3	Travel (commuting – students)	8,884
	3	Travel (international students flights to UK)	5,957

Scope 1 Total		Direct combustion of fuels or release of certain gases	2,735
Scope 2 Total		Electricity purchased from the National Grid	5,087
Scope 3 Total		Activities outwith GCU's direct control.	17,981

Table 1 Summary of GCU's reported greenhouse gas emissions, by scope, for 2012-2013.

Although the greenhouse gas emission inventory used to report emissions for 2012-2013 is broader than that used for 2008-2009, comparable data allows for comparison of emissions from key sources and make projections of likely emissions for 2013-2014 (carbon reduction target year). These are presented in Table 2 (below).

Emission Source	Scope	2008-09	2012-13	2013-14
Gas - Nat. Grid (Tonnes CO ₂ e)	1	2,674	2,572	2910
Gas – Refrigerants (Tonnes CO ₂ e)	1	152	152	152
Transport – Own (Tonnes CO ₂ e)	1	12	11	11
Electricity – Nat. Grid (Tonnes CO ₂ e)	2	6,828	5,087	3,495
Electricity - Trans. & Dist. Losses (Tonnes CO ₂ e)	3	541	435	301
General Waste & Recycling (Tonnes CO ₂ e)	3	107	41	20

Totals & Reduction from Baseline		2008-09	2012-13	2013-14
Scope 1,2 & 3 – Total (Tonnes CO ₂ e)	1,2+3	10,315	8,298	6,876
Scope 1,2 & 3 – Reduction from baseline (%)	1,2+3		20%	33%

Table 2 Actual and estimated carbon emissions for 2008-2009, 2012-2013 and projections for 2013-2014 (where comparable datasets were available).

Table 2 indicates that GCU will achieve and surpass the 2013-2014 target ahead of schedule, with 20% reduction in 2012-2013 (8,298 tonnes CO₂e, vs. 10,315 tonnes CO₂e in 2008-2009) and a projected reduction of 33% for 2013-2014 (to 6,876 tonnes CO₂e).

To facilitate a move towards full carbon accounting (as noted earlier), a broader emissions inventory was used to report GCU's emissions for 2012-2013 than was used for 2008-2009. Using a broader range of emissions will also help develop a better understanding of GCU's wider environmental impacts. As a result of this approach, reported emissions for 2012-2013 appear higher than in 2008-

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2009. However, this should not be interpreted as an increase in emissions but rather reflecting an improvement in GCU's understanding of its environmental impacts. Table 2 provides a like-for-like comparison of emissions for sources with comparable data (as reported in the baseline carbon footprint).

An evaluation of the reported emissions for 2012-2013, and where data was available for 2008-2009, is provided below by main emission activity category.

Travel

Understanding environmental impacts associated with GCU's travel will help identify opportunities to mitigate associated impacts. This category includes business travel, student and staff commuting and international student flights to the UK.

Business Travel

Business travel is a common element of many organisations' day-to-day activity and GCU is no exception. During the 2012-2013 academic year GCU staff travelled 5,686,616 km on University business (Table 3), which is equivalent to each member of staff travelling 3,681 km during the 2012-2013 academic year.

Table 3 provides a breakdown by mode of travel and includes total carbon emissions together with details of the relative carbon intensity of the different modes of transport. No comparable data is available for 2008-2009.

Mode	Distance Travelled (km)	Carbon Emissions (TCO ₂ e)	kg CO ₂ e/km
Staff Cars – Petrol	53,931	11.05	0.21
Staff Cars – Diesel	30,716	5.37	0.18
Staff Cars – Hybrid	1,368	0.16	0.12
Hired Cars – Petrol	20,917	4.29	0.21
Hired Cars – Diesel	72,770	12.72	0.18
Flight - Dom.	773,876	252.76	0.33
Flight – SH	705,549	135.79	0.19
Flight – LH	3,822,491	865.90	0.23
Rail - Nat.	194,648	9.55	0.05
Rail - Int.	10,351	0.13	0.01
Total	5,686,616	1,297.72	

Table 3 Distance travelled (km/year) and associated emissions (CO₂e) from business travel at GCU. The relative carbon intensity of the different travel options is also included.

As noted above, understanding how we travel and the impact our choices have will highlight carbon cutting opportunities and help us make more informed decisions about how we choose to travel. As an example, during 2012-2013 GCU staff made 602 journeys between Glasgow/Edinburgh and London not linked to onward international travel: of these, 90% were by air and reducing the number of flights between Scotland and London could be a simple/cost effective way of reducing our carbon emissions. Similar opportunities may exist for other mainland UK destinations, although

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not to the same extent, such as Birmingham, East Midlands and Manchester (amongst others) where there are examples of both air and rail travel by GCU staff.

We will explore this type of opportunity further through the development of a sustainable travel policy and strategy for GCU.

Student & Staff Commuting

Student and staff commuting account for 34% and 5% (respectively) of total reported emissions for 2012-2013. These estimates are based on results from the 2012 travel survey, which built on a staff travel survey carried out in 2009. A summary of the travel choices (modal distribution) made by GCU students and staff is provided by Table 4.

Mode	Students 2012	Staff 2012	Staff 2009	kg CO2e/km
Walk	17.68%	8.13%	7%	0.00
Cycle	1.83%	4.61%	2%	0.00
Rail	26.39%	34.69%	28%	0.05
Underground	4.07%	4.24%	N/A	0.06
Bus	33.53%	24.35%	26%	0.12
Motorcycle	0.00%	0.55%	N/A	0.19
Car	16.51%	23.43%	31%	0.12-0.21
Other			6%	

Table 4 Travel choices (modal distribution) of GCU students and staff.

The 2012 travel survey was the first to evaluate student commuting to GCU and provides a benchmark against how the success of future initiatives will be gauged. For staff commuting we have the benefit of the 2009 survey, which suggests that a proportion of GCU staff have made a shift towards more sustainable and active modes of travel.

Whilst the challenge for GCU will be to develop further initiatives to sustain this momentum, the fact that nearly 35% of GCU students and staff live within 5 miles of the University (Figure 2) should present a number of opportunities for reducing associated environmental impacts.

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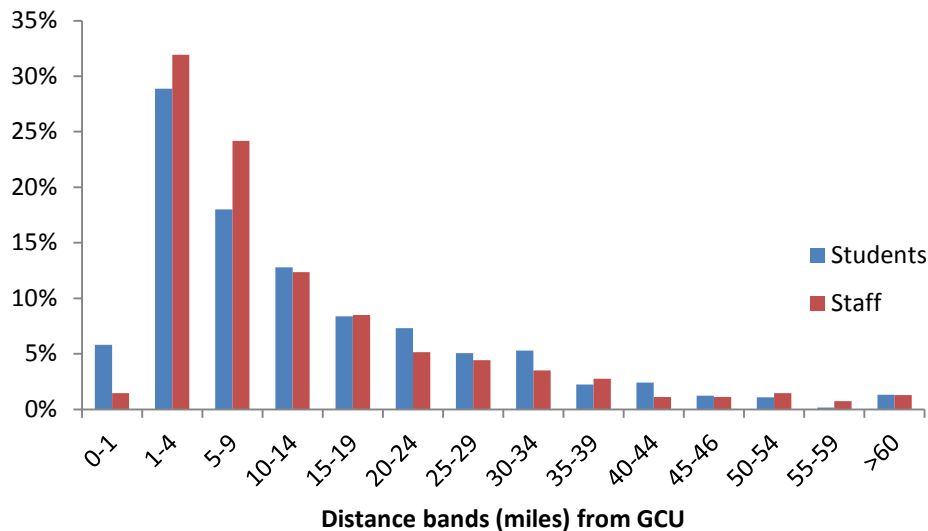


Figure 2 Distribution of how far from the University GCU students and staff live (based on the 2012 travel survey).

Such opportunities will be identified and explored as GCU develops a sustainable travel strategy.

Sustainable Travel – Free Advice & Support: Recognising that travel is one of GCU's most significant sources of greenhouse gas emissions, GCU students and staff have access to travel planning advice through the Bike Station, which includes free travel plans and access to a range of resources to encourage more active travel. The Bike Station's Dr. Bike also visits the GCU campus several times a year to help students and staff keep their bikes on the road.

As a result of feedback from these interventions, GCU has established a Cycling Forum, which is active in helping the University put in place more cycle friendly infrastructure.



GCU also works with a number of other partners, such as SPT and Sustrans, to promote more active travel. GCU has also been selected by Cycling Scotland as one of five organisations in Scotland to pilot the new Cycle Friendly Campus Award, an initiative that encourages more active travel amongst university and college students.

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International Student Air Travel

International student air travel to the UK accounts for over 20% of GCU's reported emissions for 2012-2013 and was included in GCU's latest emissions report as part of our efforts to move towards full carbon accounting.

As this was the first time this information was collected, we are hopeful that in addition to contributing to improving our understanding of our environmental impacts, it will also stimulate a conversation about how GCU can further minimise the impacts of travel.

Energy Use

After travel, energy use (gas and electricity) is the second largest source of emissions, representing around 40% of total reported emissions.

Electricity is used to power equipment and lighting in GCU's Campus and Caledonian Court and also provide space and water heating in Phase 1 of Caledonian Court. Gas is used in GCU's kitchens and for space and water heating in GCU's Campus and Caledonian Court's Phase 2. Electricity and gas are also used in GCU London and Buchanan House (in Glasgow), but as these are rented premises, and energy is included in the rental agreement, we do not have accurate data on energy consumption. Our energy consumption is detailed below in Table 5.

Site	Gas (kWh)		Electricity (kWh)	
	2008-2009	2012-2013	2008-2009	2012-2013
Campus	13,063,447	12,232,598	12,963,254	10,513,146
Caledonian Court (P1)	N/A	N/A	354,722	486,415
Caledonian Court (P2)	1,474,518	1,741,850	509,866	420,619
Total	14,537,965	13,974,448	13,827,842	11,420,180

Table 5 Electricity and gas directly purchased and consumed by GCU during 2008-2009 and 2012-2013.

Overall there have been absolute and relative reductions in the amount of energy used by GCU, with a 4% reduction in gas used and a 17% reduction in electricity used (as detailed in Table 5 and Table 6).

Energy Type/Parameter	Intensity Factor (kWh/year/m ²)		Change
	2008-2009	2012-2013	
Gas (kWh)	132	107	-19%
Electricity (kWh)	133	125	-7%

Campus GIA (m ²)	97,944	98,105	+0.15%
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Table 6 Intensity of energy use relation to gross internal area (m²) in GCU's City Campus.

Despite these overall reductions in total energy consumption, a moderate increase in energy used in Caledonian Court was registered, which was primarily attributed to a moderately colder winter in 2012-2013 than in 2008-2009 (as explained in GCU's Emissions Report for 2012-2013).

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GCU's energy saving programme was boosted by the implementation of our first Carbon Management Plan, which was adopted in 2010. With over half of the identified carbon saving interventions implemented, and a new Energy Centre coming online, the 2013-2014 20% will be easily surpassed.

An updated Carbon Management Plan will be produced during 2014-2015 to sustain the momentum created by the first plan by identifying further energy saving opportunities and setting a new carbon reduction target.

Energy Centre - Lower Carbon Heat & Power: Originally arising from the need to replace GCU's ageing boilers, the £4.9m state-of-the-art gas fired combined heat and power plant delivers a third of Campus' electricity and all of its heating requirements. The plants' high efficiency (86.5%) means that its electricity has a lower carbon footprint than that available from the National Grid and the University is able to reduce the amount it has to put-aside for Climate Change Levy payments. Projections of emissions for 2013-2014 indicate that the Energy Centre will deliver a further 10% reduction in GCU's carbon footprint.

In addition to being specified to deliver significant environmental and financial benefits to the University, the Energy Centre was also designed as a teaching resource for the School of Engineering and Built Environment.

Incorporating a teaching element to the operational aspects of the state-of-the-art CHP resulted in the Energy Centre being 'Highly Commended' at the CHPA annual awards and GCU's Estates team being shortlisted in the Times Higher Education Leadership and Management Awards for their role in delivering the project.

Waste & Recycling

This section looks at how we manage our waste and equipment that is surplus to our requirements. It includes waste from: City Campus, Caledonian Court and GCU London, but not Buchanan House. It also includes waste from the demolition of buildings on 90 Dobbies Loan. A breakdown of total waste produced and recycled by GCU is provided in Table 7 and Table 8.

General & Domestic Waste	2008-2009		2012-2013	
	Tonnes	Tonnes CO ₂ e	Tonnes	Tonnes CO ₂ e
General – Landfill	383	76.22	38.82	7.73
General – Energy Recovery	N/A	N/A	11.04	0.23
General – Recycling	33.20	0.70	323.90	6.80
Catering – Anaerobic Digestion	N/A	N/A	49.79	1.05
Glass – Recycling	N/A	N/A	1.63	0.03
Paper - Recycling	N/A	N/A	9.18	0.19
WEEE – Large – Recycling	N/A	N/A	0.24	0.01
WEEE – Small - Recycling	N/A	N/A	18.52	0.39
Domestic – Landfill*	150	29.85	125.00	24.88
Domestic – Recycling*	5.8	0.12	2.00	0.04

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Table 7 Comparison between waste arising from GCU's operations in 2008-2009 and 2012-2013 (NB.: quantities for waste streams with an asterisk (*) are based on volumetric estimates).

GCU operates a source segregated system for wastes produced on its premises. In GCU's Campus, where the majority of waste is produced, it is collected in the following fractions are collected: mixed recycling (paper, card, cans and plastic); food waste from catering outlets; glass; and bulky waste. This system increased recycling from below 5% in 2008-2009 to nearly 70% recycling for GCU as a whole and nearly 90% for the Campus.

Towards the end of 2012-2013 GCU's waste contractor stopped sending waste to landfill by converting non-recyclable waste into a fuel used in power stations in Continental Europe.

The waste management arrangements have highlighted a number of waste minimisation and re-use opportunities that GCU is actively exploring.

Zero Waste to Landfill: In 2011 GCU used the renewal of its waste management contract as an opportunity to implement some step changes that would bolster its recycling rate. Two key changes were introduced: first, a food waste collection was introduced and rolled out to all catering outlets and other busy staff areas; second, the emphasis was placed on separating materials for recycling. These changes boosted the Campus recycling rate from 5% to nearly 90%. Reducing the amount of residual waste that required disposal enabled GCU's waste contractor to convert the remaining fraction into a refuse derived fuel, which is used in power stations and eliminate the need for landfill. As a result none of GCU's waste has been sent to landfill since the summer of 2013. Becoming a zero waste campus will enable GCU to focus on waste minimisation and reduce the overall amount of waste produced, the outcome of which will hopefully become apparent over the next couple of years.

GCU's emphasis on waste minimisation and recycling is also applied to refurbishment and construction projects. Table 8 details the quantities of wastes recycled after the demolition of buildings in 90 Dobbies Loan. In addition to recycling 97% of the waste taken off site, a significant amount of additional material was also re-used on site (but for which no data is available).

Construction Waste	Tonnes	Tonnes CO ₂ e
Brick + Concrete – Recycling	69.36	0.07
Rough Wood - Recycling	19.94	0.42
Mixed Waste – Landfill	21.96	0.04
Asbestos – Landfill	1.68	0.00
Clean Soil – Recycling	420.00	0.63
Crusher Run - Recycling	240.00	0.24

Table 8 Waste landfilled or recycling from the demolition of buildings at 90 Dobbies Loan.

Although GCU's waste and recycling system is well established, it anecdotal evidence suggests that some staff still appear to be unfamiliar with it and it is imperative that efforts continue to reach everyone to raise awareness of waste minimisation and recycling opportunities within the University.

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Beyond Recycling – Waste Minimisation at GCU: Whilst our recycling rate is quite an achievement and we are proud of the fact that over the past year we've sent no waste to landfill, we believe that there is scope for reducing the amount of waste we produce. We are therefore working with local charities to explore such opportunities: we work with the Glasgow Play-Resource Association, who use fabric offcuts from our Fashion Factory in craft workshops and play sessions and GCU is also trialling furniture re-use opportunities with British Heart Foundation and Salvation Army (amongst others). As we develop a better understanding of our waste streams we will continue to explore opportunities for re-use.

Water

During 2012-2013 GCU consumed around 53,055 m³ at its City Campus, which was around 25% more than was consumed during 2008-2009, when 42,000 m³ were consumed. Whilst not a significant source of greenhouse emissions, our consumption of water represents a significant use of a natural resource and we are committed to reducing.

GCU is collating the necessary information to enable it to better understand how it uses water and will be exploring opportunities for reducing it.

Catering Operations

GCU's catering partner, Encore Hospitality Services (Encore), operate six catering outlets throughout campus, and whilst many of their impacts are included in the sections highlighted above, their contribution to GCU's environmental performance merits a note.

Encore fully embraced and supported the new waste and recycling service and ensured that food production and catering outlet procedures were updated to maximise recycling. Since then, Encore has supported GCU's environmental initiatives by trialling new technologies, investing in staff training and supporting environmental initiatives.

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Rewarding Recycling: Encore and GCU were selected to participate in Zero Waste Scotland's Recycle & Reward pilot, which funded reverse vending machines that Encore used to issue 5p for each drink cup, plastic bottle or drinks can recycled by students and staff in the refectory and Student Bistro. Once a month, the reverse vending machines issue a "Golden Ticket" that entitles the winner to free lunch for a week at the University's rectory.



Figure 3 EcoMan and friends at the launch of the Recycling & Reward reverse vending machines.

The Recycle & Reward initiative has been a useful tool for raising student and staff awareness of recycling opportunities at GCU and we are pleased to note the machines will continue in operation beyond the trial period.

Encore has further demonstrated its commitment to students and staff at GCU by achieving the Soil Association's Catering Mark Bronze for all catering outlets on-campus. The award provides "an independent endorsement that food providers are taking steps to improve the food they serve, using fresh ingredients which are free from harmful additives and better for animal welfare" (Soil Association 2014).

Successful Partnership: GCU and Encore's partnership approach to raising awareness of pressing environmental issues was recognised at the 2012 Scottish Resource Awards where it won the Best Partnership Award.



Figure 4 Scottish Resources Awards 2013 - Best Partnership Initiative Glasgow Caledonian University and Encore.

Sustainable Accommodation

As part of commitment to embedding sustainability across its operations, GCU has invested significant time, resources and funds to minimize Caledonian Court's environmental impact and ensure that its residents (both during term and during the summer) have sufficient information to make informed decisions about reducing their own environmental impacts.

LED lighting have improved the energy efficient of external lighting, movement sensors have been installed in communal areas and switch lighting off when these spaces are not in use and a strict maintenance regime ensures that boilers operate as efficiently as possible. The range of materials that residents can recycle has been broadened with the introduction of battery and clothes recycling

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facilities and external bins for glass. Information about local shops and sustainable travel is also provided.

As a result of these and other initiatives, Caledonian Court has been certified Green Business Tourisms Scheme (GBTS) Gold since 2011.



GBTS evaluated the organisations plans and measures for minimizing environmental impacts and enhancing environmental benefits associated with their operations across the following categories: management and marketing; social involvement and communication; energy, water; procurement, waste; travel; natural and cultural heritage; and innovation.

EcoCampus – Framework for Continuous Improvement

GCU is at an advanced stage in the implementation of EcoCampus: an environmental management system for Higher Education Institutions based on ISO 14001. EcoCampus provides a framework with which to identify and minimise environmental impacts and ensure legal compliance through the introduction of appropriate procedures, training and annual review process. Through EcoCampus we're introducing a culture of continuous improvement that will driving our environmental performance upwards.



GCU achieved Gold phase in August 2013 (the first in Scotland) and is now working through the requirements for the Platinum phase, which we're aiming to achieve during the 2014-2015 academic year.



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Brighter futures begin with GCU



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