



# Carbon reduction strategy 2011 to 2020

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## Executive summary

The Guildhall School of Music & Drama acknowledges that in the face of mounting global scientific consensus of man's part in global climate change, there is a moral responsibility to act to reduce carbon.

The UK Climate Change Act of 2008 has created legally binding targets to reduce carbon emissions by 34% by 2020 and by 80% by 2050 against a 1990 baseline. The HE sector has resolved that it must be in the vanguard of efforts to achieve these targets and, after widespread consultation, HEFCE has facilitated the setting and adoption of sector-level carbon reduction targets for scope 1 and 2 emissions of 43% by 2020 and 83% by 2050, both against a 2005 baseline.

The Higher Education Funding Council for England has required that each HE institution puts in place a carbon reduction strategy, containing targets that are in the context of the overall sector targets but which are realistic for each institution. Institutions that did not have an approved Carbon Reduction Strategy in place by 31 March 2011 were at risk of 40% of their capital funding from HEFCE being withheld. HEFCE will also monitor on annual basis how well institutions are performing against their carbon reduction targets.

The financial incentives for the Guildhall School to reduce carbon emissions are immediate, since it is owned and governed by the City of London Corporation which falls into the scope of the Government's Carbon Reduction Commitment Energy Efficiency Scheme. This scheme requires organisations to buy allowances from Government each year to cover their carbon emissions in the previous year. With the addition of Milton Court to the estate in September 2013 the cost for the CRC is estimated to be in the region of £25,000 for the 12/13 year.. The price of allowances is likely to rise each year reinforcing the incentive to reduce consumption and hence the costs of both the allowances and the energy itself.

The Guildhall School has analysed its historical data and, in the first version of this strategy published in February 2011, agreed to set a carbon reduction target for scope 1 and 2 emissions arising from its existing estate of 30% by 2020. Having already achieved extremely good reductions in these emissions by 2010/11, the second version published in February 2012 increased the target for these emissions to 43% by 2020. Following a further reduction in 2011/12 that is consistent with that target, this latest version maintains the target at that level. This reduction is measured against a 2005 baseline, i.e. the School's scope 1 and 2 emissions in 2020 must be 43% lower than the equivalent emissions were in 2005.

Following the collection and analysis of the necessary data, the third revision of the strategy also included a carbon reduction target of 8% for scope 3 emissions arising from transport and of 30% arising from water and waste. Again, this latest version maintains the targets at that level, but a review of the targets will be undertaken in future years once a larger dataset has been built up. These reductions are measured against a 2010 baseline, this being the first year in which the data have been compiled. However, in the case of transport emissions, this will be changed to 2012, due to a significant change in the methodology for calculating air transport emissions. The plan will be further revised in the future to include a target for emissions arising from procurement, once a sector-wide approach has been agreed.

Implementation plans have been created to achieve these targets, which include behavioural change as well as technical interventions. It is anticipated that the majority of the funding for technical interventions will come from the School's strategic capital programme – the 'capital cap'.

## **Introduction and background**

### **The Guildhall School**

1. The Guildhall School of Music & Drama is one of Europe's leading conservatoires, offering musicians, actors, stage managers and theatre technicians an inspiring environment in which to develop as artists and professionals. The School first opened its doors on 27 September 1880 to 62 part-time students in a disused warehouse in the City of London. Today it is situated in the heart of one of Britain's most important arts venues at the Barbican, with a growing international reputation for its teaching and research.
2. The modern Guildhall School is distinctive in being the only major European conservatoire which is both a music school and a drama school, and one which is pre-eminent in technical theatre, professional development and music therapy. A thriving Junior Guildhall, the recent addition of the Centre for Young Musicians and a range of annual summer schools further complement the outstanding opportunities available.
3. Situated in the heart of the City, the School moved to its present premises in the Barbican in 1977 solidifying a unique link with both Europe's largest arts and conference centre, including the Barbican Hall and the Pit Theatre, and the world-class London Symphony Orchestra. This connection is now formally recognised with the establishment of a partnership between the School, the Barbican Centre and the LSO to create the world's leading centre for performance, training and education in the performing and visual arts.
4. The School currently numbers approximately 900 students on its roll call, of which approximately 570 are undergraduate and 330 postgraduate. In any given year, more than a third of the students are from outside the UK typically representing over 40 nationalities.

### **The Guildhall School's Estate**

5. The Guildhall School of Music & Drama currently comprises approximately 30,300 m<sup>2</sup> gross internal area over four neighbouring buildings which are continually updated and enhanced.
  - i) The main building is in Silk Street and attached to the Barbican Centre. It was purpose-built by the City of London and was officially opened by the Lord Mayor of London on 25 October 1977.
  - ii) Sundial Court, the School's hall of residence, is located in Chiswell Street, just around the corner from the main Silk Street building. Sundial Court has 177 bedrooms in thirty-nine flats, each with either three, four, five or six bedrooms.
  - iii) John Hosier Annexe, named after the Principal of the School from 1978 to 1988, has 46 teaching/practice rooms and is located at the west end of the Barbican Estate.
  - iv) A small space in the neighbouring John Trundle Court building was acquired in 2007 and contains one large teaching space as well as office accommodation.
6. The Guildhall School recently embarked on a major building project to expand its

facilities. Milton Court, based across the road from the current Silk Street building, opened in September 2013, providing the School with state-of-the-art performance and teaching spaces in approximately 11,385 m<sup>2</sup>, including:

- a 608-seat Concert Hall
- a 227-seat Theatre
- a Studio Theatre
- three major rehearsal rooms
- TV studio suite

as well as teaching, meeting and administrative spaces, complementing and extending those currently in use in the Silk Street building. Designed to top quality professional standards, the new building will mean that the School's facilities will at long last match the outstanding quality of its training and the success of its graduates.

7. The School's buildings are very intensively used. Each term is 12 weeks in duration, but in practice there is considerable academic activity in the week before and the week after each term, meaning that the buildings are being used for teaching purposes for 42 weeks per year.
8. In order to provide sufficient space for individual student practice, the main Silk Street building is open during term time from 7am – 10pm Monday to Friday, 8am – 9pm on Saturday and 9am – 9pm on Sunday.
9. During the summer vacation the Silk Street building and Sundial Court are used extensively for summer schools, some of which are organised by the School and some by external companies that hire the facilities.
10. With the exception of the new Milton Court building all of the School's existing estate is grade 2 listed.

### **The City of London Corporation**

11. The Guildhall School is owned and governed by the City of London Corporation as part of its contribution towards the cultural life of London and the nation. The City is one of the most significant sponsors of the arts in the UK. It provides the Barbican Centre, Europe's largest multi arts and conference venue, and directly funds the London Symphony Orchestra's residency. It is also a major funder of the enormously popular Museum of London and supports a year-round programme of major arts festivals and events in the City and neighbouring areas.
12. The City is also the port health authority for the whole of the Thames estuary, owns and runs four famous markets: Smithfield, Billingsgate, Spitalfields and Leadenhall, manages a portfolio of property throughout London and maintains and safeguards over 10,000 acres of open space in and around it, including Hampstead Heath, Epping Forest, Burnham Beeches and a string of parks and commons in Kent and Surrey. It also runs the five bridges that cross the Thames into the City, including Tower Bridge, a major tourist attraction and an international symbol for London as a whole.
13. As part of the City of London Corporation, the Guildhall School is not a legal entity in its own right. As such, the School is subject to all the policies and rules of the City and in many cases has helped to develop them. This includes policies

relating to sustainability and carbon reduction, an area in which the City has been active since 1975.

## **HE sector context**

14. In addition to the funding that the Guildhall School receives from the City, it receives funding as part of the HE sector from the Higher Education Funding Council for England (HEFCE). Feedback to HEFCE shows that there is widespread agreement in the sector that sustainable development is important. The sector has agreed that tackling climate change is a challenging agenda and we need to move quickly to do it.
15. It is also a growing political priority both nationally and internationally. The United Nations' Intergovernmental Panel on Climate Change has concluded that warming of the climate system is unequivocal and that human activities make a substantial contribution<sup>1</sup>. Lord Stern's review of climate change<sup>2</sup> in 2006 concluded that the benefits of strong and early action will far outweigh the economic costs of not acting. In June 2008 Lord Stern said that the costs of stopping greenhouse gases rising to dangerous levels had already doubled since 2006 to 2 per cent of GDP. HE makes an important contribution to the UK's sustainable development strategy, updated in 2005, not least because of the sheer size of the estates that it controls.

## **Context and drivers**

### Climate Change Act 2008

16. The Climate Change Act 2008<sup>3</sup> aims to improve carbon management and help the transition towards a low-carbon economy in the UK. It sets the world's first legally binding targets for greenhouse gas emissions of at least 80 per cent by 2050 and at least 34 per cent by 2020<sup>4</sup>, against a 1990 baseline. Major parts of the public sector such as the NHS<sup>5</sup> and schools<sup>6</sup> have developed carbon reduction strategies. In summer 2009 the Government published the UK Low Carbon Transition Plan<sup>7</sup>, which sets out how the UK will meet the 34 percent cut in emissions on 1990 levels by 2020. Nationally, emissions have already been reduced by 21 per cent.

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<sup>1</sup> 'Climate change 2007: the physical science basis', available at [www.ipcc.ch](http://www.ipcc.ch) under Publications and Data/Reports.

<sup>2</sup> 'Stern Review on the Economics of Climate Change', available at [www.hm-treasury.gov.uk](http://www.hm-treasury.gov.uk) under Independent reviews.

<sup>3</sup> Further information is available at [www.decc.gov.uk](http://www.decc.gov.uk) under Legislation/Climate Change Act 2008.

<sup>4</sup> The 2009 Budget set the first carbon budgets, as required by the Climate Change Act. This increased the level of the 2020 target from 26 per cent to 34 per cent. A further increase to 42% has been recommended by the Committee on Climate Change.

<sup>5</sup> 'Saving Carbon, Improving Health: NHS Carbon Reduction Strategy for England' may be read at [www.sdu.nhs.uk](http://www.sdu.nhs.uk) under Carbon reduction strategy.

<sup>6</sup> 'Carbon Emissions from Schools: Where they arise and how to reduce them' may be read at [www.sd-commission.org.uk](http://www.sd-commission.org.uk) under Our work/Education, Young People and skills/Schools.

<sup>7</sup> The plan is available at [www.decc.gov.uk](http://www.decc.gov.uk) under Publications.

### Carbon Reduction Commitment

17. The Carbon Reduction Commitment Energy Efficiency Scheme (CRC) is a mandatory carbon emissions reporting and pricing scheme to cover all organisations using more than 6,000 MWh per year of electricity (equivalent to an annual electricity bill of about £500,000). The CRC came into force in April 2010 and aims to significantly reduce UK carbon emissions not covered by other pieces of legislation. The primary focus is to reduce emissions in non-energy intensive sectors in the UK. This complements the role of Climate Change Agreements and the EU Emissions Trading Scheme, which are directed primarily at energy-intensive organisations. It is UK-wide, covering large businesses and public sector organisations, and around 80 universities and colleges are likely to be within its scope. The City of London Corporation is within its scope and the Guildhall School's carbon emissions will therefore be taken into account as part of the City's reporting.
18. Participants in the CRC need to measure and report their carbon emissions annually, following a specific set of measurement rules. The first annual report of emissions was in July 2011. Starting in 2012, participants will buy allowances from Government each year to cover their emissions in the previous year. This means that organisations that decrease their emissions can lower their costs under the CRC.
19. In October 2010, the Government announced two significant changes to the CRC as a part of the Comprehensive Spending Review:
  - The money raised from the sale of allowances will be retained by the Government rather than recycled back to CRC participants.
  - The first sale of allowances to cover emissions in fiscal year 2011/12 will be in 2012 rather than 2011.
20. The price of allowances has been set at a fixed price of £12 per tonne CO<sub>2</sub> through fiscal year 2012/13, with a floating market price after that. Assuming CO<sub>2</sub> emissions of 1,401 tonnes in 2011/12 (refer to table after paragraph 50) at a price of £12 per tonne, the CRC scheme has been costing the School approximately £16,800 a year and will rise to approximately £25,000 a year with the addition of Milton Court to the estate (refer to paragraphs 58-62). The price of allowances is likely to rise each year reinforcing the incentive to the School to reduce consumption and hence the costs of both the allowances and the energy itself.
21. A publicly available CRC performance league table shows how each participant is performing compared to others in the scheme.

### Display Energy Certificates

22. Universities and colleges need to comply with increasingly stringent Building Regulations, which are now requiring energy efficiency improvements to buildings that are being extended or having changes made to building services. Since 1 October 2008, all public buildings have also been required to have Display Energy Certificates showing their actual energy usage, as recorded by gas, electricity and other meters, so that the public can see the building's energy efficiency in use.



### Cost savings

23. Potential cost savings are an important driver behind efficiency improvements, both directly from reduced resource usage and indirectly from reduced maintenance. However, ambiance and comfort is also a driving force: over or under heated rooms create discontent and inefficient working practices.

### Moral responsibilities and reputation

24. In the face of mounting global scientific consensus of mans' part in global climate change, there is a moral responsibility to act to reduce carbon. As a sector, the HE community has committed to being at the vanguard of initiatives to act in a more sustainable way, and increasingly HE institutions are being judged on how well they are performing. Since 2007 a Green League Survey has been published in the national media, which ranks HE institutions across a range of sustainability and environmental measures. Consistently low performance in this league table could ultimately affect an institution's reputation. HEFCE is also starting to introduce funding incentives according to how well HE institutions are performing (see section below on HEFCE requirements).

### **Classification of emissions sources**

25. The World Resources Institute (WRI) has developed a classification of emission sources around three 'scopes':

- **scope 1** refers to direct emissions that occur from sources that are owned or controlled by the organisation, for example emissions from combustion in owned or controlled boilers, furnaces, vehicles
- **scope 2** accounts for emissions from the generation of purchased electricity consumed by the organisation
- **scope 3** is all other indirect emissions that are a consequence of the activities of the company, but occur from sources not owned or controlled by the organisation – for example, commuting and procurement.

| Scope                                      | Description   | Examples   |
|--|---|--|
| Scope 1:<br>Direct emissions               | Direct emissions occur from sources that are owned or controlled by the HEI   | Direct fuel and energy use<br>Transport fuel used in institutions' own vehicle fleets  |
| Scope 2:<br>Electricity indirect emissions | Emissions from the generation of purchased electricity consumed by the HEI  | Purchased electricity  |
| Scope 3:<br>Other indirect emissions       | Scope 3 emissions are a consequence of the activities of the HEI, but occur from sources not owned or controlled by the HEI | Water<br>Waste<br>Land-based business travel<br>Commuting (both staff and students)<br>Air travel (international students; international student exchange; business) |
|  |   | Procurement  |

## HEFCE requirements

26. HEFCE's Carbon Reduction Strategy for the HE sector comprises:

- A sector-level target for carbon reductions that is in line with UK targets. After widespread consultation, HEFCE has facilitated the setting and adoption of sector-level carbon reduction targets for scope 1 and 2 emissions of 43% by 2020 and 83% by 2050, both against a 2005 baseline.
- A requirement for institutions to set their own targets for 2020 for scope 1 and 2 emissions against a 2005 baseline. This year is being used as a baseline because it is used for reporting against UK targets, and research done for HEFCE demonstrated that robust data for scope 1 and 2 is available for that year at institutional level. This will provide consistency across the sector against which progress can be monitored and reported.
- A commitment from institutions to achieve actual improvements through actions that are appropriate for their institution, recognising the diversity of the sector.
- Support from HEFCE, UUK and GuildHE for institutions to achieve carbon reductions.
- Funding incentives – in particular HEFCE is linking capital funding to performance against carbon management plans.
- Plans for annual monitoring and reporting on progress against the sector-level target.
- A method of regularly evaluating the approach and taking action to learn from progress to date.

27. The HE sector targets are absolute targets, which mean actual carbon emission reductions against the levels in a fixed past year. The UK national targets under different policies and legislation are absolute and set against a 1990 baseline year. The rationale for this approach is based on the fact that the capacity of the Earth to manage carbon emissions is itself finite. Targets have so far been set for scope 1 and 2 emissions only, because this baseline has been calculated with a reasonable degree of confidence. There is a degree of uncertainty for scope 3 emissions for 1990. HEFCE is working with the sector to improve measurement of scope 3 emissions, including procurement, with the intention of setting sector-level targets for these emissions by December 2013. In order to achieve this, HEFCE has commissioned research on measuring scope 3 emissions in the HE sector in the areas of transport, water and waste and procurement. All three reports have been published and in January 2012 HEFCE released Guides to Good Practice in the areas of transport<sup>8</sup> and water and waste<sup>9</sup>.

28. Recognising the significant diversity of the sector with its range of missions, priorities, histories, subject mix, infrastructure and research, institutions have been asked to set targets and develop plans that are appropriate to their individual circumstances but within the national target framework. HEFCE is collating these targets through the second phase of the Capital Investment Framework - CIF2 - and will determine whether collectively they are sufficient to meet the sector target. If necessary, HEFCE will consider what additional policy levers can be used to achieve further carbon reductions.

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<sup>8</sup> [http://www.hefce.ac.uk/pubs/hefce/2012/12\\_02/](http://www.hefce.ac.uk/pubs/hefce/2012/12_02/)

<sup>9</sup> [http://www.hefce.ac.uk/pubs/hefce/2012/12\\_01/](http://www.hefce.ac.uk/pubs/hefce/2012/12_01/)

## Linking capital funding to carbon performance

29. HEFCE's distribution of capital funding is based on the Capital Investment Framework, which relies on a mix of metrics, information submitted by institutions and HEFCE's knowledge of institutions in order to make a holistic and balanced assessment. The 84 institutions (including the Guildhall School) that satisfied the requirements of CIF1 are now benefiting from a streamlined process for capital funding. HEFCE remodelled the process for CIF2 as follows:

- metrics expanded to include carbon emissions
- strategic questions include a more specific and demanding requirement in relation to carbon
- institutions required to report on progress in implementing their carbon plans, and on the results achieved.

30. Institutions that do not meet the requirements of CIF2 are at risk of 40% of their capital funding from HEFCE being withheld. This means that an approved Carbon Reduction Strategy needed to be in place by 31 March 2011.

31. HEFCE did not specify how carbon plans should be developed or what they should contain. However, there are a number of key elements that HEFCE requires to be present in an institution's carbon management plan, which are needed to satisfy the requirements of CIF2. These are:

- A carbon management policy or strategy – this could be part of a wider environmental/sustainability policy.
- A carbon baseline for 2005 that covers all scope 1 and 2 emissions. This year is being used as a baseline because it is used for reporting against UK targets, and research has demonstrated that robust data for scope 1 and 2 is available for that year at institutional level. This will provide consistency across the sector against which progress can be monitored and reported. Institutions are encouraged to measure a baseline for scope 3 emissions and in the longer term HEFCE expects these to be included.
- Carbon reduction targets. These must:
  - cover scope 1 and 2 emissions, although institutions may choose to set additional targets for wider aspects
  - be set against a 2005 baseline. Institutions may choose to set their reductions in context by setting additional targets against an alternative baseline year
  - be set to 2020, because this is the timescale for interim government targets. This will provide consistency across the sector against which progress can be monitored and reported. Institutions may also set interim milestones
  - be publicly available.
- An implementation plan to achieve absolute carbon emission reductions across scopes 1, 2 and 3 including timescales and resources. These may cover capital projects and actions to embed carbon management within the institution, for example, through corporate strategy, communication and training.
- Clear responsibilities for carbon management.
- A commitment to monitor progress towards targets regularly and to report publicly annually.
- The carbon management plan and targets must be signed off by the governing body.

## **Approach to carbon reduction**

32. The first version of this document, published in February 2011, created a plan for reducing the School's carbon emissions and set a target for scope 1 and 2 emissions by 2020. The plan is a working document and will be updated on a regular basis in the light of the School's progress towards achieving its target. Having achieved extremely good reductions in scope 1 and 2 emissions in 2010/11, the second version considerably increased the target for these emissions. It also included targets for scope 3 emissions in the areas of transport and water and waste, following the collection and analysis of the necessary data. This third revision maintains all targets at the level of the second revision. The plan will be further revised in the future to include a target for emissions arising from procurement, once a sector-wide approach has been agreed.
33. The strategy has been developed by members of the School's Sustainability Steering Group (SSG), in particular by staff in the engineering department, and in close consultation with colleagues in the Energy Management Team of the City of London Corporation. The SSG includes staff members representing a wide cross section of the School's activities, both academic and non-academic. It includes the President of the Student Union and other student representatives. Students were also consulted directly when a workshop was held, facilitated by a member of the City's sustainability team, which asked students to consider what a more carbon-free world might look like in 2050 and what measures needed to be put in place to get there.
34. The City has been engaged with carbon reduction since 1975, and has developed a range of sustainability policies including a Carbon Descent Plan. The School's own Carbon Reduction Strategy mirrors those of the City and is complementary to them, whilst setting a target that is realistic for the Guildhall School.
35. The City's approach to carbon reduction is summarised by the 'Three 'E's':
- Energy procurement – buy energy as cheaply and efficiently as possible
  - Energy efficiency – use energy as efficiently and wisely as possible
  - Energy design – use technology to reduce the amount of energy required in the first place

## **Carbon accountability and hierarchy**

36. The carbon hierarchy in the table below provides a systematic and structured approach to managing and reducing emissions in a socially responsible and cost-effective way. Actions at the top of the hierarchy are more transformative and lasting in terms of reducing emissions. A carbon hierarchy is being used by the Department for Children, Schools and Families' Zero Carbon Task Force to help move towards the Government's ambition of delivering zero-carbon school buildings from 2016.

### The carbon hierarchy

|   |   |  |
|---|---|--|
| <b>REDUCE</b><br>energy/fuel demand                       | Avoid unnecessary use   | <b>MONITOR</b> <ul style="list-style-type: none"> <li>• Learn from existing projects and practice</li> <li>• Apply control measures</li> <li>• Evaluate impacts</li> </ul> |
|   | Passive features (for example insulation, daylight, solar gain/shading, thermal mass) |  |
|   | Encourage energy-conscious behaviours   |  |
| <b>EFFICIENCY</b><br>of equipment and energy/fuel sources | Use energy-efficient equipment  |  |
|   | Provide simple and effective controls   |  |
|   | Recover useful heat   |  |
|   | Use clean fossil fuel technology  |  |
| <b>DECARBONISE</b><br>energy/fuel supplies                | On-site or near-site renewable energy sources, including community schemes            |  |
| <b>BEFRIEND</b>   | Seek partnerships to increase capacity to do the above                                |  |
| <b>NEUTRALISE</b><br>energy/fuel supplies                 | Consider responsible carbon offsetting schemes  |  |
|   | Procure green electricity supplies  |  |

Source: Adapted from the DCSF Zero Carbon Task Force and Parkin 'The Positive Deviant: sustainability leadership in a perverse world', Earthscan, London.

### Key areas where carbon reductions can occur

37. Carbon reductions can be achieved by actions in any or all of the following areas:

- Behavioural change and awareness raising - 'softer' methods can play a significant role in highlighting changing institutional priorities and in encouraging behavioural and cultural change. Studies suggest that as much as 30% carbon reduction could be achieved by behavioural change. Actions can include the insertion of environmental objectives into staff appraisals, job descriptions and the induction process, as well as educational initiatives such as workshops.
- Lights, computers and electrical appliances – ensuring that all equipment is switched off when not in use and not just left in standby mode.
- Building energy and space management - good space management not only reduces carbon emissions, it also frees up resources that can be used for teaching and research.
- Building fabric upgrade.
- Efficient energy supply (e.g. CHP).
- Renewable energy sources.

### Waste

38. Management of waste reduces the environmental impacts associated with disposal, including the production of the greenhouse gas methane, and helps conserve finite resources.

## **Travel, including cycling**

39. In 2006 emissions from transport (business travel, and staff and student commuting) accounted for 35 per cent of the HE sector's carbon baseline. Sustainable travel is about encouraging people to make informed choices about the way they travel and being aware of the consequences of these choices – on their health, their environment and their local community.
40. At the Guildhall School, the emissions data for daily commuting are significantly less than the sector average, as most staff and students already commute by public transport or bicycle. However, the high percentage of overseas students means that significant carbon emissions are generated by travel between the School and home at the beginning and end of term.

## **Procurement**

41. Procurement decisions have a large effect on the rate of consumption and productivity of resources, and institutions are able to influence the social and environmental impact of companies in the supply chain.

## **Carbon offsetting**

42. When done correctly, carbon offsetting compensates for unavoidable emissions by paying someone to make an equivalent CO<sub>2</sub> saving elsewhere in the world. More and more individuals and businesses are volunteering to offset their emissions. Offsetting is not a 'cure' for climate change; the most effective way to combat climate change is to reduce emissions. However, good-quality offsetting can balance the impact of our actions and help raise awareness of climate change issues. The cost of offsetting can also provide an incentive to make further emission reductions at home.
43. Carbon offsetting will not be accepted by HEFCE as a means of meeting an institution's carbon reduction target for scopes 1 and 2. However, carbon offsetting may form part of an institution's carbon management plan for mitigating the effects of essential activities that create emissions under scope 3. Before choosing to offset, it is important that steps are taken to measure and, where possible, avoid and reduce emissions. To be able to offset, HEIs can then calculate their unavoidable emissions to know how many tonnes of CO<sub>2</sub> they wish to offset. Once the number of tonnes to be offset is known, credits can be bought from emissions reduction projects for the equivalent amount.
44. The carbon market is complex and there are numerous types of credits available for offsetting. To help consumers identify which credits are good-quality credits, the UK Government has established a voluntary quality assurance scheme for carbon offsetting.
45. The Guildhall School has analysed the benefits of carbon offsetting together with the financial cost of doing so, and has concluded that there is still much to be achieved by investment in technical interventions that actually reduce emissions in the first place. The conclusion is that the School's financial resources are better spent, at least for the time being, on carbon reducing initiatives rather than on carbon offsetting, as carbon reducing initiatives will have a far greater effect. The situation will be further reviewed in future years.

## Carbon emissions data – scopes 1 and 2

46. The data on the next page shows how the Guildhall School's total direct greenhouse gas emissions (scopes 1 and 2) have been calculated for academic years 2005/06 to 2012/13. The first year establishes the 2005 baseline, as required by HEFCE, against which the School's future greenhouse gas reduction targets will be based.
47. All buildings have data for the consumption of purchased electricity, measured in kWhs per month. In addition, the School's main building in Silk Street has data for the consumption of hot and chilled water from the Citigen CHP plant, and the residential accommodation at Sundial Court has data for the consumption of hot water from Citigen. Again, these data are shown in kWhs per month. The School also runs one diesel-fuel Transit van, which it uses largely for local and inter-site deliveries. Data for this vehicle has been included shown in miles travelled per month.
48. The Department of the Environment, Food and Rural Affairs (DEFRA) has developed conversion factors that can be used to calculate carbon emissions for a given fuel. All the above data have been converted into Tonnes CO<sub>2</sub>e using the Guidelines to DEFRA / DECC's GHG conversion factors for company reporting<sup>10</sup>. The exact conversion factors used for each fuel in each year are shown in the data tables., and are updated each year as necessary.
49. In the case of hot and chilled water from Citigen's CHP plant, the School has been consistent with City of London Corporation policy and used the relevant conversion factors for natural gas. Whilst at first glance this appears to be an anomaly, it is because Citigen does not generate electricity for the national grid for 100% of the time. When it is not generating electricity, it satisfies the heating and chilling requirements of its customers by using stand-alone gas boilers and electric chillers.
50. Although the above methodology is an over-estimate of the City Corporation's and the School's carbon emissions, there is a compensating factor because it is the kWhs of metered hot (and chilled) water that is being measured as opposed to the more correct kWhs of natural gas used to generate it. Rather than attempt to calculate the equivalent kWhs of natural gas used, which would require complicated assessments of the efficiency of Citigen's gas boilers, the City Corporation prefers to calculate its carbon emissions based on the lower kWhs of hot (and chilled) water supplied, because this is more than compensated by the fact that gas conversion factors are being applied to all of the metered hot (and chilled) water, when in fact at least some of it is carbon free (being the by-product of electricity generation). As Citigen builds up its customer base, with longer CHP running justified, the carbon factor for heat and chilled water supplied will gradually improve.

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<sup>10</sup> <http://www.defra.gov.uk/publications/files/pb13773-ghg-conversion-factors-2012.pdf>

**TOTAL GREENHOUSE GAS EMISSIONS - SCOPES 1 AND 2**

**NON-RESIDENTIAL**

|                                       |       | ELECTRICITY (kWh) |           |           |           |           |           |           |           |
|---------------------------------------|-------|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                       | Month | 2006 - 07         | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011-12   | 2012-13   | 2013-14   |
| MAIN SCHOOL                           | Aug   | 87,000            | 44,080    | 78,168    | 145,997   | 92,257    | 98,279    | 102,648   | 101,024   |
|                                       | Sep   | 111,372           | 55,541    | 103,323   | 148,112   | 110,537   | 109,676   | 111,436   | 102,701   |
|                                       | Oct   | 123,659           | 128,912   | 134,587   | 151,835   | 128,852   | 125,142   | 129,893   | 123,532   |
|                                       | Nov   | 144,213           | 135,221   | 141,614   | 147,732   | 134,869   | 128,331   | 132,678   | 135,759   |
|                                       | Dec   | 112,285           | 119,561   | 128,156   | 127,798   | 123,216   | 121,530   | 108,606   | 111,764   |
|                                       | Jan   | 153,004           | 136,064   | 178,570   | 154,803   | 123,517   | 129,234   | 145,959   |           |
|                                       | Feb   | 141,463           | 138,225   | 180,473   | 141,732   | 118,656   | 134,614   | 125,640   |           |
|                                       | Mar   | 143,729           | 134,248   | 192,340   | 147,330   | 127,426   | 126,628   | 138,949   |           |
|                                       | Apr   | 99,191            | 127,032   | 166,355   | 114,491   | 92,505    | 111,532   | 115,172   |           |
|                                       | May   | 117,865           | 126,953   | 160,106   | 123,142   | 111,118   | 129,483   | 118,355   |           |
|                                       | Jun   | 113,516           | 122,132   | 169,799   | 134,121   | 118,599   | 123,304   | 115,722   |           |
|                                       | Jul   | 99,976            | 114,514   | 161,642   | 128,630   | 120,050   | 110,772   | 114,773   |           |
|                                       | Total | 1,447,273         | 1,382,483 | 1,795,132 | 1,665,723 | 1,401,600 | 1,448,525 | 1,459,831 | 574,780   |
| JOHN HOSIER ANNEX                     | Aug   |                   | 34,720    | 34,720    | 43,140    | 32,490    | 0         | 7,035     | 5,061     |
|                                       | Sep   |                   |           |           |           |           | 0         | 10,079    | 7,050     |
|                                       | Oct   | 44,280            |           |           |           |           | 0         | 10,966    | 9,379     |
|                                       | Nov   |                   | 35,100    | 34,720    | 24,970    | 84,620    | 72,900    | 14,218    | 9,262     |
|                                       | Dec   |                   |           |           |           |           | 0         | 15,100    | 14,661    |
|                                       | Jan   | 37,720            |           |           |           |           | 0         | 19,156    |           |
|                                       | Feb   |                   | 13,350    | 35,100    | 24,970    | 40,320    | 0         | 18,054    |           |
|                                       | Mar   | 24,190            |           |           |           |           | 78,570    | 14,804    |           |
|                                       | Apr   |                   |           |           |           |           | 9,620     | 13,017    |           |
|                                       | May   | 56,430            | 34,720    | 33,640    | 33,460    | 40,760    | 12,170    | 13,461    |           |
|                                       | Jun   |                   |           |           |           |           | 9,800     | 9,558     |           |
|                                       | Jul   |                   |           |           |           |           | 7,530     | 4,276     |           |
|                                       | Total | 162,620           | 117,890   | 138,180   | 126,540   | 198,190   | 190,590   | 149,724   | 45,413    |
| MILTON COURT HV SUPPLY                | Aug   | 7,880             |           |           |           |           |           |           | 116,559   |
|                                       | Sep   |                   |           |           |           |           |           |           | 126,268   |
|                                       | Oct   | 8,266             |           |           |           |           |           |           | 147,272   |
|                                       | Nov   | 47,780            |           |           |           |           |           |           | 140,334   |
|                                       | Dec   |                   |           |           |           |           |           |           | 140,007   |
|                                       | Jan   | 45,108            |           |           |           |           |           |           |           |
|                                       | Feb   | 53,664            |           |           |           |           |           |           |           |
|                                       | Mar   | 16,328            |           |           |           |           |           |           |           |
|                                       | Apr   | 23,501            |           |           |           |           |           |           |           |
|                                       | May   |                   |           |           |           |           |           |           |           |
|                                       | Jun   |                   |           |           |           |           |           |           |           |
|                                       | Jul   |                   |           |           |           |           |           |           |           |
|                                       | Total | 202,525           |           |           |           |           |           |           | 670,440   |
| MILTON COURT 1 2ND FLOOR FIRE STATION | Aug   | 2,688             |           |           |           |           |           |           |           |
|                                       | Sep   |                   |           |           |           |           |           |           |           |
|                                       | Oct   | 2,930             |           |           |           |           |           |           |           |
|                                       | Nov   | 15,029            |           |           |           |           |           |           |           |
|                                       | Dec   |                   |           |           |           |           |           |           |           |
|                                       | Jan   | 9,539             |           |           |           |           |           |           |           |
|                                       | Feb   | 14,618            |           |           |           |           |           |           |           |
|                                       | Mar   |                   |           |           |           |           |           |           |           |
|                                       | Apr   | 11,564            |           |           |           |           |           |           |           |
|                                       | May   |                   |           |           |           |           |           |           |           |
|                                       | Jun   |                   |           |           |           |           |           |           |           |
|                                       | Jul   |                   |           |           |           |           |           |           |           |
|                                       | Total | 56,368            |           |           |           |           |           |           |           |
| JOHN TRUNDLE COURT 1                  | Aug   |                   | 3,968     | 3,968     | 3,968     | 2,395     | 91        | 1,088     | 1,522     |
|                                       | Sep   |                   | 3,840     | 3,840     | 3,840     | 2,395     |           | 1,310     | 1,776     |
|                                       | Oct   |                   | 3,968     | 3,968     | 3,968     | 2,395     | 2,862     | 3,064     | 3,954     |
|                                       | Nov   |                   | 3,840     | 3,840     | 3,840     | 2,395     | 2,921     | 4,117     | 3,757     |
|                                       | Dec   |                   | 3,968     | 3,968     | 3,968     |           | 4,280     | 6,821     | 1,742     |
|                                       | Jan   |                   | 3,968     | 3,968     | 3,968     | 9,716     | 4,166     | 6,245     |           |
|                                       | Feb   |                   | 3,712     | 3,584     | 2,816     |           | 5,552     | 5,354     |           |
|                                       | Mar   |                   | 3,968     | 3,968     | 3,968     | 10,438    | 3,500     | 5,180     |           |
|                                       | Apr   | 3,840             | 3,840     | 3,840     | 3,840     | 1,458     | 3,281     | 6,176     |           |
|                                       | May   | 3,968             | 3,968     | 3,968     | 3,968     | 1,642     | 2,461     | 2,460     |           |
|                                       | Jun   | 3,840             | 3,840     | 3,840     | 3,840     | 1,249     | 1,380     | 2,019     |           |
|                                       | Jul   | 3,968             | 3,968     | 1,632     | 3,968     | 1,951     | 1,273     | 1,495     |           |
|                                       | Total | 15,616            | 46,848    | 44,384    | 45,952    | 36,034    | 31,767    | 45,329    | 12,751    |
| TOTAL ELECTRICITY NON-RESIDENTIAL     | Aug   | 97,567            | 82,768    | 116,856   | 193,105   | 127,142   | 98,370    | 110,771   | 224,166   |
|                                       | Sep   | 111,372           | 59,381    | 107,163   | 151,952   | 112,932   | 109,676   | 122,825   | 237,795   |
|                                       | Oct   | 179,134           | 132,880   | 138,555   | 155,803   | 131,247   | 128,004   | 143,923   | 284,137   |
|                                       | Nov   | 207,022           | 174,161   | 180,174   | 176,542   | 221,884   | 204,152   | 151,013   | 289,112   |
|                                       | Dec   | 112,285           | 123,529   | 132,124   | 131,766   | 123,216   | 125,810   | 130,527   | 268,174   |
|                                       | Jan   | 245,372           | 140,032   | 182,538   | 158,771   | 133,233   | 133,400   | 171,360   | 0         |
|                                       | Feb   | 209,745           | 155,287   | 219,157   | 169,518   | 158,976   | 140,166   | 149,048   | 0         |
|                                       | Mar   | 184,246           | 138,216   | 196,308   | 151,298   | 137,864   | 208,698   | 158,933   | 0         |
|                                       | Apr   | 138,096           | 130,872   | 170,195   | 118,331   | 93,963    | 124,433   | 134,365   | 0         |
|                                       | May   | 178,263           | 165,641   | 197,714   | 160,570   | 153,520   | 144,114   | 134,276   | 0         |
|                                       | Jun   | 117,356           | 125,972   | 173,639   | 137,961   | 119,848   | 134,484   | 127,299   | 0         |
|                                       | Jul   | 103,944           | 118,482   | 163,274   | 132,598   | 122,001   | 119,575   | 120,544   | 0         |
|                                       | Total | 1,884,402         | 1,547,221 | 1,977,696 | 1,838,215 | 1,635,824 | 1,670,882 | 1,654,884 | 1,303,384 |
| Conversion Factor                     |       | 0.53023           | 0.53382   | 0.53865   | 0.53594   | 0.52582   | 0.52037   | 0.52037   | 0.52037   |
| TONNES CO <sub>2e</sub>               |       | 999.167           | 825.937   | 1,065.286 | 985.173   | 860.149   | 869.477   | 861.152   | 678.242   |



|   |       | CHP (Citigen) (kWh) |           |           |           |           |           |           |         |         |
|---|-------|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|
|   |       | Month               | 2006 - 07 | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 | 2013-14 |
| TOTAL CHP<br>NON-RESIDENTIAL<br>(MAIN SCHOOL) | Aug   |                     | 33,640    | 21,270    | 24,830    | 41,660    | 27,770    | 15,640    | 24,540  | 7,024   |
|   | Sep   |                     | 29,590    | 24,810    | 23,920    | 48,000    | 29,350    | 16,990    | 25,710  | 11,405  |
|   | Oct   |                     | 39,340    | 45,900    | 50,920    | 77,870    | 25,170    | 25,740    | 55,318  | 18,206  |
|   | Nov   |                     | 69,850    | 92,180    | 76,640    | 68,930    | 37,240    | 31,840    | 47,650  | 17,741  |
|   | Dec   |                     | 83,800    | 132,920   | 141,710   | 90,590    | 70,440    | 35,750    | 163,850 | 21,290  |
|   | Jan   |                     | 104,800   | 125,730   | 189,080   | 123,820   | 51,390    | 44,430    | 50,000  |         |
|   | Feb   |                     | 112,350   | 98,990    | 213,360   | 106,940   | 40,250    | 54,730    | 48,714  |         |
|   | Mar   |                     | 94,210    | 110,910   | 96,000    | 93,910    | 35,290    | 45,780    | 49,786  |         |
|   | Apr   |                     | 54,640    | 79,670    | 110,260   | 93,000    | 22,220    | 35,880    | 59,071  |         |
|   | May   |                     | 44,330    | 37,520    | 70,510    | 54,640    | 22,220    | 31,580    | 31,114  |         |
|   | Jun   |                     | 28,080    | 27,160    | 43,990    | 30,450    | 25,000    | 23,590    | 22,341  |         |
|   | Jul   |                     | 17,400    | 25,600    | 40,880    | 24,840    | 15,000    | 14,780    | 10,593  |         |
|   | Total |                     | 712,030   | 822,660   | 1,082,100 | 854,650   | 401,340   | 376,730   | 588,687 | 75,666  |

|                          |         |         |         |         |         |         |         |         |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Conversion Factor        | 0.185   | 0.18396 | 0.18523 | 0.18360 | 0.18521 | 0.18521 | 0.18521 | 0.18521 |
| TONNES CO <sub>2</sub> e | 131.726 | 151.337 | 200.437 | 156.914 | 74.332  | 69.774  | 109.031 | 14.014  |

|               |       | FLEET VEHICLE (Miles travelled) |       |       |       |       |     |  |  |
|---------------|-------|---------------------------------|-------|-------|-------|-------|-----|--|--|
| FLEET VEHICLE | Aug   |                                 |       |       | 44    | 15    |     |  |  |
|               | Sep   |                                 |       |       | 310   | 134   |     |  |  |
|               | Oct   |                                 |       |       | 202   | 367   | 137 |  |  |
|               | Nov   |                                 |       |       | 873   | 199   | 322 |  |  |
|               | Dec   |                                 |       |       | 199   | 54    | 48  |  |  |
|               | Jan   |                                 |       |       | 201   | 23    | 613 |  |  |
|               | Feb   |                                 |       |       | 55    | 71    | 211 |  |  |
|               | Mar   |                                 |       |       | 154   | 414   | 764 |  |  |
|               | Apr   |                                 |       |       | 340   | 411   | 155 |  |  |
|               | May   |                                 |       |       | 499   | 519   | 212 |  |  |
|               | Jun   |                                 | 811   |       | 464   | 760   | 208 |  |  |
|               | Jul   |                                 | 301   |       | 83    | 206   | 231 |  |  |
|               | Total |                                 | 1,112 | 3,433 | 3,378 | 3,050 |     |  |  |

|                          |         |         |         |         |         |         |         |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|
| Conversion Factor        | 0.48499 | 0.43619 | 0.43470 | 0.42877 | 0.42877 | 0.42877 | 0.42877 |
| TONNES CO <sub>2</sub> e | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   | 0.000   |

| TOTAL TONNES CO <sub>2</sub> e NON-RESIDENTIAL |           |           |           |           |           |         |         |
|--|-----------|-----------|-----------|-----------|-----------|---------|---------|
| 2006 - 07                                      | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 | 2013-14 |
| 1,130.892                                      | 977.813   | 1,267.221 | 1,143.555 | 935.789   | 939.251   | 970.183 | 692.256 |

## RESIDENTIAL

|                              |       | ELECTRICITY (kWh) |           |           |           |           |           |         |         |  |
|------------------------------|-------|-------------------|-----------|-----------|-----------|-----------|-----------|---------|---------|--|
| Month                        |       | 2006 - 07         | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 | 2013-14 |  |
| SUNDIAL COURT<br>RESIDENTIAL | Aug   | 49,803            | 46,208    | 43,394    | 61,755    | 55,671    | 51,203    | 53,541  | 51,905  |  |
|                              | Sep   | 54,389            | 44,583    | 47,767    | 51,177    | 50,891    | 47,907    | 49,333  | 45,449  |  |
|                              | Oct   | 62,536            | 58,302    | 60,493    | 61,886    | 55,385    | 56,717    | 53,375  | 51,277  |  |
|                              | Nov   | 61,113            | 63,076    | 60,525    | 62,639    | 55,861    | 54,045    | 49,040  | 52,544  |  |
|                              | Dec   | 50,135            | 59,084    | 54,566    | 50,536    | 47,797    | 42,378    | 38,660  | 43,513  |  |
|                              | Jan   | 57,035            | 60,463    | 64,252    | 60,376    | 53,408    | 49,830    | 48,765  |         |  |
|                              | Feb   | 54,746            | 60,971    | 61,098    | 55,563    | 47,204    | 49,858    | 45,943  |         |  |
|                              | Mar   | 59,113            | 61,603    | 66,315    | 62,202    | 55,495    | 49,865    | 50,356  |         |  |
|                              | Apr   | 46,911            | 55,945    | 55,457    | 48,171    | 46,279    | 41,286    | 41,511  |         |  |
|                              | May   | 57,279            | 61,064    | 65,530    | 58,956    | 54,617    | 49,630    | 46,741  |         |  |
|                              | Jun   | 53,018            | 57,549    | 61,516    | 53,532    | 52,381    | 48,635    | 46,134  |         |  |
|                              | Jul   | 52,021            | 53,935    | 62,196    | 54,927    | 53,706    | 52,294    | 51,472  |         |  |
|                              | Total | 658,099           | 682,784   | 703,109   | 681,720   | 628,695   | 593,648   | 574,871 | 244,688 |  |

|                          |         |         |         |         |         |         |         |         |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Conversion Factor        | 0.53382 | 0.53865 | 0.53594 | 0.52582 | 0.52037 | 0.52037 | 0.52037 | 0.52037 |
| TONNES CO <sub>2</sub> e | 351.306 | 367.782 | 376.824 | 358.462 | 327.154 | 308.917 | 299.146 | 127.328 |

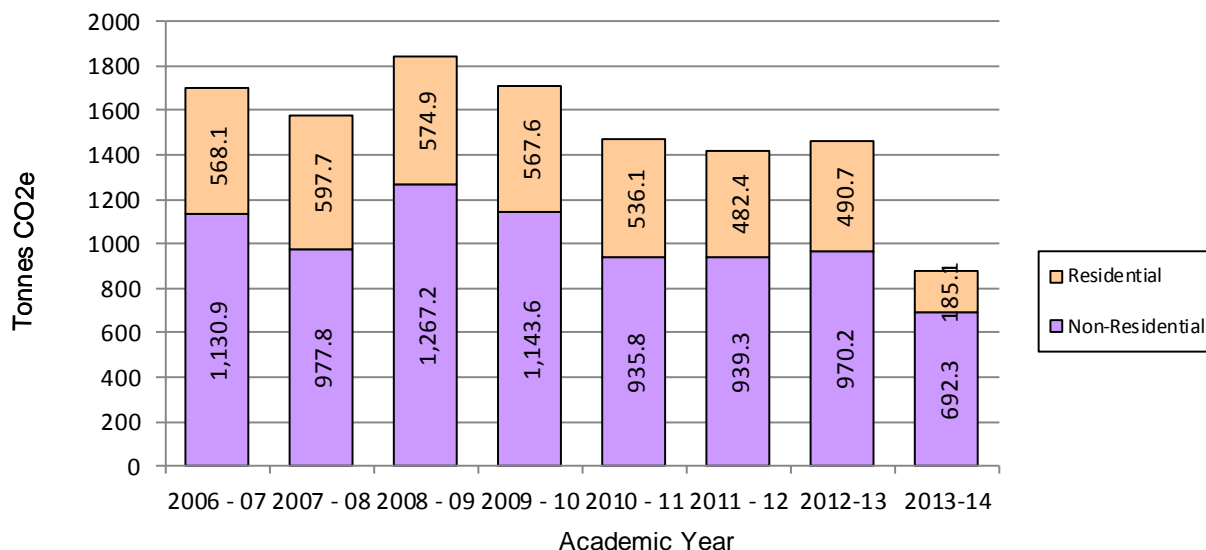
|                              |       | CHP (Citigen) (kWh) |           |           |           |           |         |           |         |  |
|------------------------------|-------|---------------------|-----------|-----------|-----------|-----------|---------|-----------|---------|--|
| SUNDIAL COURT<br>RESIDENTIAL | Aug   | 33,770              | 52,670    | 37,640    | 14,450    | 54,530    | 14,770  | 4,460     | 30,452  |  |
|                              | Sep   | 31,590              | 44,070    | 43,000    | 45,280    | 60,450    | 48,120  | 5,976     | 41,667  |  |
|                              | Oct   | 79,490              | 87,200    | 75,500    | 67,920    | 86,790    | 63,700  | 55,318    | 71,841  |  |
|                              | Nov   | 130,310             | 110,410   | 109,960   | 99,120    | 135,200   | 90,150  | 105,864   | 70,464  |  |
|                              | Dec   | 153,480             | 183,010   | 168,740   | 135,000   | 181,980   | 122,470 | 136,208   | 97,742  |  |
|                              | Jan   | 141,450             | 150,310   | 149,580   | 149,130   | 158,300   | 136,900 | 142,500   |         |  |
|                              | Feb   | 152,220             | 158,140   | 148,180   | 181,790   | 124,600   | 129,700 | 139,300   |         |  |
|                              | Mar   | 141,240             | 160,150   | 111,690   | 164,140   | 129,100   | 107,970 | 132,771   |         |  |
|                              | Apr   | 92,010              | 109,180   | 87,490    | 105,650   | 64,330    | 86,180  | 141,857   |         |  |
|                              | May   | 84,790              | 92,997    | 63,700    | 83,220    | 50,000    | 84,310  | 74,200    |         |  |
|                              | Jun   | 67,080              | 58,273    | 39,570    | 53,630    | 58,000    | 51,250  | 59,244    |         |  |
|                              | Jul   | 64,190              | 43,250    | 34,290    | 39,920    | 25,000    | 1,240   | 36,389    |         |  |
|                              | Total | 1,171,620           | 1,249,660 | 1,069,340 | 1,139,250 | 1,128,280 | 936,760 | 1,034,087 | 312,166 |  |

|                          |         |         |         |         |         |         |         |         |
|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Conversion Factor        | 0.185   | 0.18396 | 0.18523 | 0.18360 | 0.18521 | 0.18521 | 0.18521 | 0.18521 |
| TONNES CO <sub>2</sub> e | 216.750 | 229.887 | 198.074 | 209.166 | 208.969 | 173.497 | 191.523 | 57.816  |

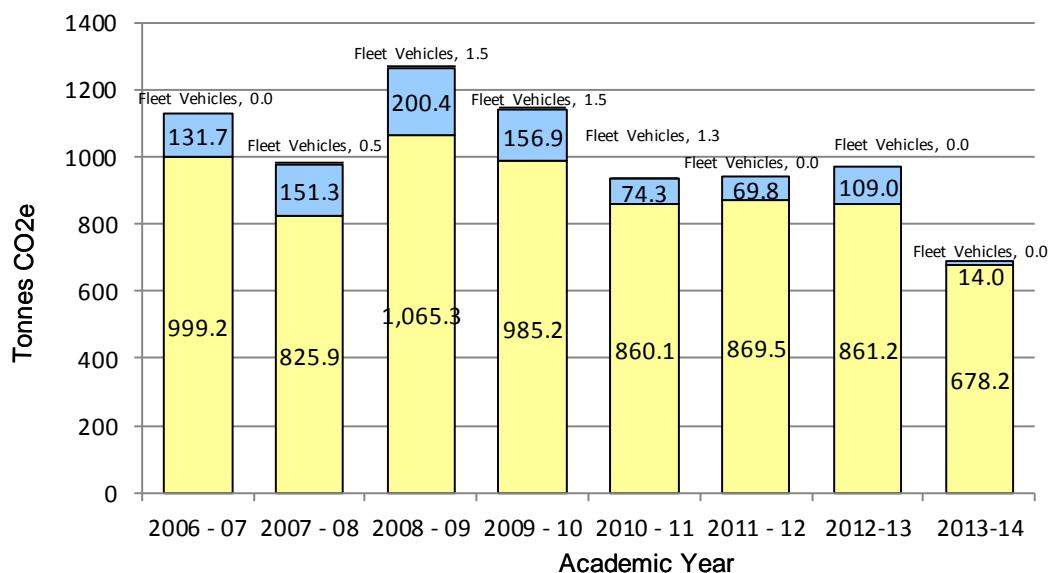
| TOTAL TONNES CO <sub>2</sub> e RESIDENTIAL |           |           |           |           |           |         |         |
|--|-----------|-----------|-----------|-----------|-----------|---------|---------|
| 2006 - 07                                  | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 | 2013-14 |
| 568.056                                    | 597.669   | 574.898   | 567.628   | 536.123   | 482.414   | 490.669 | 185.145 |

| TOTAL TONNES CO <sub>2</sub> e ALL SOURCES |           |           |           |           |           |           |         |
|--|-----------|-----------|-----------|-----------|-----------|-----------|---------|
| 2006 - 07                                  | 2007 - 08 | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13   | 2013-14 |
| 1,698.948                                  | 1,575.482 | 1,842.119 | 1,711.183 | 1,471.912 | 1,421.665 | 1,460.852 | 877.401 |

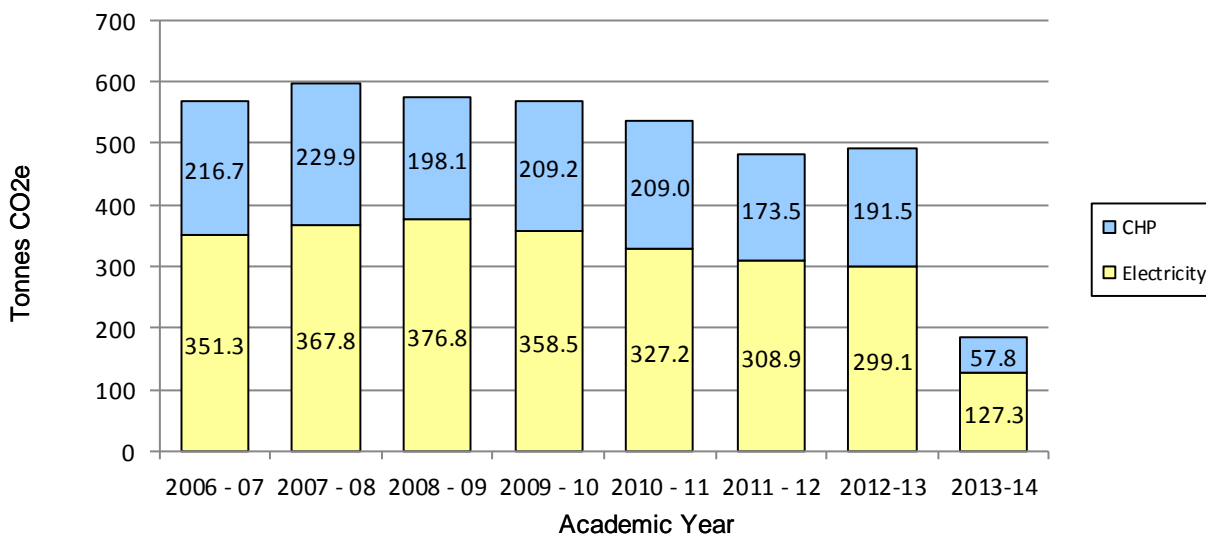
### TOTAL GREENHOUSE GAS EMISSIONS - SCOPES 1 AND 2



### GREENHOUSE GAS EMISSIONS - SCOPES 1 AND 2 NON-RESIDENTIAL



### GREENHOUSE GAS EMISSIONS - SCOPES 1 AND 2 RESIDENTIAL



## Assessment against baseline and target – scopes 1 and 2

51. The data in the previous section show that the Guildhall School's total direct greenhouse gas emissions (scopes 1 and 2) in academic year 2005/06 amounted to **2,047.545 tonnes**. This establishes the 2005 baseline against which the School's future greenhouse gas reduction targets will be based, in line with the rest of the HE sector.
52. After significant reductions in the following two years, there was a substantial increase in 2008/09, largely due to the failure of the BEMS in the main Silk Street building. After this problem was solved, energy consumption immediately started to fall, leading to a reduction of carbon emissions in 2009/10 of 5.48% to 1,730.256 tonnes. This represents a reduction of 15.5% against the 2005 baseline.
53. In 2010/11, a further very considerable reduction was achieved of 15.67% to 1,459.042 tonnes, which represents a reduction of 28.74% against the 2005 baseline. This achievement is attributable in the most to further refinements to the settings of the BEMS in the Silk Street building as engineering staff become ever more experienced in using it, but also in part to the effects of behavioural change by staff and by students, which is beginning to make a noticeable difference to energy consumption.
54. As a consequence of the above results, the Guildhall School committed itself to increasing its target for the reduction of total scope 1 and 2 direct greenhouse gas emissions arising from its existing estate from 30% to **43%** by the academic year 2019/20 against its 2005 baseline. This is an absolute target, meaning that total direct greenhouse gas emissions arising from its existing estate (i.e. not including Milton Court) must not exceed **1,167.101 tonnes** in 2019/20.
55. The School also set interim milestones towards achieving its 2020 target as follows:
- 31% reduction by 2011/12, equating to a maximum of 1,412.806 tonnes
  - 38% reduction by 2015/16, equating to a maximum of 1,269.478 tonnes
  - 43% reduction by 2019/20, equating to a maximum of 1,167.101 tonnes
56. The School achieved its first milestone target in the 2011/12 period with a reduction , of 3.95% to 1,401,352 tonnes, which represents a reduction of 31.56% against the 2005 baseline. In the the 2012/13 period this has reduced to 28% of baseline. This can be attributed to the colder winter conditions in this period. This observations is supported by a degree day comparison with the 2005 baseline year which shows a 31% increase in degree days for 2013. With further carbon reduction measures planned for the next rporting period we will continue to strive towards the overall target of 43% by 2019/20.
57. The School believes its 2020 reduction target to be appropriate and achievable but realistic, and takes into account the following factors:
- The initiatives and controls already in place as a result of the School being part of the City of London Corporation
  - The reductions already achieved as a result of the new BEMS being operational

- The constraints arising from the School's buildings being grade 2 listed, and the specialist uses to which large parts of the School's estate are put as an international performing arts institution

## Milton Court

58. The Guildhall School's long-awaited new facilities at Milton Court became operational in September 2013, adding some 11,385m<sup>2</sup> to the School's estate. The building has been designed to the highest possible environmental standards for its type, including the use of the Citigen CHP plant for all its heating and most of its cooling requirements. It has achieved a BREEAM<sup>11</sup> rating of very good. Nonetheless it is inevitable that the addition of a building of this size to the estate will lead to an overall increase in the School's energy consumption and therefore its carbon emissions.
59. The School's 2020 carbon reduction target of 43% therefore relates to the estate as it exists in 2013 and does not include Milton Court.
60. The designers of Milton Court have provisionally estimated that its annual energy consumption is likely to be in the region of 1,660,000 kWhs, which equates to total scope 1 and 2 direct greenhouse gas emissions of 632.554 tonnes. This is calculated as follows:

| Milton Court             | Electricity | CHP (Citigen) | Total          |
|--------------------------|-------------|---------------|----------------|
| kWhs                     | 970,000     | 690,000       | 1,660,000      |
| Conversion factor        | 0.52037     | 0.18521       |                |
| Tonnes CO <sub>2</sub> e | 504.759     | 127.795       | <b>632.554</b> |

61. Since the commissioning of the building, its energy consumption has been monitored separately from the rest of the estate. The first four months monitored consumption are above the estimates, this being accounted for by commissioning difficulties with the M&E plant alongside a greater utilisation than originally predicted. If possibilities emerge for reducing its energy consumption by technical interventions, these will be pursued and appropriate reduction targets set accordingly. Overall space utilisation of the entire enlarged estate will also be monitored carefully, to ensure that the most effective and efficient use is made of all the School's assets.
62. The table below estimates what the Guildhall School's predicted annual carbon emissions for Milton Court.. Taking account of the above carbon reduction targets and milestones for its existing estate and assuming that the carbon model for Milton Court prove to be accurate, the table shows that the School's overall emissions will increase with the addition of Milton Court, but by 2015/16 will still be below the 2005 baseline. Once the increased size of the estate is taken into account, the carbon emissions per m<sup>2</sup> of estate reduce from 0.091 tonnes to 0.053 tonnes, a reduction of 41.54%.

|  | 2005 - 06 | 2010 - 11 | 2011 - 12 | 2015 - 16 | 2019 - 20 |
|--|-----------|-----------|-----------|-----------|-----------|
| Total tonnes CO <sub>2</sub> e for existing estate | 2,047.545 | 1,459.042 | 1,401.352 | 1,269.478 | 1,167.101 |

<sup>11</sup> BREEAM (Building Research Establishment Environmental Assessment Method) is the leading and most widely used environmental assessment method for non-domestic buildings. It sets the standard for best practice in sustainable design and has become the de facto measure used to describe a building's environmental performance.

|   |                  |                  |                  |                  |                  |
|---|------------------|------------------|------------------|------------------|------------------|
| Total tonnes CO <sub>2</sub> e for Milton Court           |                  |                  |                  | 632.554          | 632.554          |
| <b>Total tonnes CO<sub>2</sub>e for enlarged estate</b>   | <b>2,047.545</b> | <b>1,459.042</b> | <b>1,401.352</b> | <b>1,902.032</b> | <b>1,799.655</b> |
| Approx. total area of estate (m <sup>2</sup> )            | 22,614           | 22,614           | 22,614           | 33,999           | 33,999           |
| <b>Tonnes CO<sub>2</sub>e per m<sup>2</sup> of estate</b> | <b>0.091</b>     | <b>0.065</b>     | <b>0.062</b>     | <b>0.056</b>     | <b>0.053</b>     |

## Carbon emissions data – scope 3

63. Scope 3 indirect carbon emissions arise principally from transport, from water and waste and from procurement. These carbon emissions are indirect, i.e. they are a consequence of the organisation's activities but the source of the emissions is not under the organisation's direct control. As a result, scope 3 emissions are much harder to calculate and the institution can only affect them by behavioural change.
64. HEFCE is not expected to set a sector-wide target until December 2013. Nonetheless, all HEIs have been encouraged to attempt a calculation of their emissions from these activities and the Guildhall School has done so for transport and for water and waste. These data are given on the next pages.
65. Student travel surveys were carried out in October 2010 and 2012, which gathered data on the modes of transport used by students when commuting to and from the School on a daily basis, and when travelling to and from their home address at the beginning and end of each term. Relevant multiplication factors were then applied to calculate an estimated total for those two years.
66. A staff travel survey was first carried out in May 2011, which gathered data on the modes of transport used by staff when commuting to and from the School on a daily basis. Relevant multiplication factors were then applied to calculate an estimated total for that year. Staff and student business travel for 2010/11, e.g. to conferences, courses, concerts etc., was calculated by examining the travel expense claims made through the School's finance system. A follow up survey was carried out in May 2013
67. The Guildhall School's water supply to the main Silk Street building is shared with the adjacent Barbican Centre. Water consumption for this building has been calculated at 40% of the total combined consumption, which is metered. Water consumption for Sundial Court for 2010/11 onwards has been taken directly from meter readings. Water consumption for 2010/11 onwards for John Hosier Annex and for the offices at John Trundle Court has been estimated from the utility bills. Waste water volumes in all buildings have been calculated at 49% of the water supply volumes, this being the fraction applied by the utility company to the School's bills. All volumes are measured in cubic metres.
68. Waste volumes for 2010/11 onwards have been calculated in tonnes recycled and tonnes not recycled for mixed municipal waste. Until 2010/11, the City of London sent its non-recyclable waste to landfill. From 2011/12 onwards, this waste is sent to an energy recovery plant in South East London.
69. The Department of the Environment, Food and Rural Affairs (DEFRA) has developed conversion factors that can be used to calculate scope 3 carbon emissions for various modes of transport and for water and waste. All the data have been converted into Tonnes CO<sub>2</sub>e using the Guidelines to DEFRA / DECC's

GHG conversion factors for company reporting<sup>12</sup>. The exact conversion factors used are shown in the data tables.

70. A calculation for procurement will be attempted, and included in a further revision to this strategy, once a sector-wide approach has been agreed.

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<sup>12</sup> <http://www.defra.gov.uk/publications/files/pb13773-ghg-conversion-factors-2012.pdf>

# TOTAL GREENHOUSE GAS EMISSIONS - SCOPE 3

## TRAVEL

### STAFF COMMUTER TRAVEL SURVEY MAY 2013

|                            |      | TOTAL DISTANCES TRAVELLED (KILOMETRES) |            |                |        |           |                  |             |                  |       |       |           |
|----------------------------|------|--|------------|----------------|--------|-----------|------------------|-------------|------------------|-------|-------|-----------|
|                            |      | Bicycle                                | London Bus | National Coach | Car    | Motorbike | Train (u/ground) | Train (DLR) | Train (o/ground) | Walk  | Plane | Total     |
| Full time staff            | 2011 | 14,529                                 | 37,256     | 0              | 35,124 | 28,908    | 182,329          | 20,675      | 1,399,384        | 5,123 | 0     | 1,723,328 |
|                            | 2013 | 47,150                                 | 46,103     | 0              | 32,195 | 17,929    | 185,726          | 0           | 1,402,503        | 2,258 | 0     | 1,733,864 |
| Part-time/fractional staff | 2011 | 6,815                                  | 5,096      | 0              | 22,248 | 1,875     | 26,792           | 1,341       | 426,597          | 1,164 | 0     | 491,928   |
|                            | 2013 | 2,809                                  | 3,144      | 0              | 1,676  | 991       | 16,740           | 0           | 244,036          | 136   | 0     | 269,532   |
| Hourly- paid staff         | 2011 | 12,439                                 | 1,043      | 0              | 0      | 0         | 20,730           | 4,167       | 261,030          | 615   | 0     | 300,024   |
|                            | 2013 | 58,453                                 | 3,268      | 52,140         | 44,527 | 2,996     | 120,446          | 0           | 576,245          | 154   | 3,258 | 861,487   |
| Total                      | 2011 | 33,783                                 | 43,395     | 0              | 57,372 | 30,783    | 229,850          | 26,183      | 2,087,011        | 6,902 | 0     | 2,515,279 |
|                            | 2013 | 108,412                                | 52,515     | 52,140         | 78,398 | 21,916    | 322,912          | 0           | 2,222,784        | 2,548 | 3,258 | 2,864,883 |

|                          |      |         |         |         |         |         |         |         |         |         |          |
|--------------------------|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Conversion Factor        |      | 0.00000 | 0.08314 | 0.02932 | 0.19023 | 0.11891 | 0.06361 | 0.06006 | 0.04904 | 0.00000 | 0.183404 |
| TONNES CO <sub>2</sub> e | 2011 | 0.000   | 3.608   | 0.000   | 10.914  | 3.660   | 14.621  | 1.573   | 102.347 | 0.000   | 0.000    |
|                          | 2013 | 0.000   | 4.366   | 1.529   | 14.914  | 2.606   | 20.540  | 0.000   | 109.005 | 0.000   | 0.598    |

| TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (STAFF COMMUTER TRAVEL) |         |
|---|---------|
| 2010-11   | 136.723 |
| 2012-13   | 153.558 |

### STAFF AND STUDENT BUSINESS TRAVEL 2012 - 13

| TOTAL DISTANCES TRAVELLED (KILOMETRES) |       |                |       |       |                  |                  |                    |                  |                   |                  |           |
|--|-------|----------------|-------|-------|------------------|------------------|--------------------|------------------|-------------------|------------------|-----------|
|  | Ferry | National Coach | Car   | Taxi  | Train (u/ground) | Train (o/ground) | Train (internat'l) | Plane (domestic) | Plane (shorthaul) | Plane (longhaul) | Total     |
| 2011                                   | 519   | 157            | 3,900 | 654   | 104              | 34,960           | 7,113              | 1,835            | 62,090            | 563,878          | 675,210   |
| 2013                                   | 0     | 1,653          | 2,526 | 2,832 | 4,476            | 49,300           | 13,818             | 0                | 643,079           | 313,854          | 1,031,539 |

|                          |         |         |         |          |         |         |         |          |          |          |        |
|--------------------------|---------|---------|---------|----------|---------|---------|---------|----------|----------|----------|--------|
| Conversion Factor        | 0.11608 | 0.02932 | 0.19023 | 0.144343 | 0.06361 | 0.04904 | 0.01235 | 0.326615 | 0.183404 | 0.165362 |        |
| TONNES CO <sub>2</sub> e | 2011    | 0.060   | 0.005   | 0.742    | 0.094   | 0.007   | 1.714   | 0.088    | 0.599    | 11.388   | 93.244 |
|                          | 2013    | 0.000   | 0.048   | 0.480    | 0.409   | 0.285   | 2.418   | 0.171    | 0.000    | 117.943  | 51.900 |

| TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (STAFF AND STUDENT BUSINESS TRAVEL) |         |
|---|---------|
| 2010-11   | 107.941 |
| 2012-13   | 173.654 |

| TOTAL TONNES CO <sub>2</sub> e FROM ALL FORMS OF TRANSPORT |         |
|--|---------|
| 2010-11  | 244.664 |
| 2012-13  | 327.212 |

## Notes

Not adjusted for the whole hourly-paid staff community to avoid distortion of figures

2011/2012 Data has been recalculated using 2013 conversion rates

# WATER AND WASTE WATER

## NON-RESIDENTIAL

| WATER & WASTE WATER (m <sup>3</sup> ) |           |           |         |             |           |         |     |
|---------------------------------------|-----------|-----------|---------|-------------|-----------|---------|-----|
| Month                                 | Water     |           |         | Waste water |           |         |     |
|                                       | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |     |
| MAIN SCHOOL                           | Aug       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Sep       | 186       | 176     | 162         | 91        | 86      | 79  |
|                                       | Oct       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Nov       | 186       | 176     | 162         | 91        | 86      | 79  |
|                                       | Dec       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Jan       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Feb       | 176       | 167     | 153         | 86        | 82      | 75  |
|                                       | Mar       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Apr       | 186       | 176     | 162         | 91        | 86      | 79  |
|                                       | May       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Jun       | 186       | 176     | 162         | 91        | 86      | 79  |
|                                       | Jul       | 192       | 182     | 167         | 94        | 89      | 82  |
|                                       | Total     | 2,264     | 2,144   | 1,972       | 1,109     | 1,051   | 967 |

|                   |       |     |     |     |     |     |     |
|-------------------|-------|-----|-----|-----|-----|-----|-----|
| JOHN HOSIER ANNEX | Aug   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Sep   | 21  | 20  | 18  | 10  | 10  | 9   |
|                   | Oct   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Nov   | 21  | 20  | 18  | 10  | 10  | 9   |
|                   | Dec   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Jan   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Feb   | 20  | 19  | 18  | 10  | 9   | 9   |
|                   | Mar   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Apr   | 21  | 20  | 18  | 10  | 10  | 9   |
|                   | May   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Jun   | 21  | 20  | 18  | 10  | 10  | 9   |
|                   | Jul   | 22  | 21  | 19  | 11  | 10  | 9   |
|                   | Total | 258 | 244 | 226 | 126 | 120 | 111 |

| WATER & WASTE WATER (m <sup>3</sup> ) |           |           |         |             |           |         |    |
|---------------------------------------|-----------|-----------|---------|-------------|-----------|---------|----|
| Month                                 | Water     |           |         | Waste water |           |         |    |
|                                       | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |    |
| JOHN TRUNDLE COURT                    | Aug       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Sep       | 4         | 3       | 3           | 2         | 2       | 2  |
|                                       | Oct       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Nov       | 4         | 3       | 3           | 2         | 2       | 2  |
|                                       | Dec       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Jan       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Feb       | 3         | 3       | 3           | 2         | 2       | 1  |
|                                       | Mar       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Apr       | 4         | 3       | 3           | 2         | 2       | 2  |
|                                       | May       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Jun       | 4         | 3       | 3           | 2         | 2       | 2  |
|                                       | Jul       | 4         | 4       | 3           | 2         | 2       | 2  |
|                                       | Total     | 44        | 41      | 38          | 21        | 20      | 19 |

|                       |       |       |       |       |       |       |       |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| TOTAL NON-RESIDENTIAL | Aug   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Sep   | 211   | 199   | 184   | 103   | 98    | 90    |
|                       | Oct   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Nov   | 211   | 199   | 184   | 103   | 98    | 90    |
|                       | Dec   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Jan   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Feb   | 199   | 189   | 174   | 98    | 93    | 85    |
|                       | Mar   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Apr   | 211   | 199   | 184   | 103   | 98    | 90    |
|                       | May   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Jun   | 211   | 199   | 184   | 103   | 98    | 90    |
|                       | Jul   | 218   | 206   | 190   | 107   | 101   | 93    |
|                       | Total | 2,566 | 2,430 | 2,237 | 1,257 | 1,191 | 1,096 |

| TOTAL TONNES CO <sub>2</sub> e NON-RESIDENTIAL |           |           |         |             |           |         |  |
|--|-----------|-----------|---------|-------------|-----------|---------|--|
|  | Water     |           |         | Waste water |           |         |  |
|  | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |  |
| Conversion Factor <sup>a)</sup>                | 0.3441    | 0.3441    | 0.3441  | 0.7085      | 0.7085    | 0.7085  |  |
| TONNES CO <sub>2</sub> e                       | 0.883     | 0.836     | 0.770   | 0.891       | 0.844     | 0.777   |  |



## WATER AND WASTE WATER

### RESIDENTIAL

| WATER & WASTE WATER (m <sup>3</sup> ) |           |           |         |             |           |         |       |
|---------------------------------------|-----------|-----------|---------|-------------|-----------|---------|-------|
| Month                                 | Water     |           |         | Waste water |           |         |       |
|                                       | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |       |
|                                       | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |       |
| SUNDIAL COURT                         | Aug       | 868       | 733     | 754         | 425       | 359     | 369   |
|                                       | Sep       | 840       | 675     | 561         | 412       | 331     | 275   |
|                                       | Oct       | 868       | 905     | 968         | 425       | 443     | 474   |
|                                       | Nov       | 660       | 859     | 1271        | 323       | 421     | 623   |
|                                       | Dec       | 682       | 607     | 377         | 334       | 297     | 185   |
|                                       | Jan       | 682       | 633     | 590         | 334       | 310     | 289   |
|                                       | Feb       | 784       | 787     | 980         | 384       | 386     | 480   |
|                                       | Mar       | 984       | 1022    | 836         | 482       | 501     | 410   |
|                                       | Apr       | 651       | 632     | 567         | 319       | 310     | 278   |
|                                       | May       | 904       | 748     | 789         | 443       | 367     | 387   |
|                                       | Jun       | 1084      | 970     | 757         | 531       | 475     | 371   |
|                                       | Jul       | 890       | 801     | 651         | 436       | 392     | 319   |
|                                       | Total     | 9,897     | 9,372   | 8,511       | 4,850     | 4,592   | 4,459 |

| TOTAL TONNES CO <sub>2</sub> e RESIDENTIAL |           |           |         |             |           |         |  |
|--|-----------|-----------|---------|-------------|-----------|---------|--|
|  | Water     |           |         | Waste water |           |         |  |
|  | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |  |
| Conversion Factor <sup>a)</sup>            | 0.3441    | 0.3441    | 0.3441  | 0.7085      | 0.7085    | 0.7085  |  |
| TONNES CO <sub>2</sub> e                   | 3.406     | 3.225     | 2.929   | 3.436       | 3.254     | 3.160   |  |

| TOTAL TONNES CO <sub>2</sub> e WATER & WASTE WATER |           |           |         |             |           |         |  |
|--|-----------|-----------|---------|-------------|-----------|---------|--|
|  | Water     |           |         | Waste water |           |         |  |
|  | 2010 - 11 | 2011 - 12 | 2012-13 | 2010 - 11   | 2011 - 12 | 2012-13 |  |
|  | 4.288     | 4.061     | 3.698   | 4.327       | 4.097     | 3.936   |  |

| TOTAL TONNES CO <sub>2</sub> e WATER & WASTE WATER<br>BY ACADEMIC YEAR |           |         |         |  |  |  |  |
|--|-----------|---------|---------|--|--|--|--|
|  | 2010 - 11 | 2011-12 | 2012-13 |  |  |  |  |
| Water  | 4.288     | 4.061   | 3.698   |  |  |  |  |
| Waste Water  | 4.327     | 4.097   | 3.936   |  |  |  |  |
| TOTAL  | 8.615     | 8.158   | 7.634   |  |  |  |  |

#### NOTES:

i) 2010 - 11 data has been recalculated using 2012 conversion factors. 2013 conversion factors were the same as those for 2012.

#### SOURCES:

a) 2012 Guidelines to DEFRA / DECC's GHG conversion factors for company reporting - life-cycle conversion factors for water

## WASTE

### NON-RESIDENTIAL

| WASTE RECYCLED (TONNES) |           |           |           |         |
|-------------------------|-----------|-----------|-----------|---------|
| 2008 - 09               | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 |
| 135.20                  | 140.40    | 120.24    | 110.49    | 134.88  |

|                          |                   |                   |                  |                  |       |
|--------------------------|-------------------|-------------------|------------------|------------------|-------|
| Conversion Factor        | 257 <sup>a)</sup> | 257 <sup>a)</sup> | 21 <sup>b)</sup> | 21 <sup>b)</sup> | 21    |
| TONNES CO <sub>2</sub> e | 34.746            | 36.083            | 2.525            | 2.320            | 2.830 |

| WASTE SENT TO (TONNES):  |                   |                   |                   |                 |                  |       |
|--------------------------|-------------------|-------------------|-------------------|-----------------|------------------|-------|
| LANDFILL                 |                   |                   |                   | ENERGY RECOVERY |                  |       |
| 2008 - 09                | 2009 - 10         | 2010 - 11         | 2012-13           | 2011 - 12       | 2012-13          |       |
| 175.76                   | 228.56            | 146.41            | 0                 | 127.23          | 133.20           |       |
| Conversion Factor        | 290 <sup>a)</sup> | 290 <sup>a)</sup> | 290 <sup>b)</sup> | 290             | 21 <sup>b)</sup> | 21    |
| TONNES CO <sub>2</sub> e | 50.970            | 66.282            | 42.459            | 0               | 2.672            | 2.797 |

| TOTAL TONNES CO <sub>2</sub> e NON-RESIDENTIAL |           |           |           |         |
|--|-----------|-----------|-----------|---------|
| 2008 - 09                                      | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 |
| 85.717   | 102.365   | 44.984    | 4.992     | 5.627   |

### RESIDENTIAL

| WASTE RECYCLED (TONNES) |           |           |           |         |
|-------------------------|-----------|-----------|-----------|---------|
| 2008 - 09               | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 |
| 202.80                  | 70.20     | 106.92    | 135.84    | 68.62   |

|                          |                   |                   |                  |                  |       |
|--------------------------|-------------------|-------------------|------------------|------------------|-------|
| Conversion Factor        | 257 <sup>a)</sup> | 257 <sup>a)</sup> | 21 <sup>b)</sup> | 21 <sup>b)</sup> | 21    |
| TONNES CO <sub>2</sub> e | 52.120            | 18.041            | 2.245            | 2.853            | 1.441 |

| WASTE SENT TO (TONNES):  |                   |                   |                   |                 |                  |       |
|--------------------------|-------------------|-------------------|-------------------|-----------------|------------------|-------|
| LANDFILL                 |                   |                   |                   | ENERGY RECOVERY |                  |       |
| 2008 - 09                | 2009 - 10         | 2010 - 11         | 2012-13           | 2011 - 12       | 2012-13          |       |
| 175.76                   | 228.56            | 231.66            | 0                 | 141.07          | 116.55           |       |
| Conversion Factor        | 290 <sup>a)</sup> | 290 <sup>a)</sup> | 290 <sup>b)</sup> | 290             | 21 <sup>b)</sup> | 21    |
| TONNES CO <sub>2</sub> e | 50.970            | 66.282            | 67.181            | 0               | 2.962            | 2.448 |

| TOTAL TONNES CO <sub>2</sub> e RESIDENTIAL |           |           |           |         |
|--|-----------|-----------|-----------|---------|
| 2008 - 09                                  | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 |
| 103.090                                    | 84.324    | 69.427    | 5.815     | 3.889   |

| TOTAL TONNES CO <sub>2</sub> e ALL WASTE |           |           |           |           |         |
|--|-----------|-----------|-----------|-----------|---------|
|  | 2008 - 09 | 2009 - 10 | 2010 - 11 | 2011 - 12 | 2012-13 |
| Recycled                                 | 86.866    | 54.124    | 4.770     | 5.173     | 4.271   |
| Landfill / Energy recovery               | 101.941   | 132.565   | 109.640   | 5.634     | 5.245   |
| TOTAL                                    | 188.807   | 186.689   | 114.411   | 10.807    | 9.516   |

|  |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|
| Tonnes recycled as a percentage of total waste | 49.02% | 31.54% | 37.53% | 47.87% | 44.88% |
|--|--------|--------|--------|--------|--------|

| TOTAL TONNES CO <sub>2</sub> e FROM WATER, WASTE WATER AND WASTE |           |         |         |
|--|-----------|---------|---------|
|  | 2010 - 11 | 2011-12 | 2012-13 |
| Water and Waste Water  | 8.615     | 8.158   | 7.634   |
| Waste  | 114.411   | 10.807  | 9.516   |
| TOTAL  | 123.026   | 18.965  | 17.150  |

#### NOTES:

i) 2010 - 11 data has been recalculated using 2012 conversion factors

ii) In 2011 - 12, the City of London started to send all its non-recyclable waste to an energy recovery plant in South East London

#### SOURCES:

a) 2011 Guidelines to DEFRA / DECC's GHG conversion factors for company reporting - life-cycle conversion factors for waste disposal (mixed municipal waste)

b) 2012 Guidelines to DEFRA / DECC's GHG conversion factors for company reporting - life-cycle conversion factors for waste disposal (mixed municipal waste)

## Assessment against baseline and targets – scope 3

### Transport

71. The data in the previous section show that the Guildhall School's total indirect greenhouse gas emissions (scope 3) in academic year 2010 arising from student transport activity amounted to 983.654 tonnes. This reduced dramatically in 2012 to 692.568 tonnes, largely due to a new and more accurate methodology being adopted for the calculation of air transport. When adding staff commuter travel and staff and student business travel from the 2011 survey, a grand total of **958.918 tonnes** is reached for total emissions arising from travel.
72. Due to the School's location at the heart of the City of London, the data show that the vast majority of travel to and from the School, both by staff and students, is by public transport, cycling or walking. Less than 1% of travel is by car or taxi, and the School has no car-parking facilities of its own.
73. The data also show that 57% of the above greenhouse gas emissions are generated as a result of students travelling to and from their home addresses at the beginning and end of term. Given that more than a third of the School's students are currently from outside the UK, representing over 40 nationalities, this is not a surprising statistic.
74. Consequently it is not considered feasible to expect a large reduction in greenhouse gas emissions from travel to be achievable.
75. The School nonetheless set a modest target for the reduction of total scope 3 indirect greenhouse gas emissions arising from transport of **8%** by the academic year 2019/20 against the 2010 baseline. Given the change in methodology for the calculation of air transport, it is now more realistic to set this target against the lower 2012 baseline of 958.918 tonnes. This is an absolute target, meaning that total indirect greenhouse gas emissions arising from transport must not exceed **882.205 tonnes** in 2019/20. This target will be reviewed after a larger dataset has been achieved over a longer period of years.
76. The School will seek to achieve this reduction by continuing to expand the availability of cycle bays to encourage staff and students to cycle to the School. It will also continue to ensure that the School's facilities are available for use by students throughout the year, for the benefit of students wishing to remain in London during the vacations. Currently the School is closed only on Christmas Day, Boxing Day and during the Easter weekend.
77. It should be noted that the data shown above for staff and student business travel include the emissions associated with a limited number of staff flying to New York and elsewhere in order to conduct auditions for students applying for places at the Guildhall School. If these trips did not take place, a considerably larger number of students would need to fly in the opposite direction to be auditioned in London.

### Water and waste

78. The data in the previous section show that the Guildhall School's total indirect greenhouse gas emissions (scope 3) in academic year 2010/11 arising from

water, waste water and waste amounted to 139.567 tonnes. This reduced dramatically in 2011/12 to just 21.063 tonnes, as a direct result of the City of London now sending its non-recyclable waste for incineration at an energy recovery plant in South-East London.

79. The Guildhall School has taken significant steps to reduce its water consumption by installing percussion taps in the majority of its estate and water saving shower devices in student accommodation. The School has just one hall of residence providing accommodation for 177 students.
80. Consequently it is not considered feasible to expect a large reduction in greenhouse gas emissions from water consumption to be achievable. The School will however be investing in additional water meters in order to measure its consumption more accurately.
81. On the other hand, greenhouse gas emissions arising from the disposal of waste have already reduced dramatically.
82. In 2010/11 the School set a target for the reduction of total scope 3 indirect greenhouse gas emissions arising from water, waste water and waste of **30%** by the academic year 2019/20 against the above 2010 baseline. This is an absolute target, meaning that total indirect greenhouse gas emissions arising from water, waste water and waste must not exceed 97.697 tonnes in 2019/20. Given that this target has already been exceeded, it is highly likely that the School should revise it. However there is still only a small amount of data available, and so this target will be reviewed after a larger dataset has been achieved over a longer period of years.

## Implementation plan – scopes 1 and 2

83. In order to achieve its 2020 carbon reduction target for scope 1 and 2 emissions, the School has identified a number of initiatives and interventions that will reduce its energy consumption. Many of these are behavioural adjustments that attract little or no cost, a lot of which are already being implemented. Others are engineering or technical interventions that reduce the amount of energy needed to operate the School's buildings. Whilst these initiatives have a capital cost attached to them, they will of course generate future savings in energy costs and will provide a good return on investment particularly as energy costs inevitably rise. Apart from the possibility of introducing additional secondary glazing which needs detailed evaluation, the most expensive project is to install a voltage optimisation unit in the Silk Street building, but this is also expected to produce the greatest energy savings estimated at 8%. It is anticipated that the majority of the funding for the engineering and technical interventions will be found from the School's annual ring fenced strategic capital programme;- the 'capital cap'.

84. The following tables list the initiatives and projects that will be or are already being implemented, or are the subject of detailed evaluation to establish their viability.

### Behavioural and awareness-raising solutions

| Initiative  | Detail  | Action by                                  | Timescale/progress |
|---|---|--|--------------------|
| Switch off electrical equipment   | Staff and students are encouraged to turn off all electrical equipment, monitors, lights, printers, copier machines when at meetings, lunch and at the end of the day. Room-by-room data have been collected since September 2009 identifying how many appliances are left switched on at night, and an analysis of these data are published on the School's intranet to remind staff how well they are doing. An energy saving competition has also taken place. | SSG and Facilities department              | Ongoing            |
| Screen saver and/or desktop message to turn off monitors  | This is a simple and effective reminder that switching off an unattended monitor saves more energy than leaving it on stand-by.   | IT department                              | Ongoing            |
| Encourage staff and students to turn the heating down or off if not needed, rather than opening windows | This is a particular problem in Sundial Court bedrooms, where windows are often used as the temperature control mechanism, rather than the thermostatically-controlled radiator valves. Awareness raising comprises notices in the Sundial Court handbook, as well as reminders at residential meetings.  | Student Affairs and Facilities departments | Ongoing            |
| Departmental environmental  | This initiative involves the creation of a simple internal accreditation  | SSG  | Spring term 2014   |

| <b>Initiative</b>  | <b>Detail</b>  | <b>Action by</b>                           | <b>Timescale/progress</b>                                      |
|--|--|--|--|
| accreditation  | scheme, whereby the School's departments work towards a set of environmental and sustainability standards, thus creating a competitive approach to achieving a more sustainable institution.   |  |  |
| Sundial residents' meetings  | These regular meetings are used to promote sustainability and environmental awareness and to encourage students to engage with the issues and contribute ideas.  | Student Affairs and Facilities departments | Ongoing  |
| Environmental video made by students   | This would be a very effective way of engaging students and channelling the enthusiasm of some to raise awareness of the issues in others.   | SSG and Student Affairs department         | Spring term 2014   |
| Use of foyer screens to show sustainability messages                           | The School has a number of large display screens in its main foyer, showing a variety of information such as forthcoming events and room bookings and usage for the day. The screens are programmed to show sustainability messages, either at times when their primary use is not necessary or interspersed with their primary use.   | SSG and IT department                      | Ongoing  |
| Environmental Awareness Days   | The School organises regular events in the main foyer, usually on a termly basis, at which environmental films are shown, and energy-saving ideas and statistics are promoted, often in conjunction with external initiatives.   | SSG  | Ongoing  |
| Incorporating sustainability issues into the recruitment and appraisal process | A commitment to working towards a more sustainable and environmentally friendly institution should be part of the job description of every staff member. Awareness of the initiatives in which the School is engaged should form part of the induction process. For certain management roles, particularly in Engineering and in Technical Theatre, specific environmental objectives are already being included in the appraisal process. | HR department                              | Implemented for Engineering, and Facilities staff in July 2013 |

### **Engineering and technical interventions**

| <b>Initiative</b>                      | <b>Detail</b>   | <b>Est. Cost £</b> | <b>Timescale/progress</b> |
|--|---|--------------------|---------------------------|
| Installation of 'power perfecter' unit | This is a voltage reduction and stabilisation unit that sits in-between the main incoming electrical supply | 60,000             | Summer term 2014          |

| Initiative  | Detail   | Est. Cost £ | Timescale/ progress   |
|---|--|-------------|---|
|   | and the distribution board. It monitors the incoming supply voltage and reduces it to the EU standard of 220V, making a saving of 8%. This system has already been installed in Sundial Court, and installation in the Silk Street building is now planned.  |             |   |
| Installation of new Building Energy Management System (BEMS)            | The BEMS is a computer-controlled system that manages the building heating, cooling, hot water and ventilation systems. New systems were installed in 2009 both in the Silk Street building and in Sundial Court, which allows us to monitor/manage all of the systems and optimise them for best energy usage.  |             | Already complete. Further refinement of the settings is ongoing |
| Reduce run hours on heating circuits and ventilation systems            | The run hours of the heating and ventilation systems in the Silk Street building and in Sundial Court have been reviewed in consultation with student union representatives, facilities and other relevant staff, enabling the School to use the BEMS to operate the heating circuits and ventilation systems more precisely to the times that suit operational requirements.  |             | Ongoing   |
| Introduction of low energy and LED lamps                                | A number of different trial lamps have been introduced, including replacing the old style lamps with the LED equivalent where possible. The resultant data have now been reviewed and a large scale replacement programme is to be implemented, with an expected energy saving of 8%. The development of low energy and LED lighting for theatre productions is being investigated for possible introduction in the future as the technology improves. | 15,000      | Commenced in Summer term 2013 and continuing                    |
| Installation of Chlorine Dioxide unit to reduce calorifier temperatures | The primary function of a Chlorine Dioxide unit is to control legionella bacteria. It constantly doses the water with chlorine dioxide, which is an oxidizing biocide that reacts with a wide range of organic substances and is effective against legionella bacteria. As a result of using this unit, the temperature of the hot water systems is able to be safely reduced thus saving energy in heating the water.                                 |             | Completed autumn term 2010                                      |

| <b>Initiative</b>  | <b>Detail</b>   | <b>Est. Cost £</b> | <b>Timescale/progress</b>     |
|--|---|--------------------|-------------------------------|
| Installation of variable speed drive pumps                               | The installation of these units reduces the pressure on the pumps and valves as the water flows around the systems. By using the BEMS to control them, the electricity used to drive the pumps is reduced.  | 9,000              | Completed in Summer term 2013 |
| Review of STARK meter overnight loads to reduce energy usage             | STARK is the electricity monitoring system used by the distribution company, which produces half-hourly data. A review of these data enables the School to identify what is being left on overnight, and to reduce the static load units that are permanently switched on and make them switchable so they can be turned off when not required.     |                    | Ongoing                       |
| Removal of constant load transformers in engineering areas               | A review of these units in the plant rooms and service risers revealed that they are not all required. Some units have been removed and the others have been put on isolation switches to allow them to be turned off.  | 1,000              | Summer term 2013              |
| Review and testing of movement sensors on lighting and air-conditioning  | Installation of movement sensors enables local lighting and air-conditioning to be turned on only when the room is in use. This will need extensive testing due to the specialist uses to which many areas of the School are put. They will then be installed in all areas where it is practical.   | 4,000              | Summer term 2013              |
| Review HVAC system for use of "free cooling" to reduce chiller run times | The BEMS allows the School to review inside and outside temperatures, to enable the run times of the chiller and CHP cooling systems to be balanced by using cool air from outside.   |                    | Ongoing                       |
| Auto-shut down of IT equipment   | Ensuring that staff and students switch off IT and other appliances that are their sole responsibility is a behavioural challenge, but equipment that is monitored centrally from the IT network can be automatically shut down when the School closes each night. This ensures that no energy is wasted by appliances being left on unnecessarily. |                    | Ongoing                       |
| Investigate increased use of secondary                                   | This is problematic due to the estate's grade 2 listing, but may be possible in some areas. Project requires detailed   | 800,000            | Being evaluated               |



| <b>Initiative</b> | <b>Detail</b> | <b>Est. Cost £</b> | <b>Timescale/<br/>progress</b> |
|-------------------|---------------|--------------------|--------------------------------|
| glazing           | evaluation.   |                    |                                |

## **Space management**

85. One of the most effective ways of reducing energy usage and therefore scope 1 and 2 carbon emissions is to ensure the most efficient use of space. With the School's new facilities opening at Milton Court in 2013, a perfect opportunity has presented itself to re-examine usage in all the School's buildings to ensure maximum space utilisation in the enlarged estate.
86. External consultants were appointed to carry out a study into how the School's spaces should be reconfigured once the Acting department and large parts of the Technical Theatre department have relocated to Milton Court. The final report was received in February 2011, and this was followed by a thorough evaluation by the School's senior management team. Funds already allocated in the current capital programme will be utilised to execute some of the resultant refurbishment works, with provision to be made in the next programme (from 2014/15 to 2018/19) for the more ambitious schemes.

## Implementation plan – scope 3

87. Although the Guildhall School does not anticipate being able to achieve substantial reductions in its scope 3 emissions because of its size and location, various initiatives have nonetheless been put in place, or are being evaluated, to reduce them as much as possible, as shown in the following table. Despite baseline data for emissions arising from procurement not yet being available, possible initiatives to reduce such emissions are already included in this plan.

| Initiative                                | Detail   | Action by                          | Timescale/<br>progress |
|---|--|------------------------------------|------------------------|
| Rainwater diverting                       | Diverted (grey) water can be re-used for plant watering and WCs  | Engineering department             | Being evaluated        |
| Roll out of percussion taps               | Percussion taps switch off automatically, thus saving water  | Engineering department             | Largely complete       |
| Installation of water saving shower units | Sundial Court Student accommodation  | Engineering department             | complete               |
| Install additional water meters           | Whilst water consumption in Sundial Court is accurately measured, usage in the main Silk Street building is not. Water meters in this building will enable accurate data to be compiled. | Engineering department             | Summer term 2014       |
| Reduce use of plastic                     | Encourage offices to use mugs/glasses rather than disposable plastic cups  | SSG                                | Ongoing                |
| Encourage paper-free working              | Work towards greater use of electronic communication   | SSG                                | Ongoing                |
| Reduce paper usage                        | Print double-sided (all printers default to double-sided), reduce margin sizes, reuse scrap for notepaper, recycle envelopes   | SSG                                | Ongoing                |
| Increase recycling                        | Increase number of recycling points and consider other materials that can be recycled  | SSG and Facilities department      | Ongoing                |
| Reduce waste going to skips               | Review ways of reducing the amount from theatre sets that are thrown away after each production  | Technical Theatre                  | Ongoing                |
| Encourage cycling                         | Promote cycle safety and training schemes and increase cycle bays to support staff and students who wish to cycle to the School. Promote the cycle loan scheme                           | SSG                                | Ongoing                |
| Procurement policy                        | Continue to consider locality of suppliers and agencies according to City of London procurement guidelines   | All departments – monitored by SSG | Ongoing                |
| Procurement policy                        | Continue to buy Fairtrade tea/coffee/cups and other produce  | Facilities department              | Ongoing                |
| Procurement policy                        | Consider the 'green credentials' of suppliers, e.g. accredited to ISO  | All departments                    | Being evaluated        |

| <b>Initiative</b> | <b>Detail</b>                                       | <b>Action by</b>   | <b>Timescale/<br/>progress</b> |
|-------------------|---|--------------------|--------------------------------|
|                   | 14001, before awarding contracts and placing orders | – monitored by SSG |                                |

## **Governance and progress monitoring**

### **Governors**

88. The Committee of University Chairs' 'Guide for Members of Higher Education Governing Bodies in the UK' states that: 'The governing body is responsible for oversight of the strategic management of the institution's land and buildings with the aim of providing an environment that will facilitate high-quality teaching and learning and research.' Carbon management is a key strategic issue, so it is a crucial area for governors who should be informed and involved in decision-making on the institution's approach to reducing its emissions. This is why HEFCE has asked for carbon reduction plans to be signed off by the governing body.

### **Officers**

89. At officer level, the School's Senior Management Team has ultimate responsibility for taking ownership and for communication of this strategy, and for ensuring that its action plan is implemented and progress monitored accordingly. The Senior Management Team will ensure that a monitoring report is submitted to the Board of Governors annually.

90. At an operational level, the Operations Board will have a role as the committee into which the SSG reports, particularly in respect of monitoring. It will receive progress reports on monitoring by receipt of the minutes of SSG meetings.

91. Detailed monitoring of this strategy will be carried out by the SSG at each of its meetings, which are twice termly. It will also be responsible for revising the strategy in the light of progress. The members of the SSG as at January 2014 are:

Michael Dick (The Director of Operations and Buildings)- Chairman  
Julia Lazarus (Student Affairs)  
Adrian Yardley (Library)  
Ayca Ibrahim (Music Office)  
Ben Sumner (Technical Theatre)  
Martin Auger / Tom Harrington (Estates Management)  
Jennifer Kay (Registry)  
Malcolm Johnson / Stephen Blackaby (Engineering)  
Richard Antonel (IT)  
Ieuan Davies (Student Union President)  
Student Representatives (up to four)

Supplemented by colleagues from the City of London Corporation and other external experts as required.