

# Carbon reduction strategy 2011 to 2020

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## Contents

<b>Executive summary.....</b>	<b>3</b>
<b>Introduction and background .....</b>	<b>5</b>
<b>Approach to carbon reduction.....</b>	<b>13</b>
<b>Carbon emissions data – scopes 1 and 2.....</b>	<b>16</b>
<b>Assessment against baseline and target – scopes 1 and 2.....</b>	<b>22</b>
<b>Carbon emissions data – scope 3 .....</b>	<b>24</b>
<b>Assessment against baseline and targets – scope 3 .....</b>	<b>31</b>
<b>Implementation plan – scopes 1 and 2.....</b>	<b>33</b>
<b>Implementation plan – scope 3.....</b>	<b>39</b>
<b>Governance and progress monitoring .....</b>	<b>41</b>

## Executive summary

The Guildhall School of Music & Drama acknowledges that 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.

The first version of this strategy was written in 2011 a major driving force for this strategy was the requirement from the Higher Education Funding Council (HEFCE) that each HE institution puts in place a carbon reduction strategy. HEFCE closed in 2018 and responsibility for funding the Higher Education sector fell to the Office for Students (OfS). Although it has now closed HEFCE continues to be referenced throughout this revision as those were the requirements that were in force at the time of the first version and the majority of the time that this strategy relates to. At this time of this latest revision it is unclear what requirements OfS will have in relation to HE institutions having and maintaining a carbon reduction strategy. Once any new requirements from funding bodies, legislative framework or other sources are known this strategy will be revised in line with these.

The UK Climate Change Act of 2008 created legally binding targets to reduce carbon emissions by 34% by 2020 and by 80% by 2050 against a 1990 baseline. The HE sector resolved that it must be in the vanguard of efforts to achieve these targets and, after widespread consultation, HEFCE had 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. In 2019 the Climate Change Act was amended in 2019 to set a new target of net Zero Carbon by 2050.

The Higher Education Funding Council for England had 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 would 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 (CRC) 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 was estimated to be in the region of £25,000 for the 12/13 year. The price of allowances was forecast to rise each year reinforcing the incentive to reduce consumption and hence the costs of both the allowances and the energy itself. Note: The CRC will come to an end following the 2018-19 compliance year, this will partially be offset by an increase in climate change levy.

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. In 2016/17 we exceeded the target for the estate excluding Milton Court achieving a 47% reduction against the baseline and again in 2017/18 we increased this to a 51% reduction against the baseline, this review therefore has

increased the target for scope 1 and 2 emissions arising from the estate excluding Milton Court to 55% by 2020.

This latest version of the strategy includes for the first time the emissions data for Milton Court. The building became fully operational from September 2013. The previous update of this strategy estimated that when fully operational the Milton Court Building carbon emissions would be in the region of 632,554 Tonnes. However, it was also noted that there would be significant increases to this estimated figure. The cause has been attributed to system commissioning difficulties and more intensive and extended use of the Building space and facilities when compared to the original model. The data shows the actual emissions for 2013/14 was 998.851 Tonnes an increase of 366.297, 58% over the design estimate and in 2017/18 830.411 Tonnes which still represents an increase of 31% compared to the design estimate but demonstrates a decrease in actual emissions of 16.86% compared with 2013/14. This represents an average annual decrease of 4.22%, if we continue with this trajectory we should see the annual emissions for Milton Court in 2019/20 being 761.909 Tonnes we have therefore revised the 2019/20 target for Milton Court and the enlarged estate to this figure.

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.

In 2017/18 we achieved a reduction of 75% of emissions from water, waste water and waste combined. On analysis of this date the majority of the savings are attributable to waste with the water exceeding the baseline.

Data shows that compared to our baseline of 2010/11 we have a substantial increase in emissions from water and waste water. This is due to the increased size of the estate since the introduction of Milton Court and more accurate data being available since 2013/14. Prior to 2013/14 we had been using estimated water consumption for Silk Street and have since opening estimated water consumption for Milton Court based on use per/m<sup>2</sup> of Silk Street. From 2018 we have been collecting readings for Milton Court which will ensure accurate readings for the three main buildings going forward. Due to increased accuracy in data we have re-set the baseline for emissions arising from water use and waste water for the estate to 2013/14, the new baseline being 29.228 Tonnes. We saw a reduction in 2017/18 of 4% compared to the new baseline year. Early indications show that the more accurate readings currently being collected for Milton Court will be lower than those estimated so have redrawn the target for 2019/20 to be a reduction of 15% compared to the new baseline.

Significant reductions in emissions arising from waste have been achieved from 2012 where waste previously sent to landfill was diverted energy recovery which has a significantly lower carbon conversion factor than that of landfill. In addition waste tonnages were previously estimated by our contractor, this has recently changed and we should be receiving accurate weights in the future. In light of this we have redrawn the target to be 90% reduction in emissions associated with waste against 2010/11. Once the new data is received it will be carefully analysed and monitored and targets redrawn if required.

Implementation plans have been created to achieve these targets, which include behavioural change as well as technical interventions.

An important development in 2018 was the decision by the City of London to procure 100% renewable electricity from October 2018 onwards, this now being supplied to the Guildhall School. The Higher Education Statistics Agency (HESA) have advised that electricity supplied through “green tariffs” will not be considered zero carbon and the average grid electricity carbon factor will be applied. For the purposes of reporting and in the interests of consistency we will continue to use the average grid electricity carbon conversion factor.

## **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 Guildhall School of Music and Drama 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 1,002 FTE students (taken from 2017/18 EMR report to the Higher Education Statistics Agency) on its roll call. 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 33,400 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.
6. Following a major building project 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
  - a gymnasium
  - 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 – 8pm 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 Office for Students (OfS), formerly through the Higher Education Funding Council for England (HEFCE). Previous Feedback to HEFCE showed that there was 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

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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.

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. . In 2019 the Climate Change Act was amended in 2019 to set a new target of net Zero Carbon by 2050.

### 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 purchase allowances from Government each year to cover their emissions in the previous year. This means that organisations that decrease their emissions and 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.

The price of allowances had 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. The per tonne cost of the CRC 2015/16 including Milton Court was £12,62.

20. A publicly available CRC performance league table shows how each participant is performing compared to others in the scheme.
21. The CRC will come to an end following the 2018-19 compliance year, this will partially be offset by an increase in Climate Change Levy.

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<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.



### 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.

### **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.

<b>Scope</b>	<b>Description</b>	<b>Examples</b>
Scope 1: Direct emissions	Direct emissions occur from sources that are owned or controlled by the HEI	Direct fuel and energy use Transport fuel used in institutions' own vehicle fleets
Scope 2: Electricity indirect emissions	Emissions from the generation of purchased electricity consumed by the HEI	Purchased electricity
Scope 3: 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 Waste Land-based business travel Commuting (both staff and students) Air travel (international students; international student exchange; business) Procurement

## HEFCE requirements – Historic Driver

Note: HEFCE closed at the end of March 2018, some of the former provisions are now implemented through Office for Students as of yet we have received no notification of requirements to maintain a carbon reduction strategy. HEFCE requirements however remain an important historic driver for this strategy and were in place at the time of the first version and the majority of the time to which this strategy relates.

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

- A sector-level target for carbon reductions that is in line with UK targets. After widespread consultation, HEFCE had 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 provided 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 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 was 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 had 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>.

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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/)

28. Recognising the significant diversity of the sector with its range of missions, priorities, histories, subject mix, infrastructure and research, institutions were asked to set targets and develop plans that are appropriate to their individual circumstances but within the national target framework. HEFCE was collating these targets through the second phase of the Capital Investment Framework - CIF2 - to determine whether collectively they are sufficient to meet the sector target.
29. HEFCE's distribution of capital funding was based on the Capital Investment Framework, which relied 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 benefited 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 did not meet the requirements of CIF2 are at risk of 40% of their capital funding from HEFCE being withheld. This meant 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 required to be present in an institution's carbon management plan, which are needed to satisfy the requirements of CIF2. These were:
- 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. We have been carefully monitoring sources of emissions and, in this revision have redrawn the targets for Scope 1&2 for the estate excluding Milton Court, and Milton Court itself. For Scope 3 we have redrawn the targets for Water and Waste and maintained the target for transport.
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> energy/fuel demand	<i>Avoid unnecessary use</i>	<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>
	<i>Passive features (for example insulation, daylight, solar gain/shading, thermal mass)</i>	
	<i>Encourage energy-conscious behaviours</i>	
<b>EFFICIENCY</b> of equipment and energy/fuel sources	<i>Use energy-efficient equipment</i>	
	<i>Provide simple and effective controls</i>	
	<i>Recover useful heat</i>	
	<i>Use clean fossil fuel technology</i>	
<b>DECARBONISE</b> energy/fuel supplies	<i>On-site or near-site renewable energy sources, including community schemes</i>	
<b>BEFRIEND</b>	<i>Seek partnerships to increase capacity to do the above</i>	
<b>NEUTRALISE</b> energy/fuel supplies	<i>Consider responsible carbon offsetting schemes</i>	
	<i>Procure green electricity supplies</i>	

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 was not 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 2015/16. 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. We have since 2016/17 included metered gas consumption for Sundial Court for cooking and heating. 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

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



CHP running justified, the carbon factor for heat and chilled water supplied will gradually improve.



**RESIDENTIAL**

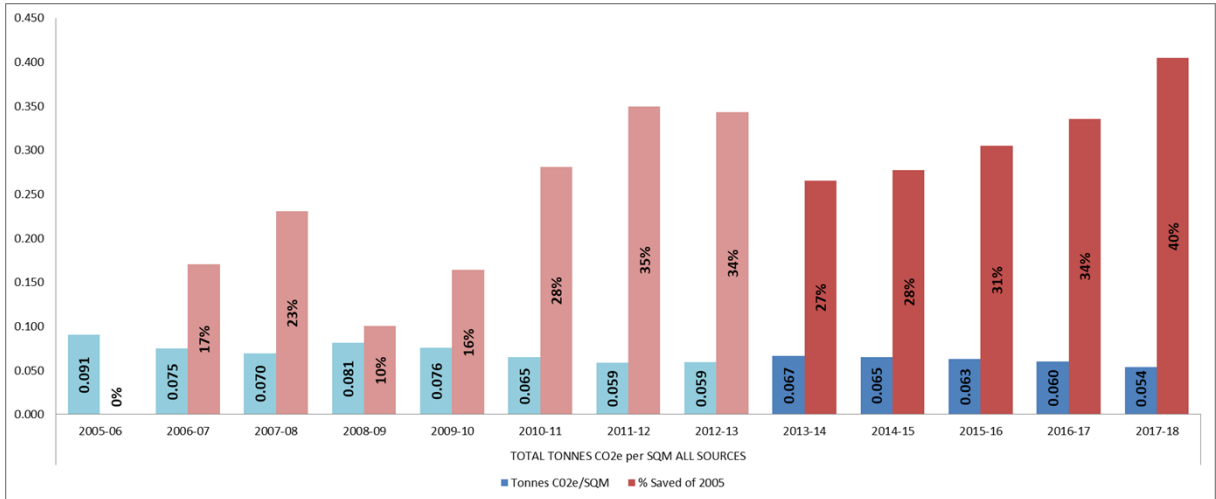
CHP HEATING (Citigen) (kWh)					TOTAL RESIDENTIAL KWH				
Month/Year	2005-06	2015/16	2016/17	2017/18	1,976,894.000	1,313,374.000	1,537,010.000	1,665,704.000	
Aug	45,550	36,290	27,320	23,190	100%	66%	78%	84%	
Sep	51,050	29,100	21,690	22,370	TOTAL TONNES CO <sub>2</sub> e RESIDENTIAL				
Oct	82,920	67,420	68,630	43,470	601.374	361.040	376.888	364.653	
Nov	125,200	74,250	110,530	118,500	100%	60%	63%	61%	
Dec	133,800	45,500	105,500	125,410	TOTAL TONNES CO <sub>2</sub> e per SQM RESIDENTIAL				
Jan	164,910	168,230	155,460	124,490	SQM	8700	8700	8700	
Feb	149,810	118,640	125,130	152,730	Tonnes CO <sub>2</sub> e/SQM	0.069	0.041	0.043	
Mar	206,000	23,770	112,010	135,630	% of 2005	100%	60%	63%	
Apr	138,630	90,938	79,740	76,280	TOTAL KWH ALL SOURCES				
May	99,390	60,511	66,240	54,750	Total KWH	5,293,070.000	7,059,193.000	7,641,930.000	7,834,614.000
Jun	53,800	42,681	36,540	38,600	% used of 2005	100%	133%	144%	148%
Jul	43,250	32,568	26,070	26,040	% Saved		-33%	-44%	-48%
Total	1,294,310	789,898	934,860	941,460	TOTAL TONNES SCOPE 1 & 2 CO <sub>2</sub> e ALL SOURCES				
Conversion Factor	0.185	0.18400	0.18416	0.18396	Tonnes of CO <sub>2</sub> e	2,047.546	2,139.397	2,044.760	1,832.941
TONNES CO <sub>2</sub> e	239.447	145.341	172.164	173.191	% used of 2005	100%	104%	100%	90%
					% Saved		-4%	0%	10%

ELECTRICITY (kWh)					TOTAL TONNES CO <sub>2</sub> e per SQM ALL SOURCES				
Month/Year	2005-06	2015/16	2016/17	2017/18	SQM	22,614	33,999	33,999	33,999
Aug	39,232	48,672	48,538	49,271	Tonnes CO <sub>2</sub> e/SQM	0.091	0.063	0.060	0.054
Sep	52,873	43,993	47,912	50,216	% used of 2005	100%	69%	66%	60%
Oct	61,068	46,607	49,517	54,596	% Saved		31%	34%	40%
Nov	61,509	46,366	45,267	51,964	TOTAL TONNES CO <sub>2</sub> e per STUDENT ALL SOURCES				
Dec	48,504	38,840	37,599	39,445	No. of Students	755	876	953	1002
Jan	61,105	45,537	47,675	49,411	Tonnes CO <sub>2</sub> e/Stu	2.712	2.442	2.146	1.829
Feb	60,289	42,127	44,647	48,295	% used of 2005	100%	90%	79%	67%
Mar	64,508	42,273	51,665	48,703	% Saved		10%	21%	33%
Apr	53,745	38,035	44,330	76,270	COMPARISON KWH NON-RESIDENTIAL / RESIDENTIAL				
May	62,251	43,901	48,404	54,710	Non-residential kWh	3,316,176.000	5,745,819.000	6,104,920.000	6,168,910.000
Jun	59,889	42,833	46,382	38,580	Residential kWh	1,976,894.000	1,313,374.000	1,537,010.000	1,665,704.000
Jul	57,611	44,292	48,589	26,070	Total kWh	5,293,070.000	7,059,193.000	7,641,930.000	7,834,614.000
Total	682,584	523,476	560,525	587,531	% age kWh non - residential	62.65%	81.39%	79.89%	78.74%
Conversion Factor	0.53023	0.41205	0.35156	0.28307	% age kWh residential	37.35%	18.61%	20.11%	21.26%
TONNES CO <sub>2</sub> e	361.927	215.698	197.058	166.312	COMPARISON TONNES CO <sub>2</sub> e NON-RESIDENTIAL / RESIDENTIAL				

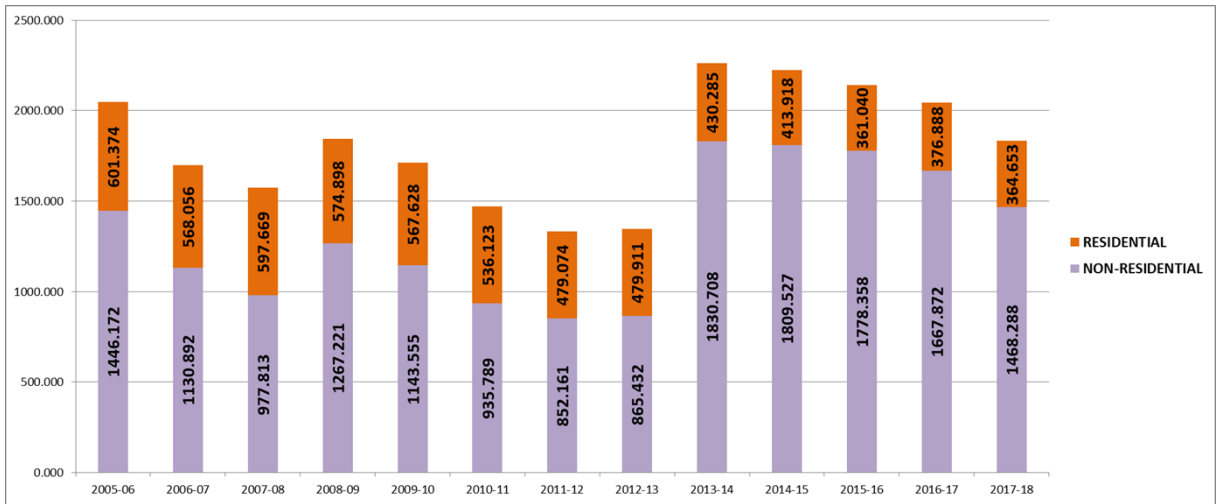
  

GAS (kWh)					COMPARISON TONNES CO <sub>2</sub> e NON-RESIDENTIAL / RESIDENTIAL				
Month/Year	2005-06	2015/16	2016/17	2017/18	Non-residential Tonnes CO <sub>2</sub> e	1,446.172	1,778.358	1,667.872	1,468.288
Aug			10,535	13,087	Residential Tonnes CO <sub>2</sub> e	601.374	361.040	376.888	364.653
Sep			1,969	12,666	Total tonnes CO <sub>2</sub> e	2,047.546	2,139.397	2,044.760	1,832.941
Oct			3,244	34,985	% age Tonnes CO <sub>2</sub> e	70.63%	83.12%	81.57%	80.11%
Nov			3,714	7,823	Non-residential % age tonnes CO <sub>2</sub> e	29.37%	16.88%	18.43%	19.89%
Dec			2,510	8,011	Residential % age tonnes CO <sub>2</sub> e				
Jan			2,571	8,346					
Feb			1,332	7,763					
Mar			3,006	8,832					
Apr			2,695	9,483					
May			4,169	8,002					
Jun			1,865	7,397					
Jul			4,015	10,318					
Total	0	0	41,625	136,713					
Conversion Factor	0.18500	0.18400	0.18416	0.18396					
TONNES CO <sub>2</sub> e			7.666	25.150					

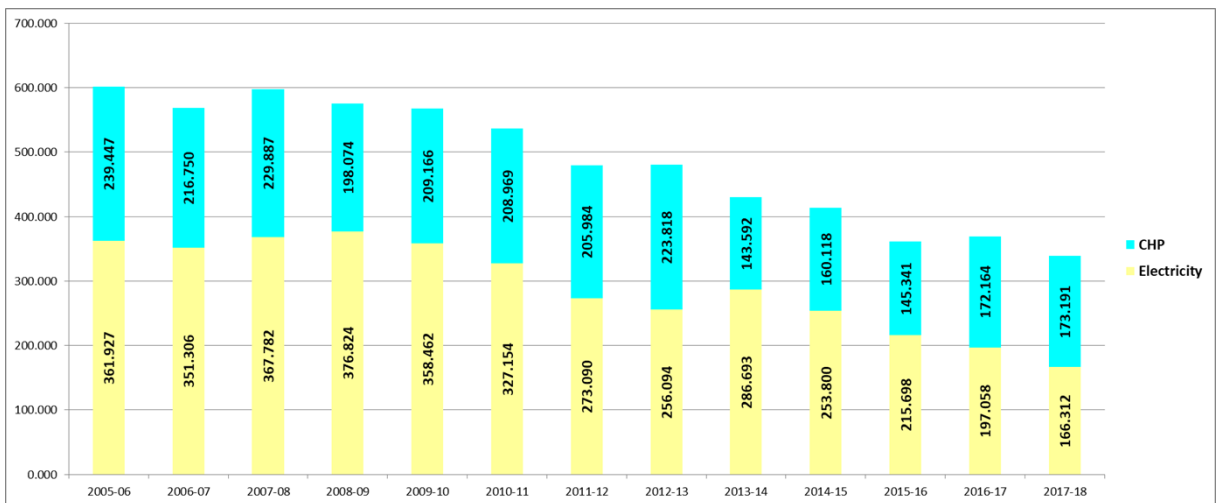


**Total Tonnes CO<sub>2</sub>e per Square Meter (all sources)**

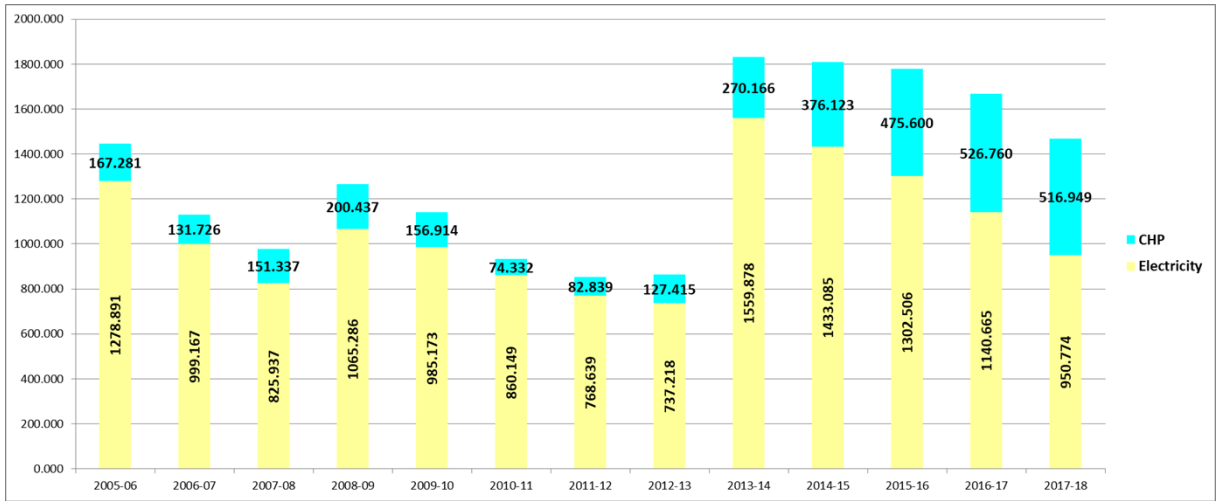
Total Sqm 2005 – 2013 = 22,614 / Total Sqm 2013 – present = 33,999



**Total Tonnes CO<sub>2</sub>e (all sources)**



**Residential CO<sub>2</sub>e: CHP/Electricity split**



**Non-Residential CO<sub>2</sub>e: CHP/Electricity split**

## 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&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 Building Energy Management System 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 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

Note the 2019/20 target has now been revised as below.

56. The School achieved its first milestone target in the 2011/12 period with a reduction to 1,331.236 tonnes, which represents a reduction of 35% against the 2005 baseline. It can be noted that in 2015/16 there was a further reduction to 1,002.530 Tonnes, which represents a reduction of 52% against the 2005 baseline. In 2017/18 the School achieved a further reduction to 1,002.530 Tonnes exceeding the third interim milestone target of 43% having achieved a reduction of 52%.
57. With further carbon reduction measures planned for the next reporting period we have increased our 2019/20 target to a 55% reduction equating to a maximum of 921,395 for the estate excluding Milton Court
58. The School believes its new 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

59. The Milton Court building became operational in September 2013, adding 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. . Inevitably, the addition of a building of this size to the estate has lead to an overall increase in the School's energy consumption and therefore its carbon emissions.
60. 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.
61. The designers of Milton Court 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>

62. Since the commissioning of the building, its energy consumption has been monitored separately from the rest of the estate. Consumption has consistently been above the estimates, this being accounted for by commissioning difficulties with the M&E plant alongside a greater utilisation than originally predicted.
63. As in the previous report the table below estimated the carbon emissions for Milton Court. Taking account of the above carbon reduction targets and milestones for its existing estate the table shows that the School's overall emissions increased with the addition of Milton Court. However, it can be noted that in 2015/16 the total emissions for the enlarged estate were still below the 2005 baseline.
64. Once the increased size of the estate is taken into account, the carbon emissions per m<sup>2</sup> of estate reduced from 0.091 tonnes to 0.054 tonnes, a reduction of 40%.
65. The data shows the actual emissions for Milton Court in 2013/14 were 998.851 Tonnes an increase of 366.297, 57% over the design estimate and in 2017/18 830.411 Tonnes, 31% over the design estimate. There is an actual decrease in 2017/18 compared to 2013/14 of 16.86% representing an annual decrease of 4.22%. If we continue with this trajectory we will see the annual emissions for Milton Court in 2019/20 being 761.909 we have therefore revised the 2019/20 target for Milton Court and the enlarged estate to this figure.

<b>Targets in previous version of carbon reduction strategy</b>					
	<b>2005 - 06</b>	<b>2010 - 11</b>	<b>2011 - 12</b>	<b>2015 - 16</b>	<b>2019 - 20</b>
Total tonnes CO <sub>2</sub> e for estate (excl Milton Court)	2,047.545	1,459.042	1,401.352	1,269.478	1,167.101
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>

<b>Revised targets this review</b>					
	<b>2005 - 06</b>	<b>2010 - 11</b>	<b>2011 - 12</b>	<b>2015 - 16</b>	<b>2019 - 20</b>
Total tonnes CO <sub>2</sub> e for estate (excl Milton Court)	2,047.545	1,459.042	1,401.352	1,269.478	921,395
Total tonnes CO <sub>2</sub> e for Milton Court				632.554	761.909
<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>1,683,304</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>0.050</b>

### **Carbon emissions data – scope 3**

66. Scope 3 indirect carbon emissions arise principally from transport, water, 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
67. Student travel surveys have been carried out in 2010, 2012 and 2014 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.
68. A staff travel survey was first carried out in 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 2013 and 2015.
69. The Guildhall School's water supply to the main Silk Street building is shared with the adjacent Barbican Centre. Water consumption for this building had been calculated at 40% of the total combined consumption, which is metered. Water consumption for Sundial Court for 2010/11 onwards had been taken directly from meter readings. Water consumption for 2010/11 onwards for John Hosier Annex has been estimated from the utility bills. Waste water volumes in all buildings had been previously calculated at 49% of the water supply volumes, this being the fraction previously applied by the utility company to the School's bills, from examination of recent billing the %age applied to calculate waste water is now 83% of water consumption.



70. From 2013/14 now have metered consumption data for Silk Street and have since estimated water consumption for Milton Court based on consumption per/m<sup>2</sup> of Silk Street. From 2018 we have been collecting readings for Milton Court which will ensure accurate readings for the three main buildings going forward. Due to increased accuracy in data we have re-set the baseline for emissions arising from water use and waste water for the estate to 2013/14, the new baseline being 29.228 Tonnes CO<sub>2</sub>e, we have seen a reduction in 2017/18 of 4.44% compared to the baseline year. Early indications show that the more accurate readings currently being collected for Milton Court will be lower than those estimated so have redrawn the target for 2019/20 to be a reduction of 15% compared to the new baseline for the whole estate.
71. 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.
72. 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>11</sup>. The exact conversion factors used are shown in the data tables.
73. Significant reductions in emissions arising from waste have been achieved from 2012 in 2017/18 these were 93% below the 2010/11 baseline. This is mainly due to waste previously sent to landfill was diverted to energy recovery which has a significantly lower carbon conversion factor than that of landfill. In addition Waste tonnages were previously estimated by our contractor, we have recently appointed a new waste contractor and we should be receiving more accurate data in the future. In light of this we have redrawn the target to be 90% reduction in emissions from waste against 2010/11. Once the new data is received it will be carefully analysed and monitored and targets redrawn if this is necessary.
74. We are working with our colleagues at the City of London to develop measurement and monitoring of emissions arising from procurement, this will be included in a further revision to this and/or any future strategy once a sector-wide approach be agreed.

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<sup>11</sup> <http://www.defra.gov.uk/publications/files/pb13773-ghg-conversion-factors-2012.pdf>

STUDENT TRAVEL SURVEY OCTOBER 2014

TOTAL DISTANCES TRAVELLED (KILOMETRES)										
	Bicycle	London Bus	Car	Motorbike	Train (u/ground)	Train (DLR)	Train (o/ground)	Walk	Total	
Term-time commuting	2010	304,699	190,548	0	0	831,341	0	834,138	171,302	2,332,027
	2012	166,968	165,836	111,458	0	529,036	86,733	1,011,169	156,893	2,228,093
	2014	247,644	137,258	0	143,059	741,312	63,766	1,174,476	181,361	2,688,877

Conversion factor <sup>a)</sup>	0.00000	0.08142	0.18943	0.11955	0.06312	0.06168	0.04738	0.00000	
TONNES CO <sub>2</sub> e	2010	0.0000	15.514	0.000	0.000	52.474	0.000	39.521	0.000
	2012	0.0000	13.502	21.113	0.000	33.393	5.350	47.909	0.000
	2014	0.0000	11.176	0.000	17.103	46.792	3.933	55.647	0.000

TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (TERM-TIME COMMUTING)		Students	per student
2010	107.510	912	0.12
2012	121.267	853	0.14
2014	134.650	936	0.14

TOTAL DISTANCES TRAVELLED (KILOMETRES)											
	Bicycle	National Coach	London Bus	Car	Train (u/ground)	Train (o/ground)	Train (internat'l)	Plane (domestic)	Plane (shorthaul)	Plane (longhaul)	Total
Vacation travel	2010	6,352	344,738	0	49,450	43,115	458,622	338,511	29,552	1,228,022	3,424,962
	2012	275	9,030	0	32,571	8,198	473,810	106,048	34,813	1,284,041	3,555,992
	2014	188	55,878	410	78,249	7,875	568,285	119,936	107,342	1,424,323	6,041,126

Conversion factor <sup>a)</sup>	0.00000	0.02932	0.08142	0.18943	0.06312	0.04738	0.01212	0.29316	0.15835	0.15054	
TONNES CO <sub>2</sub> e	2010	0.0000	10.108	0.000	9.367	2.721	21.730	4.103	8.663	194.457	515.594
	2012	0.0000	0.265	0.000	6.170	0.517	22.449	1.285	10.206	203.328	241.949
	2014	0.0000	1.638	0.033	14.823	0.497	26.925	1.454	31.468	225.542	553.783

TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (VACATION TRAVEL)		Students	per student	% domiciled		
2010 (i)	766.743	912	0.84	UK	EU	OS
2012	486.169	853	0.57	66	22	12
2014	856.163	936	0.91	66	20	14

TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (ALL STUDENT TRAVEL)		Students	per student
2010	874.253	912	0.96
2012	607.436	853	0.71
2014	990.812	936	1.06

SOURCES:

a) <http://www.ukconversionfactorscarbonsmart.co.uk/> Carbon factors full spreadsheet 2014 v 1.2

NOTES:

- i) 2010 and 2012 data has been recalculated using the latest conversion factors
- ii) Methodology for calculating data changed for 2012 since sufficient responses were received

STAFF COMMUTER TRAVEL SURVEY NOVEMBER 2015

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	1,723,328
	2013	47,150	46,103	0	32,195	17,929	185,726	0	1,402,503	2,258	1,733,864
	2015	57,880	138,703	0	181,524	128,199	331,267	27,922	3,593,550	26,146	4,485,191
Part-time/fractional staff	2011	6,815	5,096	0	22,248	1,875	26,792	1,341	426,597	1,164	491,928
	2013	2,809	3,144	0	1,676	991	16,740	0	244,036	136	269,532
	2015	4,233	3,799	0	0	0	16,695	0	263,417	655	288,799
Hourly-paid staff	2011	12,439	1,043	0	0	0	20,730	4,167	261,030	615	300,024
	2013	58,453	3,268	52,140	44,527	2,996	120,446	0	576,245	154	861,487
	2015	48,541	8,794	0	195,267	8,058	356,947	0	8,184,179	735	8,804,901
Total	2011	33,783	43,395	0	57,372	30,783	229,850	26,183	2,087,011	6,902	2,515,279
	2013	108,412	52,515	52,140	78,398	21,916	322,912	0	2,222,784	2,548	2,864,883
	2015	110,654	151,296	0	376,791	136,257	704,909	27,922	12,041,146	27,536	13,578,891

Conversion factor <sup>a)</sup>	0.00000	0.07917	0.02930	0.18635	0.11966	0.05631	0.05461	0.04506	0.00000	0.297950	
TONNES CO <sub>2</sub> e	2011	0.0000	3.436	0.000	10.691	3.683	12.943	1.430	94.034	0.000	0.000
	2013	0.0000	4.158	1.528	14.609	2.622	18.183	0.000	100.152	0.000	0.971
	2015	0.0000	11.978	0.000	70.215	16.305	39.693	1.525	542.538	0.000	0.709

TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (STAFF COMMUTER TRAVEL)	
2010-11	126.218
2012-13	142.223
2014-15	682.963

STAFF AND STUDENT BUSINESS TRAVEL 2014 - 15

TOTAL DISTANCES TRAVELLED (KILOMETRES)											
	Ferry	National Coach	Car	Taxi	Train (u/ground)	Train (o/ground)	Train (internat'l)	Plane (domestic)	Plane (shorhaul)	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	0	2,832	4,476	49,300	13,818	0	643,079	313,854	1,029,013
2015	0	1,826	0	3,811	693	27,670	16,503	7,353	167,199	302,051	527,106
Conversion factor <sup>a)</sup>	0.11608	0.0293	0.18635	0.174807	0.05631	0.045057	0.01205	0.29795	0.16634	0.15175	
TONNES CO <sub>2</sub> e	2011	0.060246	0.004603	0.726765	0.11432378	0.00585624	1.57519272	0.08571165	0.5467383	10.328051	85.568487
	2013	0	0.048466	0	0.49513467	0.25205648	2.2213101	0.1665069	0	106.96982	47.627345
	2015	0	0.053538	0	0.66618948	0.03902283	1.24672719	0.19886115	2.1908264	27.811882	45.836239

TOTAL TONNES CO <sub>2</sub> e ALL MODES OF TRANSPORT (STAFF AND STUDENT BUSINESS TRAVEL)	
2010-11	99.016
2012-13	157.781
2014-15	78.043

TOTAL TONNES CO <sub>2</sub> e FROM ALL FORMS OF TRANSPORT	
2010-11	1099.487
2012-13	907.440
2014-15	1751.819

SOURCES:

a) <http://www.ukconversionfactorscarbonsmart.co.uk>

NOTES:

- i) 2011 and 2013 data has been recalculated using the latest conversion factors
- ii) Methodology for calculating data for part-time/fractional staff changed for 2015 since sufficient responses were received
- iii) These figures have not been adjusted for the whole hourly-paid staff community to avoid distortion of figures





## Waste and Recycling

		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	
NON-RESIDENTIAL	<b>WASTE RECYCLED (Tonnes)</b>	135.20	140.40	120.24	110.49	134.88	229.07	203.18	203.18	203.18	203.18	
	Conversion Factor	257	257	21	21	21	21	21	21	21.3842	21.354	
	Tonnes C02e	34.746	36.083	2.525	2.320	2.832	4.811	4.267	4.267	4.345	4.339	
			Landfill			Energy Recovery						
	<b>WASTE SENT TO: (Tonnes)</b>	175.76	228.56	146.41	127.23	133.20	269.41	173.57	173.57	208.07	208.07	
	Conversion Factor	290	290	290	21	21	21	21	21	21.3842	21.354	
	Tonnes C02e	50.970	66.282	42.459	2.672	2.797	5.658	3.645	3.645	4.449	4.443	
	<b>Total Tonnes</b>	<b>310.96</b>	<b>368.96</b>	<b>266.65</b>	237.720	268.080	498.484	376.754	376.754	411.250	411.250	
	<b>Total Tonnes C02e</b>	<b>85.717</b>	<b>102.365</b>	<b>44.984</b>	4.992	5.630	10.468	7.912	7.912	8.794	8.782	
	RESIDENTIAL	<b>WASTE RECYCLED (Tonnes)</b>	202.80	70.20	106.92	135.84	68.62	29.60	45.96	39.23	47.65	47.80
Conversion Factor		257	257	21	21	21	21	21	21	21.3842	21.354	
Tonnes C02e		52.120	18.041	2.245	2.853	1.441	0.622	0.965	0.824	1.019	1.021	
<b>WASTE COMPOSTED (Tonnes)</b>								2.177	2.177	2.177	2.177	
Conversion Factor								6.000	6.000	10.256	10.204	
Tonnes C02e								0.013	0.013	0.022	0.022	
			Landfill			Energy Recovery						
<b>WASTE SENT TO: (Tonnes)</b>		175.76	228.56	231.66	141.07	116.55	127.78	108.89	104.63	40.24	43.00	
Conversion Factor		290	290	290	21	21	21	21	21	21.3842	21.354	
Tonnes C02e		50.970	66.282	67.181	2.962	2.448	2.683	2.287	2.197	0.861	0.918	
<b>Total Tonnes</b>	<b>378.56</b>	<b>298.76</b>	<b>338.58</b>	276.910	185.170	157.376	157.024	146.033	90.067	92.977		
<b>Total Tonnes C02e</b>	<b>103.090</b>	<b>84.324</b>	<b>69.427</b>	5.815	3.889	3.305	3.265	3.034	1.902	1.961		
Total Tonnes Waste All Sources												
Recycled / Composting		338.00	210.60	227.16	246.33	203.50	258.67	251.32	244.59	253.01	253.16	
Landfill/Energy Recovery		351.52	457.12	378.07	268.30	249.75	397.19	282.46	278.20	248.31	251.07	
<b>GRAND TOTAL TONNES</b>		<b>689.52</b>	<b>667.72</b>	<b>605.23</b>	<b>514.63</b>	<b>453.25</b>	<b>655.86</b>	<b>533.78</b>	<b>522.79</b>	<b>501.32</b>	<b>504.23</b>	
Tonnes recycled as % of total Waste		49.02%	31.54%	37.53%	47.87%	44.90%	39.44%	47.08%	46.78%	50.47%	50.21%	
<b>TOTAL TONNES C02E ALL WASTE</b>												
RECYCLED / Composting		103.090	84.324	44.704	5.524	4.238	6.279	4.623	4.482	5.491	5.486	
LANDFILL/ENERGY RECOVERY		101.941	132.565	109.640	5.634	5.245	8.341	5.932	5.842	5.310	5.361	
<b>GRAND TOTAL C02e</b>		<b>205.031</b>	<b>216.889</b>	<b>154.345</b>	<b>11.159</b>	<b>9.483</b>	<b>14.620</b>	<b>10.555</b>	<b>10.324</b>	<b>10.800</b>	<b>10.847</b>	
Tonnes recycled as % of total C02e		50.28%	38.88%	28.96%	49.51%	44.69%	42.95%	43.80%	43.41%	50.84%	50.57%	

## Assessment against baseline and targets – scope 3

### Transport

75. The data in the previous section show that the Guildhall School's total indirect greenhouse gas emissions (scope 3) in academic year 2014 arising from student transport activity amounted to 990.812 tonnes. When adding staff commuter travel and staff and student business travel from the 2014 survey, a grand total of **1751.819 tonnes** is reached for total emissions arising from travel. This is an increase on previous years.
76. 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.
77. 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.
78. Consequently it is not considered feasible to expect a large reduction in greenhouse gas emissions from travel to be achievable.
79. 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.
80. 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.
81. 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

82. The data in the previous section show that the Guildhall School's total indirect greenhouse gas emissions (scope 3) in academic year 2017/18 arising from water, waste water and waste amounted to 38.833 Tonnes. With 10.847 tonnes from waste and 27.986 from water and waste water. This reduction is 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.
83. 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.

84. Consequently it is not considered feasible to expect a large reduction in greenhouse gas emissions from water consumption to be achievable. The School has invested in water meters for the Guildhall School and from 2013 is collating water consumption data for Milton Court which has to date been estimated although we are now collecting meter readings from 2008.
85. 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 was 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 been exceeded and in light of more and increasingly accurate data that is currently being collected we have revised the targets to:
- Water 15% reduction by 2019/20 against a 2013/14 baseline with emissions not exceeding 24.843 Tonnes
  - Waste 90% reduction by 2019/20 against a 2010/11 baseline meaning emissions should not exceed 15.434 Tonnes



## Implementation plan – scopes 1 and 2

86. 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'.

87. 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.	SOG 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	SOG	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
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

Initiative	Detail	Est. Cost £	Timescale/progress
Installation of 'power perfecter' unit	This is a voltage reduction and stabilisation unit that sits in-between the main incoming electrical supply 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.	60,000	Completed
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.		Completed.  Further refinement of the settings is ongoing with BEMS survey undertaken in 2018
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	Completed
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		Completed autumn term 2010

<b>Initiative</b>	<b>Detail</b>	<b>Est. Cost £</b>	<b>Timescale/ progress</b>
	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.		
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

<b>Initiative</b>	<b>Detail</b>	<b>Est. Cost £</b>	<b>Timescale/ progress</b>
Investigate increased use of secondary glazing	This is problematic due to the estate's grade 2 listing, but may be possible in some areas. Project requires detailed evaluation.	800,000	Being evaluated
CAFM system	Introduction of Computer Aided Facilities Management (CAFM) system to ensure planned preventative maintenance programmes are in place.		Complete
Variable speed drive pumps	To reduce the pressure on the pumps and valves as the water flows around the systems. With the use of the Building Energy Management System (BEMS) to control them, the electricity used to drive the pumps is reduced	40,000	Complete

## **Space management**

88. 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.
89. 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. The School is to review and provide an update on space measures that have been taken to support the reduction in its energy usage.

### Implementation plan – scope 3

90. 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.

<b>Initiative</b>	<b>Detail</b>	<b>Action by</b>	<b>Timescale/ progress</b>
Rainwater diverting	Diverted (grey) water can be re-used for plant watering and WCs	Engineering department	Grey water is being used for plant watering
Roll out of percussion taps	Percussion taps switch off automatically, thus saving water	Engineering department	Completed
Installation of water saving shower units	Sundial Court Student accommodation	Engineering department	Completed
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	Completed
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	Consider the 'green credentials' of	All	Being

<b>Initiative</b>	<b>Detail</b>	<b>Action by</b>	<b>Timescale/ progress</b>
policy	suppliers, e.g. accredited to ISO 14001, before awarding contracts and placing orders	departments – monitored by SSG	evaluated



## **Governance and progress monitoring**

### **Governors**

91. 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**

92. 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.

93. 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.

94. 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.

Jonathan Poyner (The Director of Operations and Buildings)- Chairman  
Student Representatives (up to four)

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