

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 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/m2 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 factor.

Introduction and background

The Guildhall School

- 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 m² 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 m², 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.
- 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 contribution¹. Lord Stern's review of climate change² 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 2008³ 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 2020⁴, against a 1990 baseline. Major parts of

¹ 'Climate change 2007: the physical science basis', available at <u>www.ipcc.ch</u> under Publications and Data/Reports.

² 'Stern Review on the Economics of Climate Change', available at <u>www.hm-treasury.gov.uk</u> under Independent reviews.

³ Further information is available at <u>www.decc.gov.uk</u> under Legislation/Climate Change Act 2008.

⁴ 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 NHS⁵ and schools⁶ have developed carbon reduction strategies. In summer 2009 the Government published the UK Low Carbon Transition Plan⁷, 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_2 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 particip_ant 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.

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

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

⁷ The plan is available at <u>www.decc.gov.uk</u> under Publications.

Display Energy Certificates

22. Un_iversities 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.

Scope	Description	Examples
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 sectorlevel 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 transport⁸ and water and waste⁹.

⁸ http://www.hefce.ac.uk/pubs/hefce/2012/12 02/

⁹ 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 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				
REDUCE energy/fuel demand	Avoid unnecessary use	•	•	ОМ
chergy/luci demand	Passive features (for example insulation, daylight, solar gain/shading, thermal mass)	Evaluate impacts	Apply control measures	NITOR Learn from existing projects and practice
	Encourage energy-conscious behaviours	e imp	ontroi	om e
EFFICIENCY	Use energy-efficient equipment	acts	mea	xistin
of equipment and energy/fuel sources	Provide simple and effective controls		sures	g proj
	Recover useful heat			ects a
	Use clean fossil fuel technology			and p
DECARBONISE energy/fuel supplies	On-site or near-site renewable energy sources, including community schemes	-		ractice
BEFRIEND	Seek partnerships to increase capacity to do the above			
NEUTRALISE energy/fuel supplies	Consider responsible carbon offsetting schemes			
	Procure green electricity supplies	1		

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 CO₂ 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 CO₂ 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 CO₂e using the Guidelines to DEFRA / DECC's GHG conversion factors for company reporting¹⁰. 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

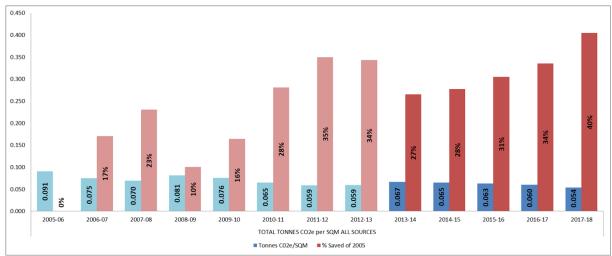
¹⁰ http://www.defra.gov.uk/publications/files/pb13773-ghg-conversion-factors-2012.pdf

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

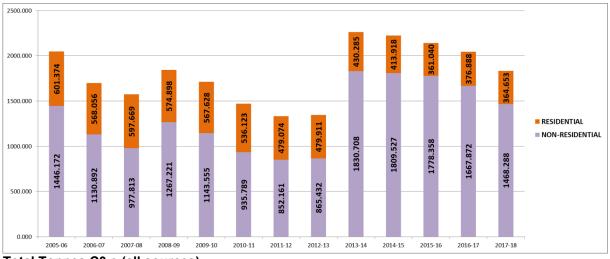
TOTAL GREENHOUSE GAS EMISSIONS – SCOPES 1 AND 2

				-	1 & 2 Emmi						
					ON-RESIDENTIAL	-					
	Month/Year	2005-06	ELECTRICITY 2015/16	(kWh) 2016/17	2017/18		Month/Year	C 2005-06	HP Heating (Citige 2015/16	n) (kWh) 2016/17	2017/18
	Aug	105,136	101,110	97,856	100,285		Aug	45,180	52,680	27,560	29,230
	Sep Oct	126,128 139,845	112,229 122,566	107,247 120,249	104,987 129,319	- F	Sep Oct	32,370 50,120	51,740 58,500	24,040 29,880	34,180 32,270
at a	Nov	165,191	125,900	134,062	142,709	SILK STREET	Nov	101,660	61,550	39,940	33,370
Silk Street	Dec Jan	169,401 212,463	105,580 135,113	106,410 135,695	126,571 138,259	E E E E E E E E E E E E E E E E E E E	Dec Jan	118,570 108,330	65,134 160,560	40,440 42,960	70,960 66,630
St	Feb	181,345	133,268	124,762	139,560	E	Feb	121,760	70,180	66,750	79,970
¥	Mar	188,735	137,130	125,615	148,220	S	Mar	121,600	77,970	49,150	79,660
Sil	Apr May	125,043 136,543	124,754 127,289	101,085 123,415	107,794 119,207	<u> </u>	Apr May	71,020 60,840	71,250 52,991	47,720 43,410	50,890 43,490
	Jun	135,015	114,027	118,409	117,014	S	Jun	39,400	36,694	31,010	36,770
	Jul Total	118,836 1,803,681	104,261 1,443,227	118,294 1,413,099	131,735 1,505,660		Jul Total	33,370 904,220	29,883 789,132	26,800 469,660	31,030 588,450
~	Aug Sep		8,822 9,348	12,664 13,117	2,289 7,678		Aug Sep		79,258 97,742	41,600 37,600	2,700 3,000
R.	Oct	44,280	12,178	15,723	10,162	Ľ. K	Oct		77,813	99,500	17,000
JOHN HOSIER ANNEX	Nov Dec		12,572 11,700	16,740 9,920	10,365 5,351		Nov Dec		87,188 84,000	171,200 165,500	96,000 145,100
HN HOS	Jan	37,720	15,411	13,320	157	ŏ	Jan		137,211	44,100	164,000
Ξź	Feb Mar	24,190	14,863 16,646	12,724 12,632	9,959 27,481	Z	Feb Mar		156,698 171,909	249,800 124,100	166,000 166,500
ĘĘ	Apr		15,506	9,859	18,107	<u> </u>	Apr		138,750	106,500	100,300
ō	May Jun	56,430	15,613 13,645	13,552 11,923	11,118 9,505		May Jun		88,250 34,825	73,900 35,200	62,200 45,200
7	Jul		12,182	6,961	8,301	Ξ	Jul		17,634 1,171,278	17,500 1,166,500	43,200 15,000 992,100
	Total	162,620	158,486	149,135	120,473		Total		1,171,278	1,166,500	992,100
	Aug		124,148	127,249	133,622	(5	Aug	45,180	131,938	69,160	31,930
T ST	Sep		131,181	125,480	138,165	IN S	Sep	32,370	149,482	61,640	37,180
MILTON COURT	Oct Nov		140,290 131,179	145,491 142,583	150,452 146,193	TOTAL CHP HEATING NON-RESIDENTIAL	Oct Nov	50,120 101,660	136,313 148,738	129,380 211,140	49,270 129,370
ō	Dec		118,376	138,866	128,994	ĒN	Dec	118,570	149,134	205,940	216,060
0	Jan Feb		128,700 131,338	135,104 130,914	148,492 135,712	1 2	Jan Feb	108,330 121,760	297,771 226,878	87,060 316,550	230,630 245,970
Z	Mar		138,912	149,396	144,212	E S	Mar	121,600	249,879	173,250	246,160
Ĕ	Apr May		128,980 133,734	133,193 149,503	132,704 151,359		Apr May	71,020 60,840	210,000 141,241	154,220 117,310	160,290 105,690
=	Jun		131,772	148,955	160,508	₹ õ	Jun	39,400	71,519	66,210	81,970
Σ	Jul Total		120,716 1,559,326	146,641 1,673,375	150,510 1,720,923	ρz	Jul Total	33,370 904,220	47,517 1,960,410	44,300 1,636,160	46,030 1,580,550
	TOTAL		1,559,526	1,673,375	1,720,923		TOLAI	904,220	1,960,410	1,030,100	1,560,550
	Aug	349,262 6,544				Conv	ersion Factor	0.185 167.281	0.18400 360.715	0.18416 301.315	0.18396 290.758
t o	Sep Oct	5,730				-	ONNES CO2e	167.281	360.715	301.315	290.758
N COURI FICES & SPACES	Nov							Cł	HILLED CHP (Citige	en) (kWh)	
Ö Ü Ö	Dec Jan	19,554									
012 % d	Feb	28,259				SILK	10			317,980	355,667
FON COU OFFICES & EH SPACE	Mar Apr	12,899				SILK	Annal Total				,
OF OF	May	15,221				S	`				
MILTON COURT OFFICES & REH SPACES	Jun Jul	8,186					Aug		83,000	121,900	82,200
2	Total	445,655					Sep		43,000	93,400	55,700
	Aug			521	1,158	4	Oct Nov		40,000 40,000	64,400 64,900	60,400 59,200
	Sep			510	1,013	MILTON COURT	Dec		29,364	71,500	44,900
R	Oct			405	1,042	U U	Jan		35,065	22,800	45,200
P	Nov Dec			537 516	929 1,046	z	Feb Mar		41,723 48,848	84,100 61,500	50,000 54,700
SI	Jan			612	956	5	Apr		48,750	51,700	71,500
S	Feb Mar			887 1,001	885 962		May Jun		56,250 73,842	75,500	102,200
P	Apr			980	909						
PROPS STORE	May Jun			973	966		Jul		84.528	96,100 98,400	130,000
					0.40		Total				
D	Jul			939 1,090	940 931		Total		84,528 624,370	98,400 906,200	130,000 873,900
۵.	Jul Total			939 1,090 8,971		L R	Total Aug Sep		84,528 624,370 83,000 43,000	98,400 906,200 148,398 119,898	130,000 873,900 111,839 85,339
	Total	454,398	234,080	1,090	931	DLING	Total Aug		84,528 624,370 83,000	98,400 906,200 148,398	130,000 873,900 111,839
	Total Aug Sep	132,672	252,758	1,090 8,971 238,290 246,354	931 11,737 237,354 251,843	COLING	Total Aug Sep Oct Nov Dec		84,528 624,370 83,000 43,000 40,000 40,000 29,364	98,400 906,200 148,398 119,898 90,898 91,398 97,998	130,000 873,900 111,839 85,339 90,039 88,839 74,539
	Total Aug Sep Oct	132,672 189,855	252,758 275,034	1,090 8,971 238,290 246,354 281,868	931 11,737 237,354 251,843 290,975	P COOLING	Total Aug Sep Oct Nov Dec Jan		84,528 624,370 83,000 43,000 40,000 29,364 35,065	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298	130,000 873,900 111,839 85,339 90,039 88,839 74,539 74,839
	Total Aug Sep	132,672 189,855 165,191 188,955	252,758 275,034 269,651 235,656	1,090 8,971 238,290 246,354 281,868 293,922 255,712	931 11.737 237,354 251,843 290,975 300,196 261,962	COOLING SIDENTIAL	Total Aug Sep Oct Nov Dec		84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998	130,000 873,900 111,839 85,339 90,039 88,839 74,539 74,539 74,839 79,639 84,339
	Total Aug Sep Oct Nov Dec Jan	132,672 189,855 165,191 188,955 250,183	252,758 275,034 269,651 235,656 279,224	1,090 8,971 238,290 246,354 281,868 293,922 255,712 284,731	931 11,737 237,354 251,843 290,975 300,196 261,962 287,864	L CHP COOLING RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr		84,528 624,370 43,000 40,000 29,364 35,065 41,723 48,848 48,750	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998 78,198	130,000 873,900 111,839 85,339 90,039 88,839 74,539 74,639 79,639 84,339 101,139
	Total Aug Sep Oct Nov Dec	132,672 189,855 165,191 188,955	252,758 275,034 269,651 235,656	1,090 8,971 238,290 246,354 281,868 293,922 255,712	931 11.737 237,354 251,843 290,975 300,196 261,962	TAL CHP COOLING ON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar		84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998	130,000 873,900 111,839 85,339 90,039 88,839 74,539 74,539 74,839 79,639 84,339
	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043	252,758 275,034 269,651 235,656 279,224 279,469 292,688 269,240	1,090 8,971 238,290 246,354 281,868 293,922 255,712 284,731 269,287 288,644 245,117	931 11,737 237,354 251,843 290,975 300,196 261,962 287,864 286,116 320,875 259,514	FOTAL CHP COOLING	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jul		84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848 48,750 56,250 73,842 84,528	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 101,998 122,599 124,898	130,000 873,900 111,839 90,039 88,839 74,539 74,539 74,839 79,639 101,139 131,839 147,539 147,539
	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043 208,194	252,758 275,034 269,651 235,656 279,224 279,469 292,688 269,240 276,636	1,090 8,971 246,354 246,354 283,922 255,712 269,731 269,287 288,644 245,117 287,443	931 11,737 237,354 251,843 200,975 300,196 261,962 287,864 286,116 320,875 259,514 286,114 320,875	TOTAL CHP COOLING NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun		84,528 624,370 83,000 40,00000000	98,400 906,200 148,398 90,898 91,398 97,998 97,998 49,298 110,598 87,998 78,198 101,998 101,998 122,598	130,000 873,900 111,839 85,339 90,039 88,839 74,539 74,839 74,839 79,639 84,339 101,139 101,139 131,839
	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022	262,768 275,034 269,651 235,656 279,224 279,469 292,688 269,240 276,636 259,444 237,159	1,090 8,971 238,290 246,354 281,868 293,922 265,712 269,287 269,287 288,644 245,117 287,443 280,226 272,986	931 11,737 237,354 251,843 290,975 300,196 261,962 287,864 286,116 320,875 259,514 286,514 282,550 287,987 281,477	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jul Total	0.185	84,528 624,370 83,000 40,000 40,000 29,384 41,723 48,780 56,250 73,842 84,528 624,370 0,18400	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998 78,198 101,998 122,598 122,598 122,598 12,258 1	130,000 873,900 111,839 85,339 90,039 88,839 74,538 74,538 74,539 75,539 75,55,539 75,53975,539 75,539 75,539 75,539 75,
	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015	252,758 275,034 269,651 235,656 279,224 279,469 282,688 269,240 276,636 259,444	1,090 8,971 238,290 246,364 281,868 293,922 255,712 284,731 288,644 245,117 288,644 245,117 287,443 280,226	931 11,737 237,354 251,843 280,975 300,196 267,864 268,116 320,875 259,514 286,514 282,550 287,967	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Total	0.185	84,528 624,370 83,000 43,000 40,000 40,000 29,364 35,065 41,723 48,848 48,750 56,250 73,842 84,528 624,370	98,400 906,200 148,398 119,888 90,898 91,338 97,998 49,228 110,598 87,998 78,198 101,998 122,598 122,598 1,224,180	130,000 873,900 85,339 90,039 88,839 74,539 74,539 74,839 79,639 101,139 131,839 101,139 131,839 147,539 159,639 1,229,567
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Jul	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956	252,758 275,034 269,651 233,666 279,224 279,469 292,688 269,240 276,636 259,444 237,159 3,161,039	1,090 8,971 238,200 246,354 281,868 283,922 255,712 284,731 288,644 245,117 287,443 269,287 272,366 3,224,580	931 11,737 237,354 251,943 280,975 287,984 287,984 288,116 320,875 289,514 288,560 287,957 299,514 282,660 287,957 291,477 3,356,793	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jul Total	0.185 0.000 167.281	84,528 624,370 83,000 40,000 40,000 29,384 41,723 48,780 56,250 73,842 84,528 624,370 0,18400	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998 78,198 101,998 122,598 122,598 122,598 12,258 1	130,000 873,900 111,839 85,339 90,039 88,839 74,538 74,538 74,539 75,539 75,55,539 75,53975,539 75,539 75,539 75,539 75,
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,865 185,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0.53023	252,758 275,034 269,651 235,655 279,224 279,469 202,688 269,240 276,635 259,444 237,159 3,161,039	1,090 8,971 246,354 281,868 293,922 255,712 284,731 269,287 288,644 245,117 287,443 280,246 272,966 3,244,580 0,35156	931 11,737 237,354 251,843 280,975 300,196 287,884 286,116 320,875 287,884 286,116 320,875 287,987 299,514 282,650 287,997 291,477 3,358,793 201,477 3,358,793	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Jun Total Total	0.000	84,528 624,370 83,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 41,723 662,500 73,842 84,528 624,370 0.18400 114,884 475,600	98,400 906,200 148,398 119,898 90,898 97,998 49,298 49,298 110,598 778,198 101,998 122,598 11,224,180 0,184,16 225,445	130,000 873,900 1111,839 85,339 90,039 88,839 74,839 74,839 74,839 79,639 101,139 131,839 147,539 131,839 147,539 132,8567 0,18396 226,191
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956	252,758 275,034 269,651 233,666 279,224 279,469 292,688 269,240 276,636 259,444 237,159 3,161,039	1,090 8,971 238,200 246,354 281,868 283,922 255,712 284,731 288,644 245,117 287,443 269,287 272,366 3,224,580	931 11,737 237,354 251,943 280,975 287,984 287,984 288,116 320,875 289,514 288,560 287,957 299,514 282,660 287,957 291,477 3,356,793	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Jun Total Total	0.000	84,528 624,370 43,000 40,000 29,364 40,000 29,364 41,723 48,848 48,750 56,250 73,842 84,528 6624,370 0.18400 114,884	98,400 906,200 148,388 119,888 90,898 91,398 97,998 49,298 1101,598 87,998 122,598 101,998 122,598 124,898 12,24,180	130,000 873,900 111,839 85,339 90,039 88,839 74,838 74,839 74,839 101,139 131,839 147,639 131,839 147,639 156,639 1229,567 0.18396 228,191 516,849
LOTAL ELECTRICITA TOTAL ELECTRICITAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,865 185,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0.53023	252,758 275,034 269,651 233,656 279,224 279,469 292,688 269,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506	1,090 8,971 246,354 281,868 293,922 255,712 284,731 269,287 288,644 245,117 287,443 280,226 272,966 3,244,580 0,35156	931 11,737 237,354 251,843 280,975 300,196 287,884 286,116 320,875 287,884 286,116 320,875 287,987 299,514 282,650 287,997 291,477 3,358,793 201,477 3,358,793	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total Feb Convert Co	0.000	84,528 624,370 83,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 41,723 662,500 73,842 84,528 624,370 0.18400 114,884 475,600	98,400 906,200 148,398 119,898 90,898 97,998 49,298 49,298 110,598 778,198 101,998 122,598 11,224,180 0,184,16 225,445	130,000 873,900 1111,839 85,339 90,039 88,839 74,839 74,839 74,839 79,639 101,139 131,839 147,539 131,839 147,539 132,8567 0,18396 226,191
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,865 185,191 188,955 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0.53023	252,758 275,034 269,651 233,656 279,224 279,469 292,688 269,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506	1,090 8,971 238,200 246,364 281,868 233,922 255,712 289,287 288,644 245,117 287,443 200,226 272,966 272,966 272,966 1,140,665	931 11,737 237,354 251,843 280,975 300,196 287,884 286,116 320,875 287,884 286,116 320,875 287,987 299,514 282,650 287,997 291,477 3,358,793 201,477 3,358,793	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total Feb Convert Co	0.000	84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848 48,750 56,250 73,842 84,528 84,528 84,528 84,528 0,18400 114,884 475,600 ravelled	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 124,898 124,898 124,898 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,5988 125,	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,539 74,539 74,539 74,539 74,639 74,639 74,639 74,639 74,639 101,139 101,139 101,139 101,139 102,639 1,229,657 1,539 1,229,657 1,557 1,229,657 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,259,557 1,
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176.000	252,758 275,034 269,651 235,656 279,224 279,469 229,240 279,469 2269,444 237,159 3,161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000	1.090 8.971 238.200 246.364 281.868 283.922 255.712 289.287 288.644 245.117 287.443 280.226 272.986 3.224,580 0.35156 1,140.665 1,140.665 RESIDENTIAL KWH	931 11,737 237,354 251,243 280,975 300,196 287,964 287,964 288,116 320,875 289,514 282,650 287,967 291,477 291,477 291,477 295,774 950,774	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total Feb Convert Co	0.000	84,528 624,370 83,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 40,000 41,723 662,500 73,842 84,528 624,370 0.18400 114,884 475,600	98,400 906,200 148,398 119,898 90,898 97,998 49,298 49,298 110,598 778,198 101,998 122,598 11,224,180 0,184,16 225,445	130,000 873,900 111,839 85,339 90,039 88,839 74,838 74,839 74,839 101,139 131,839 147,639 131,839 147,639 156,639 1229,567 0.18396 228,191 516,849
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132.672 189.855 165.191 188.965 250.183 209.604 225.824 125.043 208.194 135.015 127.022 2.411.956 0.53023 1.278.891 2005-06	252,758 275,034 269,651 235,666 279,224 279,469 292,688 269,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506 TOTAL NON- 2015/16	1.090 8.971 238,290 246,354 281,868 293,922 285,712 288,644 245,717 288,644 245,117 287,443 280,287 287,443 280,287 272,986 3,224,580 0.35156 1,140,665 RESIDENTIAL KWH	931 11,737 237,354 251,243 290,975 300,196 261,962 287,864 286,116 320,875 289,514 282,650 287,957 291,477 3,358,793 0,28307 950,774 2017/18	Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Jun Total Total	0.000	84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848 48,750 56,250 73,842 84,528 84,528 84,528 84,528 0,18400 114,884 475,600 ravelled	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 124,898 124,898 124,898 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,5988 125,	130,000 873,000 85,339 90,039 88,839 74,539 74,539 74,539 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 74,639 101,139 101,139 101,139 101,139 102,639 1,229,563 1,209,563 1,209,565 1,209,565 1,209,565 1,209,565 1,209,5
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176.000	252,758 275,034 269,651 235,656 279,224 279,469 289,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173%	1.090 8.971 238.290 246.354 281.868 293.922 255.712 284.731 269.287 288.644 245.117 287.443 280.287 287.443 287.443 280.226 277.966 3.224.580 0.35156 1.140.665 RESIDENTIAL KWH 2016/17 6.104.920.000 184%	931 11,737 237,354 251,243 280,975 300,196 287,964 287,964 288,116 320,875 289,514 282,650 287,967 291,477 291,477 291,477 295,774 950,774	Conv T Combin Combin L FLEET K EHICLE	Total Aug Sep Oct Nov Dec Jan Feb	0.000 167.281 Miles 1	84,528 624,370 83,000 43,000 40,000 29,384 35,065 41,723 48,848 48,750 56,250 56,250 73,842 84,528 624,370 0,18400 114.884 475,600 ravelled 966.00	98,400 906,200 148,398 119,898 90,898 91,398 97,998 49,298 110,598 87,998 77,198 101,998 122,598 104,898 122,598 124,898 12,24,489 1,224,480 0,18416 225,445 526,760 Litres Pt 172	130,000 873,800 88,339 90,039 88,339 90,039 88,839 74,539 74,539 74,539 74,539 74,539 147,539 114,7559 114,7559
LOTAL ELECTRICITA TOTAL ELECTRICITAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176.000	252,758 275,034 269,651 235,656 279,224 279,469 289,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173%	1.090 8.971 238.200 246.364 281.868 283.922 255.712 289.287 288.644 245.117 287.443 280.226 272.986 3.224,580 0.35156 1,140.665 1,140.665 RESIDENTIAL KWH	931 11,737 237,354 251,243 280,975 300,196 287,964 287,964 288,116 320,875 289,514 282,650 287,967 291,477 291,477 291,477 295,774 950,774	Conv T Combin L E H C Conv Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total Feb Convert Co	0.000	84,528 624,370 83,000 40,000 40,000 29,364 35,065 41,723 48,848 48,750 56,250 73,842 84,528 84,528 84,528 84,528 0,18400 114,884 475,600 ravelled	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 122,598 124,898 124,898 124,898 124,898 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,598 124,898 125,5988 125,	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,539 74,539 74,539 74,539 74,639 74,639 74,639 74,639 74,639 101,139 101,139 101,139 101,139 102,639 1,229,657 1,539 1,229,657 1,557 1,229,657 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,229,557 1,259,557 1,
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176,000 100%	252,758 275,034 269,651 233,656 279,224 279,469 229,240 279,469 2269,444 237,159 3,161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173%	1.090 8.971 238.200 246.364 241.868 233.922 255.712 249.287 288.644 245.117 288.644 245.117 287.443 280.226 272.986 3.2244.580 0.35156 1.140.665 RESIDENTIAL KWH 2016/17 6.104.920.000 184% Co.e NON-RESIDENTIAL	931 11,737 237,354 285,1243 280,975 300,196 287,884 286,116 320,875 289,514 282,650 287,687 291,477 2950,774 0,28307 950,774 2017/18 6,168,910,000 186%	Conv T Combin L E H C Conv Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total retail re	0.000 167.281 Miles T	84,528 624,370 83,000 43,000 40,000 29,364 35,065 41,723 48,4750 56,250 73,842 84,528 624,370 0.18400 114,884 475,600 ravelled 966.00 0.26116	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,489 124,489 124,499 124,499 124,49914,499 124,499 124,499 124,499 124,499 124,49	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,639 101,139 131,839 147,539 1,229,657 0,138,639 1,229,657 0,1839 76,639 228,191 516,949 rchased 215 2,62694
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176,000 100%	252,758 275,034 269,651 233,655 279,224 279,469 292,688 269,240 276,638 259,444 237,159 3,1161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173% TOTAL TONNES 4 1,778,358 123%	1.090 8.971 238.290 246.364 281.868 293.922 255.712 284.644 245.717 287.443 280.644 245.117 287.443 280.226 272.986 3.244.580 0.35156 1.140.665 1.140.665 1.140.665 2016/17 6.104.920.000 184% 205.000 184%	931 11,737 237,354 251,943 280,975 300,196 261,962 287,884 286,116 320,875 259,514 282,650 287,967 291,477 292,477 293 292,477 293 293 293 293 293 293 293 293	Conv T Combin L E H C Conv Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total retail re	0.000 167.281 Miles T	84,528 624,370 83,000 43,000 40,000 29,364 35,065 41,723 48,4750 56,250 73,842 84,528 624,370 0.18400 114,884 475,600 ravelled 966.00 0.26116	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,489 124,489 124,499 124,499 124,49914,499 124,499 124,499 124,499 124,499 124,49	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,639 84,339 101,139 131,839 147,539 1,229,657 0,18396 228,191 516,649 215 2,62694
TOTAL ELECTRICITA NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132,672 189,855 165,191 188,965 250,183 209,604 225,824 125,043 208,194 135,015 127,022 2,411,956 0,53023 1,278,891 2005-06 3,316,176,000 100%	252,758 275,034 269,651 233,655 279,224 279,469 292,688 269,240 276,638 259,444 237,159 3,1161,039 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173% TOTAL TONNES 4 1,778,358 123%	1.090 8.971 238.290 246.354 281.868 293.922 255.712 284.731 289.247 285.644 245.117 287.443 280.244 245.117 287.443 280.226 272.986 3.244.580 0.35156 1.140.655 1.140.655 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580 0.35156 1.140.655 2.144,580	931 11,737 237,354 251,943 280,975 300,196 261,962 287,884 286,116 320,875 259,514 282,650 287,967 291,477 292,477 293 292,477 293 293 293 293 293 293 293 293	Conv T Combin L E H C Conv Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total retail re	0.000 167.281 Miles T	84,528 624,370 83,000 43,000 40,000 29,364 35,065 41,723 48,4750 56,250 73,842 84,528 624,370 0.18400 114,884 475,600 ravelled 966.00 0.26116	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,489 124,489 124,499 124,499 124,49914,499 124,499 124,499 124,499 124,499 124,49	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,639 101,139 131,839 147,539 1,229,657 0,138,639 1,229,657 0,1839 76,639 228,191 516,949 rchased 215 2,62694
TOTAL ELECTRICITY NON-RESIDENTIAL	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	132.672 189.855 165.191 186,955 250,183 209.604 225.824 125.043 208.194 135.015 127.022 2.411,956 0.53023 1.278.891 2005-06 3,316,176.000 100%	252,758 275,034 269,651 235,656 279,224 279,469 229,240 279,469 229,240 276,636 259,444 237,159 3,161,039 0,41205 1,302,506 0,41205 1,302,506 TOTAL NON- 2015/16 5,745,819,000 173% TOTAL TONNES (1,778,389 123%	1.090 8.971 238.200 246.354 231.868 233.922 255.712 269.287 288.287 288.287 288.644 245.117 287.296 272.966 272.966 272.966 3.3244,580 0.35166 1.140.665 RESIDENTIAL KWH 2016/47 6.104,920.000 184% Per SQM NON-RESIDENTIAL 1,667.872 113%	931 11,737 237,354 251,843 280,975 300,196 287,884 286,116 320,875 287,884 286,216 320,875 287,987 281,477 291,477 201,477 201,477 201,774 0,28307 950,774 201,774	Conv T Combin L E H C Conv Conv	Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total retail re	0.000 167.281 Miles T	84,528 624,370 83,000 43,000 40,000 29,364 35,065 41,723 48,4750 56,250 73,842 84,528 624,370 0.18400 114,884 475,600 ravelled 966.00 0.26116	98,400 906,200 148,398 90,898 91,398 97,998 49,298 110,599 87,998 78,198 101,998 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,898 122,588 124,489 124,489 124,499 124,499 124,49914,499 124,499 124,499 124,499 124,499 124,49	130,000 873,900 111,830 85,339 90,039 88,839 74,539 74,539 74,639 101,139 131,839 147,539 1,229,657 0,138,639 1,229,657 0,1839 76,639 228,191 516,949 rchased 215 2,62694

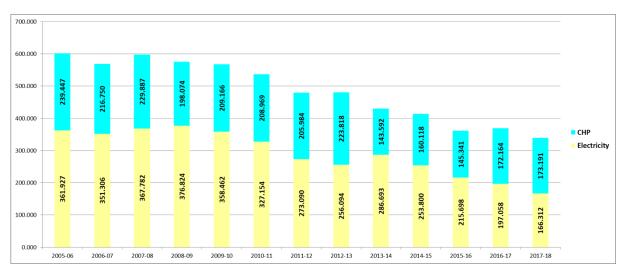
					RESIDENTIAL					
			CHP HEATING (Citi						DENTIAL KWH	
	Month/Year	2005-06	2015/16	2016/17	2017/18		1,976,894.000	1,313,374.000	1,537,010.000	1,665,704.000
	Aug Sep	45,550 51,050	36,290 29,100	27,320 21,690	23,190 22,370		100%	66%	78%	84%
	Oct	82,920	67,420	68,630	43,470			TOTAL TONNES (O ₂ e RESIDENTIAL	
SUNDIAL COURT RESIDENTIAL	Nov	125.200	74.250	110.530	118.500		601.374	361.040	376.888	364.653
UNDIAL COUR RESIDENTIAL	Dec	133,800	45,500	105,500	125,410		100%	60%	63%	61%
S F	Jan	164,910	168,230	155,460	124,490					
E AL	Feb	149,810	118,640	125,130	152,730				per SQM RESIDEN	
<u> </u>	Mar	206,000	23,770	112,010	135,630	SQM	8700	8700	8700	8700
52	Apr May	138,630 99,390	90,938 60.511	79,740 66.240	76,280 54,750	Tonnes C02e/SQM % of 2005	0.069	0.041 60%	0.043 63%	0.042
S	Jun	53.800	42.681	36.540	34,730	/8 01 2005	100 %	00%	0378	0176
	Jul	43,250	32,568	26,070	26,040					
	Total	1,294,310	789,898	934,860	941,460					
Conversion Fa	ctor	0.185	0.18400	0.18416	0.18396					
TONNES CO	e	239.447	145.341	172.164	173.191			TOTAL KWH A	ALL SOURCES	
						Total KWH	5,293,070.000	7,059,193.000	7,641,930.000	7,834,614.00
						% used of 2005	100%	133%	144%	148%
			ELECTRICITY	(kWh)		% Saved	100 /6	-33%	-44%	-48%
	Month/Year	2005-06	2015/16	2016/17	2017/18					
	Aug	39,232	48,672	48,538	49,271					
₹	Sep	52,873	43,993	47,912	50,216				1 & 2 CO2e ALL	
z	Oct	61,068	46,607	49,517	54,596	Tonnes of C02e	2,047.546	2,139.397	2,044.760	1,832.941
ä	Nov	61,509	46,366	45,267	51,964	% used of 2005	100%	104%	100%	90%
ISI	Dec	48,504	38,840	37,599	39,445	% Saved	10070	-4%	0%	10%
꾿	Jan	61,105	45,537	47,675	49,411					
RT	Feb	60,289	42,127	44,647	48,295					
SUNDIAL COURT RESIDENTIAL	Mar	64,508	42,273	51,665	48,703				per SQM ALL S	
õ	Apr	53,745	38,035	44,330	76,270	SQM	22,614	33,999	33,999	33,999
AL AL	May	62,251	43,901	48,404	54,710	Tonnes C02e/SQM	0.091	0.063	0.060	0.054
ē	Jun	59,889	42,833	46,382	38,580	% used of 2005	100%	69%	66%	60%
5	Jul	57,611	44,292	48,589	26,070	% Saved	10070	31%	34%	40%
	Total	682,584	523,476	560,525	587,531					
Conversion Fa	ctor	0.53023	0.41205	0.35156	0.28307					
TONNES CO	e	361.927	215.698	197.058	166.312		TOTAL TON	INES CO ₂ e per	STUDENT ALL	SOURCES
						No. of Students	755	876	953	1002
			GAS (kWI	1)		Tonnes C02e/Stu	2.712	2.442	2.146	1.829
	Month/Year	2005-06	2015/16	2016/17	2017/18	% used of 2005	100%	90%	79%	67%
Ļ	Aug			10,535	13,087	% Saved	100 /6	10%	21%	33%
₹	Sep			1,969	12,666					
E.	Oct			3,244	34,985		COMPARISO	N KWH NON-R	ESIDENTIAL / F	RESIDENTIA
ä	Nov			3,714	7,823	Non-residential kWh	3,316,176.000	5,745,819.000	6,104,920.000	6,168,910.00
SUNDIAL COURT RESIDENTIAL	Dec			2,510	8,011	Residential kWh	1,976,894.000	1,313,374.000	1,537,010.000	1,665,704.00
R	Jan			2,571	8,346	Total kWh		7,059,193.000	7,641,930.000	
RT I	Feb			1,332	7,763	%age kWh non -				· · ·
2	Mar			3,006	8,832	residential	62.65%	81.39%	79.89%	78.74%
ö	Apr			2,695	9,483	%age kWh				
٦	May			4,169	8.002	residential	37.35%	18.61%	20.11%	21.26%
ā	Jun			1,865	7,397	roonaonnaa				
3	Jul			4,015	10,318		COMPARIS	ON TONNES O	O2e NON-RES	IDENTIAL /
S	Total	0	0	41,625	136,713			RESID	ENTIAL	
Conversion Fa	ctor	0.18500	0.18400	0.18416	0.18396	Non-residential	1,446.172	1,778.358	1,667.872	1,468.288
TONNES CO	e			7.666	25.150	Tonnes CO2e	1,440.172	1,110.330	1,007.072	1,400.200
						Residential Tonnes	604 374	361.040	276 000	264.652
						CO2e	601.374	361.040	376.888	364.653
						Total tonnes CO2e	2,047.546	2,139.397	2,044.760	1,832.941
						% age Tonnes CO2e				
						Non-residential % age tonnes CO2e	70.63%	83.12%	81.57%	80.11%
						%age tonnes CO2e		10.000/	10.100/	
						Residential	29.37%	16.88%	18.43%	19.89%



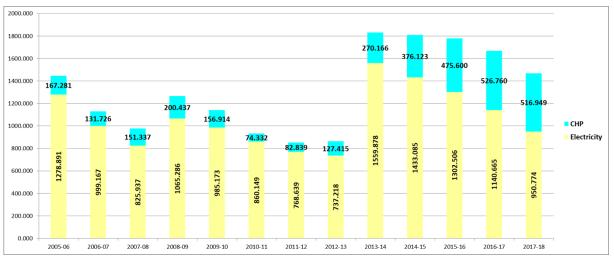








Residential C0₂e: CHP/Electricity split



Non-Residential C02e: 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 166.478 Tonnes, which represents a reduction of 43% Tonnes again exceeding the second interim milestone target of 38%. In 2017/18 the School achieved a further reduction to 1,002.530 Tonnes ecceding the third interim milestone target of 43% having achieved a reducion 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 11,385m² 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 ₂ e	504.759	127.795	632.554

- 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 m² 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.

	Targets i	n previous ve	ersion of car	bon reductio	on strategy
	2005 - 06	2010 - 11	2011 - 12	2015 - 16	2019 - 20
Total tonnes CO ₂ e for estate (excl Milton Court)	2,047.545	1,459.042	1,401.352	1,269.478	1,167.101
Total tonnes CO ₂ e for Milton Court				632.554	632.554
Total tonnes CO ₂ e for enlarged					
estate	2,047.545	1,459.042	1,401.352	1,902.032	1,799.655
Approx. total area of estate (m ²)	22,614	22,614	22,614	33,999	33,999
Tonnes CO ₂ e per m ² of estate	0.091	0.065	0.062	0.056	0.053

			Revi	sed targets	this review
	2005 - 06	2010 - 11	2011 - 12	2015 - 16	2019 - 20
Total tonnes CO ₂ e for estate (excl Milton Court)	2,047.545	1,459.042	1,401.352	1,269.478	921,395
Total tonnes CO ₂ e for Milton Court				632.554	761.909
Total tonnes CO ₂ e for enlarged					
estate	2,047.545	1,459.042	1,401.352	1,902.032	1,683,304
Approx. total area of estate (m ²)	22,614	22,614	22,614	33,999	33,999
Tonnes CO ₂ e per m ² of estate	0.091	0.065	0.062	0.056	0.050

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/m2 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 CO2e, 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 CO₂e using the Guidelines to DEFRA / DECC's GHG conversion factors for company reporting¹¹. 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.

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

	JRVEY OC		14											-			
				TOTAL				0		1				_		_	
				TOTAL	ISTANCES	TRAVELLED	KILOMETRE	5)			1			-			
			London			Train		Train									
	2010	Bicycle 304,699	Bus 190,548	Car	Motorbike 0	(u/ground) 831,341	Train (DLR)	(o/ground) 834,138	Walk 171,302	Total 2,332,027				_			
erm-time commuting	2010	304,699	190,548	111,458	0	529,036	86,733	1,011,169	171,302	2,332,027				-			
	2012	247,644	137,258	0	143,059		63,766	1,174,476	181,361	2,688,877				-			
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Conversion factor ^{a)}		0.00000	0.08142	0.18943	0.11955	0.06312	0.06168	0.04738	0.00000								
	2010	0.000	15.514	0.000	0.000	52.474	0.000	39.521	0.000								
TONNES C02e	2012	0.000	13.502	21.113	0.000	33.393	5.350	47.909	0.000								
	2014	0.000	11.176	0.000	17.103	46.792	3.933	55.647	0.000					-			
		ΤΟΤΔΙ Τ	ONNES CO.		DES OF TR	ANSPORT (TI	FRM-TIME CO	MMUTING	Students	perstudent				-			
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					TOTAL D	ISTANCES T	RAVELLED (I		5)					-		-	
			National			Train	Train	Train	Plane	Plane	Plane						
		Bicycle	Coach	Bus	Car				(domestic)		(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	5,923,323					
Vacation travel	2012 2014	275 188	9,030 55,878	0 410	32,571 78,249	8,198 7,875	473,810 568,285	106,048 119,936	34,813 107,342	1,284,041 1,424,323	1,607,205 3,678,640	3,555,992 6,041,126		-		-	
	2014	100	55,676	410	10,249	7,075	500,205	13,330	107,342	1,724,323	5,570,040	0,041,120	-	-			
Conversion factor a)		0.00000	0.02932	0.08142	0.18943	0.06312	0.04738	0.01212	0.29316	0.15835	0.15054						
	2010	0.000	10.108	0.000	9.367	2.721	21.730	4.103	8.663	194.457	515.594						
TONNES C02e	2012	0.000	0.265	0.000	6.170	0.517	22.449	1.285	10.206	203.328	241.949						
	2014	0.000	1.638	0.033	14.823	0.497	26.925	1.454	31.468	225.542	553.783						
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TAFF AND STUDENT				-								
			[TANCES TRA		METRES)			
		Ferry	National Coach	Car	Taxi	Train (u/ground)	Train	Train	Plane		Plane (longhaul)	Tot
	2011	519	157	3,900	654	104	34,960	7,113	1,835	62,090	563,878	675,2
	2013	0	1,653	0	2,832	4,476	49,300	13,818	0	643,079	313,854	1,029,0
	2015	0	1,826	0	3,811	693	27,670	16,503	7,353	167,199	302,051	527,1
Conversion factor a)		0.11608	0.0293	0.18635	0.174807	0.05631	0.045057	0.01205	0.29795	0.16634	0.15175	
	2011	0.060246	0.004603	0.726765	0.11432378	0.00585624	1.57519272	0.08571165	0.5467383	10.328051	85.568487	
TONNES CO ₂ e	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	
		то	TAL TONNI	ES CO₂e AL	L MODES OF	TRANSPORT	(STAFF AND	STUDENT BL	ISINESS TRA	VEL)		
				2010-11				99.016				
				2012-13 2014-15				157.781 78.043				
				2014-10				78.043				
				TOTAL	TONNES CO	e FROM ALL	FORMS OF T	RANSPORT				
			2010-11					1099.487				
			2012-13					907.440				
			2014-15					1751.819				
OURCES:) http://www.uk.convers	ionfactorsc	arbonsma	t co uk									
i) http://www.ukconvers.	101114010130	anoonamai	1.00.uk									
IOTES:												
2011 and 2013 data h			0									
) Methodology for calcu	lating data				0	since sufficier						

Water & Waste Water

	Month	2005-06	2006-07	2007-08	2008-09	2009-10	Water in c 2010-11	ubic meter 2011-12	s 2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
	Aug	2000-00	2000-07	2007-00	2000-03	2003-10	192	182	167	362	556	423	566	739
	Sep						186	176	162	597	631	648	634	724
H	Oct						192	182	167	642	526	635	707	907
	Nov Dec						186 192	176 182	162 167	712 815	513 560	753 554	696 700	839 682
SILK STREET	Jan						192	182	167	1089	640	775	630	910
L.	Feb						176	167	153	1091	546	798	647	1161
ů,	Mar						192	182	167	1,175	688	828	736	767
	Apr May						186 192	176 182	162 167	1,314 973	590 590	793 637	646 886	808 725
S	Jun						192	176	162	631	590	648	905	689
	Jul						192	182	167	657	522	764	791	753
	Total	0	0	0	0	0	2,264	2,145	1,970	8,969	6,934	8,256	8,544	9,704
	Aug Sep						22 21	21 20	19 18	21 20	21 20	21 20	21 20	21 20
Ω.	Oct						22	21	10	20	21	21	20	21
Ξ	Nov						21	20	18	20	20	20	20	20
N N	Dec						22 22	21	19	21 21	21 21	21 21	21	21
HN HOSI ANNEXE	Jan Feb						22	21 19	19 18	19	19	19	21 19	21 19
zź	Mar						22	21	19	21	21	21	21	21
H	Apr						21	20	18	20	20	20	20	20
John Hosier Annexe	May						22 21	21	19 18	21	21 20	21	21 20	21 20
	Jun Jul	242	242	242	242	242	21	20 21	18	20 21	20	20 21	20	20
	Total	242	242	242	242	242	258	246	223	242	242	242	242	242
	Aug						4	4	3		3			
112	Sep						4	3	3		3			
"	Oct						4	4	3		4			
9	Nov						4	3	3					
5 7	Dec Jan						4	4	3				1	
2 3	Feb						3	3	3		1			
N TRUN COURT	Mar						4	4	3		1			
JOHN TRUNDLE COURT	Apr						4	3	3					
ō	May Jun						4	4 3	3					
7	Jul	42	42	42	42	42	4	4	3	42	1			
	Total	42	42	42	42	42	47	43	36	42	10	0	0	0
										150	307	500	746	000
	Aug Sep									456 752	701 795	533 816	713 799	800 912
The second secon	Oct									809	663	800	891	1,143
5	Nov									897	646	949	877	1,057
Ō	Dec									1,027	706	698	882	859
0	Jan Feb									1,372 1,375	806 688	977 1,005	794 815	1,147 1,463
MILTON COURT	Mar									1,375	867	1,005	927	966
Ĕ	Apr									1,656	743	999	814	1,018
	May									1,226	743	803	1,116	914
Σ	Jun Jul									795 828	721 658	816 963	1,140 997	868 949
	Total	0	0	0	0	0	0	0	0	12673	8737	10403	10765	12096
	Aug	0	0	0	0	0	218	207	189	839	1280	977	1300	1560
Ł	Sep	0	0	0	0	0	211	199	183	1369	1449	1484	1453	1656
212	Oct	0	0	0	0	0	218	207	189	1472	1213	1456	1618	2070
FAL WATER RESIDENTIAL	Nov Dec	0	0	0	0	0	211 218	199 207	183 189	1629 1863	1179 1286	1721 1273	1593 1603	1916 1562
A E	Jan	0	0	0	0	0	218	207	189	2482	1266	1273	1603	2077
	Feb	0	0	0	0	0	199	189	174	2485	1253	1822	1481	2643
ЦЩ	Mar	0	0	0	0	0	218	207	189	2676	1576	1892	1684	1754
	Apr May	0	0	0	0	0	211	199 207	183	2989	1353 1354	1812	1480 2023	1846
0 N	May Jun	0	0	0	0	0	218 211	199	189 183	2220 1446	1354	1460 1484	2023	1659 1577
NON.	Jul	284	284	284	284	284	218	207	189	1547	1200	1747	1808	1722
	Total	284	284	284	284	284	2569	2434	2229	23015	15923	18901	19552	22042
Comu	ion East	0.2444	0.2444	0.2444	0.2444	0.2444	0.2444	0.2444	0.2444	0.2444	0.2444	0.244	0.244	0.244
	ion Factor INES CO ₂ e	0.3441 0.098	0.3441 0.098	0.3441 0.098	0.3441 0.098	0.3441 0.098	0.3441 0.884	0.3441	0.3441 0.767	0.3441 7.920	0.3441 5.479	0.344 6.502	0.344 6.72581	0.344 7.5825283
	A					0		ubic meter		764	700	700	664	644
	Aug Sep					0 578	868 840	733 675	754 561	764 486	780 641	780 641	661 706	614 673
	Oct					900	868	905	968	835	894	894	839	776
¥ ت	Nov					784	660	859	1271	1025	954	954	851	798
₽Ö	Dec Jan					592 230	682 682	607 633	377 590	463 482	532 597	532 597	434 775	276 782
	Feb					1218	784	787	980	482	925	925	831	931
	Mar					645	984	1022	836	818	915	915	719	761
RESIDENTIAL: SUNDIAL COURT	Apr					914	651	632	567	471	580	580	719	619
s u	May					1540	904	748	789	935	844	844	920	750
	Jun Jul					1542	1084 890	970 801	757 651	633 781	861 781	861 781	745 604	750 725
	Total	0	0	0	0	7,403	9,897	9,372	9,101	8,842	9,303	9,303	8,803	8,454
			0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.011	0.011
	ion Factor INES CO ₂ e	0.3441	0.3441 0.000	0.3441 0.000	0.3441 0.000	0.3441 2.547	0.3441 3.406	0.3441 3.225	0.3441 3.132	0.3441 3.042	0.3441 3.201	0.344 3.200	0.344 3.028	0.344 2.908
							ATER ALL							
м	13	0	284	284	284	7687	12466	11806	11330	31857.08	25226.09	28203.81	28354.773	30496.233

							te Water i							
	Month Aug	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11 94	2011-12 89	2012-13 82	2013-14 300	2014-15 461	2015-16 351	2016-17 470	2017-18 613
	Sep						91	86	79	496	524	538	526	601
. ta	Oct Nov						94 91	89 86	82 79	533 591	437 426	527 625	587 578	753 696
ü	Dec						94	89	82	676	465	460	581	566
SILK STREET	Jan Feb						94 86	89 82	82 57	904 906	531 453	643 662	523 537	755 964
S	Mar						94	89	82	975	571	687	611	637
Ľ	Apr						91	86	79	1,091	490	658	536	671
ิเ	May Jun						94 91	89 86	82 79	808 524	490 475	529 538	735 751	602 572
	Jul						94	89	82	545	433	634	657	625
	Total	0	0	0	0	0	1,108	1,049	947	8,348	5,755	6,852	7,092	8,054
	Aug						11	10	9	17	17	17	17	17
	Sep Oct						10 11	10 10	9 9	16	16 17	16 17	16 17	16 17
li ili ili ili ili ili ili ili ili ili	Nov						10	10	9	17 16	16	16	16	16
S U	Dec						11	10	9	17	17	17	17	17
JOHN HOSIER ANNEXE	Jan Feb					-	11 10	10 9	9	17 16	17 16	17 16	17 16	17 16
zź	Mar						11	10	9	17	17	17	17	17
는 도 조	Apr May						10 11	10 10	9 9	16 17	16 17	16 17	16 17	16 17
ř	Jun						10	10	9	16	16	16	16	16
	Jul Total	118 118	118 118	118 118	118 118	118 118	11 127	10 119	9 108	17 201	17 201	17 201	17 201	17 201
	Total	110	110	110	110	110	121	113	700	201	201	201	201	201
	Aug						2	2	2		2			
Щ	Sep Oct						2	2	2		2 2			
<u>d</u>	Nov						2	2	2			1		
S t	Dec Jan						2	2	2					
N TRUN COURT	Feb						2	2	1		1			
JOHN TRUNDLE COURT	Mar Apr			<u> </u>			2	2	2					
E	May						2	2	2					
Š	Jun Jul	23	23	23	23	23	2	2	2	23				
	Total	23	23	23	23	23	24	24	23	23	6	0	0	0
	Aug									370	501	442	502	664
	Aug Sep									379 624	581 660	442 678	592 663	664 757
2	Oct									671	550	664	739	949
S	Nov Dec									745 852	536 586	787 579	728 732	877 713
ŏ	Jan									1,139	669	810	659	952
Z	Feb Mar									1,141 1,229	571 720	835 866	677 770	1,214 802
TON	Mar Apr									1,229 1,374	720 617	866 829	770 676	802 845
VILTON	Mar Apr May									1,229 1,374 1,018	720 617 617	866 829 666	770 676 927	802 845 758
MILTON COURT	Mar Apr May Jun Jul									1,229 1,374 1,018 660 687	720 617 617 598 546	866 829 666 678 799	770 676 927 946 827	802 845 758 721 787
MILTON	Mar Apr May Jun	0	0	0	0	0	0	0	0	1,229 1,374 1,018 660	720 617 617 598	866 829 666 678	770 676 927 946	802 845 758 721
MILTON	Mar Apr May Jun Jul Total									1,229 1,374 1,018 660 687 10518.656	720 617 617 598 546 7251.5772	866 829 666 678 799 8634.125	770 676 927 946 827 8935.3152	802 845 758 721 787 10039.6
	Mar Apr May Jun Jul Total Aug	0	0	0	0	0	107	101	93	1,229 1,374 1,018 660 687 10518.656 696	720 617 617 598 546 7251.5772 1,062	866 829 666 678 799 8634.125 811	770 676 927 946 827 8935.3152 1,079	802 845 758 721 787 10039.6 1,295
	Mar Apr May Jun Jul Total Aug Sep Oct	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	107 103 107	101 98 101	93 90 93	1,229 1,374 1,018 660 687 10518.656 696 1,136 1,221	720 617 617 598 546 7251.5772 1,062 1,202 1,006	866 829 666 678 799 8634.125 811 1,232 1,208	770 676 927 946 827 8935.3152 1,079 1,206 1,343	802 845 758 721 787 10039.6 1,295 1,374 1,719
	Mar Apr May Jun Jul Total Aug Sep Oct Nov	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	107 103 107 103	101 98 101 98	93 90 93 90	1,229 1,374 1,018 660 687 10518.656 696 1,136 1,221 1,352	720 617 617 598 546 7251.5772 1,062 1,202 1,202 1,006 979	866 829 666 678 799 8634.125 8634.125 811 1,232 1,208 1,429	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322	802 845 758 721 787 10039.6 1,295 1,374 1,719 1,590
	Mar Apr May Jun Jul Total Aug Sep Oct	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	107 103 107	101 98 101	93 90 93	1,229 1,374 1,018 660 687 10518.656 696 1,136 1,221	720 617 617 598 546 7251.5772 1,062 1,202 1,006	866 829 666 678 799 8634.125 811 1,232 1,208	770 676 927 946 827 8935.3152 1,079 1,206 1,343	802 845 758 721 787 10039.6 1,295 1,374 1,719
	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	107 103 107 103 107 107 98	101 98 101 98 101 101 93	93 90 93 90 93 93 93 67	1,229 1,374 1,018 660 687 10518.656 1,136 1,221 1,352 1,546 2,060 2,062	720 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.040	866 829 666 678 799 8634.125 811 1,232 1,208 1,429 1,056 1,471 1,513	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,229	802 845 758 721 787 10039.6 1,295 1,374 1,719 1,590 1,296 1,724 2,194
	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan	0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0	107 103 107 103 107 107	101 98 101 98 101 101	93 90 93 90 93 93 93	1,229 1,374 1,018 660 687 10518.656 1,0518.656 1,136 1,221 1,352 1,546 2,060	720 617 598 546 7251.5772 1,062 1,202 1,006 979 1,068 1,218	866 829 666 678 799 8634.125 8811 1,232 1,208 1,429 1,056 1,471	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,343 1,322 1,330 1,199	802 845 758 721 787 10039.6 1,295 1,374 1,719 1,590 1,296 1,724
	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103 107	101 98 101 98 101 101 93 101 98 101	93 90 93 93 93 93 67 93 90 93	1,229 1,374 1,018 660 687 10518.656 1,136 1,221 1,352 1,546 2,060 2,062 2,221 2,481 1,842	720 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.040 1.308 1.123 1.123	866 829 666 678 799 8634.125 811 1,232 1,208 1,429 1,056 1,471 1,513 1,570 1,570 1,570	770 676 927 946 835.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.228 1.679	802 845 758 721 10039.6 1.295 1.374 1.296 1.724 2.194 1.456 1.532 1.377
	Mar Apr May Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103	101 98 101 98 101 101 93 101 98	93 90 93 93 93 93 67 93 90	1,229 1,374 1,018 660 687 10518.656 696 1,136 1,221 1,352 1,546 2,060 2,062 2,221 2,481	720 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.040 1.308 1.123	866 829 666 678 799 8634.125 811 1,232 1,208 1,429 1,056 1,471 1,513 1,570 1,504	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.228	802 845 758 721 787 10039.6 1.295 1.374 1.719 1.590 1.296 1.724 2.194 1.456 1.532
	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103 107 103	101 98 101 98 101 101 93 101 98 101 98	93 90 93 93 93 93 67 93 90 93 90 90	1.229 1.374 1.018 680 687 10518.656 696 1.136 1.221 1.352 1.546 2.062 2.221 2.481 1.842 1.200 1.273	720 617 617 598 546 7251.5772 1.006 1.202 1.006 1.218 1.046 1.218 1.046 1.308 1.123 1.123 1.123	866 829 666 678 799 8634.125 811 1.232 1.208 1.429 1.056 1.429 1.056 1.471 1.513 1.570 1.504 1.212 1.232	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.228 1.679 1.774	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.296 1.724 2.194 1.456 1.532 1.377 1.309 1.430
	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Nov Dec Jan Keb Mar Apr May Jul	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141	107 103 107 103 107 107 98 107 103 107 103 107 1259	101 98 101 98 101 101 93 101 98 101 98 101	93 90 93 90 93 93 67 93 90 90 93 90 93	1.229 1.374 1.018 680 687 10518.656 696 1.136 1.221 1.352 1.546 2.062 2.221 2.481 1.842 1.200 1.273	720 617 617 598 598 598 598 598 598 598 598 1,002 1,006 1,006 979 1,062 1,202 1,006 979 1,062 1,202 1,000 1,202 1,002 1,	866 829 666 678 799 8634.125 811 1.232 1.208 1.429 1.056 1.429 1.056 1.471 1.513 1.570 1.504 1.212 1.232	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.228 1.679 1.774 1.501	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.296 1.724 2.194 1.456 1.532 1.377 1.309 1.430
TOTAL WATER NON-RESIDENTIAL	Mar Apr Jun Jun Jun Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	107 103 107 103 107 107 98 107 103 107 103 107 1259	101 98 101 98 101 101 93 101 98 101 1192 0.70850	93 90 93 90 93 93 93 67 93 90 93 90 93 90 93 90 0.70850	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.354 2.060 2.062 2.221 2.481 1.200 1.273 1.200 1.273 1.200 1.273	720 617 617 598 546 7251,5772 1,062 1,006 979 1,068 1,218 1,040 1,308 1,123 1,124 1,089 996 13213,934	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,513 1,570 1,554 1,212 1,450 1,222 1,450 1,232 1,450 1,232 1,450	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.714 1.679 1.714 1.627.972	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.296 1.296 1.296 1.296 1.296 1.296 1.296 1.296 1.296 1.296 1.295 1.397 1.309 1.430 1.295 1.309 1.430 1.295 1.309 1.430 1.309 1.430 1.295 1.309 1.430 1.309 1.430 1.295 1.309
TOTAL WATER NON-RESIDENTIAL	Mar Apr Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 141 141	107 103 107 103 107 107 98 107 103 107 103 107 1259	101 98 101 98 101 93 101 98 101 98 101 1192	93 90 93 93 93 67 93 90 93 90 93 90 93 1078	1.229 1.374 1.018 660 687 10518.656 966 1.136 1.221 1.546 2.060 2.062 2.221 2.421 1.842 1.200 1.842 1.200 1.273 19090.933	720 617 617 598 546 7251.5772 1.062 1.202 1.068 1.218 1.068 1.218 1.308 1.124 1.308 1.124 1.308 1.124 1.309 996 13213.934	866 829 666 678 799 3634.125 1,232 1,208 1,429 1,056 1,471 1,513 1,570 1,504 1,212 1,232 1,212 1,232 1,450 15687.74	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.228 1.679 1.714 1.501	802 845 758 721 10039.6 1.295 1.374 1.719 1.596 1.724 2.194 1.456 1.532 1.377 1.309 1.377 1.309 1.430 18295.05
TOTAL WATER NON-RESIDENTIAL	Mar Apr Jun Jun Jun Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	107 103 107 103 107 107 98 107 103 107 103 107 1259	101 98 101 98 101 101 93 101 98 101 1192 0.70850	93 90 93 90 93 93 93 67 93 90 93 90 93 90 93 90 0.70850	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.354 2.060 2.062 2.221 2.481 1.200 1.273 1.200 1.273 1.200 1.273	720 617 617 598 546 7251,5772 1,062 1,006 979 1,068 1,218 1,040 1,308 1,123 1,124 1,089 996 13213,934	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,513 1,570 1,554 1,212 1,450 1,222 1,450 1,232 1,450 1,232 1,450	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.714 1.679 1.714 1.627.972	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.374 1.296 1.295 1.295 1.295 1.295 1.294 1.456 1.532 1.309 1.430 1.309 1.430 1.309 1.430 1.309 1.430 1.309 1.295 1.309
TOTAL WATER NON-RESIDENTIAL	Mar Apr Jun Jun Jun Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jun Jun Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	107 103 107 103 107 107 98 107 103 107 103 107 1259	101 98 101 93 101 93 101 98 101 101 101 101 1192 0.70850 0.845	93 90 93 93 93 93 67 93 90 93 90 93 90 93 1078 0.70850 0.764	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.354 2.060 2.062 2.221 2.481 1.200 1.273 1.200 1.273 1.200 1.273	720 617 617 598 546 7251,5772 1,062 1,006 979 1,068 1,218 1,040 1,308 1,123 1,124 1,089 996 13213,934	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,513 1,570 1,554 1,212 1,450 1,222 1,450 1,232 1,450 1,232 1,450	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.714 1.679 1.714 1.627.972	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.374 1.296 1.295 1.295 1.295 1.295 1.294 1.456 1.532 1.309 1.430 1.309 1.430 1.309 1.430 1.309 1.430 1.309 1.295 1.309
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jul Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 14	107 103 107 103 107 107 98 107 103 107 103 107 103 107 1259 0.70850 0.892 0.892	101 98 98 101 93 101 93 101 101 98 101 1192 0.70850 0.845	93 90 93 93 93 93 67 93 90 93 90 93 90 93 1078 0.70850 0.764	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.060 2.062 2.221 2.481 1.842 1.200 1.273 19090.333 90.070850 13.526	720 617 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.040 1.308 1.123 1.124 1.040 1.308 1.3213.934 0.70850 9.362	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,513 1,570 1,550 1,570 1,550 1,232 1,450 15687.74 0.708 11.107 647	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.228 1.679 1.714 1.501 16227.972 0.708 11.489404	802 845 758 721 10039.6 1.296 1.374 1.719 1.590 1.296 1.724 2.194 1.456 1.532 1.379 1.430 18295.05 0.708 12.9529 0.708
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr Jun Jul Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 98 107 103 107 103 107 103 107 1259 0.70850 0.892 • Water 1 425 412	101 98 101 99 93 101 101 101 98 101 1192 0.70850 0.845 0.845	93 90 93 93 67 93 90 93 90 93 90 93 1078 0.70850 0.764 eters 754 561	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.060 2.022 2.221 2.481 1.842 1.200 1.273 19090.933 1.273 19090.933	720 617 617 598 546 7251.5772 1,062 1,202 1,006 979 1,068 1,218 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,202 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,008 1,007 1,008 1,	866 829 666 678 799 8634.125 1,232 1,208 1,429 1,056 1,471 1,570 1,570 1,570 1,570 1,570 1,570 1,212 1,232 1,450 15687.74	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,229 1,330 1,229 1,388 1,228 1,679 1,714 1,501 16227.972 0.708 11.489404 549 586	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.456 1.532 1.456 1.456 1.456 1.456 1.456 1.377 1.309 1.430 1.429 5.05 0.708 12.9529
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Dec Jan Mar Apr May Jun Jul Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 141 0.70850 0.100 0.100 0.578 900 784	107 103 107 103 107 107 98 107 103 107 103 107 1259 0.70850 0.892 0.70850 0.892 ste Water 1 425 412 425 412 425	101 98 101 93 101 93 101 93 101 101 98 98 101 1192 0.70850 0.845 0.845	93 90 93 93 67 93 90 93 93 90 93 93 1078 0.70850 0.764 561 968 261 271	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.546 2.060 2.221 2.421 1.200 1.842 1.200 1.273 19090.933 0.70850 13.526	720 617 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.006 1.218 1.006 1.218 1.008 1.124 1.308 1.124 1.308 1.124 1.308 1.213.934 0.70850 9.362	866 829 666 678 799 3634.125 1.208 1.422 1.208 1.422 1.056 1.471 1.570 1.505 1.212 1.232 1.450 1.212 1.450 1.212 1.450 1.212 1.450 1.212 1.208 1.410 1.212 1.208 1.212 1.208 1.212 1.570 1.570 1.212 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.570 1.770 1.570 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.770 1.77	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.228 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706	802 845 778 721 10039.6 1.295 1.374 1.719 1.596 1.296 1.724 2.194 1.456 1.537 1.377 1.309 1.430 18295.05 0.708 12.9529 0.708 12.9529
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr Jun Jun Jun Jun Jun Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 1 1 1	107 103 107 103 107 107 103 107 103 107 103 107 103 107 103 107 105 0.892 0.89	101 98 101 98 101 98 101 98 101 198 101 1192 0.70850 0.845 0	93 90 93 93 93 90 93 90 93 90 93 1078 0.70850 0.764 0.764 561 968 1271 968 1277	1.229 1.374 1.018 660 687 10518.656 696 1.136 1.221 1.352 1.546 2.060 2.062 2.221 2.481 1.200 1.273 1.949 1.200 1.273 1.949 1.200 1.273 1.949 1.200 1.273 1.945 1.200 1.256 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.3526 1.352 1.35	720 617 617 598 546 7251,5772 1,062 1,202 1,006 1,202 1,006 1,202 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,202 1,202 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,006 1,203 1,203 1,006 1,203	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,212 1,232 1,456 7,42 1,268 1,107 1,568 7,42 1,208 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,568 1,107 1,564 1,272 1,568 1,570 1,272 1,475 1,472 1,470 1,570 1,272 1,475 1,472 1,4	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,229 1,398 1,299 1,398 1,229 1,398 1,679 1,714 1,501 16227,972 0,708 11.489404 549 549 549 549 586 696 706 360	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.456 1.532 1.456 1.456 1.456 1.456 1.456 1.456 1.456 1.456 1.377 1.309 1.430 1.456 1.397 1.309 1.430 1.456 1.397 1.309 1.456 1.395 1.309 1.456 1.559 644 662 229
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feto Feto SCO ₂ e	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 141 0.70850 0.100 0 578 900 578 900 578	107 103 107 103 107 107 98 107 103 107 103 107 103 107 1259 0.70850 0.892 0.70850 0.892 412 425 323 334 334 334	101 98 101 93 101 93 101 98 101 1192 0.70850 0.845 0.845 0.845 0.845	93 90 93 93 93 90 93 90 93 90 93 1078 0.70850 0.70850 0.764 561 968 561 968 1271 377 590 980	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.060 2.221 2.421 1.546 2.060 2.062 2.221 2.481 1.273 19090.933 0.70850 13.526 3.526 3.526 3.526	720 617 617 598 546 7251.5772 1,062 1,202 1,006 979 1,202 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,202 1,006 1,203 1,204 1,006 1,203 1,204 1,203 1,204 1,203 1,204 1,203 1,204 1,203 1,204 1,204 1,204 1,203 1,204 1,	866 829 666 678 799 3634.125 1,232 1,208 1,429 1,056 1,471 1,570 1,504 1,212 1,232 1,450 15687.74 0.708 11.107 1.504 1,212 1,450 15687.74 0.708 11.107	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,228 1,330 1,229 1,388 1,228 1,679 1,228 1,679 1,228 1,679 1,228 1,501 16227.972 0.708 11.489404 549 549 586 696 706 360 643 690	802 845 778 778 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.456 1.532 1.430 1.8295.05 0.708 12.9529 0.708 12.9529 510 559 644 642 659 644
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Jun Jul Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 141	107 103 103 107 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 103 103 103 103 103 103 103 103	101 98 98 101 93 98 101 98 101 198 101 1192 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.70850 0.845	93 90 93 90 93 93 90 93 90 93 90 93 1078 1078 0.764 0.764 0.764 561 968 1271 3590 980 836	1.229 1.374 1.018 1.018 660 687 10518.656 696 1.136 1.221 1.546 2.060 2.062 2.221 2.481 1.200 1.273 1900.933 1900.933 1000.933 693 851 384 403 693 851 384	720 617 617 546 7251,5772 1,062 1,202 1,006 979 1,068 1,218 1,040 1,308 1,123 1,123 1,308 1,123 1,308 1,307	866 829 666 678 799 8634.125 1,232 1,208 1,471 1,613 1,570 1,564 1,212 1,232 1,450 15687.74 647 532 742 792 442 495 769	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.330 1.199 1.229 1.343 1.229 1.343 1.199 1.229 1.306 1.343 1.501 1679 1.714 1.601 1627.972 0.708 11.489404 549 549 549 549 549 549 549 54	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.374 1.590 1.296 1.724 2.194 1.456 1.532 1.377 1.456 1.532 1.309 1.430 1.430 1.430 1.429 50 0.708 12.9529 0.708 12.9529 510 559 644 662 229 649 773 632
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feto Feto SCO ₂ e	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 14	107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 0.70850 0.892 0.70850 0.892 0.89	101 98 98 101 98 101 98 101 98 101 199 98 101 1192 0.70850 0.845 0	93 90 93 93 90 93 90 93 90 90 93 1078 0.70850 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.7750 0.775 0.775 0.7750 0.7750 0.7750000000000	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.062 2.062 2.221 2.481 1.842 1.200 1.273 19090.933 0.70850 13.526 3.566 3.5666 3.566 3.566 3.566 3.5666 3.5666 3.5666 3.56666 3.5666 3.5666 3.5	720 617 617 598 546 7251.5772 1.006 1.202 1.202 1.202 1.202 1.202 1.208 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.308 1.123 1.308 1.123 1.123 1.123 1.123 1.308 1.123 1.308 1.123 1.308 1.213 9.96 1.223.934 1.223 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.309 1.224 1.309 1.224 1.309 1.224 1.309 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.255 1.2	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,570 1,504 1,471 1,570 1,504 1,471 1,570 1,504 1,212 1,232 1,450 0,708 11,107 1,564 1,107 1,564 1,212 1,252 1,450 0,708 11,107	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.398 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706 360 643 690 596 596 596 596	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.29529 0.708 12.9529 510 559 644 662 229 644 662 229 644 662 229 644 662 229 644 662 229 644 662 229 644 662 229 644 662 229 644 662 652
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Mar Apr May Jun Jul Total Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 141	107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 1259 0.70850 0.892 0.70850 0.892 0.70850 0.892 0.7850 34 334 334 334 334 334 334 334 334 334	101 98 101 98 101 101 93 101 98 101 1192 0.70850 0.845 0.845 0.845 0.845 0.845 0.845 0.574 787 787 787 787 787 1.022 0.632 748 800	93 90 93 93 93 93 90 93 90 93 90 93 1078 0.70850 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.754 0.561 980 0.980 0.980 0.93 0.757 757	1,229 1,374 1,018 667 687 10518.656 696 1,1136 1,221 1,346 1,221 1,346 2,060 2,221 2,481 1,200 1,273 19090.933 0,70850 13.526 634 403 693 851 384 403 693 851 384 400 954 384 400 954 954 954 391 776 525	720 617 598 546 7251.5772 1.062 1.202 1.006 729 1.068 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.008 9.96 1.213.934 0.70850 9.362 9	866 829 686 678 799 3634.125 1,232 1,208 1,450 1,517 1,570 1,517 1,570 1,517 1,570 1,517 1,570 1,513 1,570 1,511 1,570 1,512 1,212 1,212 1,450 15687.74 647 532 742 442 495 768 768 768 768 768 705	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,229 1,330 1,199 1,229 1,330 1,229 1,330 1,29 1,29 1,300 1,29 1,29 1,206 1,343 1,320 1,29 1,48 40 4 549 548 696 696 596 596 596 596 596 764 618	802 845 758 721 10039.6 1.295 1.374 1.719 1.596 1.724 2.194 1.456 1.537 1.377 1.309 1.430 18295.05 12.9529 550 644 662 2.29 6549 662 622 2.62 773 6514 662
TOTAL WATER NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr Sep Oct Mar Apr Sep Oct SCO20	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850	0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 14	107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 103 107 107 103 107 107 103 107 107 103 107 107 103 107 107 107 107 107 107 107 107 107 107	101 98 98 101 98 101 98 101 98 101 199 98 101 1192 0.70850 0.845 0	93 90 93 93 90 93 90 93 90 90 93 1078 0.70850 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.7750 0.775 0.7750 0.7750 0.7750 0.7750 0.7750 0.7750 0.7750 0.7750	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.062 2.062 2.221 2.481 1.842 1.200 1.273 19090.933 0.70850 13.526 3.566 3.5666 3.566 3.566 3.566 3.5666 3.5666 3.5666 3.56666 3.5666 3.5666 3.5	720 617 617 598 546 7251.5772 1.006 1.202 1.202 1.202 1.202 1.202 1.208 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.308 1.123 1.308 1.123 1.123 1.123 1.123 1.308 1.123 1.308 1.123 1.308 1.213 9.96 1.223.934 1.223 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.308 1.224 1.309 1.224 1.309 1.224 1.309 1.224 1.309 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.255 1.2	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,570 1,504 1,471 1,570 1,504 1,471 1,570 1,504 1,212 1,232 1,450 0,708 11,107 1,564 1,107 1,564 1,212 1,252 1,450 0,708 11,107	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.398 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706 360 643 690 596 596 596 596	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.374 1.719 1.296 1.724 2.194 1.456 1.377 1.309 1.430 1.377 1.309 1.430 1.377 1.309 1.430 0.708 12.9529 0.708 12.9529 510 559 644 622 229 649 773 632 632 612
RESIDENTIAL: TOTAL WATER SUNDIAL COURT NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Aug Jun Jul Total Total	0 0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103 103 107 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 107 103 103 103 103 103 103 103 103 103 103	101 98 101 98 101 93 101 93 101 1192 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.845 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.845 0.70850 0.845 0.70850 0.845	93 90 93 93 93 93 93 90 93 93 90 93 93 1078 0.70850 0.704 0.70850 0.764 1078 1078 1078 1078 1078 1078 1078 1078	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.546 2.060 2.221 2.421 1.200 1.546 2.062 2.221 1.842 1.200 1.842 1.200 1.3.526 0.70850 13.526 634 403 663 851 3840 400 954 679 954 6691	720 617 617 598 546 7251.5772 1.062 1.202 1.006 979 1.068 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.008 1.213 9.362 1.223 1.224 1.089 9.362 1.213.934 0.70850 9.362 1.213.934 0.70850 9.362 1.2124 1.224 1.225 1.2277 1.227 1.2277 1.2277 1.2277 1.2277 1.2277 1.22777 1.22777 1.22777 1.227777 1.227777 1.2277777 1.227777777777	866 829 686 678 799 3634.125 1,232 1,208 1,471 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,212 1,232 1,471 1,212 1,232 1,471 1,212 1,232 1,471 1,212 1,232 1,471 1,212 1,232 1,470 6,47 532 742 792 442 442 701 715 648 7,073	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.330 1.229 1.330 1.229 1.330 1.229 1.308 1.228 1.679 1.714 1.501 1.6227.972 0.708 11.489404 549 586 696 696 596 764 618 501 6805 6805	802 845 758 721 10039.6 1.295 1.374 1.719 1.596 1.724 2.194 1.456 1.532 1.430 18295.05 0.708 12.9529 0.708 12.9529 5510 559 644 662 229 644 662 229 544 662 229 644 662 622 602 6,415
RESIDENTIAL: TOTAL WATER NON-RESIDENTIAL NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Aug Jun Jul Total Total	0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 14	0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100 0.70850 0.100 0.708 0.100 578 900 578 900 578 900 1.218 645 914 914	107 103 107 103 107 107 98 107 103 107 103 107 1259 0.70850 0.892 0.70850 0.892 412 425 412 425 412 425 334 334 334 334 334 384 443 531	101 98 101 93 101 93 101 98 101 101 98 101 1192 0.70850 0.845 0.845 0.845 0.845 0.70850 0.845 0.75 905 859 807 574 1.210 859 807 574 809 807 877 1.022 839 807 837 807 837 839 807 837 839 839 839 839 839 839 839 839	93 90 93 97 93 97 93 90 93 90 93 90 93 1078 0.70850 0.70850 0.764 561 271 377 590 880 8567 789 789	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.060 2.221 2.481 1.546 2.060 2.221 2.481 1.200 1.273 19090.933 0.70850 13.526 3.5266 3.526 3.526 3.526 3.526 3.526 3.526 3.526 3.526 3.526 3.526 3.52	720 617 617 598 546 7251.5772 1,062 1,202 1,006 979 1,202 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,218 1,006 1,202 1,308 1,124 1,089 996 13213.934 0,70850 9,362 9,362 9,362 9,362 9,362 9,362 742 742 742 742 742 742 742 742 742 74	866 829 666 678 799 3634.125 1,232 1,208 1,471 1,570 1,570 1,570 1,570 1,570 1,504 1,212 1,232 1,450 15687.74 0.708 11.107 647 532 742 792 442 495 768 759 482 701 745	770 676 927 946 827 8935.3152 1,079 1,206 1,343 1,322 1,330 1,199 1,229 1,328 1,679 1,228 1,679 1,228 1,679 1,228 1,679 1,228 1,679 1,228 1,501 16227,972 0,708 11,489404 549 586 696 643 6896 596 596 764 618 501	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.724 2.194 1.426 1.532 1.430 1.430 1.8295.05 0.708 12.9529 0.708 12.9529 0.708 12.9529 510 559 644 644 622 229 649 773 632 514 622 622
RESIDENTIAL: TOTAL WATER NON-RESIDENTIAL NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr Sep Oct May Jun Jul Total	0 0 0 0 0 0 0 0 0 0 141 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103 107 1259 0.70850 0.892 0.70850 0.892 0.70850 334 334 334 334 334 334 334 334 334 33	101 98 90 101 93 101 93 101 98 98 98 98 98 98 98 98 98 98 98 98 98	93 90 93 97 93 90 93 90 93 90 93 90 93 93 1078 0.708 0.708 561 8450 980 836 567 789 980 836 567 789 980 836 567 789 980 980 836 567 789 980 980 980 980 980 980 980 980 980 9	1.229 1.374 1.018 660 687 10518.656 9696 1.136 1.221 1.352 1.546 2.062 2.021 2.481 1.200 1.273 19090.933 1.273 19090.933 0.70850 13.526 13.566 13.526 13.566 13.566 13.566 13.5666 13.5666 13.5666 13.	720 617 617 598 546 7251.5772 1.006 1.202 1.202 1.202 1.202 1.202 1.203 1.213 1.068 1.218 1.046 1.218 1.046 1.218 1.046 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.006 1.202 1.203 1.208 1.223 1.208 1.223 1.208 1.223 1.208 1.223 1.224 1.008 9.966 1.2213.934 1.224 1.208 1.223 1.224 1.208 1.223 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.224 1.225 1.224 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.2555 1.255 1.255 1.2555 1.2555 1.2555 1.2555 1.2555 1.2555	866 829 666 678 799 8634.125 1,232 1,268 1,471 1,570 1,570 1,571 1,572 1,212 1,232 1,471 1,570 1,570 1,571 1,572 1,212 1,232 1,214 1,232 1,215 1,212 1,232 1,212 1,232 1,214 0,708 11,107 0,708 11,107 647 532 742 95 759 482 701 7048 7,073 0,708	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.398 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 596 596 596 596 596 596 596 596 59	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.295 1.374 1.719 1.590 1.295 1.295 1.377 1.309 1.430 1.430 1.435 1.377 1.309 1.430 0.708 12.9529 0.708 12.9529 510 559 644 662 229 644 662 229 644 662 62 62 62 62 62 62 62 62 62 602 602
RESIDENTIAL: TOTAL WATER NON-RESIDENTIAL NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Feb Mar Apr Sep Oct May Jun Jul Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 1259 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 103 107 1259 103 104 103 107 1050 0 0.892 103 104 104 104 104 104 104 104 104 104 104	101 98 101 98 101 93 101 98 101 1192 0.70850 0.845 0.70850 0.845 0.70850 607 574 788 809 801 8,819 0.70850 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7788 0.7088 0	93 90 93 93 97 93 90 93 90 90 93 1078 0.70850 0.764 968 1271 3754 968 1271 3754 968 1271 3754 968 1271 3757 590 980 661 8,450 0.70850 0.70850 5.987	1.229 1.374 1.018 660 687 10518.656 1.136 1.221 1.352 1.546 2.062 2.062 2.221 2.481 1.842 1.200 1.273 1.842 1.200 1.273 1.9090.933 0.70850 13.526 634 403 663 851 384 384 403 663 851 776 679 391 776 525 648 6,691	720 617 617 598 546 7251.5772 1.062 1.202 1.202 1.202 1.203 1.204 1.208 1.218 1.068 1.218 1.068 1.218 1.308 1.123 1.124 1.308 1.123 1.123 1.308 1.123 1.308 1.123 1.308 1.123 1.308 1.123 1.308 1.123 1.308 1.213 1.308 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.223 1.309 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.225 1.307 1.255 1.307 1.255 1.3555 1.3555 1.35555 1.35555 1.35555555555	866 829 666 678 799 8634.125 1,208 1,429 1,056 1,471 1,570 1,504 1,471 1,570 1,504 1,471 1,570 1,504 1,212 1,232 1,456 1,212 1,232 1,456 7,078 11,107 15687,74 20,708 11,107 15687,74 20,708 11,107 15687,74 20,708 7,59 482 7,073 0,708 5,008	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.228 1.398 1.229 1.398 1.229 1.398 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706 360 643 690 596 596 596 596 596 596 596 596 596 596	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.450 1.29529 0.708 12.9529 510 559 644 662 229 644 662 622 622 622 622 622 622 622 622
RESIDENTIAL: TOTAL WATER NON-RESIDENTIAL NON-RESIDENTIAL	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Aug Sep Oct Nov Dec Jan Total Total Total Total Total Total Total Total Total Total Total Total Total Total Total	0 0 0 0 0 0 0 0 0 0 141 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 107 98 107 103 107 1259 0.70850 0.892 0.70850 0.892 0.70850 334 334 334 334 334 334 334 334 334 33	101 98 90 101 93 101 93 101 98 98 98 98 98 98 98 98 98 98 98 98 98	93 90 93 97 93 90 93 90 93 90 93 90 93 93 1078 0.708 0.708 561 8450 980 836 567 789 980 836 567 789 980 836 567 789 980 980 836 567 789 980 980 980 980 980 980 980 980 980 9	1.229 1.374 1.018 660 687 10518.656 9696 1.136 1.221 1.352 1.546 2.062 2.021 2.481 1.200 1.273 19090.933 1.273 19090.933 0.70850 13.526 13.566 13.526 13.566 13.566 13.566 13.5666 13.5666 13.5666 13.	720 617 617 598 546 7251.5772 1.006 1.202 1.202 1.202 1.202 1.202 1.203 1.213 1.068 1.218 1.046 1.218 1.046 1.218 1.046 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.006 1.202 1.203 1.208 1.223 1.208 1.223 1.208 1.223 1.208 1.223 1.224 1.008 9.966 1.2213.934 1.224 1.208 1.223 1.224 1.208 1.223 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.208 1.224 1.224 1.225 1.224 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.225 1.2555 1.255 1.255 1.2555 1.2555 1.2555 1.2555 1.2555 1.2555	866 829 666 678 799 8634.125 1,232 1,268 1,471 1,570 1,570 1,571 1,572 1,471 1,570 1,570 1,570 1,570 1,571 1,572 1,212 1,232 1,471 1,212 1,232 1,212 1,232 1,212 1,232 1,212 1,232 1,212 1,232 1,212 1,232 1,214 0,708 11,107 0,708 11,107 647 532 742 495 768 799 482 701 748	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.398 1.229 1.398 1.229 1.398 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 596 596 596 596 596 596 596 596 59	802 845 758 721 10039.6 1.295 1.374 1.719 1.590 1.724 2.194 1.450
RESIDENTIAL: TOTAL WATER NON-RESIDENTIAL: NON-RESIDENTIAL MINIAL COURT	Mar Apr May Jun Jul Total Aug Sep Oct Nov Dec Jan Aug Sep Oct Nov Dec Jan Total Total Total Total Total Total Total Total Total Total Total Total Total Total Total	0 0 0 0 0 0 0 0 0 0 0 141 141 141 0.70850 0.100 0 0.000 0 0.000 0 0.000	0 0 0 0 0 0 0 0 0 0 141 141	0 0 0 0 0 0 0 0 0 0 0 0 141 141 0.70850 0.100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0	107 103 107 103 107 103 107 103 107 103 107 1259 0.70850 0.892 0.70850 0.892 0.70850 0.892 0.70850 334 334 334 334 334 334 334 334 334 33	101 98 101 98 101 93 101 98 101 198 98 101 199 0.70850 0.845 0.70850 0.845 0.70850 0.845 0.70850 607 747 787 1.022 748 800 801 8,819 8,018 8,018 8,018 8,018 8,018 8,018 8,018 1,210 6,248 1,011 0.70850 6,248 1,011 1,011 1,210 6,248 1,011 1,210 6,248 1,011 1,210 6,248 1,011 1,210	93 90 93 93 97 93 93 90 93 90 93 1078 0.70850 0.764 0.764 0.764 0.764 0.764 0.765 0.764 0.765 0.764 0.765 0.764 0.765 0.765 0.765 0.765 0.765 0.765 0.775 757 757 757 757 757 759 757 757 759 759	1.229 1.374 1.018 667 687 10518.656 1.136 1.221 1.546 2.062 2.221 2.421 1.200 1.273 19090.933 0.70850 13.556 634 403 663 851 3861 3851 3851 3851 3851 776 6.691 7.76 5.76 6.691 0.70850 4.776 5.76 6.691	720 617 598 546 7251.5772 1.062 1.202 1.006 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.006 1.218 1.008 1.124 1.089 996 13213.934 0.70850 9.362 742 742 742 742 742 742 742 768 768 759 768 768 759 768 759 768 772 768 772 772 772 772 772 772 772 772 772 77	866 829 686 678 799 3634.125 1,208 1,471 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,570 1,212 1,232 1,471 1,570 1,570 1,570 1,570 1,570 1,212 1,212 1,232 1,471 1,570 1,212 1,214 1,215 647 532 742 792 742 768 7,073 648 7,073 0.708 5.008 22761.21 <th>770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.330 1.229 1.398 1.228 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706 360 643 690 596 596 764 618 501 6,805 0.708 4.818</th> <th>802 845 758 721 10039.6 1.295 1.374 1.719 1.596 1.724 2.194 1.456 1.537 1.296 1.724 2.194 1.456 1.537 1.296 1.724 2.194 1.430 18295.05 0.708 12.9529 510 559 644 662 659 644 662 229 514 662 649 6415 0.708 4.542</th>	770 676 927 946 827 8935.3152 1.079 1.206 1.343 1.322 1.330 1.199 1.229 1.330 1.229 1.398 1.228 1.679 1.714 1.501 16227.972 0.708 11.489404 549 586 696 706 360 643 690 596 596 764 618 501 6,805 0.708 4.818	802 845 758 721 10039.6 1.295 1.374 1.719 1.596 1.724 2.194 1.456 1.537 1.296 1.724 2.194 1.456 1.537 1.296 1.724 2.194 1.430 18295.05 0.708 12.9529 510 559 644 662 659 644 662 229 514 662 649 6415 0.708 4.542

	TOTAL TONNES C02e WATER & WASTE WATER BY ACADEMIC YEAR												
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Water	0.0977	0.0977	0.0977	0.0977	2.6451	4.2896	4.0624	3.8987	10.9620	8.6803	9.7021	9.7540	10.4907
Waste Water	0.0999	0.0999	0.0999	0.0999	5.3449	4.0179	7.0928	6.7506	18.2662	14.3736	16.1149	16.3075	17.4948
GRAND TOTAL	0.1976	0.1976	0.1976	0.1976	7.9900	8.3075	11.1552	10.6492	29.2283	23.0539	25.8170	26.0615	27.9855

Waste and Recycling

1		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
	WASTE RECYCLED (Tonnes)	135.20	140.40	120.24	110.49	134.88	229.07	203.18	203.18	203.18	203.18
	Coversion 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								
	WASTE SENT TO: (Tonnes)	175.76	228.56	146.41	127.23	133.20	269.41	173.57	173.57	208.07	208.07
NON-REDIDENTIAL	Coversion Factor	290	220.30	290	21	21	209.41	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
	Tonnes Coze	50.970	00.202	42.435	2.072	2.151	5.050	3.043	3.045	4.449	4.443
	Total Tonnes	310.96	368.96	266.65	237.720	268.080	498.484	376.754	376.754	411.250	411.250
	Total Tonnes C02e	85.717	102.365	44.984	4.992	5.630	10.468	7.912	7.912	8.794	8.782
	WASTE RECYCLED (Tonnes)	202.80	70.20	106.92	135.84	68.62	29.60	45.96	39.23	47.65	47.80
	Coversion 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
	WASTE COMPOSTED (Tonne	s)						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
RESIDENTIAL											
		Landfill			Energy Recovery						
	WASTE SENT TO: (Tonnes)	175.76	228.56	231.66	141.07	116.55	127.78	108.89	104.63	40.24	43.00
	Coversion 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
	Total Tonnes	378.56	298.76	338.58	276.910	185.170	157.376	157.024	146.033	90.067	92.977
	Total Tonnes C02e	103.090	84.324	69.427	5.815	3.889	3.305	3.265	3.034	1.902	1.961
Total Tonnes Waste All Souces											
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
GRAND TOTAL TONNES		689.52	667.72	605.23	514.63	453.25	655.86	533.78	522.79	501.32	504.23
Tonnes recy	cled as % of total Waste	49.02%	31.54%	37.53%	47.87%	44.90%	39.44%	47.08%	46.78%	50.47%	50.21%
	NES CO2E ALL WASTE	1									

TOTAL TONNES COZE ALL WASTE										
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
GRAND TOTAL C02e	205.031	216.889	154.345	11.159	9.483	14.620	10.555	10.324	10.800	10.847
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 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.

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

Behavioural and awareness-raising solutions

Initiative	Detail	Action by	Timescale/ progress
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 perfector' 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

Initiative	Detail	Est. Cost £	Timescale/ progress
	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

Initiative	Detail	Est. Cost £	Timescale/ progress
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.

Initiative	Detail	Action by	Timescale/ progress
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

Initiative	Detail	Action by	Timescale/ progress
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 decisionmaking 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.