

**Carbon**

**Management Plan**







Updated April 2023

The Carbon Management Plan reports current and historic performance against the School's carbon emissions reduction target for 2024/25. This includes carbon emissions from the London Business School campus.

The Plan is updated every six months with current carbon emissions figures

Within this document is an implementation plan, which lays out carbon saving projects over the coming years to ensure the School continues to make progress against the target.



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## Executive Summary

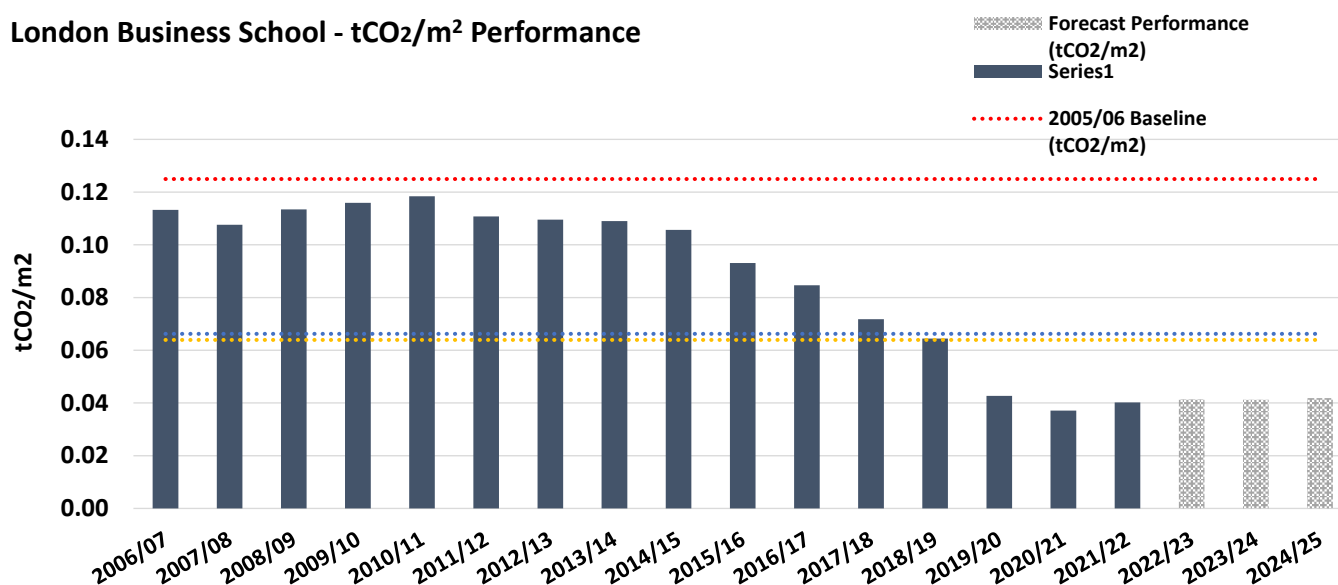
Tackling climate change is a top international priority. Since 2011 London Business School have had in place a carbon management plan that records plans for, and measures progress against, a reduction target in carbon emissions against a 2005 baseline. The targets originally ran to 2020 but have now been extended out to 2025.

This document sets out the School's strategy for reducing its carbon emissions towards a relative target of 47% by 2024/25. The relative targets means that we are able to show progress in carbon emissions reduction whilst adjusting for School growth; target is shown as a relative measure per unit of floor area. An implementation plan is included, which gives details of projects that will be undertaken to reduce energy consumption and so cut carbon emissions. The plan is made up of standalone energy saving projects, energy savings resulting from any planned campus development and measures that will be taken to embed a low carbon vision within the workings of the School.

Projected relative carbon emissions over the 2022/23 year are 0.04125 tCO<sub>2</sub>/m<sup>2</sup>, a **66.9%** reduction on the base year. Absolute carbon emissions through electric and gas use on site increased 8.8% in 2017/18 compared to the previous year due to the addition of the Sammy Ofer Centre. In 2018/19 carbon emissions dropped back below the 2017/18 level, negating the impact of the new building. Overall, absolute emissions in 2022/23 sit **49.2%** lower than the 2005 baseline.

Taking into account the School's planned level of growth, carrying out the implementation plan will likely result in a reduction in carbon emissions going forward as shown below. The planned reductions, combined with the estimated consumption for new buildings, are forecast to deliver an overall absolute reduction of **48.8%**. The relative carbon levels, taking into account the growth in campus facilities, are due to be **66.5%** down on the baseline by 2024/25. As seen in the graph below, this brings the School down below the target tCO<sub>2</sub>/m<sup>2</sup> level. Although it is difficult to predict campus activity over the coming year we do expect to see a steady increase in occupancy over 2023/24 – this is reflected in the graph. Beyond 2023/24, forecast energy use has been based on the 2021/22 year, with planned reductions, sales and expansions added. 2019/20 and 2020/21 and in part 2021/22 have been treated as anomalous years due to covid restrictions.

Figure 1 – Planned reduction in carbon emissions



Progress against the implementation plan will be reported publicly every year. Measurement and review of carbon savings will be carried out and communicated internally every six months alongside the School's corporate plan reporting structure. Action will be taken in the case of actual savings falling below the forecast. Milestone targets of 12% in 2012, 29% in 2017 and 43% in 2020 (against a 2005 baseline) were set in order to measure interim progress.

The Head of Building Services is accountable to the Governing Body for delivery of the plan.

London Business School believes that delivering savings in line with sector targets over the timeframe in question, against a baseline that was established prior to the significant increases in site use and building capacity forecast over the next ten years, is a demonstration of the School's commitment to carbon management, energy efficiency and sustainable building design.

In the academic year 2021/22 and through to the current 2022/2023 year the business school has returned to operating at Pre-Covid student capacity levels.

## 1 – Introduction

London Business School's sustainability policy commits the School to the:

- provision of effective leadership from its management to ensure that sustainability issues are considered strategically and that initiatives are implemented in a coherent and planned manner across the School
- setting of annual objectives and key performance indicators in relation to its work towards achieving sustainable development, in order that its performance can be monitored and reviewed, and be subject to continual improvement
- effective communication of its commitment to sustainable development and its performance against its annual objectives to its key stakeholders
- provision of appropriate training and consultation opportunities with employees and students on sustainability issues.

London Business School is taking an increasingly active role in promoting sustainability in its operational activities. Initiatives have included:

- targeting packaging from School food outlets
- reducing water consumption
- reducing waste sent to landfill
- procuring from local and regional suppliers

These have reduced the School's environmental impact and have worked well to increase awareness of sustainability on campus, but have not made a significant impact on reducing measured carbon emissions. Energy and fuel use are the only measured sources of carbon emissions within this document, which is why the focus is on electricity and gas use within the plan.

Going forward from the first draft of this plan issued in 2011, London Business School will focus on reducing the carbon footprint of the estate, as well as encouraging employee and student participation in green issues through promotion of energy saving and energy awareness campaigns.

This document sets out a plan for the period to 2024/25 with a target for relative reduction in carbon emissions. The School will publicly report both absolute and relative progress against the target, and will regularly review the projects and measure savings to ensure that the reduction is achieved. The document has been updated to include data from current academic year (2022/2023)

It is important to note that at the same time as putting in place a plan to reduce absolute levels of carbon emissions, the School is committed to growth. As such it is prudent to expect an overall growth in site demand for energy if no energy savings were to take place.

## 2 – Carbon Management Strategy

### 2.1 – Context

Over the past decade, the UK has set a series of legally binding targets for reducing carbon emissions. The UK Climate Change Act 2008 set a target for reducing greenhouse gas emissions of 80% by 2050 and at least 34% by 2020 against a 1990 baseline. Most recently this has been escalated to a target to have 'net zero' greenhouse gas emissions by 2050.

Higher education is required to play its part in meeting these targets. In its statement of policy for carbon reduction in 2010, the Higher Education Funding Council for England (HEFCE) set out a target for the sector of 34% by 2020 against a 1990 baseline. Owing to the high level of growth in the sector from 1990, a 2005 baseline was recommended as a basis for looking forward, and the sector target is a 43% reduction against a 2005 baseline. Milestones to measure progress have been set at 12% reduction by 2012 and 29% reduction by 2017 against a 2005 baseline.

London Business School recognise the urgency of tackling climate change, and the part that carbon emissions from building energy use play in addressing this. London Business School have a plan in place to continue to reduce energy use. In 2011, London Business School set out targets in line with the HEFCE. Despite the closure of HEFCE, London Business School will continue to update their carbon management plan and use it as a tool for driving energy reduction at the school (although it is no longer a regulatory requirement) in recognition of the importance of achieving continuous reductions in energy use.

Legislation has been put in place to drive reductions in carbon emissions across the UK to meet the targets set by the Climate Change Act, a number of which apply to London Business School.

DECs – Display Energy Certificates are required for all public buildings with a footprint larger than 250m<sup>2</sup>. These provide information to building users of energy consumption within the building and provide an operational rating, showing the energy efficiency of the building on a graded scale, against a typical value. DECs are accompanied by an Advisory Report, which is designed to help building occupiers increase their energy efficiency and so improve their rating.

The London Plan - Planning policy for London is based on The London Plan, a spatial development strategy for Greater London. It stipulates that future developments within London must meet high standards of sustainable design and construction which exceed current building regulations. Within the standards, onsite renewable generation along with combined cooling, heat and power (CCHP) and combined heat and power (CHP) systems are encouraged wherever feasible. One of the main aims of the plan is to contribute to sustainable development within the UK. This framework could directly impact the School through future plans for growth; planning permission is partly dependent on the forecasted environmental performance of any new building. Whilst this makes planning new building work more complicated, it does mean that any building work undertaken by the School will be highly energy efficient and should lower the organisation's footprint on a kWh/m<sup>2</sup> basis.

As well as legislative drivers, environmental performance has become increasingly important in other respects. It is playing a more important role in overall reputation, as demonstrated by indicators such as the Emissions Reduction Pledge (which London Business School has signed up to), Beyond Grey Pinstripes international business school ranking and the People and Planet Green League of Britain's universities.

Commentators believe that energy prices are likely to continue to increase into the foreseeable future. As such, the School will, as will many other organisations, continue to experience the financial benefits of improving energy efficiency and reducing carbon emissions.

## 2.2 – Vision

London Business School's vision is to have a profound impact on the way the world does business, and the way business impacts the world. The School recognises the importance of engagement in sustainable development in the achievement of this vision. It aims to promote awareness of, and engagement in, sustainable development and to work towards achieving sustainable development in all aspects of its activity.

## 2.3 – Existing Policy, Strategy and Targets

In order to achieve the School's vision, the School's work will focus on the following strategic priorities:

- Elevate the LBS brand
- Harness the power of digital
- Increase the School's relevance globally

Work towards these priorities will be underpinned by a number of key initiatives, including the implementation of an estates master plan to increase the capacity and quality of the School's estate. A number of small scale capital projects designed to refurbish and enhance the quality of the campus will also take place. The delivery of the capital projects will be co-ordinated with ongoing work to ensure that the School's employees, customers and visitors continue to enjoy a healthy and safe working and learning environment. Plans for the projects include sustainability and energy strategies, with a focus on keeping energy use within the development to a minimum.

The School's sustainability policy covers a wide range of aspects of sustainability, and has the support of the Governing Body and the senior management. It is available to view on the School website and the internal portal. There is also a Sustainability Initiative, which will concentrate on the following five key themes, with the following objectives, which match the areas of activity within the policy:

- Energy and emissions – to reduce energy related carbon emissions in line with the Carbon Management Plan.
- Waste and recycling – to increase the recycling rate against non-recycling rate during each academic year.
- Technology – to reduce the amount of photocopying and paper we print by 20%. Additionally, a schoolwide PC upgrade strategy has been initiated, and will continue over the coming years.
- Health and Well being – to improve the physical, mental and financial wellbeing of the LBS community.
- Community – to contribute to the sustainability of our local community.

The goals of this carbon management plan are to:

- Implement and maintain an automated monitoring and targeting system in order to measure energy use in detail
- Carry out energy efficiency projects within the estate
- Engage staff, faculty and students in energy conservation and carbon management
- Meet the sector target for reduction in scope 1 and 2 carbon emissions – allowing the School to grow without growing carbon emissions.



## 3 – Emissions Base-lining and Forecasting

### 3.1 – Scope

This plan includes all scope 1 and 2 emissions. Scope 1 emissions are defined as 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 or vehicles. Scope 2 accounts for emissions from the generation of purchased electricity consumed by the organisation.

Scope 3 emissions are all other indirect emissions that are a consequence of the activities of the organisation, but occur from sources not owned or controlled by the organisation – for example commuting and procurement. As of April 2023, these are not included within the scope of this plan at this stage. However London Business School is currently undertaking analysis to quantify both upstream and downstream scope 3 emissions within the supply chain. This includes an analysis of the energy generated from operational waste that is being converted to energy through incineration.

London Business School operates from teaching and accommodation facilities in the Ratcliffe and neighbouring Plowden buildings, which face onto Regents Park, as well as the nearby Taunton Centre. Additionally, the school has extended teaching and other activities to the Sammy Ofer Centre building from the start of the 2017/18 academic year, and now has occupation of North Building.

The scope 1 and 2 carbon footprint of the School includes emissions from energy use in every building owned or leased by the School in the UK.

2021 saw the sale of three buildings on site – Lorne Close, 2-4 Huntsworth Mews and 36 Linhope Street. In early 2023 the lease for 17 Linhope Street came to an end and LBS no longer occupies this building.

### 3.2 – Baseline

SQW Consulting was commissioned by HEFCE to calculate estimated carbon baselines for all HE institutions. For the majority of institutions, 2005 data has been taken from the 2005-06 Estate Management Statistics (EMS) returned by universities. Total sector emissions for scopes 1 and 2 for 2005 were found to be 2.046 million tonnes of carbon dioxide (MtCO<sub>2</sub>), a 15% increase on 1990 figures.

The School's 2005 baseline, against which performance is measured, is a 3,822.05 tonnes of carbon dioxide (tCO<sub>2</sub>) carbon footprint. The total carbon emissions for the 2021/22 year were 1,885.88 tCO<sub>2</sub>; an absolute reduction of 50.7% on 2005 levels. Significant increases in gas and renewables generation and subsequent decreases in coal generation have resulted in an improved carbon content of supplied electricity; 2021/22 CO<sub>2</sub> factors for electricity decreased by 59.8% since the baseline. The 2019/20 academic year saw a very large drop in energy and associated carbon due to Covid-19 closures – a 24.5% drop on the previous year. The first months of 2021/22 also saw totals remaining at the lower level compared with pre-pandemic energy consumption, although with increased campus activity 2021/22 saw an overall increase in energy consumption compared with 2020/21.

Year	Gas (kWh)	Electricity (kWh)	Gas conversion (tCO <sub>2</sub> /kWh)	Electricity conversion (tCO <sub>2</sub> /kWh)	Gas emissions (tCO <sub>2</sub> )	Electricity emissions (tCO <sub>2</sub> )	Total emissions (tCO <sub>2</sub> )
<b>2005/06</b>	<b>5,357,825</b>	<b>6,034,122</b>	<b>0.00018366</b>	<b>0.00047033</b>	<b>984.0</b>	<b>2,838.0</b>	<b>3,822.1</b>
2006/07	4,514,077	5,682,201	0.00018366	0.00046359	829.1	2,634.2	3,463.3
2007/08	4,306,139	5,076,791	0.00018366	0.00049263	790.9	2,501.0	3,291.9
2008/09	4,475,593	5,396,955	0.00018366	0.00049054	822.0	2,647.4	3,469.4
2009/10	4,337,537	5,701,049	0.00018366	0.00048219	796.6	2,749.0	3,545.6
2010/11	5,451,708	5,833,213	0.00018366	0.00044917	1,001.3	2,620.1	3,621.4
2011/12	4,462,971	5,620,610	0.00018366	0.00045706	819.7	2,569.0	3,388.6
2012/13	5,119,550	5,450,028	0.00018366	0.00044238	940.3	2,411.0	3,351.2
2013/14	3,898,470	5,332,571	0.00018456	0.00049023	719.5	2,614.2	3,333.7
2014/15	4,996,346	5,041,031	0.00018407	0.00045850	919.7	2,311.3	3,231.0
2015/16	4,363,401	4,995,741	0.00018365	0.00040957	801.3	2,046.1	2,847.4
2016/17	4,464,093	5,278,036	0.00018381	0.00034885	820.5	1,841.2	2,661.8
2017/18	5,639,934	6,619,728	0.00018362	0.00028088	1,035.6	1,859.4	2,895.0
2018/19	5,132,074	6,526,439	0.00018385	0.00025358	943.5	1,655.0	2,598.5
2019/20	4,336,230	5,041,694	0.00018387	0.00023104	797.3	1,164.8	1,962.1
2020/21	4,854,774	4,365,574	0.00018282	0.00021016	887.6	917.5	1,805.0
2021/22	4,755,915	5,297,277	0.00018219	0.00019121	866.4	1012.8	1885.8
2022/23	4,857,491	5,483,398	0.00018219	0.00019121	884.99	1048.48	1,939.98

**Table 1 – Actual and current forecast carbon emissions for London Business School since 2005**

### 3.3 – Past Actions

The School has already undertaken a number of sustainability projects focused on energy savings, which have reduced scope 1 and 2 emissions:

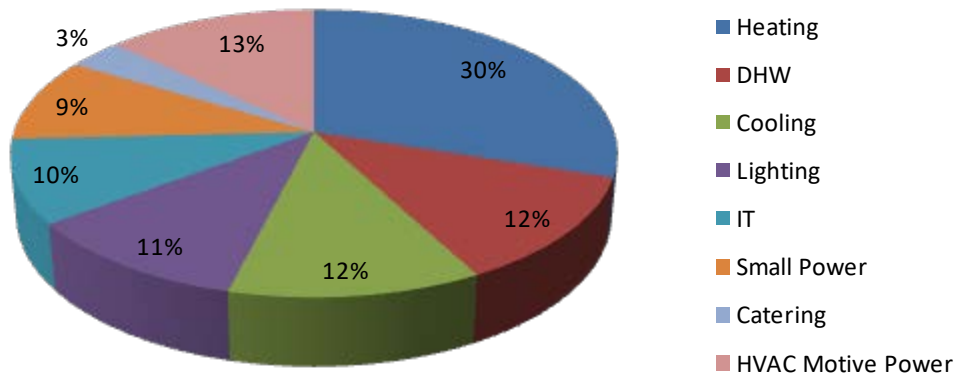
- Upgrading all PCs to Energy Star V5 compliant systems (ongoing schoolwide strategy in place to continually review and upgrade PCs and laptops)
- Implementing motion sensors to control lighting in interview and group study rooms in the Taunton Centre, the Nash Lounge, Park Road, A Wing seminar rooms, Huntsworth Mews and Linhope House
- Implementing continuous building management system (BMS) updates depending on day to day occupancy changes
- Extending the BMS to cover more of the campus, and upgrading for various buildings to align across the whole site
- Installing a swimming pool cover to reduce heat loss
- Rolling out LED lamps
- Installation of voltage optimisation units at the main incoming supplies
- Replacement of the Plowden and Sainsbury boilers for high efficiency, fully modulating types
- Moving the essential server load off site
- Replacing the main chiller plant with more energy efficient units

- Installing a sub-metering system across the main energy users on campus
- Decentralisation of the Plowden Domestic Hot Water plant; point of use water heaters are now installed - no domestic hot water stored on the main campus
- Replacing the motors and fans in the air handling units that supply Lecture Theatres 1-6.
- The hot and cold water system on the main campus has been upgraded. The first phase included installation of boosters for the supply and installation of point of use water heaters in all areas excluding the B wing bedrooms.
- Undertaking optimisation of HVAC plant via BMS at the Sammy Ofer Centre.
- Replace North Building roof.
- Extract fans replaced across site.

### 3.4 – Initial Energy Performance

In developing this carbon management plan, an energy reduction survey was carried out in 2011 and energy mapping was undertaken to identify how energy was being used across the campus at that time (see figures 2 and 3 below). A number of areas came out as having high usage, particularly the low temperature hot water (LTHW) and domestic hot water (DHW) services, together with heating, ventilating and air conditioning (HVAC) motive power. This indicated where savings were possible, and projects were identified to minimise energy use in these areas.

**LBS - Energy Consumption (kWh/yr)**



**Figure 2 – Energy use (kWh) in 2011 for London Business School**

### LBS - Energy Carbon Emissions (tCO<sub>2</sub>/yr)

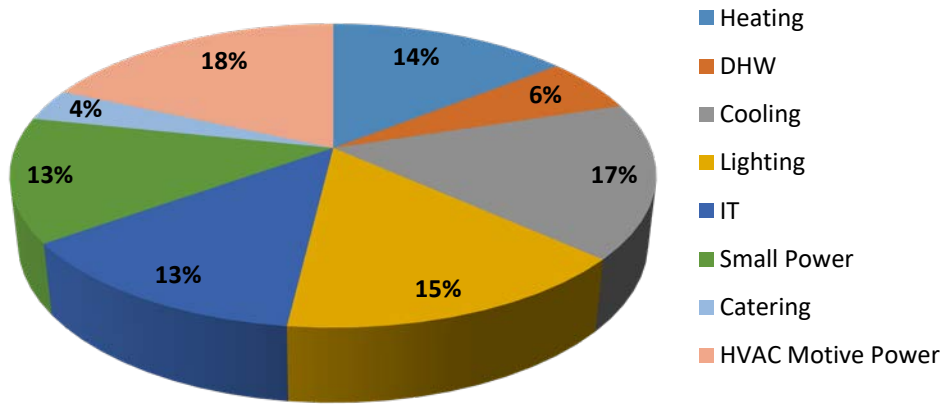


Figure 3 – Energy use (tCO<sub>2</sub>) in 2011 for London Business School

In autumn 2015 a further energy mapping exercise was carried out as part of a further energy survey as required as part of the Energy Savings Opportunity Scheme (ESOS), for which London Business School qualified. The results for the 2015 survey are given below:

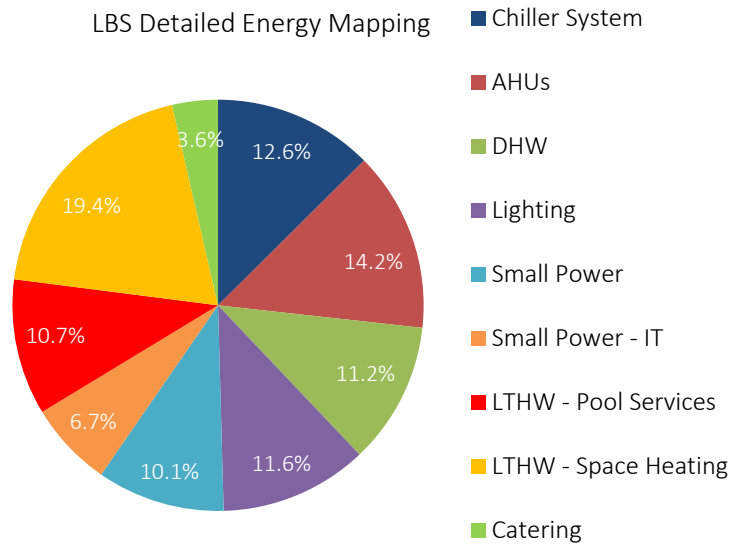


Figure 4 – Energy use (kWh) in 2015 for London Business School

This more recent mapping showed a decrease in IT consumption, due to the reduction in on-site server capacity, but an increase in the level of other small power (which includes employee and student laptops and other electronics). Other than catering services, the proportion of energy used for building services has stayed fairly constant, although in real terms has decreased.



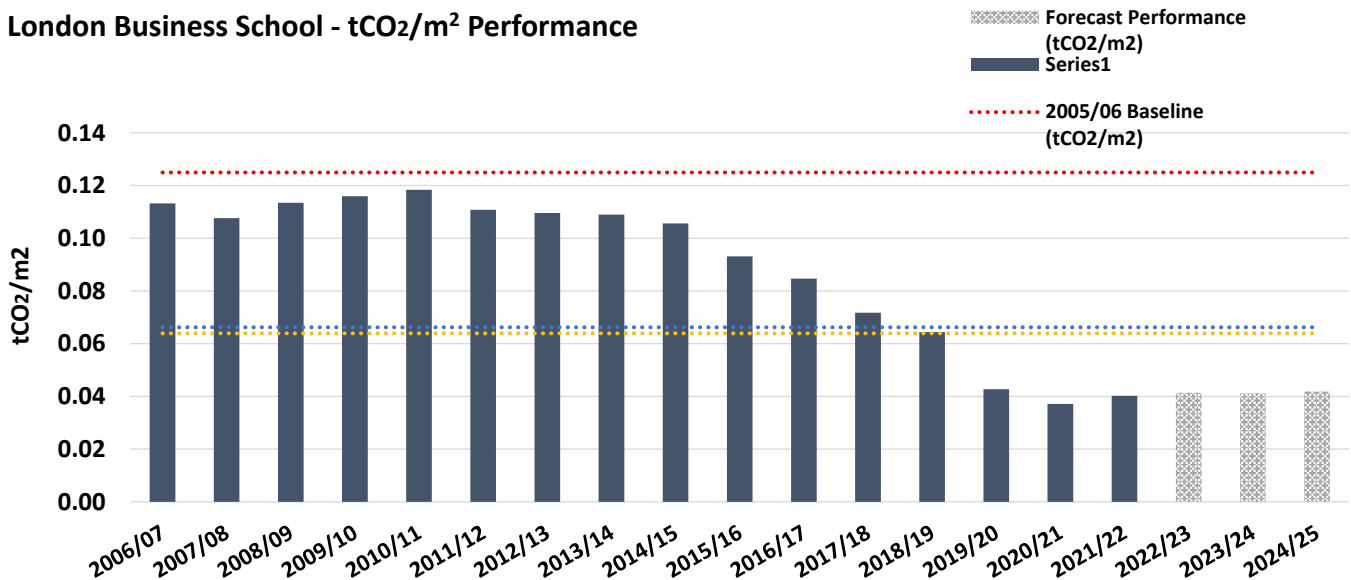
### 3.5 – Projections

As set out in its strategic priorities, the School will continue to expand its programme portfolios. To support this planned growth, the School extended teaching and other activities to the new Sammy Ofer Centre building from the start of the 2017/18 academic year. Further development of the main campus has seen the School acquire the neighbouring 27 Sussex Place building (North Building) from the Royal College of Obstetricians and Gynaecologists.

To allow for the planned expansion of the School, this carbon management plan includes both expected reductions and increases in carbon emissions owing to factors going forward. There is an estimate of the energy consumption of the new buildings (based on current energy use, the GIA and the ECG054 benchmarks), as well as an annual increase in use of small power such as PCs, printers and other devices. These increases have been taken into account in the forecast emissions and the reductions targets going forward. Savings resulting from projects in one academic year have been counted going forward from the next year.

The previous and forecast performance against the target is shown in the graph below. Beyond 2022/23, forecast energy use has been based on the 2021/22 year, with planned reductions, sales and expansions added. 2019/20 and 2020/21 and in part 2021/22 have been treated as anomalous years due to covid restrictions.

Figure 5 – Forecast emissions based on the actions in the implementation plan and planned expansion



### 4 – Emissions Reduction Targets

London Business School has set a target of 47% relative reduction in scope 1 and 2 carbon emissions by 2024/25 against a 2005 baseline. This is reported based on the energy use per unit of floor area across the campus.

This is based on carrying out all the actions in the implementation plan, which are challenging yet achievable with the School's resources. Recent savings are broadly broken down as follows:

- In 2019/20, a 65.8% reduction in carbon emissions/m<sup>2</sup> was achieved against the 2005 baseline
- In 2019/20, a 48.7% reduction in absolute, total carbon emissions was achieved against the 2005 baseline.
- In 2020/21, a 70.3% reduction in carbon emissions/m<sup>2</sup> was achieved against the 2005 baseline
- In 2020/21, a 52.8% reduction in absolute, total carbon emissions was achieved against the 2005 baseline.
- In 2021/22, a 67.8% reduction in carbon emissions/m<sup>2</sup> was achieved against the 2005 baseline
- In 2021/22, a 50.6% reduction in absolute, total carbon emissions was achieved against the 2005 baseline.
- In 2022/23 a projected 66.9% reduction in carbon emissions/m<sup>2</sup> against the 2005 baseline
- In 2022/23, a projected 48.7% reduction in absolute, total carbon emissions against the 2005 baseline

This will be achieved through following the implementation plan, which sets out projects along a timeline to 2025.

#### 4.1 – Milestones

In order to track interim progress against the 2024/25 target, milestones have been created along the timeline. These are not necessarily evenly spread, but are based on the initial timing of projects from the original plan.

The summary of the milestones is as follows:

Year	London Business School Target Reduction on 2005 Emissions (%)	HEFCE Sector Target Reduction on 2005 Emissions (%)	Actual London Business School Carbon Emissions/m <sup>2</sup> Reduction (%)
2005-06	0%	0%	0%
2009-10	7.6%		7.6%
2012-13	12%	12%	12.3%
2017-18	29%	29%	42.6%
2020-21	43%	43%	70.3%
2024-25	47%	N/A	

**Table 2 – Carbon reduction target milestones**

The reduction in carbon emissions/m<sup>2</sup> achieved by London Business School at 2012/13 compared to 2005/06 was 12.3%. This matched the HEFCE target for this milestone. 2017/18 was 42.6% down on the base year.

This surpassed the milestone target for this year. The 43% target was reached and surpassed in 2019/20, and 2021/22 performance saw a 67.8% reduction on the base year.

## 5 – Implementation Plan

The implementation plan contains details of projects that will be carried out in order to work towards maintaining and exceeding the 43% target reduction in carbon emissions. Savings estimates are based on consultants' experience of similar projects, and where a range of results is possible, the most conservative has been used.

The building potential has been continuously reviewed since the plan was originally put in place, and individual projects have been added, adjusted or taken off the plan as technology in the field develops.

Project	Year	Project Costs (£)	Annual Project Savings		
			(kWh)	(£)	(tCO <sub>2</sub> e)
EN1 – Add further sub-metering to measure all main plant and areas	2022/23	£3,900	21,189	£6,664	4.05
EN2 – Install sub-metering and monitor main meters in the North Building	2022/23	£20,000	7,042	£2,464	1.34
BMS Upgrade & boiler & chiller upgrade in North Building	2021-23	£679,800	99,463	£13,437	18.4
EN4 – Improve type and control of lighting across estate	2018-25	£87,500	20,800	£6,921	3.9
EN5 – AHU refurbishment and replacement programme	2019- 2023	£128,011	182,710	£63,948	34.9
EN6 – Add BMS lighting control for Lecture Theatres	2021-23	£38,280	22,714	£7,949	4.3
EN7 – Link various VRV/VRF units to central controllers and link back to BMS	2021 - 23	£81,546	62,370	£20,519	11.9
EN8 – Install VSDs onto unregulated fans and pump sets	2018-2023	£50,000	41,369	£14,479	7.9
EN9 – Schoolwide PC upgrade	2020-25	£TBC	71,580	£25,053	16.5
EN10 – Implement a demand side response programme across the estate	2021-23	£12,960/year	115,965	£36,475	22.2
EN11 – Hot and cold water upgrade	2019-2023	£250,000	154,776	£9,286	28.5
EN12 – Window replacements at Main Campus	2022/23	£1,400,000	189,307	£11,358	34.8
EN13 – On site generation	2022/23	£TBC	TBC	TBC	TBC
EN14 – Lighting controls to reduce out of hours use	2019 -2023	£40,000	49,928	£17,474	9.5
Totals		£2,791,997	1,039,213	£236,027	198.19

**Table 3 – Summary of projects in the implementation plan**



## EN1 – Add further sub-metering to measure all main plant and areas

<b>Project Start Date</b>	FY 2022/23	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£3,900	<b>Funding stream</b>	Annual improvements energy efficiency budget
<b>Annual Savings</b>	21,189kWh	£6,664	4.05tCO <sub>2</sub> e

### Details

The School has a high number of automated sub-meters in place across the main campus buildings.

A number of gaps have been identified in the existing sub-metering, across the Ratcliffe, Plowden, Taunton and Sammy Ofer buildings. From the main supplies, around 60% of the total electricity consumption is sub-metered. Further electric sub-meters will be installed to cover the rest of the main plant and areas. This will give a full map of where electricity is used and the profiles, allowing areas of waste to be identified.

There are also some areas where there would be a benefit to installing further sub-metering downstream of the main mechanical plant distribution boards, to give a higher level of detail on which pumps, AHUs etc. are running. These have not been included in the cost figures above, but could be considered once complete coverage of the main campus has been achieved.

To minimise disturbance these works will be undertaken during the summer break as a power shut down will be required.

### Risks

The aM&T system itself will not save energy, but it will allow energy saving opportunities to be identified, and after implementation, measured through the collection of energy data. Further sub-metering could be used to increase departmental awareness and ownership of their energy use. Energy use could be reduced through transferring costs to departments or offering incentives to cut use.

There is therefore a risk that the stated savings will not be achieved – or if they are achieved initially, could reduce over time. It is key that processes are put in place that use the energy data regularly, and that reporting is updated to remain as interesting and fresh to stakeholders as possible.

### Next Steps

- Gaps in sub-metering specified and metering proposal received
- Carry out installation works
- Add new sub-meter data to the existing system

## EN2 – Install sub-metering and monitor main meters in the North Building

<b>Project Start Date</b>	FY 2022/23	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£20,000	<b>Funding stream</b>	Annual improvements energy efficiency budget
<b>Annual Savings</b>	7,042kWh	£2,464	1.34tCO <sub>2</sub> e

### Details

The School has a high number of automated sub-meters in place across the main campus buildings.

Currently there are none installed in the North Building. It is planned that sub-meters will be added onto the main plant and other significant distribution boards at a similar level of granularity as the rest of the campus.

The new sub-metering is planned to be installed before July 31<sup>st</sup> 2023.

### Risks

The aM&T system itself will not save energy, but it will allow energy saving opportunities to be identified, and after implementation, measured through the collection of energy data. Further sub-metering could be used to increase departmental awareness and ownership of their energy use. Energy use could be reduced through transferring costs to departments or offering incentives to cut use.

There is therefore a risk that the stated savings will not be achieved – or if they are achieved initially, could reduce over time. It is key that processes are put in place that use the energy data regularly, and that reporting is updated to remain as interesting and fresh to stakeholders as possible.

### Next Steps

- Distribution boards to be metered specified and metering proposal received
- Carry out installation works
- Add new sub-meter data to the existing system

## EN3 – BMS Upgrade & boiler & chiller upgrade in North Building

<b>Project Start Date</b>	FY 2022/23	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Total Cost</b>	£679,800	<b>Funding stream</b>	BMS budget
<b>Annual Savings</b>	99,463kWh	£13,437	18.4 tCO <sub>2</sub> e

### Project Details

The Building Management Systems across the portfolio have all been upgraded so that they are now aligned. Any outstanding issues following this work have now been addressed, and the system is operating effectively.

This project includes upgrading the Building Management System (BMS) at North Building to bring it in line with the Trend IQ Vision control across the rest of the campus. The graphics have been completed, so that the system can be accessed from the same central system as the rest of the campus, but the controllers are still the originals. The upgrades for these will follow in line with the upgrades of the rest of the main plant in the North Building. The boiler and chiller replacement as well as the BMS upgrade work is ongoing as is set to be complete by mid-October. The chiller upgrades have not been rolled out yet, but will follow. The budget stated includes the asset replacement work. Annual savings are currently based on the BMS upgrade improvements alone but it can be assumed that further savings will be achieved through the improved efficiency of the new boilers and chillers.

The chiller is due to be upgraded during the summer of 2023.

### Risks

There are no risks associated with this project, providing the emphasis is on maintaining and improving comfort conditions for employees and students, with a by-product of energy savings from the improved measures.

### Next steps

- Project underway

## EN4 – Improve type and control of lighting across estate

<b>Project Start Date</b>	September 2014	<b>Project Completion Date</b>	July 2025
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Total Cost</b>	£6,000/year (planned £50,000 influx in 2021/22 to accelerate project)	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	20,800kWh/year	£6,921/year	3.98tCO <sub>2</sub> e/year

### Project Details

Lighting is provided by a variety of lamp types and sizes of an overall average efficiency. Lighting improvements have been undertaken, including replacement of halogen dichroic lamps and T12 fluorescents with LEDs. This includes around 90% of the lighting in the North Building, and in some lecture theatres on other parts of the campus.

Further lighting improvements are planned. This includes conversion of the B Wing bedrooms, which will include replacement of old lighting as part of an overall refurbishment. The original project savings and costs were based on replacing 200 lamps every year throughout the estate spread over 10 years. These new lamps will use on average 104kWh/year less than the existing stock. The annual savings above represents the replacement of 200 lamps per year over the foreseeable future, in line with refurbishments of different areas of the School.

This project is still ongoing and currently upgrades are being undertaken to the teaching areas with expected completion by 31<sup>st</sup> July 2023. The current phase of work is to include LED upgrades and new lighting controls at:

- LT1
- LT6
- RG06
- LT3
- NUFFIELD HALL
- COUNCIL CHAMBER

### Risks

In order to keep the lighting types to a narrow range of lamps, any new refurbishments in particular areas or additional lighting should be kept in line with lamps used in other areas.

### Next steps

- Continue to implement lighting replacement programme



## EN5 – AHU refurbishment and replacement programme

<b>Project Start Date</b>	2020/21	<b>Project Completion Date</b>	July 2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£128,000	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	182,710kWh	£63,948	34.9tCO <sub>2</sub> e

### Project Details

The air handling units around the School vary in age and condition. Many have belt drives, and the motors are not variable speed.

A programme is in place to replace fans and motors for the AHUs.

The first phase of these staged works included the replacement of the motors and fans in the 2 air handling units that supply Lecture Theatres 1 – 6, which was completed over summer 2019.

The E Wing toilet extract fans were then both replaced in the spring of 2021. The A Wing toilet and kitchen extract fans were completed during Christmas 2021. Going forward the next the rollout will be continued across the E wing with expected completion in July 2023.

Further phases of works will then be scoped based on the records of the age, size and type of the air handling units around the School, including AHUs at North Building once they come into LBS responsibility.

### Risks

-

### Next steps

- Finalise staged programme of replacement and refurbishment works
- Price improvement works
- Timetable AHU downtime to install, refurbish and commission parts and system
- Monitor performance and associated savings

## EN6 – Add lighting controls for Lecture Theatres and seminar rooms

<b>Project Start Date</b>	2021/22	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£38,280	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	22,714kWh	£7,949	4.34tCO <sub>2</sub> e

### Project Details

The lighting in the lecture theatres is currently controlled locally from the front of the theatre or from the main entrance.

If these circuits are added to the new BMS system, then the lighting schedule can be checked from a central location, so there is less danger of the lights being left on when groups leave the theatres.

This project has started in the seminar rooms – 10 rooms Ratcliffe 1<sup>st</sup> floor, now link lighting to the HVAC plant, and controllers allow HVAC and lighting to be brought on once they are occupied, but then revert back to default status once the room has been vacated. 12 rooms in the E Wing have also been completed, covering the ground and first floor and group rooms in the North Building.

One lecture theatre has already been fitted with the new lighting controls, this work will be extended to the remaining lecture theatres.

### Risks

-

### Next steps

- Await feedback on operation of seminar room control
- Address any issues, and roll out across further rooms
- Carry out detailed scoping of current and required lighting controls in lecture theatres.

## EN7 – Link various VRV/VRF units to occupancy controllers

<b>Project Start Date</b>	2021/22	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£81,546	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	62,370kWh	£20,519	11.9tCO <sub>2</sub> e

### Project Details

Within the School there are a number of VRV/VRF units in order to provide local comfort cooling, which are not part of the central cooling system. They are therefore controlled locally.

It is possible to link these all back to the central building management system, so that the scheduling and set points for each unit can be controlled as part of the overall building strategy rather than according to the preference of the user. It would be possible to give a level of local control, but have the unit revert to central control after a set period of time.

The North Building Seminar Rooms have been completed and works are due to commence on the North Building staff areas. There are also 12 rooms in the E Wing which have also been completed, covering the ground and first floor; the three other floors in E Wing are also planned to be completed this year. As part of the B wing refurbishment project 3 floors will be upgraded with VRF and associated controls.

### Risks

-

### Next steps

- Carry out detailed scoping of range and number of VRV/VRF units around the School.

## EN8 – Install VSDs onto unregulated fans and pump sets

<b>Project Start Date</b>	December 2018	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Cost</b>	£50,000	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	41,369kWh	£14,479	7.9tCO <sub>2</sub> e

### Project Details

There are pump sets around the School campus that currently run at a fixed speed, regardless of demand. A variable speed drive can be installed onto these in order to vary the run speed to match the demand. This will result in energy savings.

The first phase of this included the fan for the Sussex Place kitchen extract fan, which was upgraded in December 2018. The other areas completed project are the E Wing as of summer 2021 and more recently the A wing kitchen extract fan and A wing toilet extract fans have been upgraded.

### Risks

-

### Next steps

- Carry out detailed scoping of current unregulated pump sets.

## EN9 – Schoolwide PC Upgrade

<b>Project Start Date</b>	July 2016	<b>Project Completion Date</b>	July 2025
<b>Owner</b>	Head of Estates	<b>Support</b>	Project Manager
<b>Cost</b>	£Ongoing	<b>Funding stream</b>	Estates budget
<b>Annual Savings</b>	71,580kWh/year	£25,053/year	16.5tCO <sub>2</sub> e

### Project Details

London Business School has been undertaking a schoolwide PC upgrade strategy, which is currently underway. The roll out will continue over the coming years. All new PCs and laptops are ENERGY STAR qualified.

ENERGY STAR qualified computers use energy efficient power supplies, operate efficiently in multiple modes of operation (Off, Sleep, and Idle), take advantage of power management features, and provide user education about these features.

Annual savings are based on a percentage of the total PCs across the school been upgraded each year.

This is an ongoing project which is being managed by the IT department.

### Risks

- The PCs are being replaced through a planned programme, with gradual replacement taking place to give plenty of flexibility in case of issues arising from replacement in particular areas.

### Next steps

- Continue PC roll out.

## EN10 – Implement a Demand Side Response (DSR) Programme across the estate

<b>Project Start Date</b>	2022/23	<b>Project Completion Date</b>	2024
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Total Cost</b>	£12,960/year	<b>Funding stream</b>	
<b>Annual Savings</b>	115,965kWh	£36,475	22.2 tCO <sub>2</sub> e

### Project Details

Now that London Business School have an electricity contract with pass through network charges, it is possible to make further savings by implementing an active Demand Side Response (DSR) programme.

In simple terms, DSR is about using the minimum amount of energy at the most expensive times and transferring the consumption to the cheaper time periods.

Savings are achieved through 5 key areas:

1. Reducing the amount of energy/load used during expensive 'Distribution Use of System' (DUOS) charging periods.
2. Reducing the amount of energy/load used during 'TRIAD' periods.
3. Reducing each building's Maximum Demand.
4. Reducing the amount of energy used during the most expensive energy purchase periods (Arbitrage).
5. Improved commodity unit price (at next contract fix), due to more attractive energy profile being available to the selected electricity supplier.

This project is yet to commence



### Risks

If LBS started moving usage from cheaper times of day to the more expensive periods, there is a chance that overall energy costs could rise under this contract.

We therefore need to put in place controls to ensure that demand during Triad periods is kept low, and the energy profiles are trimmed during the early evening peak period.

### Next steps

- Identify areas/plant for DUoS and Triad reductions
- Discuss and agree changes
- Implement, test and commission changes
- Provide ongoing monitoring of user comfort and verification of savings

## EN11 – Hot and cold water upgrade

<b>Project Start Date</b>	2019	<b>Project Completion Date</b>	2023
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Total Cost</b>	£250,000	<b>Funding stream</b>	
<b>Annual Savings</b>	154,776kWh	£9,286	28.5tCO <sub>2</sub> e

### Project Details

The hot and cold water system on the main campus is being upgraded. Phase 1 of the project was completed in August 2019.

The first phase included installation of boosters for the supply and installation of point of use water heaters in all areas excluding the B wing bedrooms.

The second phase of the project has now commenced in the B Wing, where bedrooms have been converted to office space. The works are due to be completed in July 2023.

### Risks

Carrying out the project in two phases will mean that the savings will be somewhat delayed, but will mean that the second phase will fulfil the final requirements, with no further changes to the building use due.

### Next steps

- Monitor performance of boosted system and point of use water heaters from phase 1
- Carry out phase 2 of the project

## EN12 – Window replacements at Main Campus

<b>Project Start Date</b>	2021/22	<b>Project Completion Date</b>	2025
<b>Owner</b>	Head of Building Services	<b>Support</b>	Project Manager
<b>Total Cost</b>	£1,400,000	<b>Funding stream</b>	-
<b>Annual Savings</b>	189,307kWh	£11,358	34.8 tCO <sub>2</sub> e

### Project Details

32 timber box windows and all of the secondary glaze have been replaced on the first floor of Plowden Building.

Planning permission has been obtained to replace 454 listed windows. The window replacements will take place in 3 phases:

- Phase 1 – June/July 2023: A & B Wing
- Phase 2 – June/July 2024: Ratcliffe
- Phase 3 – June/July 2025: Plowden Building

### Risks

As this is an asset replacement that is required for a number of reasons, the units will not simply be chosen based on energy efficiency. Other factors such as aesthetics will be central to the decision. This will ensure that all stakeholders are happy with the replacements.

### Next steps

- Calculate heat losses through existing windows.

EN13 – On-site generation			
Project Start Date	2022/23	Project Completion Date	TBC
Owner	Head of Building Services	Support	Project Manager
Total Cost	£TBC	Funding stream	
Annual Savings	TBCkWh	£TBC	TBCt CO <sub>2</sub> e

#### Project Details

#### EXPLORED FEASIBILITY ON SOLAR ON ADDITIONAL BUILDING. LIMITATIONS ON FURTHER EXPANSION.

Following from the installation of PV cells onto the Sammy Ofer Centre, the School has scope to expand on-site renewable or non-renewable generation.

This could include an extension to the SOC PV cells, installation of PV cells onto other buildings, installation of CHP plant or addition of micro gas turbine engines.

The options need to be explored in order to commit to the most appropriate technology or technologies.

The energy efficiency budget will be used to improve the currently installed Sammy Ofer Centre PV cells. The feasibility of additional on-site generation has been explored, but there are limitations to further expansion of on-site generation capacity.

#### Risks

There is a performance risk with on-site generation that it does not operate as designed. This is minimal with more mature technologies such as PV (although an inflated output is likely to be quoted by some installers and suppliers). There is also a regulatory risk that the regulatory framework surrounding on-site generation will change in future. Although operating projects should be protected from these changes once in place, it could impact the feasibility during the planning process.

**Next steps**

- Assess feasibility of different on-site generation options at different locations.

EN14 – Lighting controls to reduce out of hours use			
Project Start Date	Dec 2019	Project Completion Date	2023
Owner	Head of Building Services	Support	Project Manager
Total Cost	£40,000	Funding stream	
Annual Savings	49,928kWh	£17,474	9.5tCO <sub>2</sub> e

**Project Details**

A number of opportunities for automated lighting controls have been identified across the campus. The scope of these is currently being finalised, to ensure that the correct method of control is identified in each case and the energy savings maximised.

The savings figures above are based on the 2012/13 academic year as a basis for current lecture theatre lighting usage.

In 2020/21 lighting controls were installed in Ratcliffe 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> floors. Circulation areas and corridors are being targeted for the further roll outs. Ratcliffe Lower Ground level and the North Building education centre are the next two areas to be targeted.

## Risks

There is a risk with lighting controls that adding automated controls may not improve the run hours to the extent estimated – manual control may already be delivering lower run hours than expected. To try to avoid this, we have conducted out of hours surveys to see how these areas are occupied in the evenings, so we can target areas with poor manual control, or low occupancy.

## Next steps

- Scope lighting control opportunities
- Tender for installation works
- Carry out installation of controls
- Monitor energy use and lighting provision for end users

## 5.1 – Sources of Financing

London Business School has sources of funding for projects within the implementation plan as follows:

- £150,000 current annual budget specifically for energy efficiency measures, which will be varied year on year to meet the forecast costs of planned projects. During the 2018/19 year it was £250,000 in order to include the hot and cold water upgrade project. Major projects for energy efficiency were delayed over the 2020/21 year, and funding paused. The £50,000 budget will be focused this year on upgrading fluorescent/halogen lighting to LED in various areas of the Campus.
- There is a £210,000 separate budget in place for the window replacement project.
- There was a £1.1M separate budget in place for the North Building roof replacement project (now complete).
- The boiler, chiller, Huntsworth Mews and data centre move projects were funded separately as individual asset replacement projects.
- Salix Energy Efficiency Loans Scheme (SEELS) funding was secured for historic Voltage Optimisation and lighting replacement projects, but has not been used for more current projects.
- Additional £100,000 added to the BMS budget for previous years when the upgrade project was in place across the campus (this does not include North Building).

- An annual budget is also planned for refurbishment of areas going forward. This will be used to fund lighting replacement and controls in some existing areas. Where necessary, replacement of small items of old or faulty equipment within other building services will be carried out. Savings from small works of this nature are not included within the plan, but are expected to result in savings of between 1 and 2% for each building that is refurbished on top of the planned projects. Major projects for energy efficiency were delayed over the 2020/21 year.

## 6 – Carbon Stakeholder Engagement

### 6.1 – Strategic Process

The School is committed to effective communication with stakeholders on sustainability practices and progress against targets. A plan for communication of issues relating to carbon management and the carbon management plan is outlined in sections 6.2 and 6.3 below.

### 6.2 – Identifying Stakeholders

Key stakeholders are identified in the table below.



Name/Position	Interest	Specific Indicators	Method of Communication
Governing Body	<ul style="list-style-type: none"> <li>o Reputation of School</li> </ul>	<ul style="list-style-type: none"> <li>o Progress against carbon management plan and targets</li> </ul>	<ul style="list-style-type: none"> <li>o Progress summaries submitted to Governing Body meetings</li> </ul>
Secretary	<ul style="list-style-type: none"> <li>o Reputation of School</li> <li>o Compliance with legislation and HEFCE requirements</li> <li>o General carbon management</li> </ul>	<ul style="list-style-type: none"> <li>o Progress against carbon management plan and targets</li> </ul>	<ul style="list-style-type: none"> <li>o Progress summaries submitted to Governing Body and Health, Safety and Environment Committee meetings</li> </ul>
Head of Building Services	<ul style="list-style-type: none"> <li>o Progress of current projects</li> <li>o Planning of upcoming projects</li> <li>o Budget planning</li> <li>o Compliance with legislation and HEFCE requirements</li> </ul>	<ul style="list-style-type: none"> <li>o Detailed progress against project timelines</li> <li>o Updated carbon management plan</li> <li>o Progress against carbon management plan and targets</li> <li>o Legislative updates</li> </ul>	<ul style="list-style-type: none"> <li>o Project timelines and notes</li> <li>o Provide progress reports to Estates Strategic Steering Committee</li> <li>o Amendments to carbon management plan</li> </ul>
Deputy Secretary	<ul style="list-style-type: none"> <li>o Compliance with legislation and HEFCE requirements</li> <li>o Progress of current projects</li> <li>o Planning of upcoming projects</li> </ul>	<ul style="list-style-type: none"> <li>o Detailed progress against project timelines</li> <li>o Progress against carbon management plan and targets</li> <li>o Legislative updates</li> <li>o Updated carbon management plan</li> </ul>	<ul style="list-style-type: none"> <li>o Project timelines and notes</li> <li>o Provide progress summaries to relevant stakeholders</li> <li>o Amendments to carbon management plan</li> </ul>
Project Manager	<ul style="list-style-type: none"> <li>o Progress of current projects</li> <li>o Planning of upcoming projects</li> <li>o Resource allocation</li> </ul>	<ul style="list-style-type: none"> <li>o Detailed progress against project timelines</li> <li>o Updated action plan from carbon management plan</li> </ul>	<ul style="list-style-type: none"> <li>o Project timelines and notes</li> <li>o Provide regular updates to Head of Buildings Management.</li> </ul>
Health, Safety and Environment Committee	<ul style="list-style-type: none"> <li>o Progress of current projects</li> <li>o Factors that might affect the plan</li> <li>o Updating the plan</li> </ul>	<ul style="list-style-type: none"> <li>o Progress against carbon management plan and targets</li> <li>o Updated carbon management plan</li> </ul>	<ul style="list-style-type: none"> <li>o Progress summaries submitted to meetings, and the 6 monthly updates are signed off.</li> </ul>

School employees, student body and alumni	<ul style="list-style-type: none"> <li>o Working practices and environment</li> <li>o Awareness of promoted actions and practices</li> <li>o General carbon management</li> </ul>	<ul style="list-style-type: none"> <li>o Progress against carbon management plan and targets</li> <li>o Awareness actions</li> </ul>	<ul style="list-style-type: none"> <li>o Publicly available on School website and Portal intranet</li> <li>o Other communication channels including email, School newsletters and surveys</li> </ul>
Catering, cleaning, security and out of hours staff	<ul style="list-style-type: none"> <li>o Working practices and environment</li> <li>o Awareness of promoted actions and practices</li> <li>o General carbon management</li> </ul>	<ul style="list-style-type: none"> <li>o Progress against targets</li> <li>o Awareness actions</li> </ul>	<ul style="list-style-type: none"> <li>o Specific information in service level agreements</li> <li>o The Carbon Management Plan is publicly available on School website</li> </ul>
Suppliers and contractors	<ul style="list-style-type: none"> <li>o Awareness of carbon policy</li> <li>o Specific School requirements</li> </ul>	<ul style="list-style-type: none"> <li>o Signposting to sustainability policy, and carbon management plan</li> </ul>	<ul style="list-style-type: none"> <li>o The Carbon Management Plan is publicly available on School website</li> </ul>
Prospective students and employees	<ul style="list-style-type: none"> <li>o Reputation of School</li> <li>o School attitude and commitment to carbon management</li> </ul>	<ul style="list-style-type: none"> <li>o Signposting to sustainability policy, and carbon management plan</li> </ul>	<ul style="list-style-type: none"> <li>o The Carbon Management Plan is publicly available on School website</li> </ul>

**Table 5 – Identified stakeholders and their interest in the carbon management plan**

### 6.3 – Internal Communication

Issues relating to sustainability are currently communicated to employees and students of the School in the following ways:

- The sustainability policy, carbon management plan and corporate plan reports are made publicly available on the School’s website and intranet Portal
- The commitments outlined in the sustainability policy are communicated to all new starters, together with information on how to get involved in achieving the sustainability targets and a route for suggestions and ideas

The following key communication channels will be used to ensure that all stakeholders remain updated on London Business School’s carbon management plan and associated projects. Where possible these communications will be electronic rather than in hard copy.

Specific Indicators	Communication Method	Responsibility	Frequency
Progress against carbon management plan and targets	Summary report – included within papers for meetings of the Governing Body and communicated to other relevant stakeholders. Also published on website and Portal.	Deputy Secretary	Six-monthly
Updates and amendments to carbon management plan	When the carbon management plan is reviewed, amendments will be communicated to Health, Safety and Environment Committee and other relevant stakeholders, and the new issue of the plan will be made publicly available.	Head of Building Services & Deputy Secretary	Six-monthly
General progress against plan	Inclusion onto agenda of the Health Safety and Environmental Committee	Head of Building Services	Six-monthly
Awareness of actions	Information will vary – energy awareness material is more effective when methods and messages are regularly refreshed.	Deputy Secretary	Varying

**Table 6 – Summary of planned communications relating to the carbon management plan**

### 6.4 – Influence and Outreach

One of the objectives of the sustainability policy is to develop ties with the School’s surrounding community in order to reduce collective environmental impact. Actions to support this objective include the development of a Community Action Group, which makes a positive contribution to employee volunteering in the community and the donation of unwanted resources to local charities. The School allows for specific volunteering days. The School has introduced a cycle to work scheme for staff and faculty – which had its funding increased in the 2020/21 academic year- and invested in communications technology to provide alternatives to travelling to meetings.

In terms of carbon reduction, these community outreach activities will contribute to the reduction of scope 3 carbon emissions and the emissions of other organisations, rather than the energy related scope 1 and 2 emissions which are the focus of this carbon management plan.

## 6.5 – Future-Proofing

This carbon management plan has been based on the current strategies and plans that the School has for the future. Whilst this has made the plan as robust as possible, the plan will need to respond to changes. The ultimate goal of the plan is to achieve a 47% reduction in scope 1 and 2 carbon emissions through conducting energy saving projects and entrenching low carbon practice within the School's routine. If any aspects of the School's policy or plans change, then it is essential that this goal can still be achieved.

For each energy saving project, a specific KPI will be established to measure success. One of the actions within the implementation plan was to put into operation an automated monitoring and targeting system, with the installation of sub-meters on main plant and in other areas (now complete). This will make it possible to confirm the level of energy reduction for each project. Should it be necessary for the scope of one of the projects to change, or that upon completion the savings are not as high as estimated, action will be taken to identify another opportunity for carbon reduction, and a budget requested and an owner nominated. Carbon savings will be reviewed termly, in detail by the Estates Strategic Steering Committee, and at a higher level by the Health, Safety and Environment Committee alongside other sustainability issues.

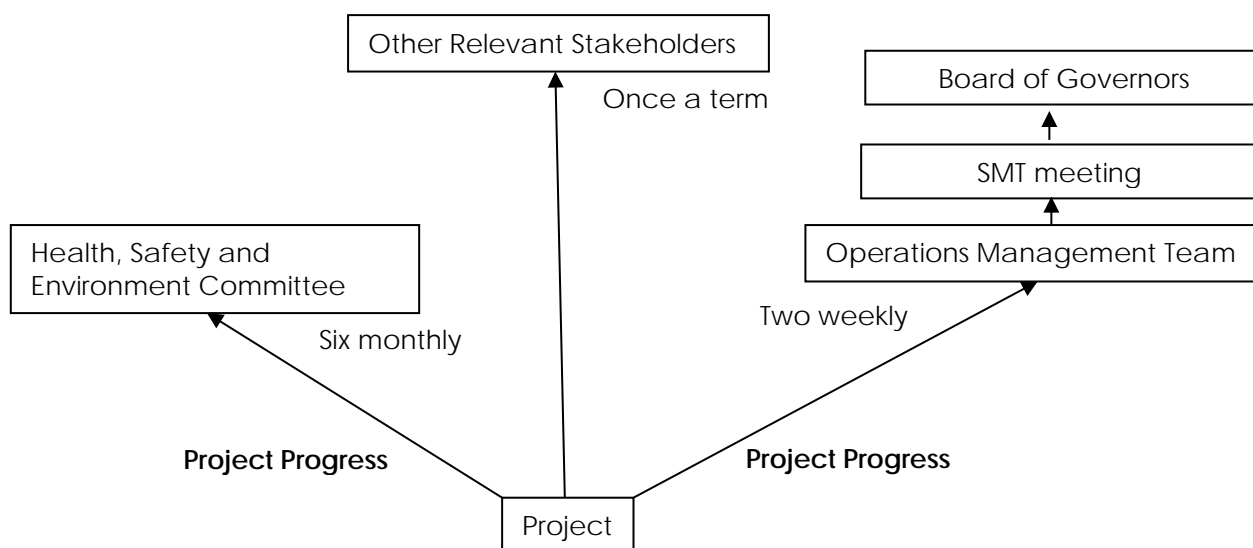
As part of the School's vision, the estate continues to grow; further buildings have already been added to the campus since the Carbon Management Plan was first drafted. The energy use and floor area of any new buildings are taken into account and added to the performance figures. The overall forecast performance will then be reviewed, and changes made to the implementation plan if necessary to make progress against targets.

## 7 – Programme Management

### 7.1 – Governance

The carbon management plan will be kept updated and revised as necessary. The document will be reviewed by the Health, Safety and Environment Committee and any amendments to general policy or responsibility added. New issues will be circulated to key stakeholders and made publicly available.

Existing project management procedures at the School entail the project manager reporting to the Operations Management Team every two weeks to pick up any problems on progress. This detail is also fed upwards to the fortnightly Senior Management Team meetings. These bring together all departments to ensure that the School is on track for meeting regulations and project timelines. Progress will also be reported every six months to the Health, Safety and Environment Committee once the plan has been updated, in order for the committee to review and sign off the updated plan.



The action plan, associated timeline and project documentation will be kept separately to the main carbon management document, and will be updated if any major changes are made to the projects. Any project documentation created by the project owner will be signposted from the action plan as a record of when improvements were commissioned, for measuring purposes.

Overall progress against targets will be reported every six months and included in the sustainability progress reports. This will be in the form of a summary of the current projects and the progress against the carbon emissions milestones set out in section 4.1. For any projects not on track to achieve the estimated savings, action will be taken to identify other opportunities for reducing carbon emissions and, if required, further budget requested for allocation the following year.

Feedback from employees and students will be directed to the Deputy Secretary, who will forward it to relevant members of staff and arrange for appropriate actions to be assigned.

## 7.2 – Accountability

Accountability for progress against the carbon management plan lies with the Head of Building Services.

## 7.3 – Ownership

Ownership of individual projects has been assigned. It is the owner's responsibility to progress the project as far as possible. To ensure that projects achieve the estimated savings, project owners will create and report the following (see section 6.3) in line with the School's current project management practice:

- Project timeline against the start and completion date in the implementation plan.
- Two weekly progress updates to the Operations Management Team (where projects are estate based), through notes against the project spreadsheet, recording any changes to projected timeframe, costs and project details. The frequency of these meetings was interrupted during 2020 due to the School's Covid response, but will continue once the School returns to business as usual.
- Two weekly general progress and status updates to the Senior Management Team meetings. The frequency of these meetings was interrupted during 2020 due to the School's Covid response, but will continue once the School returns to business as usual.
- Ensure that a measurement indicator is set up so that savings can be accurately and easily reported going forward.

Progress will also be summarised six-monthly for Health, Safety and Environment Committee and the regular sustainability progress reports.

## 7.4 – Risks

The key risks identified are as follows:

- Changes to the campus master plan. When the campus footprint grows, this causes the energy use to increase. This is why London Business School have adopted a relative measure against the target, so that floor area is taken into account. When this occurs, then the 'Business as Usual' case is adjusted to incorporate the increase in energy use. The energy reduction projects will then be applied to this profile, to give the expected energy use in future.
- Project delays. Each project will be managed separately and risks to project completion will be mitigated as part of this where appropriate. The risk to the carbon management plan is that delays to projects will postpone the realisation of reductions in carbon emissions. Estimated carbon savings from projects have not been included in forecast emissions levels until the year after they are implemented. This means that within the milestone targets there is some flexibility for projects to run late without impact. When projects are created within the School's system, both a Manager and Stakeholder are generated. This means that projects have at least two parties driving progress.
- Carbon emissions reductions are lower than forecast. Where the measured savings from a project are lower than estimated, this will be reported. Whilst savings against estimates are bound to vary slightly, if at the end of the year, overall savings are lower than estimated, then action will then be taken to identify an opportunity for saving elsewhere, which will be added to the implementation plan and a budget requested if needed.



## 8 – Conclusion

London Business School seeks to build upon its reputation as one of the world's top business schools with an ambitious development programme that will ensure improved and enlarged facilities for years to come. It will also allow for a larger number of students to access the London Business School experience.

In order to continue to improve performance, further projects will be reviewed and added to the implementation plan as possible. These require scoping fully, and the estimated savings will be added to the plan during the next update. Of equal importance is the ongoing reporting and defined structures for accountability to provide the foundations for successfully lowering carbon emissions at London Business School, all of which are detailed within this carbon management plan.

Overall, the School will continue to recognise the importance of sustainability in achieving its vision amongst staff, faculty, students and stakeholders alike, and can look forward to promoting a lower carbon future both on campus and beyond.