King's College London

Carbon Management Plan Update

CMP Update

Documentation and Approvals

Revision History

This document is subject to revision control. The master electronic copy of this document can be found at:

https://1809274_kcl_ac_uk/Documents/CMP/310119%20Carbon%20Management%20Plan%20Update%20v2.docx

Approvals

FP			
Version	**Reason**	**Name**	**Date**
0.0	Initial Draft	Julie Allen	Jan 19
1.0	Final Release		
2.0	**Approval/Audit**	**Kat Thorne**	**March 19**

Distribution

This document has been distributed to:

Distribution list	Date of Issue	No of Copies
Web		

Intended Audience

This document is intended for all interested parties.

CMP Update

Contents

CMP Update

Introduction

King's College London aims to be exceptional in all that it does encompassing in its vision overcoming some of the world's great challenges. In recognition of its role in service to society and what is required to remain a world leading university, King's has made significant sustainability commitments, including being one of the initial signatories of the Paris Pledge for Action[1] on climate change which has committed King's to working to keep global temperature rise under 2 degrees and a commitment to be carbon free by 2025, by which time the net emissions from our use of fossil fuels will be zero.

In line with global carbon reduction targets and the UK university sector, King's has set a challenging absolute 43% carbon reduction target to be achieved by 2020 (from a 2005/06 baseline). So far, despite growth in staff and student numbers, we have consistently decoupled our growth as a university from our environmental impacts. These impressive reductions have been enabled, in part, by the introduction of LED lighting in many of our buildings, pioneering work in laboratory sustainability and significant increases in the amount of low-carbon energy we use to power our teaching and research.

King's Vision 2029 states that we "will continue to decrease the carbon intensity of our business as part of our commitment to reduce our emissions and strengthen society's ability to deal with the impacts of climate change".

Management Summary

King's College London maintains a carbon management plan to guide the University's implementation of carbon reduction projects in line with the Energy and Carbon policy. This document is the 2017-18 annual revision of the University's 2010 – 2020 Carbon Management Plan.

King's carbon target is currently under review following the University's commitment to be carbon free by 2025.

King's is making progress, showing a 37% reduction against our baseline, however, more work will required to meet the 2020 target

King's continues to invest in energy efficiency using Salix and ring fenced budgets for projects and has procedures for major projects and top-up funding.

The Energy function has been through a state of flux, but will move forward in a much stronger position from 2018-19.

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Headline targets

Major Commitments	Summary of progress
2020 – HEFCE Target of an absolute reduction of 43% by 2020 against the 2005/06 baseline	• 37% reduction
2025 – King's Carbon Free	• New commitment to align with the Paris Agreement commitment will require zero emissions by 2030-2050 to achieve the 1.5 °C limit increase in global CO2
Scope	1 & 2 carbon emissions • KCL owned buildings • NHS Trust embedded space (except when utility charges are apportioned • University residences Scope 3 emissions • Transport • Waste • Water • Processes improving to account for additional sources

Performance Review

	2005/6	2016/17	2017/18	Change
tCO₂ (scope 1&2)	52,389	36,475	32,904	-37%
Total Staff (FTE)	4,572	6,590	6,918	51%
Students (FTE)	19,289	25,978	27,464	42%
Turnover (£000)	387,951	778,200	841,000	117%
GIA (m²)	407,093	401,189	401,189	0%

CMP Update

Note: King's has re-baselined following a review of processes and improved data improving accounting for embedded spaces.

Performance Against Baseline

King's College London continues to make progress towards our 2020 target however, has made significant improvements against a business as usual scenario factoring the University's growth plans.
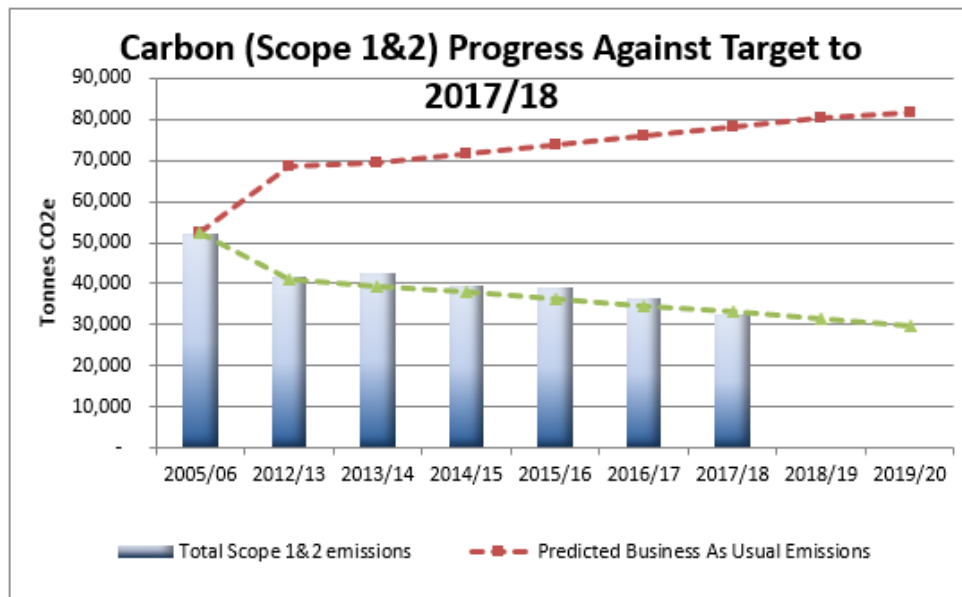
King's has revised the baseline as changes in methodologies, improvements in the accuracy, or discovery of previous errors have triggered a recalculation. This has been due to improvements in the GSTT data.

Work Streams

This section provides a brief update on main projects by tranche showing overall contribution to the baseline, please see the annex below for full details of individual projects and costs.

Year	Tranche	t.CO2	Of Baseline
2015	Salix 2015	152	0.3%
2016	Bouygues EPV 2016	1511	2.9%
2016	Maintenance 2016	426	0.8%
2016	Salix 2016	501	1.0%
2017	Salix 2017	156	0.3%
2018	Salix 2018	211	0.4%

CMP Update

Capital Projects

The sustainable construction or refurbishment of buildings and infrastructure is fundamental to achieving King's vision for sustainability by driving a reduction in operational impacts including costs and carbon, whilst providing enriched teaching and learning facilities.

The University's aim is to originate, design, operate and maintain environmentally sustainable facilities. To achieve this, the University requires that design teams:

- Use sustainable design principles, integrate Passive Design and performance modelling
- Consider the whole life cost of the building/project
- Contribute to achieving King's targets
- Achieve or exceed required BREEAM ratings

Investment

King's will continue make use of Salix funding in addition to a ring fenced budget for energy efficiency and carbon reduction projects. Further funding will be made available as requested via business case for major projects and programmes. Continued resource and effort is required to manage King's utilities and carbon reduction including surveys.

The 2015-16 Carbon Management Plan update outlined that an investment minimum of £11,500,000 at current costs would be required to meet the current target. This estimate remains on track.

Sustainability

Warp It, the furniture and equipment re-use system at King's, has grown impressively. Since it was launched, over 300 users have helped to save over £50,000 in procurement costs and prevented over 8.5 tonnes of waste.

These examples – among many others – have resulted in King's achieving the ISO 14001 Standard across all our campuses for environmental management. A particularly impressive achievement given the size and complexity of our estate.

The PLUS Alliance has begun developing cross-border research into sustainability solutions and the world-leading work undertaken by the Environmental Research Group continues to inform the public policy response to the persistently high levels of Air Pollution in London and throughout the UK. King's hosted members of the Global Consortium for Sustainability Outcomes to discuss sustainability solutions to energy, water and waste. The meeting resulted in King's becoming part of a collective 'living lab' to test energy-saving solutions to hot water provision.

CMP Update

King's has also endorsed a new Socially Responsible Investment Policy following a holistic and considered review process involving student campaigners, academic staff and members of the Senior Executive Team. This new policy will see the university endowment gradually phase its investment out of companies involved in the extraction of fossil fuels and increase our investment into low-carbon and ethical funds. For further information, please the statement by Chris Mottershead, Senior Vice President (Quality, Strategy and Innovation) on https://www.kcl.ac.uk/newsevents/news/newsrecords/2017/03-March/Agreement-between-King's-management-and-Kings-College-Climate-Emergency.aspxt.

Governance and Resources

King's College Energy team works within Estates & Facilities under Gordon White, Head of Asset Improvement. The Directorate is led by Nick O'Donnell MRICS MCIBSE IEng. The Real Estate Management and Capital Projects team meet the academic needs of the College and Estates strategy. This has a broad portfolio of responsibilities which range from security and daily cleaning and mail services, to small building projects and creating and sustaining a safe and healthy environment for our students and staff.

Energy Manager	Julie Allen
Energy Coordinator	Karen Shaw
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CMP Update

Annex

Projects

A continued focus will be required to build on the project register by way of site surveys and audits. This will strengthen the project pipeline, ensuring that we can meet our commitments to reduce carbon emission.

The tables below show energy/carbon reduction projects specifically designed for Salix.

Salix Project List – Delivered 2017/18

Project Title	Cost	Total Annual kWh Saved	Total Annual Cost Saved	Total Annual t.CO2 Savings	£/Tonne CO2 Saved	Payback
Surrey St communal areas and stairwells LEDs	63,000	92,951	11,619	36	68	5.4
Great Dover St corridors and circulation LEDs	68,000	72,425	9,053	28	94	7.5
Henrietta Raphael 2nd offices LEDs	7,328	16,166	2,021	6	45	3.6
Strand Safra Lecture Theatre	32,931	55,717	7,243	25	59	4.5
Strand Post Grad LED	38,650	73,591	10,302	23	53	3.75
Strand Basement LED	75,226	126,536	17,715	39	59	4.25
Hen Raph classroom LED upgrade	5,935	113,013	14,126	43	5	0.42
IoPPN LED upgrade	30,368	36,853	4,975	11	82	6.1
Total	£321,438	587,252	£77,054	211	28.13	4.17

CMP Update

Performance to date 2017/18
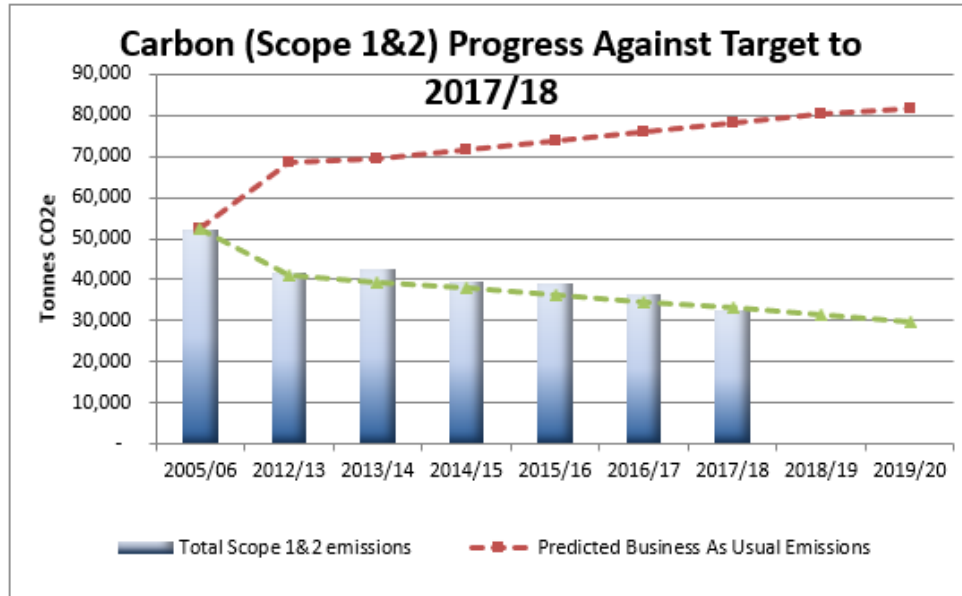
Salix Project List – In Delivery 2018/19

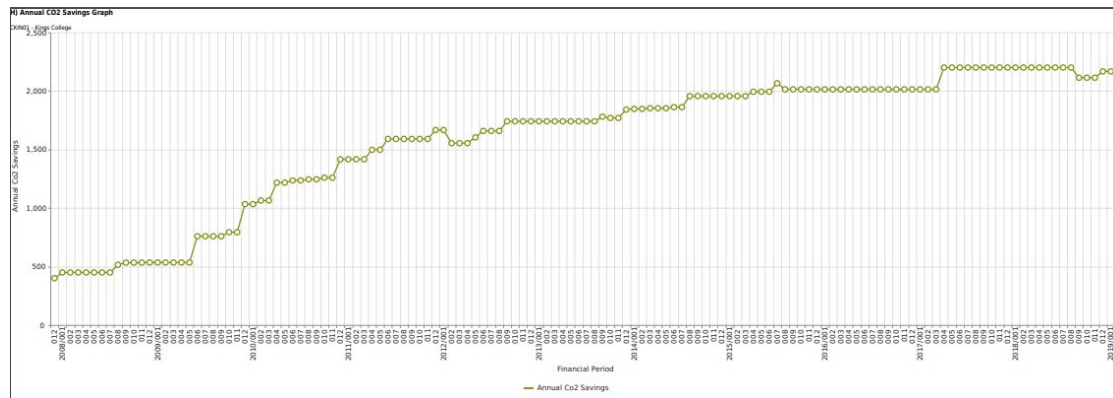| Project Title	Cost	Total Annual kWh Saved	Total Annual Cost Saved	Total Annual t.CO2 Savings	£/Tonne CO2 Saved	Payback
Hodgkin Bldg Teaching Labs	£9,652.50	**18,739**	£2,342	7.20	53.60	4.12
Hen/Raph Classrooms and Labs lighting	£2,337.12	**9,997**	£1,250	3.84	24.33	1.87
Hen/Raph Rooms 1.34 - 1.37	£5,934.75	**113,013**	£14,127	43.45	5.46	0.42
King's Food Hen/Raph	£2,242.26	**4,211**	£526	1.62	55.41	4.26
IOPPN RELAMP Corridors & Stairwells	£1,795.13	**3,850**	£481	1.48	48.52	3.73
DG Seminar Room	£19,214.83	**36,853**	£4,975	14.17	54.25	3.86
IOPPN 1st Flr east wing offices	£2,463.39	**17,518**	£2,365	6.73	14.63	1.04
	£86,683.17	306,399	38,918	117.77	*39.29*	2.9

CMP Update

Salix Project List – Pipeline 2018/19

Project Title	Cost	Total Annual kWh Saved	Total Annual Cost Saved	Total Annual t.CO2 Savings	£/Tonne CO2 Saved	Payback
JCMB Lighting upgrade	120750	708,325	£102,707	218	55	5.2
Replacement external lighting HOP	87,020	101,743	£14,244	31.26	36	3.5
	£207,770	810,068	£116,951	249	26	1.78

At time of release.

Cumulative Carbon Savings – Salix Projects

CMP Update

Maintenance with carbon impacts 2018

The following table outlines maintenance projects scheduled for delivery in 2019 that will impact energy efficiency and carbon emissions.

Project Title	Cost	Total Annual t.CO2 Savings
Shepherd House Boiler replacement	-	-
BMS upgrades	-	-
JBC AHU replacement	-	-
VWB boiler	-	-
Bush House boiler replacement	-	-
Rayne boiler replacement	-	-

* Not all costs data available.

Bouygues EPV

King's College London has entered into an agreement with Bouygues who manage two of the main site buildings through a PFI agreement to significantly improve the energy efficiency of these buildings.

Target Carbon Emission Reductions: Minimum CO_2 saving of 1,282 t.CO_2 for the first annual assessment, achieved but further work required, 1,511 tCO2, which is a saving of approximately 3% from King's baseline, for the following annual assessment and maintained annually until 2021.

Works started in 2016/17 and continue, with an expected completion date of April 2020.

Due to delays with meter failures, the evaluation of these works is not yet complete

Projects

- BMS Measures including:
  - BMS Enhancements & Improvements - completed at FWB (Not NHH)
  - Toilet Extract fans - completed
  - Non Critical AHU Volumes – completed at FWB (9 outstanding at NHH)
  - Add VSD's to pumps on heating/ cooling systems - completed
  - Dynamic Set point rescheduling on Chillers – completed, chillers replaced.
  - LonDec air compressor controls - completed
- Boiler backend valves - completed
- Pipework and valve insulation / Isocovers - completed
- LED lighting and lighting control - completed
- AHU Upgrades - completed
- Smart Impulse Metering 5 year Opex including some AMR sub-metering – 3 meters installed in lab spaces