

Carbon Reduction Plan

Supplier name: Imperial College London

Publication date: October 2023

Commitment to achieving Net Zero

Imperial College London is committed to achieving Net Zero emissions (scopes 1 and 2) by 2040, minimising Scope 3 emissions where possible.

Baseline Emissions Footprint

Baseline emissions are a record of the greenhouse gases that have been produced in the past and were produced prior to the introduction of any strategies to reduce emissions. Baseline emissions are the reference point against which emissions reduction can be measured.

Baseline Year: 2018-19 academic year

Additional Details relating to the Baseline Emissions calculations:

Imperial College London's Scope 1 and 2 CO₂e emissions relate to the building operations and calculated from a combination of billed energy consumption, meters and budget figure or estimated based on previous usage data. The Higher Education Statistics Agency (HESA) methodology for the annual Estates Management Record (EMR) is used as the basis for this data collection. Department for Energy Security and Net Zero's CO₂e figures are used to convert energy use into CO₂ emissions.

Baseline Scope 3 emissions were calculated using the conversion factors based on Procurement spend categories. Emissions are calculated from total spend in line with the methodology set out by HESA. Emission sources are broken down and categorised to allow intra-sector comparison with peers and other organisations in the sector.

We are bringing our methodology in line with the sector methodology set out by the Environmental Association for Universities and Colleges (EAUC) which is based on the GHG Protocol Reporting Framework.

Baseline year emissions:

EMISSIONS	TOTAL (tCO ₂ e)
Scope 1	39,794tCO ₂ e (scope 1 utilities) + Ca.21tCO ₂ e (fleet emissions)
Scope 2	15,454

Scope 3 (Included Sources)	163,041
Total Emissions	218,289 TOTAL (tCO₂e)

Current Emissions Reporting

Reporting Year: 2021-22 academic year	
EMISSIONS	TOTAL (tCO₂e)
Scope 1	44,995tCO ₂ e (utilities) + Ca.14tCO ₂ e (fleet emissions)
Scope 2	10,250tCO ₂ e
Scope 3 (Included Sources)	208,832 tCO ₂ e (79%) Of which: <ul style="list-style-type: none"> - Business travel: 16,706 tCO₂e (8%) - Employee commuting: eight out of our nine Campuses are based in central London where we have very limited car parking spaces and well-connected public transport links. The majority of our employees commute into work via public transport or cycling which have a very low impact on our scope 3 emissions. - Waste generated in operations: 89,863 tCO₂e. - Upstream and downstream transportation and distribution: These two categories are reported implicitly within our scope 3 emission data. We do not yet have the data to break this out from the wider emissions from purchased goods and services. We expect this to be a small part of our emissions compared to the larger impacts of producing the goods we buy.
Total Emissions	264,017 TOTAL (tCO₂e)

Emissions reduction targets

In order to continue our progress to achieving Net Zero, we have adopted the following carbon reduction targets.

We project to achieve carbon net zero by 2040 for Scopes 1 and 2 emissions as well as reducing our Scope 3 emissions as much as possible.

We aim to reduce total Scope 1 and 2 carbon emissions arising from energy consumption by 15% by 2025–26 against the baseline year 2018–19. To support this, we are currently developing a carbon budget model to set evidence-based targets and lay out our pathway to net zero.

Carbon Reduction Projects

Completed Carbon Reduction Initiatives

The following environmental management measures and projects have been completed or implemented since the 2018-19 baseline.

We have reduced our energy intensity, from our baseline year of 2018–19 to 2021–22, we achieved a 5% reduction in scope 1 and 2 emissions per m² of Gross Internal Area (GIA).

Combined scope 1 and 2 emissions increased in 2020–21 compared with the previous year but have dropped by nearly 5% in 2021–22, even with an increase in student numbers compared to our 2018-19 baseline, showing an improvement in our efficiency.

Total emissions across the three scopes increased by roughly 30,000 tCO₂e compared to 2019–20, driven largely by scope 3 increases. We have seen an increase in scope 3 emissions, in part due to the improved reporting methodology, an increased presence on Campus (increase in purchasing of precision medical equipment due to the College's COVID-19 response) and its associated impacts.

Replacing Gas Boilers with District Heating

This project involved replacing natural gas boilers located on the roof of Bessemer and Royal School of Mines buildings on our South Kensington Campus, with a connection to the district heating network from the Energy Centre. Instead of replacing the boilers like for like at the end of their service life, the decision was made to utilise the district heat network, with both heating and hot water now delivered to each building from the Energy Centre.

Benefits of migrating from local gas boilers to our district heat network include:

- low carbon heat and power delivery
- reduced emissions
- improved plant availability
- lower maintenance costs
- reduced overall operating costs.

Steam to Water Based District Heating

The City and Guilds building has two separate water heating systems generating hot water, one for process, the other for domestic. This consisted of five steam to hot water heat generators. The steam-based network at South Kensington is slowly being removed, with the heat demand migrated to the more efficient water-based network. This work is a significant undertaking by the College and will lead to considerable efficiencies in the raising of heat energy.

The system consists of five large hot water storage vessels, each with its own electric immersion heaters, acting as a backup system. Each tank is connected to a plate heat exchanger, further utilising the network at South Kensington. Hot water used in the taps within the building is now raised by CHP by-product, so for approximately a third of the year the hot water will be supplied from what is currently unutilised heat by-product, further improving the efficiency of the overall system.

Sustainable Food and Drink Policy

In 2022 we published our Sustainable Food and Drink Policy. The policy, led by the College's in-house catering team, will guide the menus we develop, how we procure our

food and equipment and how we increase awareness on how what we eat impacts the environment. It includes commitments to:

- Phase out beef products from College menus by 30% per year, ultimately removing them entirely by 2025-26.
- Only serve fish that is Marine Stewardship Council (MSC) Certified.
- Prioritise local, seasonal produce across-the-board.
- Introduce a revised reusable cup scheme to reduce single-use cups across campus.
- Increase the educational materials available in outlets on sustainable food and drink choices.
- Develop community spaces to support student and staff involvement in sustainable food projects.

In the future we hope to implement further measures such as:

Infrastructure project on South Kensington Campus

The College has been awarded funding via the Salix Public Sector Decarbonisation Scheme (PSDS) Phase 3b, for a £12.3 million grant. Funding was sought for a large, aspirational infrastructure project to remove the steam heat network and central steam generating systems located in the Energy Centre at Imperial's South Kensington Campus.

For legacy reasons the South Kensington Campus has two heat networks, with two different mediums: one water and one steam. Neither had the capacity to replace the other, and with the need for a water heat network being greater than for a steam network, our planned project is to remove steam services, migrating the heat load to the centralised water heat network.

There are three elements to the project:

- i. Energy Centre – Replace the three large 12MW steam boilers with Low Temperature Heating Water (LTHW) boilers. Two units will incorporate waste heat recovery from exhaust gasses, helping to gain the most from our two 4.5MWe (megawatts of electrical output) CHP engines.
- ii. Heat networks – The LTHW network on the South Kensington Campus requires upgrading in several places; heat loads currently on the steam heat network will migrate across to the LTHW network. Steam and condensate services will be removed.
- iii. Buildings and plant rooms – Plant that relies on a steam connection within buildings and plant rooms will be replaced or converted to utilise LTHW. The project has significant environmental, safety and financial benefits to Imperial, not least a projected 2,449 tCO₂ e emissions reduction. The project will help to improve local air quality by reducing our NO_x emissions and lay the groundwork for further NO_x reduction in future. Moreover, it will make it possible, in time, to move to using heat pumps to heat some or all of our buildings.

Sustainable Travel Policy

In 2023 we have developed a sustainable business travel policy, focusing on reducing air travel because that is where our largest environmental impacts lie within business travel. This policy applies to all employees of the College and all students who choose to, or are required to, undertake travel as part of their learning or research.

Our measure of progress will be a reduction in carbon emissions from air travel by 25% by 2026 against the baseline year 2017–18 (tonnes of CO₂e per person per year).

We are currently engaging the College community for their thoughts. We are open to feedback in this scoping stage and open to amending the ‘how’ aspect of the policy in order to ensure it works well in practice, with the intention to finalise and implement the travel policy in the 2023 Autumn Term.

Sustainable Procurement Policy

We are beginning a project to refresh our sustainable procurement policy and strategy. This will include strengthening the sustainability asks of suppliers in our procurement process and weightings in procurement decisions, doing a deep dive into major categories such as construction and laboratory purchasing to reduce our carbon impact, and improving our reporting on scope 3 so that it more accurately reflects our footprint and guides us on where to focus next.

White City Campus – South site

The sustainability strategy has been developed for the south site of Imperial's White City Campus and is being implemented in the upcoming Infrastructure Development Plan (IDP), is aligned with the targets and aspirations of Imperial's overarching Sustainability Strategy.

It specifically responds to the objective in that strategy to “develop a roadmap towards a carbon neutral south site of our White City Campus”. The strategy addresses both the carbon and sustainability impacts of the IDP works themselves, and the longer-term impacts of the buildings that will be constructed on the site.

This includes, but not limited to:

Operational carbon impact

The energy strategy for the site is to achieve zero fossil fuels following a final decision in 2022 to remove the gas main from the design proposals. An earlier decision to incorporate diverse high-voltage (HV) electrical supplies on to the site provides sufficient supply resilience to ensure that standby generators are not required. The electrical distribution capacity for the site has been tested to ensure that this infrastructure strategy does not reduce flexibility in terms of building uses, including high-energy intensity research labs.

Sustainable materials

The environmental impact, and in particular the carbon footprint of the construction of the IDP works, has been a major focus during the design process. The construction of a new retaining wall bordering the Central Line, and the “Basement Box” which provides a below ground vehicle route from east to west, are particularly material intensive. Through works to optimise both the design and the material specifications, the carbon impact overall of the IDP works has been reduced by 28 per cent from concept through to detailed design.

Active travel

The White City south masterplan is focused on active travel (walking and cycling) – this is reflected in both the revised junction with Wood Lane and throughout the public realm. An aim regarding the creation of the “Basement Box” is to deliver a pedestrian-prioritised public

realm. Cycle routes run around the perimeter of the site and extensive cycle storage is also provided. There is no car parking delivered as part of the IDP works, and an electric charging point is provided for a future electric bus linking other College campuses with White City.

Existing estate and retrofit work

We are developing multi-year programme plans for investment and retrofit. Our older buildings need significant improvements to their insulation and ventilation, heating and cooling systems and building management systems. We also need to transform our energy infrastructure over time to allow a move from using our current gas-fired combined heat and power (CHP) and boiler plant to renewable energy sources. This will enable decarbonisation of our campuses to meet our net zero goals.

Declaration and Sign Off

This Carbon Reduction Plan has been completed in accordance with PPN 06/21 and associated guidance and reporting standard for Carbon Reduction Plans.

Emissions have been reported and recorded in accordance with the published reporting standard for Carbon Reduction Plans and the GHG Reporting Protocol corporate standard¹ and uses the appropriate Government emission conversion factors for greenhouse gas company reporting².

Scope 1 and Scope 2 emissions have been reported in accordance with SECR requirements, and the required subset of Scope 3 emissions have been reported in accordance with the published reporting standard for Carbon Reduction Plans and the Corporate Value Chain (Scope 3) Standard³.

This Carbon Reduction Plan has been reviewed and signed off by the board of directors (or equivalent management body).

Signed on behalf of the Supplier:

Professor Nigel Brandon

Dean of the Faculty of Engineering, Chair of the Sustainability Strategy Committee

Date: 24 October 2023

¹<https://ghgprotocol.org/corporate-standard>

²<https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

³<https://ghgprotocol.org/standards/scope-3-standard>