Pathways to Net Zero Carbon by 2030

The science is clear that without urgent action, the world is on track for catastrophic temperature increases. We must rapidly reduce emissions to limit the worst effects of the climate emergency.

Net zero carbon by 2030

The Mayor of London, Sadiq Khan, has set a target for London to be net zero carbon by 2030. To support this ambition, he has commissioned experts **Element Energy** to analyse the possible pathways to achieving net zero.

Fairness must be at the heart of the net zero pathway. The cost of no action will impact lower income Londoners the most, with overheating, toxic air and flooding all posing a risk. We must ensure

we are supporting those on low incomes from the costs and ensure they benefit from warm, energy efficient homes, cleaner air and the new green jobs that will come from taking faster action.

Element Energy analysed four possible pathways to net zero, looking at the different ways London can reduce emissions. The report shows that under all pathways it is possible to accelerate action and radically reduce carbon emissions with the right ambition, leadership, powers and funding. As well as helping avoid catastrophic climate change, there are many other benefits in achieving net zero, including supporting tens of thousands of jobs; improving health through better air quality and more active lifestyles; reducing inequalities and improving quality of life for all.

Read the report

The Accelerated Green pathway

The Mayor has selected a preferred pathway to net zero - the Accelerated Green pathway. Amongst other things, achieving this will require:

- Nearly 40 per cent reduction in the total heat demand of our buildings, requiring over 2 million homes and a quarter of a million non-domestic buildings to become properly insulated
- 2.2 million heat pumps in operation in London by 2030
- 460,000 buildings connected to district heating networks by 2030
- A 27 per cent reduction in car vehicle km travelled by 2030

Fossil fuel car and van sales ended by 2030 and enforced in line with Government's existing commitments.

The Mayor's response to the Element Report explains the key issues, benefits and challenges of the four possible pathways and why the Accelerated Green pathway is the preferred option for London. This pathway balances ambition with deliverability and replaces the previous trajectory in the 1.5°C Plan.

Read the Mayor's response

Monitoring greenhouse gas emissions

The Greater London Authority monitors London's greenhouse gas emissions and publishes its results in the **London energy and greenhouse gas emissions inventory (LEGGI)** annually. The latest data, for 2020, was published in January 2023. The data shows that in 2020, London's CO_2e emissions were 28.1 million tonnes, down from 31.5 million tonnes in 2019. This is largely due to impacts of COVID-19 on London's economy. For example, due to lockdown restrictions, transport emissions decreased by an unprecedented level of nearly 2 million tonnes of CO_2e between 2019 and 2020.

2020 emissions represent a 38 per cent reduction on 1990 levels and a 45 per cent reduction since the peak of emissions in 2000. This is despite an increase in population of nearly 32 per cent since 1990 and significant economic growth over that period. London's per capita emissions have reduced by 53 per cent, from 6.7 tonnes

CO_2e per person in 1990 to 3.1 tonnes CO_2e per person in 2020. Compared to the rest of the UK, London has the lowest CO_2e per capita emissions of any region.

LEGGI reports on five sectors: emissions from buildings, transport, industrial processes and product use (IPPU), waste and agriculture, forestry and other land use (AFOLU). Around 90% of emissions come from buildings and transport. Most sectors have seen a significant reduction in emissions over the last few decades. This is largely due to the nation-wide decarbonisation of electricity but interventions such as London's Ultra Low Emission Zone and the Mayor's Energy Efficiency Fund have helped to further reduce emissions in London. 2020 emissions are compared with 1990, 2000 and 2019 in Table 1.

Table 1. London's emissions by sector in 2020, compared to 1990, 2000 and 2019

Emission sector	Emission sub-sector	Total (MtCO2e tonnes)	Sector as % of grand total	CO2e change since 201
Stationary energy	CO2e emissions from burning fossil fuel	18.9	Domestic: 37.3% Commercial & Industrial: 29.7%	Domestic: -0.8% Commerc & Industri -12.8%
	CO2e fugitive emissions	0.2	0.7%	-0.1%
Transport	Emissions from Road Transport, Rail, Shipping & Aviation	6.4	22.6%	-22.5%

	NRMM	0.5	1.6%	2019 data used
Waste*	Solid waste disposal, Biological treatment, Incineration, Wastewater treatment	0.5	1.7%	-9%
Industrial Processes and Product Use	Industrial Processes, Product Use	1.7	6.0%	-5.3%
Agriculture, Forestry, other Land Use	Livestock, Land, Aggregate sources, other land use	0.1	0.4%	2018 data used

*Data availability allowed emission estimates for the Waste sector with back-calculations for solid waste disposal to 2008, for biological treatment to 2016 and for wastewater to 2013.

The latest data for 2020, and previous years, can be found on the **London DataStore.**

To compare London's progress with other C40 Cities, the C40 Knowledge Hub provides data **via an interactive dashboard**.

The scenarios to reach a zero carbon have been modelled at the Greater London and London borough level. The **Zero Carbon Pathways Tool** shows the energy, transport and other emissions under each scenario.

We have also commissioned a study on London's wider greenhouse gas impacts – read the report about **London's consumption based emissions.** Whilst outside of the scope of the Mayor's net zero target, he is doing everything within his power to influence a reduction in consumption based emissions. For example, the London Plan includes a pioneering policy that targets the whole life-cycle emissions of new development and the Mayor has committed to working with the food sector to reduce consumption-based emissions and food loss and waste from the supply chain.

Previous 2050 pathway

The previous net zero pathway is outlined in the 2018 1.5C Compatible Plan:

Read the 2018 1.5C Compatible Plan

Previous supporting publications

The 2018 1.5C Compatible Plan was informed by the following reports:

Building Energy Efficiency - Arup built a model to help us understand how energy efficiency can be achieved.

Zero Carbon Energy Systems - Element Energy modelled four scenarios to zero carbon energy by 2050, based on electrification, decarbonisation of gas, decentralisation of energy or a patchwork solution.

Adaptation - Mott McDonald have reviewed London's existing activity on climate adaptation and identified where there is need for more to avoid the impacts of increasingly hot, dry summers and unpredictable weather

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