

Oxford Climate Change Action Plan

Executive Summary

This document describes a clear, concise and action-oriented *Climate Change Action Plan for the City of Oxford* (OCCAP) to be used primarily by City Council Staff and Councillors. The OCCAP constructs an accurate carbon dioxide (CO₂) emissions inventory for the city of Oxford for a baseline year, establishes CO₂ emissions reduction targets and proposes action and measures for each of the energy-related sectors to meet those targets. It is divided into three sections which discuss about:

- Climate change and the need for action
- Oxford in the global context: greenhouse gas (CO₂) emissions
- Action for Oxford

Section 1: Climate change and the need for action

Climate change, caused by the release of greenhouse gases into the atmosphere, has been recognised as one of the greatest threats of the 21st century. The most significant greenhouse gas is CO₂ since its contribution to global warming is as much as the other entire human-produced greenhouse gases combined. Its major source is from the burning of fossil fuels such as coal, gas and oil (including petrol and diesel used in cars). This strategy therefore concentrates on the measurement, and potential for reduction of, energy-related CO₂ emissions in Oxford.

Climate change is also the key driver for a raft of international, European and national policy aimed at reducing CO₂ emissions and improving energy efficiency. Local authorities are ideally placed to tackle climate change as they are seen as a trusted source of information with the ability to engage with individuals, communities and businesses. Oxford should recognise the social, economic as well as the environmental benefits of implementing an OCCAP, which will also improve the quality of life of people living and working in Oxford. Moreover, developing a climate change action plan will help Oxford City Council to meet other legal responsibilities under the Home Energy Conservation Act 1995, Decent Home standard, Fuel poverty strategy, Best Value Performance Indicators, Community Well Being and the Asset Management Plan.

Section 2: Oxford in the global context: greenhouse gas (CO₂) emissions

The most important part of any climate change action plan is to have an accurate emissions inventory for a baseline year. This not only enables one to identify the main energy-using sectors and set reduction targets, but it also provides a benchmark to measure the effectiveness of actions and programmes adopted and the progress towards targets. The available methods and models for measuring greenhouse gas (CO₂) emissions on a city level are reviewed and, the sources and levels of greenhouse gas emissions by sector in Oxford are quantified using data from top-down (national) and bottom-up (local) datasets. This provides an

indication of how Oxford greenhouse gas (CO₂) emissions, overall and from each sector, compare with national emissions figures.

The top-down datasets included are those published by NAEI, DTI and DEFRA. NAEI inventory differs fundamentally from DTI and DEFRA in its approach to collecting data, by focussing on the source of emissions (point, line or area source), whilst both DTI and DEFRA focus on the consumption of energy. Between the datasets of DTI and DEFRA, statistics by DEFRA are more comprehensive since they include CO₂ emissions from all fuels.

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According to DEFRA, CO₂ emissions from Oxford in 2003 are estimated to be 987,853 tCO₂, with domestic energy use and road transport responsible for half the total emissions. The sectoral emissions in Oxford are indicative of the trends observed regionally and nationally, especially the domestic sector which in 2003 was responsible for around 30% of the total emissions at all levels. However the overall annual CO₂ emissions from an Oxford dwelling (6,478 kgCO₂) in 2003 are higher as compared to the GB typical of 6,000 kgCO₂; clearly offering potential for reductions. A similar trend is observed in the mean energy use and CO₂ emissions of an Oxford dwelling when compared with the GB average. Furthermore, it is realised that the average annual gas and electricity consumption of, and CO₂ emissions from, the commercial and industrial sector in Oxford in 2003 were almost 20% more than corresponding figures for Great Britain. Nevertheless the per capita emissions of an Oxford resident at 6.9tCO₂ (DEFRA statistics) are much lower than that of the Southeast of England (8.8tCO₂) and UK (9.5tCO₂) averages. However in a global context they appear very high, almost three times the sustainable level of 2.5 tCO₂ per person. Comparing per capita annual CO₂ emission figures of an Oxford resident with international figures

Although the national datasets construct an overall inventory of CO₂ emissions from Oxford city by sector, these do not identify which particular areas within a sector could be targeted for future action and improvement. Such information is generally provided by bottom-up local datasets. For the domestic sector in Oxford, the Oxford House Condition Survey carried out in 1995 estimates the average SAP of Oxford dwellings to be 43, Elmhurst energy surveys in 2001 calculate it as 44, while DECoRuM₁ studies conducted in 2003 assess the average SAP as 45 for North Oxford dwellings. Most recently, the private house condition survey undertaken in 2004 estimates the average SAP as 54.

It is realised that DECoRuM is the only GIS-based domestic energy and emissions model deployed in North Oxford which displays results on an individual dwelling level, pinpoints pollution hotspots, and predicts the potential for emissions reduction. Its capabilities could be extended to evaluate energy consumption in, and CO₂ emission reductions from, the entire Oxford housing stock, and the cost of a range of measures to reduce both.

¹ Domestic energy, carbon-counting and carbon-reduction model

Oxford citizen: 6.9tCO₂/year

Sustainable level: 2.5tCO₂/year

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For the non-domestic sector, the only local dataset available is the regular monitoring of energy use and CO₂ emissions for 16 high-energy consuming council buildings.

Assessing the baseline CO₂ emissions from Oxford city not only helps in

identifying the main energy-using sectors, but it also provides a benchmark to set targets and measure the effectiveness of various actions and programmes.

Section 3: Action for Oxford

This section reviews existing citywide CO₂ reduction targets set nationally and internationally, for stabilising future levels of atmospheric CO₂ concentrations. Targets for Oxford to reduce CO₂ emissions in the medium to long term are established, and action to achieve these targets in each of the energy-related sectors are proposed. In summary, the most effective interventions (strategies) are listed which Oxford City Council could lead on with, supported by national, regional and local agencies.

In line with national goals (both legal and aspirational) and the pressing need to stabilise atmospheric concentration of CO₂ emissions, the overall aim in Oxford should be to ultimately achieve CO₂ emission reductions **above 60%** by 2050 over the 2005 baseline emissions. This long term target should be accompanied with the following intermediate goals (objectives) of CO₂ reduction (over 2005 baseline emissions) in the near to medium term:

- 15% reduction in CO₂ emissions by 2010
- 20% reduction in CO₂ emissions by 2015
- 30% reduction in CO₂ emissions by 2020
- 40% reduction in CO₂ emissions by 2030

Such emission reduction targets will no doubt require concerted action by all sectors of the community in Oxford city. In this regard, the key strategies that Oxford City Council could adopt in its effort to bring citywide CO₂ emission reductions are:

1. Raising awareness and understanding of the impact of lifestyle on climate change
2. Mapping CO₂ emissions in Oxford using GIS-based modelling
3. Encouraging energy conservation and local generation of energy
4. Improving average SAP of Oxford dwellings to 65 by 2010
5. Setting and achieving targets for domestic energy efficiency
6. Energy audits and surveys of non-domestic buildings
7. Improving energy efficiency standards of new developments
8. Increasing uptake of low carbon systems
9. Minimising transport impact of new developments
10. Transforming Oxford into a Solar (sustainable) City

The next step is to implement these measures and monitor and verify the reductions in CO₂ emissions achieved as a result. A GIS-based CO₂ model of Oxford would enable the city council to meet these requirements. Therefore, work on building the GIS CO₂ model should be commissioned as soon as possible.

Although this OCCAP is to be used by City councillors and Council staff, it importantly highlights how climate change will affect everyone and makes the case for all of us to do our bit.