

# **Bromley's Carbon Footprint 2009/10 Progress Report**

Annexe to Executive Report ES10188  
Carbon Management Programme:  
Progress Report 2009/10

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*Owner: Sustainable Development Team*

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## **BROMLEY'S CARBON FOOTPRINT PROGRESS REPORT: 2009/10**

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## 1. Reporting Bromley's 2009/10 Carbon Footprint

- 1.1. Bromley Council's policy (ED08067, Minute 69) is to reduce its direct carbon dioxide emissions by 25% over five years.
- 1.2. Officers have written this (2009/10) annual summary report to show what action the Council has taken and how the Council is progressing towards its (2012/13) target.
- 1.3. In 2006/07, the Council established its carbon footprint<sup>1</sup> for the first time. The carbon baseline (which covers a number of sectors – see Section 2) was calculated as 37,780 tonnes (t) carbon dioxide equivalent (CO<sub>2</sub>e)<sup>2</sup>.
- 1.4. In 2007/08, the preparatory year during which the action plans were drawn up, Bromley's carbon footprint increased by 484t (1.25%) to 38,264t. This illustrates the importance of taking sustained action to reduce carbon.
- 1.5. In 2008/09, the first action year, there was a reduction of 1,177t CO<sub>2</sub>e (3%) in the Council's environmental footprint: strong evidence of positive outcomes (across the board) resulting from a comprehensive approach to reducing use of natural resources and environmental impacts.
- 1.6. In 2009/10, there was a more significant reduction of 4,773t CO<sub>2</sub>e
- 1.7. During 2009/10, significant action has been taken, through a range of projects, to reduce the Council's use of natural resources and environmental impacts. These have included physical measures such as window replacements, insulation, pool covers and centralising IT (replacing printers, scanners and photocopiers with multifunctional devices), and softer measures such as the continuation of the staff Environmental Champions' Network, environmental management system auditing and taking further action to improve our data collection and monitoring approach.
- 1.8. Bromley's approach is to monitor and report on the effectiveness of such initiatives by measuring energy/fuel/water consumption and waste production, and expressing this data as a 'carbon equivalent' (CO<sub>2</sub>e) figure. In this way, much more than just energy use gets measured, providing a more rounded assessment of the Council's environmental impacts.
- 1.9. Section 3 of this report provides more detail on which sectors have been included in Bromley's carbon footprint. Section 4 discusses both annual progress and progress against 2006/07 baseline. Sections 5-8 provide more detailed, sectoral, analysis including how the data was obtained, what action has been taken, and what the carbon outcome has been.

## 2. Sectoral Analysis

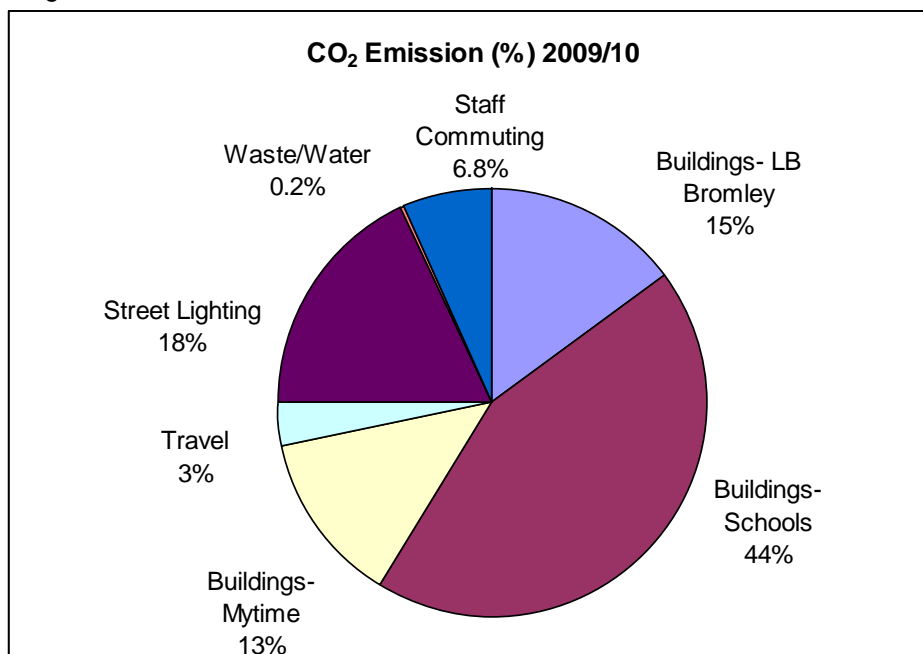
- 2.1. Bromley's carbon footprint comes from a number of different sources including the energy (gas / electricity / oil) used by the Council, schools and Mytime and also the carbon associated with the Council's fleet, business travel, commuting, and street lighting, as well as water use and waste production at the Civic Centre.

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<sup>1</sup> A 'carbon footprint' measures an organisation's contribution to climate change and is usually expressed in tonnes of carbon dioxide equivalent (CO<sub>2</sub>e). Most reporting currently concerns the 'primary footprint', which measures direct CO<sub>2</sub> emissions from energy consumption and transportation.

<sup>2</sup> **CO<sub>2</sub> Equivalent (CO<sub>2</sub>e):** Six main greenhouse gases contribute to climate change and are currently controlled under the Kyoto Protocol. Each has a different 'global warming potential' with distinct atmospheric lifespan and heat-trapping strength. For reporting, the mass of each gas is translated into a carbon dioxide equivalent (CO<sub>2</sub>e) amount, allowing the impact from all sources (say, methane from waste) to be shown as one common measurement.

Figure 1: What sectors did our carbon come from in 2009/10?



2.2. The (above) pie chart shows the main sources of carbon emissions in 2009/10. It can be seen that buildings are the Council's main source of carbon, with schools (44%) being the largest contributor both overall and within the building sector (72%). Street lighting is the next most significant source (18%) of Bromley's carbon emissions.

### 3. Making progress

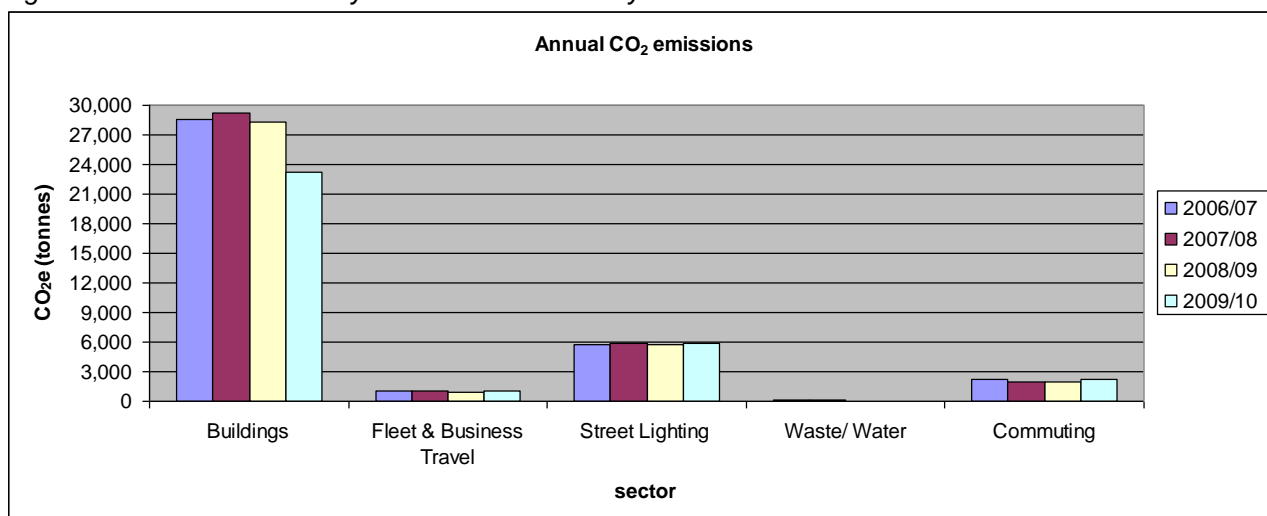
3.1. Table 1 (below) shows progress (in both tonnage and percentage terms) comparing 2009/10 data with the previous year's (2008/09) performance. It can be seen that the Council has reduced its overall carbon emissions by 12.9% (rounded to 13% in tables and graphs) or 4,773t. This overall reduction is the result of very good progress in the Buildings sector, offsetting relatively modest rises in emissions from other sectors.

Table 1: Annual Change (2009/10 compared with 2008/09)

Sector	2008/09 (tCO <sub>2</sub> e)	2009/10 (tCO <sub>2</sub> e)	Tonnage change	Percentage change
Buildings	28,329	23,186	-5,143	-18%
Fleet & Business Travel	971	1,042	+71	+7%
Street Lighting	5,729	5,841	+112	+2%
Waste/Water	56	56	0	0%
Commuting	2,002	2,189	+187	+9%
<b>TOTAL</b>	<b>37,087</b>	<b>32,314</b>	<b>-4,773</b>	<b>-13%</b>

3.2. Figure 2 (below) shows progress in tonnage terms since the baseline year (2006/07):

Figure 2: Carbon emissions by sector since baseline year



3.3. Table 2 (below) shows progress (in both tonnage and percentage terms) between the baseline year (2006/07) and the previous year (2009/10). It can be seen that, overall, the Council has reduced its carbon emissions by 14% (emissions rose by 1% in 2007/08). Significant progress has been made in the building sector (which of course has the largest footprint to attack) and the waste & water sector, with commuting also showing a modest reduction. However, emissions from fleet & business travel and street lighting have grown slightly. In tonnage terms, the Council has reduced its carbon emissions by 5,466 tonnes against baseline, with the greatest progress being in the buildings sector (5,424t).

Table 2: Change against Baseline (2009/10 compared with 2006/07)

Sector	Baseline 2006/07 (tCO <sub>2</sub> e)	2009/10 (tCO <sub>2</sub> e)	Tonnage change	Percentage change
Buildings	28,610	23,186	-5,424	-19%
Fleet & Business Travel	1,001	1,042	+41	+4%
Street Lighting	5,791	5,841	+50	+1%
Waste/Water	104	56	-48	-46%
Commuting	2,274	2,189	-85	-4%
<b>TOTAL</b>	<b>37,780</b>	<b>32,314</b>	<b>-5,466</b>	<b>-14%</b>

3.4. Bromley is now fourteen percentage points towards its 25% (2012/13) target; with three years to go. If we can maintain this rate of progress we could hope to meet, and perhaps exceed, our target.

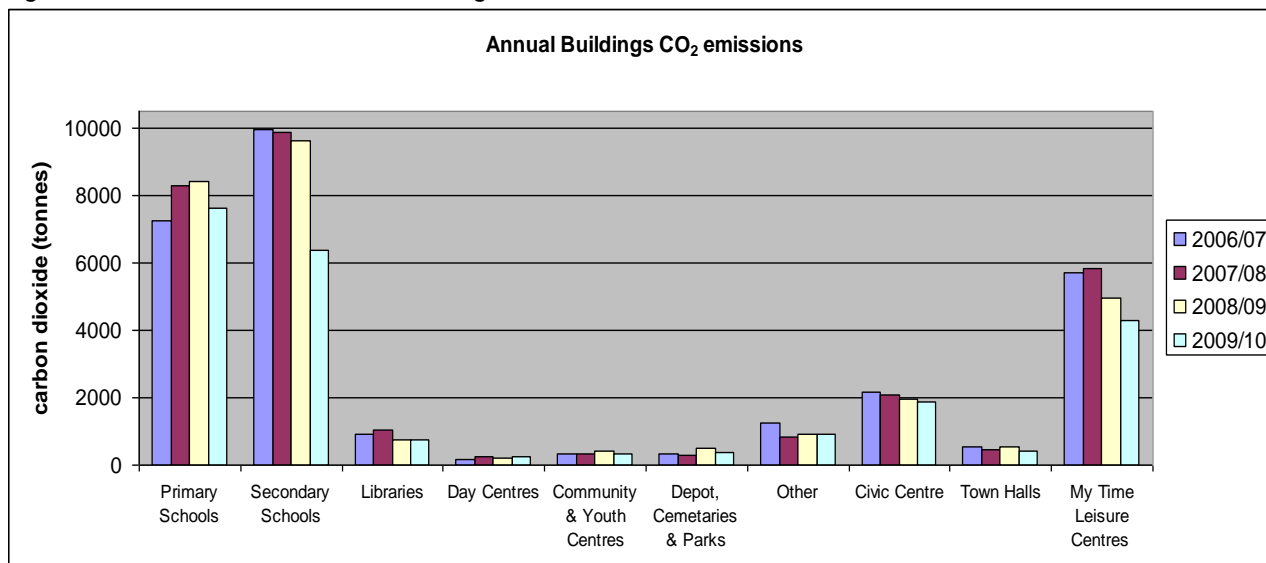
#### 4. Building Sector

4.1. **Background:** Buildings comprise properties directly operated by the Council (e.g. Civic Centre, Exchequer House, and the Libraries), local authority-funded schools, and the leisure facilities operated by Bromley Mytime. Schools comprise much the largest element of Bromley's property-related carbon emissions (44%), followed by Council operational property (15%) and Mytime's leisure facilities (13%).

4.2. **Data acquisition:** Gas and oil are used for space-heating, hot water, swimming pools and electricity is generally used for lighting and electrical equipment. Gas, electricity and heating-oil consumption data were provided by the Council's energy suppliers (and also by Bromley Mytime) and this data was converted into CO<sub>2</sub> emissions (using CO<sub>2</sub> conversion factors<sup>3</sup>).

<sup>3</sup> **Carbon conversion factors:** Energy use (electricity, gas, heating oil, or vehicle fuel) is converted into CO<sub>2</sub> using DEFRA's greenhouse gas conversion factors. These factors convert energy (e.g. kWh) into CO<sub>2</sub> (kg): energy used being multiplied by the relevant conversion factor. Factors vary between energy types and reflect their global warming potential. Factors are updated annually reflecting change: e.g. how electricity is generated (national mix of gas, coal, nuclear and renewables).

Figure 3: Carbon emissions from buildings



#### 4.3. Commentary

4.3.1. *Annual progress:* CO<sub>2</sub> emissions from all buildings decreased by 5,143t (18%) from 28,329t (2008/09) to 23,186t (2009/10).

This reduction has been achieved through a number of initiatives including:

##### Council Operational Buildings

- Centralised kitchen programme completion
- Property Planned Maintenance Programme 2009/10
- Centralised IT (Multifunctional devices rather than separate printers, faxes, copiers)
- St. Blaise thermal refurbishment (window replacements, cavity wall and roof insulation)
- Continuing behavioural change initiatives through the Environmental Champions' Network
- Solar Hot Water installation
- Strict control of the BMS time & temperature settings
- Installation of Variable Speed Driver pumps
- The removal of a redundant large hot water cylinder (North Block)
- New insulated roofs on Civic Centre East, West and Old Palace Blocks
- New double glazed windows to Civic Centre East, West and Old Palace Blocks

##### Schools

- Continued implementation of projects from School audits
- Bromley Sustainable School Forum
- Planned LBB maintenance programme action
- Improved data acquisition

##### Mytime

- ISO14001 Environmental Management System is directing operational housekeeping standards
- Two new teaching pool covers and one liquid pool cover
- Nine Smart Metres (six electric and three gas)

This carbon emissions reduction from buildings (for 2009/10 compared with 2008/09) might have actually have been even greater had not the number of degree days<sup>4</sup> for 2009/10 (2,062) been significantly higher than both the previous year and the 20-year average (1,828).

<sup>4</sup> **Degree-day data** shows how hot or cold the weather has been as a single index number for a particular region and period of time. The greater the value, the colder it's been and the more energy (usually gas) will have been used for heating. This tool can be used to weather-correct gas consumption data and ensure footprint commentaries reflect the past year's weather.

4.3.2. *Progress against baseline:* Overall, emissions have decreased by 5,424t (19%) from 28,610t (2006/07) to 23,186t (2009/10).

## 5. Street Lighting Sector

5.1. Background: Street lighting is the second largest component of Bromley's carbon footprint (after buildings). LB Bromley owns and maintains a range of street lighting and illuminated street furniture including over 27,000 street-lights, 3,000 sign-lights and illuminated signposts, 1,600 illuminated bollards, and another 900 items of illuminated street furniture. With such a large stock of street lighting and associated energy use, it is clear that carbon emissions in this sector must be managed accordingly.

5.2. Data acquisition: Electricity consumption figures from street lighting and street furniture were converted into CO<sub>2</sub> emissions. It should be noted that street lighting is an 'un-metered supply' and, therefore, this carbon data is extrapolated from the Bromley inventory (number, condition and hours of operation) coupled with operational hours data from the photoelectric cell unit array on a Civic Centre roof.

### 5.3. Commentary

5.3.1. *Annual progress:* CO<sub>2</sub> emissions from street lighting increased by 112t (2%) from 5,729t (2008/09) to 5,841t (2009/10). This has been despite a number of initiatives including:

- Dimming trials
- Lit-sign conversion project (sensors fitted to 2x8 watt lit-signs - now only lit when dark)

This increase is thought to be from three main sources:

- The negative carbon impact of lighting new traffic schemes
- LBB's commitment to upgrading old sodium lighting with better quality, but higher consuming white light. The Street Lighting Replacement Programme upgrades old columns from the old orange-coloured low-pressure sodium lamps to the new white lamps. Whilst the new lamps are far better in terms of colour-rendering (essential for improved safety, ability for CCTV to distinguish objects better etc.), they are also more energy intensive to run<sup>5</sup>. This is balanced out where possible by spacing the new lamps further apart (possible because of the better light quality) but overall, energy consumption is likely to rise from this swap-out.
- An EdF audit also prompted a further review of the assets recorded in the Confirm system; this uncovered that there were more illuminated signposts in our inventory than previously registered

Although this increase is in line with government projections that the aforementioned drive for better lighting will increase emissions for this sector, we are hopeful that the trend can be reversed in coming years.

5.3.2. *Progress against baseline:* Emissions have increased by 50t (1%) from 5,791t (2006/07) to 5,841t (2009/10).

## 6. Commuting Sector

6.1. Background: Commuting is the third largest component of our carbon footprint (after buildings and street lighting). The commuting footprint covers how Council staff travel to work (most of whom are based at the Civic Centre site) and not commuting by school or Bromley Mytime staff.

6.2. Data acquisition: Data is usually extrapolated from the annual Staff Travel Survey, which gives information on the mode of transport (i.e. car, bus, and train) and distance travelled from a sample of staff. This data is then converted into carbon by assigning each mode of transport with the official CO<sub>2</sub> conversion factor and multiplying the mileage. This is factored up to reflect the carbon impact of the entire Council workforce. The first Staff Travel Survey was associated with staff commuting was undertaken in 2006/07 (2,285 staff – 787 returned surveys). A follow-up survey was conducted in 2007/08 (2,556 staff – 472 returns) but the declining response rate contributed to a decision not to repeat the survey in 2008/09 (2,700 staff). The survey (heavily incentivised) was reinstated to

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<sup>5</sup> The **British Standard** recommendation is for all new street lighting to have a colour-rendering index greater than 20; low-pressure sodium lamps have a colour-rendering of 0.

capture 2009/10 data and a far better response rate was achieved (over a third of the total of 2,704 staff responded)

6.3. Commentary:

6.3.1. *Annual progress:* The latest Staff Travel Survey showed that carbon emissions associated with staff commuting increased by 187t (9%) from 2,002t (2008/09) to 2,189t (2009/10).

6.3.2. *Progress against baseline:* Emissions have decreased by 85t (4%) from 2,274t (2006/07) to 2,189t (2009/10).

6.3.3. *Detailed explanation:*

The 2007/08 staff travel survey was the first full scale survey of LBB staff modal patterns as such there was no previous data to compare against. The 2009/10 staff travel survey had some variations in wording and possible response selection. The number of responses to the 2010 survey was over double the response to the 2008 survey, and hence statistical significance has increased dramatically:

- 2008: 18% of staff responded
- 2010: 37% of staff responded

A combination of better raw data (both in quality and quantity) and comparison of datasets have enabled the identification of some historic errors. The change in statistical significance can be seen most dramatically in rail travel:

- 2008 – 3 of 471 responders (1%) selected rail as their commute transport
- 2010 – 94 of 1004 responders (9%) selected rail as their commute transport

It is highly unlikely that this is due to a large-scale modal change; rather that 2008 survey sample was not representative of rail users. Similarly a large proportion of the sample in 2008 who travelled by bicycle gave the distance travelled as greater than 10 miles, this fell substantially in the 2010 survey and is likely to be due to sample anomaly.

**For direct comparison:**

- Incomplete survey responses were removed from sample population
- Transport modals were aligned (2008 did not differentiate between driver and passenger in car share)
- The same value for 'over 10 miles' commute was used (15 miles rather than 23)
- Multi-modal responses were removed from the sample population

The overall workforce had increased in real terms

- 2008: 2,556 staff
- 2010: 2,704 staff

Excluding bicycles and walking (carbon neutral), the average commuting distance per person has increased by 0.5km. The large increase in rail commutes skews the figures for the other modal trends.

**7. Fleet & Business Travel Sector**

7.1. Background: The fleet is defined as vehicles directly managed by the Council but not vehicles used by our contractors (e.g. Veolia for Waste Services).

7.2. Data acquisition: Business Travel data is derived from reimbursed mileage claims collected by Human Resources. Figures were converted (using carbon factors) into CO<sub>2</sub> emissions. It should be noted that mileage is not always claimed by officers, so there will be a degree of under-reporting. Fleet emissions were calculated from fuel (litres) used by Council vehicles.

7.3. Commentary:

7.3.1. *Annual progress:* Carbon from this sector increased by 71t (7%) compared with 2008/09.

**Fleet emissions** increased by 80t (18%). This is likely to be due to the increased number of fleet vehicles, the continuing replacement of LPG vehicles with diesel vehicles and the fact that the closure of day centres has increased the amount of miles Adult & Community Services has travelled. **Business Travel** (use of private cars on Council business) emissions decreased by 9t (1.5%). Increased fuel prices and the need to protect budgets contributed to staff driving less and planning



their work more effectively (e.g. combining visits etc). The three pool cars also mean fewer people are using their own cars for business travel.

- 7.3.2. *Progress against baseline:* Carbon emissions from this sector increased by 4% (41t) compared with 2006/07 baseline data.
- Fleet emissions 100t (22%) from 347t (2006/07) to 447t (2009/10)
  - Business Travel emissions decreased by 59t (9%) from 654t (2006/07) to 595t (2009/10)

## 8. Water & Waste Sector

8.1. *Background:* The emissions associated with waste production and water consumption at the Civic Centre site is the smallest component to our carbon footprint. It was decided to restrict reporting for this sector to the Civic Centre due to data quality issues which are being addressed.

8.2. *Data acquisition:* The amount of waste (calculated by taking the number of large outdoor waste collection containers, their weight, and emptying frequency) is converted into a tonnage figure (and then into a carbon figure). Metered water consumption figures at the Civic Centre were converted into CO<sub>2</sub> emissions.

### 8.3. Commentary

8.3.1. *Annual progress:* Carbon from this sector did not change significantly since 2008/09, remaining at 56t. Carbon emissions associated with Civic Centre waste management were stable; in 2009/10, 72.55% of Civic Centre waste was recycled compared with 71.83% in 2008/09.

Carbon emissions associated with Civic Centre water management was also stable at 2.5t

8.3.2. *Progress against baseline:* Carbon emissions from this sector decreased by 46% (48t) compared with 2006/07 baseline data.

- Waste emissions have decreased by 43t (45%) from 97t (2006/07) to 54t (2009/10). In 2009/10, 72% of Civic Centre waste was recycled; this compares to 54% in 2008/09. This achievement is due to a number of ongoing initiatives including:
- Environmental Champions Network: 75 staff encouraging their colleagues to 'waste less and recycle more' including a special meeting dedicated to 'reuse and recycling'. The Champions have a Handbook (including information on recycling and waste avoidance) and access to a dedicated website (including a discussion forum).
- Dedicated website on the [staff intranet](#) explaining, to all staff, what can be recycled and where. This was necessary for the relaunch of the in-house recycling scheme.
- Two Chief Executive 'all-staff' emails to recruit Environmental Champions and raise awareness of the new in-house recycling scheme.
- Re-launch of the in-house recycling scheme: scheme expanded to include green bins in centralised kitchens areas for glass, plastics and cans and also containers for batteries. New cleaning contractor is supporting the expanded recycling service.
- Compost bins have been sited at the Civic Centre to allow staff to compost putrescible material (e.g. tea bags etc)
- Tidy Friday & Clutter Free Friday events to encourage staff to identify what materials they no longer need and to make these items available for reuse (by other teams) or recycling.
- Water emissions decreased by 5t (65%) from 7t (2006/07 baseline) to 2.5t (2009/10). This reduced consumption may be ascribed to a meter change, leakage control, and conservation measures. The Council also has had 'Aquafund' reporting since August 2008 (e.g. monthly benchmarking/validation reports).

## 9. Future Challenges and Targets

- 9.1. Despite this positive environmental financial and environmental outcome, the Council is not complacent and has identified where it needs to take further action to ensure continued progress is made. The foundation of this plan is the five-year Carbon Management Programme<sup>6</sup> which aims to reduce the Council's carbon footprint, by 25% over five years, through a range of initiatives (see Executive Report, October 2008, ED08067). These actions will help to mitigate our climate impacts and reduce revenue costs and will be reported annually to the Executive.
- 9.2. In addition to this, the [Carbon Reduction Commitment](#) (CRC) scheme means that, in future, the Council will have to purchase allowances for the carbon it emits, at an initial £12 per tonne (also see Executive Report ES10189 Carbon Reduction Commitment - January 2011). Naturally, the less carbon the Council emits, the lower will be the cost of purchasing the carbon allowances. There will also be an annual published performance league table and, therefore, the potential for reputational damage. Sustained progress on the Carbon Management Programme should benefit the Council's compliance with, and performance under, the CRC scheme.
- 9.3. We need to manage with care the gradual synchronisation of historic Carbon Management Programme emission data with the fast-improving data from the Carbon Reduction Commitment data workstream.
- 9.4. The aforementioned Carbon Reduction Commitment scheme is solely geared towards emissions from buildings (including schools) and street lighting. Naturally this has concentrated minds in that direction. A key challenge going forward is to reignite momentum in harder-to-target areas, such as commuting, business travel, and fleet emissions.
- 9.5. It is also worth noting that 'Scope 3' emissions (from our procurement of services and goods) may also be targeted in the future and carbon reporting (as part of Financial Reporting) in the business sector and central government is fast becoming the norm.

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<sup>6</sup> During 2007/08, the council's Sustainability Team led a cross-departmental initiative (in partnership with the Carbon Trust's *Local Authority Carbon Management Programme*) to develop a five-year Strategy and Implementation Plan (SIP) to tackle emissions from the council estate (and schools and Mytime properties). The SIP included a set of action plans outlining both technical and behavioural measures to be implemented over five years with a view to reducing the council's carbon footprint by 25%.

London Borough of Bromley: Environmental Services Department  
2009/10 Carbon Footprint Report



Table 3: 2009/10 Progress (against 2006/07 baseline and previous reporting years)

Sector	2006/07 (tCO <sub>2</sub> e)	2007/08 (tCO <sub>2</sub> e)	2008/09 (tCO <sub>2</sub> e)	2009/10 (tCO <sub>2</sub> e)	2009/10 Progress Against Baseline		2009/10 Annual Progress (compared with 2008/09)	
	Baseline Year	Preparatory Year	First Year	Second Year	Tonnage Change	Percentage Change	Tonnage Change	Percentage Change
Buildings	28,610	29,260	28,329	23,186	-5,424	-19%	-5,143	-18%
<i>(Buildings – Council)</i>	5,688	5,275	5,317	4,887	-801	-14%	-430	-8%
<i>(Buildings – Schools)</i>	17,216	18,160	18,049	14,025	-3,191	-19%	-4,024	-22%
<i>(Buildings – Mytime)</i>	5,706	5,825	4,963	4,274	-1,432	-25%	-689	-14%
Fleet/Business Travel	1,001	997	971	1,042	41	4%	71	7%
Street Lighting	5,791	5,908	5,729	5,841	50	1%	112	2%
Waste/Water	104	97	56	56	-48	-46%	0	0%
Commuting	2,274	2,002	2,002	2,189	-85	-4%	187	9%
<b>TOTAL</b>	<b>37,780</b>	<b>38,264</b>	<b>37,087</b>	<b>32,314</b>	<b>-5,466</b>	<b>-14%</b>	<b>-4,773</b>	<b>-13%</b>