

Decision Maker: IE&E Sub-Committee

Date: 18 January 2012

Decision Type: Non-Urgent Non-Executive Non-Key

Title: CARBON MANAGEMENT FUND: PROGRESS REPORT
2010/11

Contact Officer: Alastair Baillie, Environmental Development Manager
Tel: 020 8313 4915 E-mail: alastair.baillie@bromley.gov.uk

Chief Officer: Nigel Davies: Director of Environmental Services
Mark Bowen: Director of Resources

Ward: All

1. Reason for report

- 1.1 In October 2008, the Executive agreed to establish (ED08067 Minute 69) a ring-fenced Carbon Management Fund to invest in energy efficiency projects, with the aim of reducing the Council's carbon emissions by 25% over five years and avoiding unnecessary energy costs.
- 1.2 The Executive requested that its Improvement, Efficiency & Effectiveness sub-committee (IE&E) receive annual reports to monitor the Fund's operation (ES08185, December 2008; ES09102, December 2009; and ES10198 January 2011).
-

2. **RECOMMENDATIONS**

That IE&E Sub-Committee:

- 2.1 Notes and comments on the progress of completed, current and proposed Carbon Management Fund projects; and
- 2.2 Receives a further annual report in January 2013.

Corporate Policy

1. Policy Status: Existing policy.
 2. BBB Priority: Excellent Council.
-

Financial

1. Cost of proposal: Estimated cost £200k of potential project
 2. Ongoing costs: N/A. Estimated avoided spend p.a.: 2011/12 - £20k; 2012/13 - £69k; 2013/14 - £127k; 2014/15 - £221k; 2015/16 - £319k ; 2016/17 - £436k; 2017/18 - £572k
 3. Budget head/performance centre: Carbon Management Programme within Capital Programme
 4. Total current budget for this head: £320k current uncommitted balance
 5. Source of funding: Capital Programme (£250k) and Carbon Trust / Salix (£250k)
-

Staff

1. Number of staff (current and additional): 0.4 FTE current
 2. If from existing staff resources, number of staff hours:
-

Legal

1. Legal Requirement: No statutory requirement or Government guidance.
 2. Call-in: Call-in is applicable
-

Customer Impact

1. Estimated number of users/beneficiaries (current and projected): N/A
-

Ward Councillor Views

1. Have Ward Councillors been asked for comments? N/A.
2. Summary of Ward Councillors comments: N/A

3. COMMENTARY

Background

- 3.1 In 2008, the Council established a ring-fenced Carbon Management Fund (Fund). This £500k facility (£250k LB Bromley / £250k Salix) is used to provide internal loans for investment in proven energy saving technologies to reduce carbon emissions and energy costs.
- 3.2 The capital in the Fund is protected as each loan is repaid, from an agreed adjustment to an energy budget reflecting reduced consumption and costs. Consequently the Fund is continually replenished for re-investment in new projects. Once an individual project has fully paid back into the Fund, the avoided energy spend then permanently benefits the Council.
- 3.3 To be considered for funding, projects should payback in fewer than five years and have a long-lasting effect. This ensures that the Council receives good value-for-money. Investment projects are focussed on Council operational property and street lighting assets.
- 3.4 The Fund is not currently used for tackling carbon emissions from other sectors of the Carbon Management Programme, such as schools' energy efficiency, and cannot be used for transport-related initiatives. However, the Fund may be used for investing in renewable energy technologies, assuming they meet the pay-back criteria. This has not happened to date as, generally speaking, energy efficiency measures are more carbon and cost-efficient.
- 3.5 When all possible invest-to-save opportunities have been exhausted, it is intended that the initial £500k capital investment will be returned to the Council's reserves and Salix.
- 3.6 The term 'avoided spend' is used in this report rather than 'saving' to describe the financial benefit to the Council. This is because price changes and other factors (e.g. weather) may negate the benefit of the installed measures. Nevertheless, these invest-to-save initiatives will always avoid unnecessary energy consumption and spending.
- 3.7 The projects benefit the Council financially irrespective of energy price changes:
- if energy prices rise, then the avoided spend will be even greater than projected
 - If energy prices fall, the avoided spend will be less but energy bills will be lower too, making for even greater energy budget savings
- 3.8 The following terms are used in this report:
- 'Committed' is the date on which a project was formally authorised to start work
 - 'Commissioned' is when a project was completed and began paying back to the Fund
- 3.9 Projects are described as 'completed', 'current' or 'planned'.
- Completed Projects (1): have fully paid-back their capital investment and are now permanently saving energy, money and carbon emissions
 - Current Projects (4): have been commissioned (installed) and are currently repaying the capital investment (back to the Fund). They are already saving carbon emissions.
 - Planned Projects (3): have been committed (i.e. have been quantified) and usually have a projected commissioning date
 - Potential Projects (1): are being assessed prior to being committed
- 3.10 Some planned projects assessed under this programme and previously reported to IE&E (e.g. fitting variable speed drives to pumps and boiler adjustments), have subsequently been funded through Property's Planned Maintenance Programme. This is why fewer projects are reported in this report compared with previous annual reports. These projects have been robustly quantified to Fund standards and because there is no requirement to repay the investment cost, the avoided spend will benefit the Council's energy budgets immediately.

Table 1: Salix Project Summary at-a-glance

Name	Commissioned*	Description
COMPLETED PROJECTS		
Street-signage: conversion from 24hr to dusk-to-dawn switching (Phase 1)	October 2009	Photoelectric cell units are fitted to lit street signs, enabling the lamps to sense when there is sufficient light for them to automatically switch off – rather than being lit 24hrs a day
CURRENT PROJECTS		
Voltage Optimisation: Civic Centre electricity supply	February 2009	Optimising voltage remedies the discrepancy between the actual supply voltage received at the Civic Centre (207 – 253 volts) and the optimum voltage that electrical equipment such as lighting and computing needs (220 volts). The result is that equipment runs at peak efficiency and energy is not wasted
Street-signage: conversion from 24hr to dusk-to-dawn switching, (Phase 2)	December 2010	Phase 2 of the October 2009 completed street signage project but for a different class of road sign
Central Island Columns: conversion from 24hr to dusk-to-dawn switching	February 2011	Photoelectric cell units are fitted to the lit columns on pedestrian road-crossing islands, so that lamps automatically switch off when its light
Street Lighting: Fit electronic gear to MI26 Lanterns	November 2011	MI26 lanterns are used in street lighting for ‘minor roads’. Control gear starts (or ‘ignites’) and runs lamps. The lamps were previously controlled by mechanical gear but electronic control gear allows them to operate more efficiently.
PLANNED PROJECTS		
Crossing Bollards: conversion from 24hr to dusk-to-dawn switching	February 2012 (estimated)	Photoelectric cell units are being fitted to crossing bollards, so that lamps automatically switch off when its light
Server Room: Evaporative Cooling	March 2012 (estimated)	This project will replace the current, energy-intensive air-conditioning system in the Civic Centre server room. Evaporative cooling combines the natural process of water evaporation with an ‘air-moving’ system. In effect, outside air is drawn through moist pads where it is cooled by evaporation and circulated through the server room by a large fan – cooling the servers
North Block: Lighting	May 2012 (estimated)	In addition to the refurbishment of the North Block, this project will install high-efficiency fluorescent luminaires with daylight and motion sensor controls, consuming around half the energy of the old lighting it replaces
POTENTIAL PROJECTS		
Street Lighting: SON Lamp Dimming	TBC	This project, still at the feasibility stage, would fit equipment to many of the borough’s high-pressure sodium (‘SON’) street lights so that they could be dimmed at appropriate times in appropriate locations

* ‘Commissioned’ means when a project has been completed and has started paying back to the Fund

Completed Projects

- 3.11 Table 2 describes the first project to have completed the whole process: that is it has been commissioned, fully paid-back its £43k investment cost, and is now permanently benefitting the Council by avoiding unnecessary energy use and spend. It sets out the investment cost, carbon and energy savings (February 2009 costs and energy prices) as reported to IE&E.

Table 2: Street-signage conversion from 24hr to dusk-to-dawn switching (Phase 1)

Project Description	Commission Date	Investment Cost (£)	Avoided Spend (£p.a.)	Savings (tCO ₂ p.a.)	Payback (years)
Street-signage conversion	October 2009	43,482	26,862	124	1.62

- 3.12 Energy prices varied over the period that the project was paying back into the Fund (October 2009 – June 2011). Tables 2a, 2b, and 2c show what happened, using actual energy prices. This allows for a comparison to be made between the avoided spend which was projected in 2009 and how much spending was actually avoided over the project period.
- 3.13 The following issues should be noted when considering this analysis:
- electricity prices fell by nearly 3p/kWh between the project start and completion dates
 - electricity prices continued to fluctuate (around this lower figure) during the project's payback period and consequently less spend was avoided than originally projected
 - the positive effect of reduced electricity prices far outweighs this reduced avoided spend
 - having fully paid back, the avoided consumption is permanent and will help protect the energy budget from future price rises
- 3.14 The £43k installation cost should have resulted in an avoided spend of £43k over 1.62 years. However because energy prices fell, the avoided spend was only £31k. The £12k difference, however, was more than compensated for by a fall in energy prices (benefiting the energy budget). Based on current prices, there will be a permanent £18k p.a. avoided spend.

Table 2a: Street-signage conversion: Analysis using Actual Energy Prices

Energy price changes by date	Price p/kWh	Avoided Spend (pro rata)
Price when project Committed	0.1164	N/A
October 2009 to March 2010 (Commissioned: 01/10/2009)	0.0828	£7,959.95 (5 months)
April 2010 to September 2010	0.0629	£7,252.30 (6 months)
October 2010 to March 2011	0.0942	£10,862.31 (6 months)
April 2011	0.0796	£4,590.05 (3 months)

Table 2b: Project timetable

Action dates	Date
Commissioned (<i>Project completed</i>)	01/10/2009
Started paying back (<i>One month lag before savings can be accounted for</i>)	01/11/2009
Project fully paid back	01/06/2011
Avoided spend begins to directly benefit LB energy budget	01/06/2011

Table 2c: Avoided Spend (projected v actual)

	Avoided spend
Projected avoided spend from Commission date to full payback	£43,482.48
Actual avoided spend from Commission date to full payback	£30,664.62
Projected avoided spend per annum (based on 2009 prices)	£26,862.35
Actual avoided spend per annum (based on current prices)	£18,360.20

Current Projects

- 3.15 Table 3 summarises the key data for projects which have been formally commissioned but have yet to fully pay back their loans to the Fund. The Voltage Optimisation project will soon have completed this process and the avoided spend will then permanently benefit the Council.

Table 3: Current Projects

Project Description	Commission Date	Investment Cost (£)	Avoided Spend (£/pa)	Savings (tCO ₂ p.a.)	Payback (years)
Voltage Optimisation: Civic Centre electricity supply	February 2009	89,827	30,703	141	2.93
Street-signage: conversion from 24hr to dusk-to-dawn switching, (Phase 2)	December 2010	49,385	14,434	95	3.42
Central Island Columns: conversion from 24hr to dusk-to-dawn switching	February 2011	17,920	7,197	47	2.49
Street Lighting: Fit electronic gear to MI26 Lanterns	April 2011	93,436	20,784	87	4.5

Planned Projects

- 3.16 Table 4 summarises the key data for projects which have been approved and are being implemented / installed but have yet to be formally commissioned.

Table 4: Planned Projects

Project Description	Commission Date	Investment Cost (£)	Avoided Spend (£/pa)	Savings (tCO ₂ p.a.)	Payback (years)
Crossing Bollards: conversion from 24hr to dusk-to-dawn switching	February 2012 (Estimated)	19,928	11,631	53	1.71
Server Room: Evaporative Cooling	March 2012 (Estimated)	35,000	21,192	142	1.7 / 2.2*
North Block: Lighting	May 2012 (Estimated)	83,920	17,000	77	4.9

* The technical payback is 1.65 years but the loan payback is 2.2 years as it was agreed with the budget holder to only pay back 75% of the savings each year: This slightly extends the payback period but offers the budget holder more protection against energy price rises and/or consumption rising elsewhere on the Civic Centre site.

Potential Projects

- 3.17 There is a street lighting project which is still at the feasibility testing stage. If this project proves to be viable under the Fund's rules, it should avoid significant energy use and spend – potentially around £200k p.a.

Table 5: Potential Projects

Project Description	Commission Date	Investment Cost (£)	Avoided Spend (£/pa)	Savings (tCO ₂ p.a.)	Payback (years)
SON Lamp Dimming	-	-	TBC, potentially £200k	-	-

4. POLICY IMPLICATIONS

- 4.1 The Quality Environment section of the Council's Building a Better Bromley 2020 Vision states that 'we are also determined to work together in reducing energy consumption' and 'reducing energy use' is also identified as an issue to be tackled and how we will judge success. One of the council's Building a Better Bromley priorities for 2012/13 is to "Improve Energy Efficiency in the Borough".
- 4.2 Undertaking energy efficiency activity will place the Council in an improved position with regard to complying with, and reducing liabilities under, the statutory Carbon Reduction Commitment: see Executive report ES12005 (February 2012).

5. FINANCIAL IMPLICATIONS

- 5.1 Table 6 shows how much / when the Current and Planned projects payback into the Fund.

Table 6: Current and Planned Projects: Payback into the Fund

PROJECT	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
	£	£	£	£	£	£	£
Current Projects							
Voltage Optimisation: Civic Centre electricity supply	30,703	24,288	0	0	0	0	0
Street-signage: conversion from 24hr to dusk-to-dawn switching, (Phase 2)	4,811	14,434	14,434	14,434	1,272	0	0
Central Island Columns: conversion from 24hr to dusk-to-dawn switching	1,200	7,197	7,197	2,327	0	0	0
Street Lighting: Fit electronic gear to MI26 Lanterns	0	6,928	20,784	20,784	20,784	20,784	3,372
Planned Projects							
Crossing Bollards: conversion from 24hr to dusk-to-dawn switching	0	969	11,631	7,328	0	0	0
Server Room: Evaporative Cooling	0	0	15,894	15,894	3,212	0	0
North Block: Lighting	0	0	17,000	17,000	17,000	17,000	15,920

5.2 Table 7 shows when Completed, Current and Planned Projects stop repaying into the Fund and begin benefitting the Council's energy budgets. Almost £600k of avoided spend is currently being projected by 2017/18.

Table 7: Completed, Current and Planned Projects: Projected Avoided Spend

PROJECT	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
	£	£	£	£	£	£	£
Completed Projects							
Street-signage: conversion from 24hr to dusk-to-dawn switching (Phase 1) (Actual)	13,770	18,360	18,360	18,360	18,360	18,360	18,360
Current Projects							
Voltage Optimisation: Civic Centre electricity supply	6,415	30,703	30,703	30,703	30,703	30,703	30,703
Street-signage: conversion from 24hr to dusk-to-dawn switching, (Phase 2)	0	0	0	13,162	14,434	14,434	14,434
Central Island Columns: conversion from 24hr to dusk-to-dawn switching	0	0	4,870	7,197	7,197	7,197	7,197
Street Lighting: Fit electronic gear to MI26 Lanterns	0	0	0	0	0	17,412	20,784
Planned Projects							
Crossing Bollards: conversion from 24hr to dusk-to-dawn switching	0	0	4,303	11,631	11,631	11,631	11,631
Server Room: Evaporative Cooling	0	0	0	12,682	15,894	15,894	15,894
North Block: Lighting	0	0	0	0	0	1,080	17,000
Total Avoided Spend	20,185	49,063	58,236	93,735	98,219	116,711	136,003
Total Cumulative Avoided Spend	20,185	69,248	127,484	221,219	319,438	436,149	572,152

Completed project savings are based on actual savings and current and planned project figures are based on projected savings.

- 5.3 The Carbon Reduction Commitment (see Executive Report ES10189 January 2011) – effectively a carbon tax – places a significant additional financial liability on avoidable carbon, reinforcing the need for the demand management measures set out in this report.
- 5.4 The projects in this report as well as reducing energy costs will provide another financial benefit because fewer CRC allowances will have to be purchased.
- 5.5 Table 8 demonstrates that the 766t of carbon emissions saved annually from Fund projects will save £12,256 of CRC allowance costs in 2012/13. This benefit will increase as the price of CRC allowances increases (it is expected to rise by £4/t per annum).

5.6 **Table 8: CRC scheme avoided spend: 2012/13**

Project Description	Annual Carbon Savings (tCO₂)	Avoided CRC Costs @ £16/tCO₂
Street-signage conversion from 24hr to dusk-to-dawn switching (Phase 1)	124	£1,984
Voltage Optimisation (Civic Centre)	141	£2,256
Street-signage conversion from 24hr to dusk-to-dawn switching (Phase 2)	95	£1,520
Central Island Column conversion from 24hr to dusk-to-dawn switching	47	£752
Fit electronic gear to MI26 Lanterns	87	£1,392
Crossing Bollards conversion from 24hr to dusk-to-dawn switching	53	£848
Server room evaporative cooling	142	£2,272
North Block Lighting	77	£1,232
TOTAL	766	£12,256

5.7 Table 9 shows a summary of the Fund for financial year 2010/11 and also as at 31.12.11 (the position when writing this report).

Table 9: Carbon Management Fund Financial Summary

Carbon Management Fund	£'000
Funding Received to date as at 31.3.2011	
LBB Capital Programme	250
Four Instalments received from Salix	250
Total funding received to date	<u>500</u>
Less expenditure to 31.03.11	(279)
Add back loan repayments to 31.03.11	110
Balance as at 31.03.11	<u>331</u>
Less actual spend 2011/12 as at 31.12.11	(15)
Less commitments as at 31.12.11	(55)
Add back loan repayments 2011/12	59
Latest uncommitted balance as at 31.12.11	<u><u>320</u></u>

Non-Applicable Sections	<ul style="list-style-type: none"> • Legal Implications & Personnel Implications
Background Documents: (Access via Contact Officer)	<ul style="list-style-type: none"> • Executive Report ED08067: Carbon Management Programme • IE&E Report ES08185: Carbon Management Programme: First Tranche Projects • IE&E Report ES09102: Carbon Management Fund: Progress

	<p>Report 2009</p> <ul style="list-style-type: none">• IE&E Report ES10198: Carbon Management Fund: Progress Report 2010• Executive Report ES12007: Carbon Management Programme Progress Report 2010/11• Executive Report ES12005: Carbon Reduction Commitment Scheme 2010/11 Annual Report
--	---