

Carbon Plan 2015-2020

*Managing energy and water to deliver a low
carbon future for Reading Borough Council*

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The use of energy and water is essential to the operation of Reading Borough Council and in providing services to the community. Whilst its use is vital to the functioning of the organisation it is crucial that our use of energy and water is managed and minimised, to reduce our impact on the environment, limit our expenditure and mitigate our exposure to insecure energy supplies and limited water resources.

The use of certain types of energy directly, or indirectly, produces greenhouse gas emissions, typically in the form of carbon dioxide, such as from the combustion of natural gas in boilers, or from combustion of gas in power stations generating electricity for the National Grid. Greenhouse gases are a main factor causing man-made climate change, which is having and will in the future, have a significant impact on our way of life, and the world around us. By limiting our energy and water use and thereby restricting our carbon emissions we are helping to safeguard our world for future generations.

This policy and implementation plan sets out the council's policy and targets on corporate energy and water management, and identifies actions to achieve these within the time period 2015-2020. The plan sets out actions to ensure the authority is compliant with relevant legislation (such as Energy Performance in Buildings legislation) and national reporting requirements (GreenHouse Gas Protocol). The strategy will assist the council in making energy and water management an integral part of decision making processes, to ensure efficient use of these resources today and in the future.

How successful we are in managing our energy and water use will have a significant impact on the council's key priorities and service delivery to the community. The Carbon Plan will support the organisation in achieving the Council's service priorities in; 'Keeping the town clean, safe, green and active'; 'Providing infrastructure to support the economy' and 'Remaining financially sustainable to deliver these service priorities' (Corporate Plan 2015-18).

1 Our vision and ambition

Our vision for Reading Borough Council is to have an energy and water efficient estate and operations, in which we strive to achieve best practice. The organisation will have an energy management approach which will endeavour to continually make improvements, and lead by example. By 2020 we will have reduced our energy consumption and resulting carbon emissions by 50%, against a 2008/9 baseline. Reading Borough Council will take an innovate approach to limiting costs and generating income. The local authority will have increased the use of low carbon and renewable technologies, generating at least 15% of total energy use off grid by 2020. Reading Borough Council will have taken a significant step down the road to decarbonise its energy use, position itself well for uptake of 'new' technologies and prepare for demand management.

ABOUT THE COUNCIL

2008/9 Baseline:
19,761 tCO₂

2013/14 carbon
footprint:
13,585 tCO₂

Avoided costs
of £1.1m in
2013/14

2008/9 baseline
year spend on gas
& electricity
~£1.9m

31% down on
baseline

2013/14 ~£2.1m
spent on gas &
electricity

2013/14 **63%** carbon footprint from
buildings

2013/14 **24%** carbon footprint
from street lighting

2013/14 **12%** carbon footprint
from travel and transport

Electricity unit prices
increased **71 %** in 5 years

Gas unit
prices
increased **5%**
in 5 years

Carbon emissions per
kilometre travelled of
Reading Transport Ltd bus
fleet down by **13%** since
2008/09

Group purchasing
of gas and
electricity
benefitting from
economies of scale

46% gas meters upgraded
to Automatic Reads

23 corporate sites with Display Energy
Certificates

Over **40** invest-to-save Salix
funded projects

46 solar PV installations generating
over **2%** of building electricity used

Over **90%** of electricity
meters upgraded to
Automatic Reads

10% of street
lighting upgraded
to LEDs

£1.1m invested
on energy
efficiency and
renewable
technology in
newly refurbished
Civic Offices

465 solar pv systems being installed on
Council houses

2 Managing our resources - progress to date and the savings gap

Reading Borough Council's current corporate energy use is principally through electricity and gas, for buildings and street lighting, with a small volume of fuel oil for heating buildings, with the cost in 2013/14 totalling over £2 m (commodity elements only). The carbon emissions from energy used in buildings accounted for 63% of the carbon footprint in 2013/14. Carbon emissions from street lighting made up 24% of the carbon footprint in 2013/14. Other energy is used to fuel cars for the RBC fleet and business travel, which accounted for 12% of the carbon footprint in 2013/14.

Unit prices for energy have gradually increased over the last six years, so although energy use in kWh has decreased by over 30% since 2008/9, spend on energy has slightly increased.

Since Reading Borough Council signed the Nottingham Declaration on Climate Change in 2006 the authority has undertaken a wide range of work to address energy, water and carbon management, focusing on reducing costs, limiting its impact on the environment, decarbonising our energy supply and integrating these approaches across the organisation.

Since the Council began its investment programme in 2008 just under £1m has been invested through the SALIX energy efficiency fund. Of this, £669 k has been invested in 48 corporate projects, totalling an annual saving of £190 k, 1,320 tCO₂, with an average 3.5 year pay back. Reading Borough schools have invested £261 k in 22 projects, giving a total annual saving of £50 k, 278 tCO₂, with an average pay back period of 5.3 years.

Reading Transport Ltd have continued to invest in their bus fleet. These investments include electric hybrid vehicles and more recently a fleet of renewably sourced, Compressed Natural Gas (CNG) fuelled buses. This investment included the infrastructure at the bus depot to fuel the vehicles with CNG which has also been made available to external fleet operators, including Reading's taxi operators in conjunction with the Council's Cleaner Vehicle CNG conversion grant scheme. RTL have begun replacing Euro IV vehicles with more efficient Euro VI double deck buses. This substantial investment in the bus fleet has reduced the fuel consumption and associated carbon emissions of the fleet by 13% (tCO₂ per kilometre travelled) and helped to improve the air quality of the Borough.

A major investment of £1.22m on 26 solar panel systems on schools, council and community buildings was made in 2012, saving 210 tonnes of carbon emissions per annum and creating an income of £135,000 per annum to the Council.

In 2013/14, the Council installed 1,300 LED streetlights. This represents around 10% of the streetlights in Reading. LED (Light Emitting Diode)

technology is capable of reducing energy use from the lamps by over 70% and makes significant savings on maintenance.

In 2014/15 the Council invested £1.1m on energy efficiency and renewable energy measures in the new Civic centre, which is predicted to reduce the energy use from the Council's headquarters by 75%. The new Civic Centre now hosts the Council's largest solar panel system with 572 solar panels, generating an estimated 10% of the building's electricity.

RBC's carbon emissions reduction target was set by the Climate Change Strategy 2008-2013 as 50 % by 2020. As a result of these actions with others, The 2013/14 carbon footprint for the Council's corporate activities is now 31.3% lower than the baseline emissions in 2008/09, 10% ahead of target, which is significant progress to meet the 50% reduction target. An assessment of 'value at stake' showed that over £1m of costs were avoided by the Council in 2013/14.

Work is ongoing to continue to reduce the carbon emissions of the Council, including the installation of approximately 5,400 PV solar panels on to around 465 Council houses, full upgrade of street lights across the borough to LED lamps and investigations into the development of energy performance contracting schemes to invest in whole building approaches with guaranteed energy savings. Cautious predictions estimate that the most recent and ongoing investments should save at least a further 2,400 tCO₂. Should RBC maintain its current energy consumption, and make only these recently identified savings, the carbon footprint would be around 1,300 tCO₂ adrift from its corporate 2020 target, or over 10% above the target emissions. The aims, objectives and actions set out in this strategy should bridge this savings gap.

Reading Borough Council has set out its key priorities to help narrow the gaps in Reading to ensure that everyone can benefit from its success (in its Corporate Plan 2015-2018). Six service priorities have been identified to focus the work of the Council. Our priority for the period of this strategy, 2015-2020, is to reduce the carbon emissions savings gap and our work to manage our energy and water use directly supports three of the Council's service priorities;

Keeping the town clean, safe, green and active

Providing infrastructure to support the economy

Remaining financially sustainable to deliver these service priorities

We continue to focus our work on the four key issues which affect our energy and water use and carbon emissions; cost; environmental impact; energy decarbonisation; and integration of energy management approaches throughout the organisation.

Cost

Whilst the use of energy and water is vital to the functioning of the organisation it's crucial that it is managed and minimised, to limit our expenditure and mitigate our exposure to limited water resources and insecure energy supplies, particularly in globally uncertain times.

Although energy use in kWh has decreased significantly over the last six years, spend on energy has only slightly increased. This is due to unit prices increasing, and in particular electricity, which has increased by over 70%. This rising cost of energy puts increasing pressure on financial resources, with the need to make consistent energy savings ever more critical.

The current (2013/14) approximate corporate annual spend on gas and electricity for RBC is around £2.1m (non-commodity elements are not included in this figure). Since the baseline year of 2008/9 there have been significant avoided costs on energy, as more efforts have been directed to reduce energy use. Had energy consumption continued as Business As Usual (BAU), increasing at 1.5% per year (based on assumptions used by the Carbon Trust) since 2008/9, then the total annual energy spend would likely be closer to £3.2m in 2013/14.

Remaining financially sustainable to deliver these service priorities
Providing infrastructure to support the economy

Environmental impact

The use of certain types of energy directly, or indirectly, produces greenhouse gas emissions, typically in the form of carbon dioxide, such as from the combustion of natural gas in boilers, or from combustion of gas in power stations generating electricity for the National Grid. Greenhouse gases are a main factor in causing man-made climate change, which is having and will in the future, have a significant impact on our way of life, and the world around us. By limiting our energy and water use and thereby restricting our carbon emissions we are helping to safeguard our world for future generations.

Keeping the town clean, safe, green and active

Decarbonisation

Whilst RBC has been and will continue to manage and reduce its energy use throughout its operations, this resource is still required to deliver services to the community. Decarbonising our energy supply will reduce the impact on the environment, limit the cost and exposure to volatile energy markets of this essential energy use. A decarbonised energy supply would see energy which is renewably generated, locally, off-grid, and supplied directly to the demand on site.

Keeping the town clean, safe, green and active
Remaining financially sustainable to deliver these service priorities
Providing infrastructure to support the economy

Integration

The use of energy and water is integral to the functioning of the organisation, and is used at all levels of the council and by all members of staff. Different roles and levels of seniority have varying degrees of influence over this use of energy and water. To ensure these resources are used efficiently, an integrated energy and water management approach is essential, in which all individuals are aware of and understand their responsibilities, and energy and water use is considered in decision making processes.

Remaining financially sustainable to deliver these service priorities

3 What we will do to reduce our energy, water use and carbon footprint

Policy Statement

Reading Borough Council is committed to working to reduce its energy use, Greenhouse Gas emissions and water use across its estate and operations, and to make energy, carbon and water savings an integral part of the everyday decision making process. Reading Borough Council is dedicated to continually reduce its dependence on fossil fuels and diversify its range of energy supplies, whereby reducing the organisations exposure to the volatility of the energy markets, limited water resource availability and the financial risks from price fluctuations.

We will ensure that the necessary systems and processes are in place to allow continuous improvement in the council's operations, through effective monitoring and management of energy and water use.

Targets

We will reduce RBC's carbon footprint by 50 % by 2020, and aim for 100 % by 2050, against a 2008/9 baseline, to include provision of renewable energy of 15 % by 2020 (15 % of total energy consumed), and aiming for 50% by 2050.

To meet these 2020 targets, on an annual basis we will continually reduce RBC's energy and water use by 7 %, and increase the use of renewable/low carbon energy by 35 % per year.

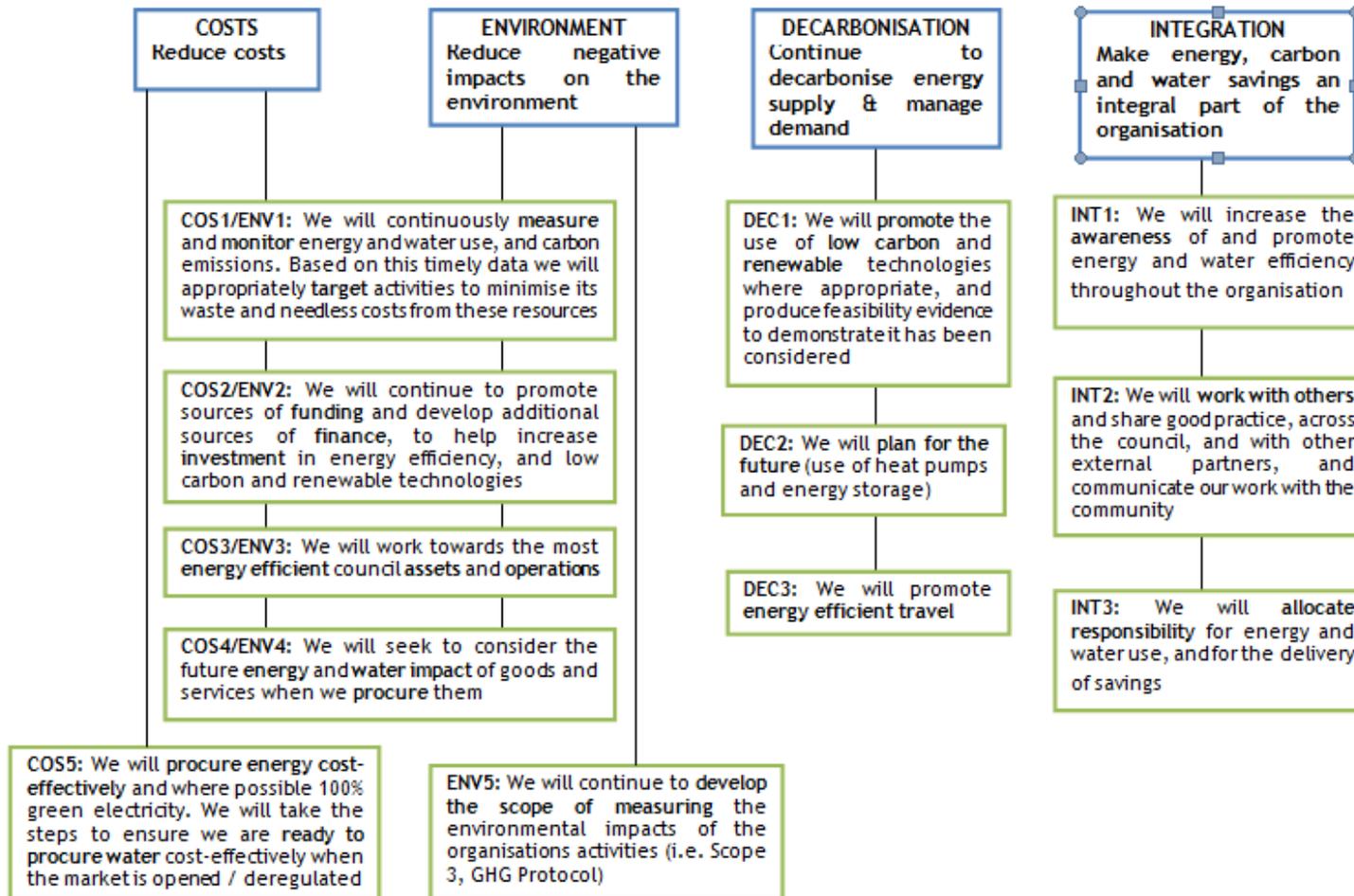
We will review progress against each aim annually, and review the Policy & Strategy after 3 years and develop a new strategy for the 2020-2025 period.

Aims & objectives

This plan focusses our work on the four key issues which affect our energy and water use and carbon emissions. We identify four aims to address the key goals of the policy, as outlined below;

COST:	<i>Reduce costs</i>
ENVIRONMENT:	<i>Reduce negative impacts on the environment</i>
DECARBONISATION:	<i>Continue to decarbonise energy supply & manage demand</i>
INTEGRATION:	<i>Make energy, carbon and water savings an integral part of the organisation</i>

To meet the aims of the policy, Reading Borough Council has 12 objectives, which identify the work streams to meet the aims and reduction targets;



Action Plan

Each objective has a number of actions, which outline our work to help bridge the carbon emissions savings gap by 2020, and reduce the Council's energy and water use. The following tables provide a summary of actions to meet each aim and objective of this strategy.

In summary the actions fall into four categories;

- Establishing and maintaining organisational systems and approaches that maintain and improve the efficient use of energy and water
- Identification and investment in infrastructure and building estate
- Planning for and being ready for opportunities in the future
- Working with others and sharing good practice

Our Service Priority
 Remaining financially sustainable to deliver these service priorities
 Keeping the town clean, safe, green and active
 Providing infrastructure to support the economy

Our Aim
COST: Reduce costs
ENVIRONMENT: Reduce negative impacts on the environment

Our Objectives:
 COS1/ENV1: We will continuously measure and monitor energy and water use, and carbon emissions. Based on this timely data we will appropriately target activities to minimise waste and the associated costs from these resources
 COS2/ENV2: We will continue to promote sources of funding and develop additional sources of finance, to help increase investment in energy efficiency, and low carbon and renewable technologies
 COS3/ENV3: We will work towards the most energy efficient council assets and operations
 COS4/ENV4: We will seek to consider the future 'energy/water' impact of goods and services when we procure them
 COS5: We will procure energy cost-effectively and where possible 100% green electricity. We will take the steps to ensure we are ready to procure water cost-effectively when the market is opened / deregulated
 ENV5: We will continue to develop the scope of measuring the environmental impacts of the organisations activities (i.e. Scope 3, GHG Protocol)

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
COS1/ENV1: We will continuously measure and monitor energy and water use, and carbon emissions. Based on this timely data we will appropriately target activities to minimise waste and the associated costs from these resources							
Baseline, benchmark, monitor, review & report energy and water use, energy generation and carbon footprint	Q1 15/16	Establish water baseline, incl. full asset list	1% of building use & avoided costs in future -£18k (and avoiding 1.5% growth)	Staff time	Without continuous input savings will not be realised, and likely drift in energy consumption increasing by 1.5% each year	EMO, Finance, ENRG	Building Manager, Services, Budget holders, Solar users, feed into Corporate Asset Review
	Annually & quarterly, incl. annual reports to CMT & SEPT	Review & reports on water, energy, carbon, solar, street lighting, other renewable generation and compare against targets					
	At budget setting	Budget predictions. Staged approach - Corporate FM sites 15/.16. Identify next sites in					

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
		15/16					
Automatic Meter Read (AMR), automatic monitoring, bill validation in place	By end 16/17	Elec, gas, solar - 80% of meters automated	1% of building energy costs -£18k (and avoiding 1.5% growth)	£ for AMR £ for monitoring systems - already in place, expansion will require additional cost	Without continuous input savings will not be realised, and likely drift in consumption increasing by 1.5% each year	EMO, Finance, ENRG	Building Manager, Services, Budget holders, Solar users
	By end 15/16	Water - review cost effectiveness & options appraisal					
Leak alerts for water	By end 15/16	Options appraisal - water accounts on bill validation	10% water costs = -£40k, over 5 years. Avoided costs in future	£ to set up water bill on validation system. Staff time to monitor & react		EMO, Finance, ENRG	Services
DECs & A/C assessments	Annual, first Q	DECs - all completed by expiry dates	Legal requirement. Recommendations for improvement provided	£ and staff resource		EMO, Prop Serv, Educ Assets	Building Managers, Services
	AC every 5 yrs	AC - Completed within 12 months					
COS2/ENV2: We will continue to promote sources of funding and develop additional sources of finance, to help increase investment in energy efficiency, and low carbon and renewable technologies							
Salix, SEELS investment	By end each FY	Investment targets. £250k/yr	5-8 yr Pay Back Period £30-50k/yr, after loan repaid	£250k/yr Potential link with Energy Performance Contracting through RE:FIT	Projects need to be continually identified across the estate, and resources to implement projects needs to be available	EMO/Sustainability Manager	ENRG, Prop Serv, Educ Assets, Services, Finance
Energy Performance Contracting, likely RE:FIT framework	Options & initial assessment by Q2 15/16	Options appraisal and building short list. Desktop assessment of potential savings by RE:FIT Staged investment. Initial 5 buildings followed by further 5-10.	15-20% on affected buildings. Indicative annual savings total £78-105k annual savings on energy costs (based on current energy prices) once all phased complete. Other savings will be realised, e.g. maintenance	£££ Likely £2-5m across 5 yrs, though likely to include Salix Fund	Allocated project management will be required to manage Procurement phase and installation phase - without dedicated resource savings will be delayed. Monitoring systems need to be in place to manage contract and monitor predicted savings	EMO, Sustainability Manager	Finance, Procurement, Assets, Legal, Educ Assets, Prop Serv, FM, Services

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
Income from renewables sources - FIT, RHI	Summer 2015	Deliver Solar Housing	Potential for income/savings of over £565k/yr (£180-280k net), based on current unit prices.	£££ Possible further £2m over next 5 yrs	Allocated project management will be required	EMO, Housing, Sustainability Manager	ENRG, Services, Finance
	By Q2 15/16	Review other options					
Horizon scanning	Biannually or as necessary	Funding grid distributed to relevant officers		Staff resource		EMO/Sustainability Team	TVE, ENRG
COS3/ENV3: We will work towards the most energy efficient council assets and operations							
Energy management system approach and procedures for building use	By Q2 15/16 (1) By Q4 15/16 (2)	1) Investigate & develop first stages energy management system approach 2) Identify best practice protocols for building use.	1% on buildings affected. Avoided costs up to -£18k (and avoiding 1.5% growth)	Staff resources	Without continuous input savings will not be realised, and likely drift in consumption increasing by 1.5% each year	Sustainability Manager, Head FM, Prop Serv	Services, building managers, EMO, ENRG
Standards for refurbishment, upgrade & maintenance projects	By Q4 15/16	Develop technology list, refurb checklist and identify design routes	Avoided costs for the future	Staff resource	Cross directorate input required	Sustainability Manager, Head FM, Prop Serv	EMO, L&P Officer Group, ENRG
Street lighting upgrade, deilluminate where possible and standards for new additions	By Q3 15/16	Review inventory		Staff resource		Transport	EMO, ENRG, Finance, Slough BC and Wokingham BC
	15/16 Procurement 16/7 start install	Street lighting upgrade, to include all units on Central Management System (CMS) and use of dimming & trimming where appropriate	Savings from energy, maintenance and replacement costs over £500k/yr	£££ -£10m over 2-3 yrs 70% funding won from Challenge Fund, DfT	Allocated project management will be required		
	15/16	New standards & policy		Staff resource			
COS4/ENV4: We will seek to consider the future 'energy/water' impact of goods and services when we procure them							
Investigate potential to consider future energy/water impacts of goods & services	By end 15/16	Discussion paper	Avoided costs for the future	Staff resource		Procurement	Sustainability Team, EMO, ENRG
COS5: We will procure energy cost-effectively and where possible 100% green electricity. We will take the steps to ensure we are ready to procure water cost-effectively when the market is opened / deregulated							
Group purchasing of energy	Start FY	Contract renewals	Avoided costs	Staff resource		Finance	EMO
Central contracts for	Ongoing	Continued	Avoided costs	Staff resource	Staff resource	Finance	Service managers,

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
energy & water	15/16	Consolidated water bills to 1 group account					EMO, Prop Serv, Educ Assets, Building Managers
New supplies/meters provided through central contract suppliers	Ongoing	Continued		Staff resource		Finance	Service managers, EMO, Prop Serv, Educ Assets, Building Managers
Prepare for opening of the water market in 2017 & negotiate more favourable contract	By Q2 15/16	Water baseline and historic billing info. Link to COS1/ENV1 action	10% saving on price -£40k	Staff resource	Without reasonable baseline data and monitoring systems set up, RBC will not be in a position to negotiate to most favourable contract	EMO, Finance	TW
	Ongoing throughout 15/16	Seek support, potentially through Crown Commercial Services					
ENV5: We will continue to develop the scope of measuring the environmental impacts of the organisations activities (i.e. Scope 3, GHG Protocol)							
Identify wider environmental impacts of RBC & how to report this	By Q2 16/17	Discussion paper	Raise awareness & assist in identifying future areas for savings. Focus on initially working with RTL.	Staff resource		EMO, ENRG	Finance, TW, Transport, Health, Housing, CICT, RTL

Our Service Priority
 Remaining financially sustainable to deliver these service priorities
 Keeping the town clean, safe, green and active
 Providing infrastructure to support the economy

Our Aim
DECARBONISATION:
 Continue to decarbonise energy supply & manage demand

Our Objectives:
 DEC1: We will promote and increase the use of low carbon and renewable technologies where appropriate, and produce feasibility evidence to demonstrate it has been considered
 DEC2: We will plan for the future (use of heat pumps and energy storage, demand management)
 DEC3: We will promote energy efficient travel

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
DEC1: We will promote and increase the use of low carbon and renewable technologies where appropriate, and produce feasibility evidence to demonstrate it has been considered							
Identify potential opportunities for low carbon/renewable technology and district energy schemes	Q2 15/16	Review assets for potential. Identify potential for incorporation in new build/refurb, and review against target	Potential income (see COS2/ENV2)	Staff resource or £ for consultancy		Sustainability Team	EMO, L&P Officer group, ENRG, Prop Serv, Planning, TVE, RCCP, Climate Berks, APSE
DEC2: We will plan for the future (use of heat pumps and energy storage, demand management)							
Identify best scenarios & possible risks for new technology	By Q2 15/16 (1) By Q4 15/15 (2) and annual thereafter	1) Needs Assessment 2) Review technology and identify risks & 'best' scenarios, highlight trials and potential training	Potential savings for future Raise awareness & make prepared for uptake of new technology	Staff resource		Sustainability Team, EMO	ENRG, Prop Serv, TVE
Demand Side Management & Electricity Demand Reduction	Start Q2 15/16	Investigate potential. Civic Offices & Street lighting considered first. Other sites after 2017	0.5-1% (approx. £5-10k) on DUOS costs of HH electricity sites + savings on reduced energy consumed	Staff resource initially	DUOS charges currently account for approx. 10% of the bill Most appropriate in locations where best monitoring is available (to date, Plaza West and Street lighting)	EMO	ENRG, University of Reading research

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
DEC3: We will promote energy efficient travel							
New staff travel plan	Summer 15	Launch Travel Plan	Requirement for new civic offices, shows meeting planning stipulations.	Time of small team of officers Could also produce online learning	Lack of committed resource	Transport/ FM	Sustainability
Promote energy efficient travel	15/16	Inform Staff of key elements of travel plan	Raise awareness, increase active travel, improve staff health and potentially attendance, improve Reading's air quality	Printing of travel packs - time for regular review to keep up to date	Lack of committed resource	Transport/ HR	Communications
		Promote national campaigns					
		Travel packs for all new staff					
Annual review car parking permits	Annual	Parking permit review carried out	Cost of parking space maintenance	Officer Time	Not seen as important	Transport	FM Team, building managers
Staff travel surveys	Bi-annual	Staff travel survey carried out	Measurement to inform future action on travel plan	Time to produce, analyse and respond to survey	Lack of committed resource	FM team	Communications
Fleet review	Every 5 years	Review carried out	Greater efficiency, greater safety	Currently free from EST	Charge introduced for this service by EST	Transport Streetcare	Risk management Health and Safety

Our Service Priority
Remaining financially sustainable to deliver these service priorities

Our Aim
*INTEGRATION:
Make energy, carbon and water savings an integral part of the organisation*

Our Objectives:
 INT1: We will increase the awareness of and promote energy and water efficiency throughout the organisation
 INT2: We will work with others and share good practice, across the council, and with other external partners, and communicate our work with the community
 INT3: We will allocate responsibility for energy and water use, and for the delivery of savings

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success	Who will do it	Who else will be involved
INT1: We will increase the awareness of and promote energy and water efficiency throughout the organisation							
Develop & deliver training, communications & reporting	By Q2 15/16 (1) By Q3 15/16 (2) Review schedule annually Deliver throughout year	1) Identify audience, develop training options, reporting 2) Delivery schedule	1% of energy use -£18k (and avoiding 1.5% growth)	Staff resource	Without continuous input savings will not be realised, and likely drift in consumption increasing by 1.5% each year	Sustainability Team	EMO, Finance, ENRG, Learning & Development, HR
INT2: We will work with others and share good practice, across the council, and with other external partners, and communicate our work with the community							
Build network of relevant stakeholders & share good practice, explore shared services/procurement etc	By end 15/16	Identify and meet stakeholders and develop communications. Focus initial network on small number of key organisations, such as RTL.	Potential shared service/economies of scale savings	Staff resource		Sustainability Team, EMO	RTL, NHS, UoR, Las, Prop Serv, Building Managers, Transport
Communications plan	Q1 15/16	Develop & deliver		Staff resource		Sustainability Team	EMO, Comms
INT3: We will allocate responsibility for energy and water use, and for the delivery of savings							
Set directorate carbon budgets & targets for reduction, and monitor progress	Start Q1/2 of 15/16 (1) By Q4 15/16	1) Start dialogue with directorates, 2) Establish carbon budgets & targets. Potential staged approach	1% of energy use -£18k (and avoiding 1.5% growth)	Staff resource	Without continuous input savings will not be realised, and likely drift in consumption increasing by 1.5%	Sustainability Manager	EMO, Finance

What we'll do	When we'll do it	How will we measure progress	What we think we will save	What might we need to invest	What might affect our success each year	Who will do it	Who else will be involved
Identify who has responsibility for energy/water use	Start Q3 15/16	Review assets to identify responsibility		Staff resource		Sustainability Manager, EMO	Services, FM, Finance

4 How we will do it

Our responsibilities

The council has a responsibility to be compliant with the Energy Performance of Buildings legislation, and to provide verifiable annual carbon emissions reporting to the Department of Energy and Climate Change. We also have a duty to ensure that public money is safeguarded and properly accounted for, and used economically, efficiency and effectively. As a signatory to Reading's Climate Change Strategy '*Reading Means Business on Climate Change*', the authority is committed to reducing its carbon emissions by 50% by 2020.

Leadership

Our elected councillors make decisions about council services and funding, and the policy direction of the organisation. Lead Councillors are appointed to have particular responsibilities or 'portfolios'. The Lead Councillor for Strategic Environment, Planning and Transport oversees the policy direction for energy, water and carbon management.

The Council and Committees shape what services are delivered and how Reading develops and grows. The Strategic Environment, Planning and Transport Committee is responsible for the Carbon Plan.

The Director of Environment and Neighbourhood Services is the sponsor for this strategy, and will bring annual update reports to the Corporate Management Team and the Strategic Environment, Planning and Transport Committee.

Senior managers will have a responsibility to work to reduce energy and water use, and carbon emissions within their service areas. Each directorate will have an annual carbon budget for its operations. The Energy and Natural Resources Group will support senior managers in achieving this. This officer group will be responsible for driving and monitoring the progress of the Carbon Plan.

Integration and good decision making

The Energy and Natural Resources Group will have appropriate directorate representatives and technical specialists as members. The officer group will monitor the progress of the delivery of the strategy on a quarterly and annual basis. The group will also drive the progress of the key projects identified within the strategy, and will update and communicate with other relevant officer groups, such as Land and Property Working Group, to ensure all key stakeholders are involved in the development and implementation of actions from the strategy, and decisions are made with the appropriate information.

The Energy and Natural Resources Group will work with others and share good practice with other external partners, such as Reading Transport Ltd.

The Energy and Natural Resources Group will hold a working document of the Carbon Plan's actions, and will update and develop as appropriate. This working document will be responsive and flexible, allowing for potential adjustments of focus and inclusion of new opportunities.

A communication plan for the Carbon Plan will be developed in the early stages of the strategy period. It will aim to ensure that communications between services, energy management officers, senior management, building managers, general staff

and Reading residents are well co-coordinated, effectively managed and responsive to the information needs of each of those groups.

All staff are responsible for being aware of the best use of resources, for reporting issues and following the sustainable travel hierarchy.

5 Investment in the future

The key investments identified for further investigation within this Plan are;

1. Further Salix investment in RBC building estate
2. Full street lighting upgrade across the borough, including bollards and signage
3. Energy Performance Contracting, potentially using the RE:FIT framework, to upgrade key buildings using a 'whole building approach'
4. Further investment in renewable technology to generate additional, long-term income and carbon savings, for example, further pv on corporate buildings, a solar farm and on school expansions

Salix Funding is invest-to-save funding which was secured in 2008, and will remain available to the Council should appropriate investment opportunities continue to be identified. Any projects must meet strict Salix Funding investment criteria.

Funding has been secured from the Department For Transport (DfT) to cover 70% of the cost of upgrading all street lighting across the borough, in collaboration with Slough and Wokingham Borough Council. The remaining 30% of our cost will be met by the council.

Any further significant investment to undertake energy performance contracting or to install additional renewable technologies will require further business cases to be developed before finances are committed.

The cost of ongoing energy and water management activities will be met within current budgets.

Value at stake

The value at stake represents the total potential cost savings in energy and water that can be obtained through adopting the proposed activity within this Plan.

Should RBC adopt the Carbon Plan, the potential savings over and above the energy savings recently identified, represent at least a further £500 k per year. Should energy prices increase, which over a 5 year period is likely to occur, with the Department of Energy and Climate Change predicting on average an annual increase of 1.7%, these avoided costs would be higher.

Avoided costs should also be taken into consideration. Organisations which do not monitor and manage their energy use effectively across their estate typically experience a drift in energy use upwards of around 1.5% per year (Carbon Trust). By managing our energy use closely and effectively the Council would avoid this drift in energy use, which would be over £380k per year, in 2020/21, assuming no energy price increases.

Glossary of terms

A/C Assessments	Inspection and assessment of energy efficiency of Air Conditioning systems. Systems totalling 12kW and over in a building. Aircon inspection Reports and Certificates in accordance with Part 4 of the Energy Performance of Buildings (Certificates and Inspections) (England & Wales) Regulations 2007 which implements Article 9 of the EU Energy Performance of Buildings Directive.
AMR	Automatic Meter Read - automatically read meter, which pulses automatic read to a centralised data collation point.
APSE	Association for Public Services Excellence
Baseline	A starting point (year) to allow for future comparisons. RBC's baseline year is 2008/09
Bill validation	Validation of utility bills (gas and electricity) against various different factors, such as unit cost, meter readings, standing charges etc. Bill validation services provided by TEAM follows up queries on bills which fail validation.
Carbon emissions (or equivalent) or Greenhouse Gases	Any of the atmospheric gases that contribute to the greenhouse effect, such as carbon dioxide, methane and fluorocarbons. In this context, any greenhouses gases released as a result of activities by the Council. CO ₂ equivalents (CO ₂ -e) offer a universal standard measurement that allows for the comparison of different greenhouse gases based on their ability to trap heat in the atmosphere. There are many types of greenhouse gases, and some gases are more effective at warming the atmosphere than others because they trap heat more effectively and longer.
Central Management System (CMS)	Central Management System for remotely controlled street lighting. RBC's CMS is currently Mayflower.
Commodity	A raw material or primary product that can be bought and sold. In this context, the commodities of gas or electricity. Charges on a gas or electricity bill are split out into commodity and non-commodity elements. The commodity charge would be cover the kWh supplied to site. Non-commodity charges would cover, for example, network delivery charges, standing charges and taxes.
Crown Commercial Services	The Crown Commercial Service is an executive agency and trading fund of the Cabinet Office of the UK Government. The CCS is responsible for improving government commercial and procurement activity.
Decarbonisation	To remove carbon from, for example, to remove the release of carbon emissions, or greenhouse gases, from the generation of energy, by renewably generating energy and reducing energy generation from fossil fuels.
Demand Side Management (DSM)	Actions undertaken on the demand side (customer side) of energy metres. Usually, the goal of demand side management is to encourage the consumer to use less energy during peak hours, or to move the time of energy use to off-peak times such as nighttime and weekends.
Demand-Side Response (DSR)	Electricity demand-side response (DSR) is when consumers adjust the amount of electricity they use at particular times in response to a signal or alert.
Display Energy Certificates and advisory reports	A Display Energy Certificate (DEC) shows the energy performance of a building based on actual energy consumption as recorded over the last 12 months within the validity period of the DEC (operational rating). The operational rating is a numerical indicator of the actual annual carbon dioxide emissions from the building. This rating is shown on a scale from A to G, where A is the lowest CO ₂ emissions (best) and G is

	<p>the highest CO2 emissions (worst).</p> <p>A DEC and advisory report are required for buildings with a total useful floor area over 500m² that are occupied in whole or part by public authorities and frequently visited by the public. A DEC must be accompanied by an advisory report and the owner of the building must have a valid one available. The advisory report highlights recommendations to improve the energy performance of the building.</p>
DUOS/DUoS	<p>Distribution Use of System charge. This charge is included on all electricity bills and covers the use of the regional electricity networks to distribute electricity to homes and businesses. The DUoS charge covers the cost of receiving electricity from the national transmission system and feeding it directly into homes and businesses through the regional distribution networks. These networks are operated by Distribution Network Operators (DNOs). The distribution networks include overhead lines and underground cables, as well as substations and transformers, which reduce the electricity's voltage to safe levels for use in homes and businesses. This is a non-commodity element of your electricity bill.</p>
Electricity Demand Reduction	<p>Reducing the amount of electricity consumed through being more efficient. In particular, electricity savings at peak times are focused on, by installing more efficient equipment or increasing the efficiency of selected existing electrical systems.</p>
EMO	<p>Energy Management Officer</p>
Energy Management System	<p>A management system model to develop and embed processes and procedures within an organisation to help continual improvement in energy management. For example, the international standard ISO 50001. The ISO 50001:2011 Energy Management System provides a framework of requirements for organizations to develop a policy for more efficient use of energy, fix targets and objectives to meet the policy, use data to better understand and make decisions about energy use, measure the results, review how well the policy works, and continually improve energy management.</p>
Energy Performance Contracting	<p>An Energy Performance Contract (EPC) offers a financing mechanism designed to accelerate investment in cost effective Energy Conservation Measures. An EPC is a partnership between a customer and an energy services company that allows the improvement of building energy efficiency without any upfront capital costs to the end client.</p> <p>Under an EPC, the energy services company will probably implement a number of Energy Conservation Measures (ECMs). But what is different about an EPC compared to a normal programme of upgrades is that the provider will guarantee that the energy savings delivered will pay for the capital investments in new equipment.</p>
ENRG	<p>Energy and Natural Resources Group</p>
EPBD / Energy Performance of Buildings Directive	<p>EU Energy Performance of Buildings Directive (EPBD) was introduced in the UK from January 2006 with a three year implementation period ending January 2009. Its objective is to improve energy efficiency and reduce carbon emissions as part of the government's strategy to achieve a sustainable environment and meet climate change targets agreed under the Kyoto Protocol. The EPBD introduced higher standards of energy conservation for new and refurbished buildings from April 2006 and will require energy performance certification for all buildings when sold or leased. In addition it will introduce regular inspections for larger air conditioning systems and advice on more efficient boiler operation for commercial property.</p> <p>Directive 2002/91/EC of the European Parliament and of the Council of</p>

	16 December 2002 on the energy performance of buildings
Feed in Tariff (FiT)	Government renewable generation incentive scheme. set amount for each unit (kilowatt hour or kWh) of electricity you generate - a 'generation tariff'.
Fossil fuels	A natural fuel such as coal or gas, formed in the geological past from the remains of living organisms.
GHG Protocol	The Greenhouse Gas (GHG) Protocol, developed by World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD), sets the global standard for how to measure, manage, and report greenhouse gas emissions.
Greenhouse gases (or carbon emissions)	Any of the atmospheric gases that contribute to the greenhouse effect, such as carbon dioxide, methane and fluorocarbons. In this context, any greenhouses gases released as a result of activities by the Council.
HH	Half-hourly meter - utility meter automatically read on a half-hourly basis. Some electricity meters are mandatory HH meters. For customers with an electricity capacity of 100kW or more, half hourly metering is not only mandatory, but a pre requisite in electricity supply agreements.
LED	Light-emitting diode
Low carbon technology	Technologies which result in fewer carbon emissions than traditional technologies, either through generation of energy or improving energy efficiency.
National Grid	The National Grid is the high-voltage electric power transmission network in Great Britain, connecting power stations and major substations and ensuring that electricity generated anywhere in England, Scotland and Wales can be used to satisfy demand elsewhere
NHH	Supplies under 100kVA tend to be Non Half-Hourly (NHH) metered, using standard meters that are read manually, or meters that feature Automated Meter Reading (AMR) technology.
Nottingham Declaration on Climate Change	Declaration on climate change which signalled political commitment to taking action to tackle climate change. Over 300 councils signed up to the original statement.
Off-grid	Generation of energy, typically electricity, not on the centralised network, the National Grid.
RCCP	Reading Climate Change Partnership
RE:FIT	A national procurement framework for Energy Performance Contracting available to the public sector. The scheme uses an Energy Service Company (ESCo) to implement energy efficiency measures which enables organisations to cut running costs, energy consumption and carbon emissions. The ESCo guarantees the level of energy savings at the outset.
Renewable energy	Energy from a source that is not depleted when used, such as wind or solar power
Renewable Heat Incentive (RHI)	Government incentive scheme which pays participants of the scheme that generate and use renewable energy to heat their buildings.
Salix Funding	Salix was established in 2004 as an independent, publicly funded company, dedicated to providing the public sector with loans for energy efficiency projects.
Solar PV/solar panels	A photovoltaic system, also photovoltaic power system, solar PV system, PV system or, casually, solar array, is a power system designed to supply usable solar power by means of photovoltaics. It consists of an arrangement of several components, including solar panels to absorb and directly convert sunlight into electricity, a solar inverter to change the electrical current from DC to AC, as well as mounting, cabling and other electrical accessories to set-up a working system.
Tonnes of CO₂ equivalent or tCO₂ (e)	Unit of measure of carbon emissions
TUOS / TUoS /	Transmission Network Use of System Charge (TNUoS). This covers the

TNUoS	cost of using the National Transmission System, owned and operated by National Grid, to deliver electricity from power stations into and across the transmission network. Your electricity supplier will repay this charge to National Grid on your behalf. This is a non-commodity element of your electricity bill.
TVE	Thames Valley Energy - regional energy agency to encourage and help local people progress from non-sustainable energy resources to sustainable energy resources

Appendix 1

1. Background

1.1. Early work

Since Reading Borough Council signed the Nottingham Declaration on Climate Change in 2006 there has been numerous local and national policies and targets, and legislation which have influenced the council's energy management work.

1.2. National Policies

The 2008 Climate Change Act established the world's first legally binding climate change target. The act aims to reduce the UK's greenhouse gas emissions by at least 80% (from the 1990 baseline) by 2050. The net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline. Moving to a more energy efficient, low-carbon economy will help to meet this target. It will also help the UK become less reliant on imported fossil fuels and less exposed to higher energy prices in the future.

A number of actions set out by the UK government are relevant to Reading Borough Council's work on energy and carbon reduction;

Setting national policy and strategy

- setting carbon budgets to limit the amount of greenhouse gases the UK is allowed to emit over a specified time

Reducing the demand for energy and helping people and businesses to use energy more efficiently

- reducing demand for energy with smart meters and other energy-efficient measures for industry, businesses and the public sector
- providing incentives for public and private sector organisations to take up more energy-efficient technologies and practices through the CRC Energy Efficiency Scheme
- reducing greenhouse gases and other emissions from transport

Investing in low-carbon technologies

- taking action to increase the use of low-carbon technologies and creating an industry for carbon capture and storage
- providing over £200 million of funding for innovation in low-carbon technologies from 2011 to 2015

Publicly reporting carbon emissions from businesses and the public sector

- asking English local authorities to measure and report their greenhouse gas emissions

1.3. Carbon management and climate change

In 2007 RBC worked with the Carbon Trust to produce Reading's Local Authority Carbon Management Plan (LACM), which measured and reported the authority's carbon footprint, set targets for reduction and identified potential activities to make carbon reductions. The Council went on to successfully win Salix Finance (interest-free loan) funding in 2008 and has continued to invest this, totalling almost £1m investment to date, and delivering over 70 projects.

The LACM set an annual reduction target of 2%, against a 2005/6 baseline. In addition the LACM helped inform Reading's Climate Change Strategy 2008-2013, which set a target of 20% reduction for RBC by 2012/13 and 50% by 2020 (against 2006/7 baseline), which equated to an annual reduction target of 4%. This has been superseded by the Reading Climate Change Strategy 2013-20, a collaborative strategy with business, community and public sector which sets out to 'develop a low carbon Reading [and] prepare for a changing climate'. This strategy set a target for borough-wide carbon emissions reductions of 34% by 2020, against a 2005 (2005/6) baseline. This would be achieved in part by encouraging participants to achieve a 7% per annum reduction. The annual carbon footprint figures are outlined later, in the Section 4.

1.4. Data, measuring and monitoring

Significant improvements in measuring, monitoring and reporting of energy use have occurred since the original carbon footprint was published in 2007. In 2010 RBC entered into a contract with TEAM (Energy Auditing Agency Ltd) for a bill validation of all RBC's gas and electricity bills. This service validates all aspects of energy bills, identifying any financial or consumption related issues. All bills are stored on a centralised database, enabling interrogation and monitoring of the energy consumption for each site.

Over the last 2 years, since April 2012, a significant number of electricity and gas meters have been upgraded to 'smart' meters. These meters automatically pulse meter readings to a data collector, who pass them to the supplier, ensuring that all bills are based on actual energy consumption at site. Significant benefits have been realised through this, as RBC now only pays for energy actually consumed, and energy consumption data stored on the database is appreciably more accurate.

1.5. Legal requirements

In 2010 RBC was required to participate in a new mandatory carbon reduction scheme, the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme. The council has been required to measure, report and in later years, to purchase credits equivalent to the tonnes of CO₂ emitted by the organisation's activities (mainly from buildings, excluding housing). In addition, the government has required all local authorities to annually report carbon emissions from their wider activities, originally through

National Indicator 185 (NI 185), and more recently through the Green House Gas (GHG) Protocol. The GHG Protocol calls for reporting in three scopes; Scope 1 are all direct emissions, from sources that are owned or controlled by the reporting entity, such as from gas fired boilers; Scope 2 are indirect GHG emissions from consumption of purchased electricity, heat or steam; and Scope 3 are other indirect emissions, electricity-related activities (e.g. Transmission & Distribution losses) not covered in Scope 2, outsourced activities, waste disposal, etc. The GHG Protocol figures are outlined in Appendix 3.

All buildings over 1,000m² have required Display Energy Certificates (DEC), since 2008, and more recently (since 2013) buildings over 500m². A DEC shows the actual energy usage and the operational rating of the building, which is an indicator of how efficiently energy is being used in the building. In the first year the DEC is produced, an Advisory Report is also required, which contains recommendations to improve the energy performance of the building. RBC has 25 corporate sites which require certificates, and 39 schools that have one or more DEC.

1.6. Investment

1.6.1 Salix & SEELS

In 2008 RBC set up its internal Salix Fund of £390,000 (£195k awarded from Salix Finance and £195k RBC match funding). This is an invest-to-save, ring-fenced, revolving fund for energy efficiency projects which meet a set pay-back and carbon savings criteria. Following four years of continued investment, totalling over £590,000 for nearly 40 projects, an additional £270,000 of RBC funds (known as Client Contribution) was added to the fund. The Salix Fund now has an annual investment target of £250,000.

Since 2011/12 RBC has been awarded two SEELS (Salix Energy Efficiency Loans Scheme) funds for two larger projects, a street lighting upgrade and energy efficiency upgrades to the new Civic offices at Plaza West. RBC also supported Prospect College in their successful application for a SEELS fund, of almost £95,000 to upgrade their lighting, in 2013/14. The annual investment in energy efficiency through the Salix and SEELS funds are illustrated in Figure 1 below.

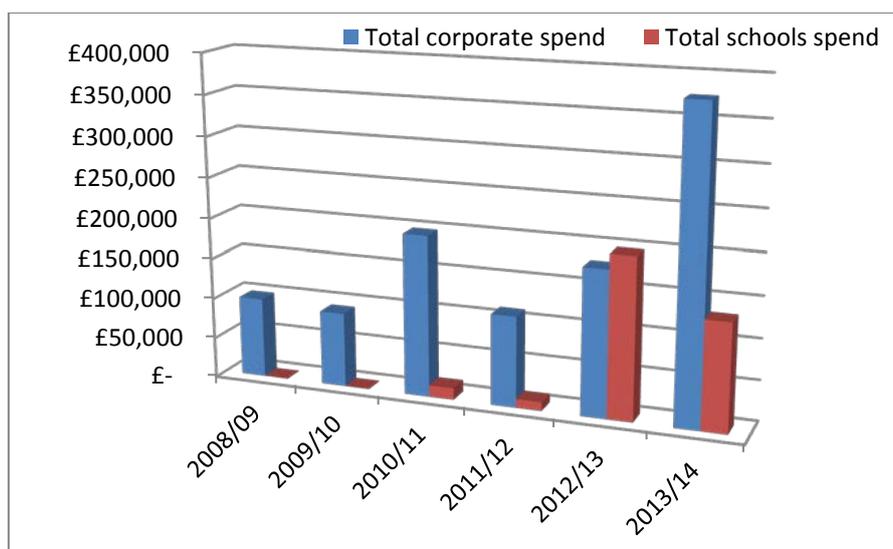


Figure 1: Total annual Salix and SEELS investment in RBC corporate sector and schools

1.6.2 Other recent investment

In 2013/14 the council invested in an initial street lighting upgrade, of 1,300 LED lights. The technology is capable of reducing energy use from the lamps by over 70% and make savings on maintenance.

In 2013, a project to install approximately 6,500 PV solar panels on to 465 Council houses was instigated. Tenants will benefit from free electricity from the panels and the Council will receive payment from the Feed-in Tariff and export of electricity to the National Grid, which is predicted to total £177,000 per year. Installation began in early 2015, with completion scheduled for summer 2015.

In 2014/15 the Council invested £1.1 m on energy efficiency and renewable energy measures in the newly refurbished Civic offices, which is predicted to reduce the energy use from the Council's headquarters by 75%.

In 2014/15 initial investigations have been made into the potential for an upgrade of the whole of the Council's street-lighting with LED lamps. This major investment will aim to reduce the Council's single largest electricity consuming service by over 70%. Initial predictions indicate that the upgrade could reduce the RBC carbon footprint by 1,650 tCO₂.

1.7. Purchasing energy and water

In 2010/11 RBC moved to purchase its central electricity (Half-Hourly and Non-Half-Hourly) and gas contracts through a group buying framework, with the central aim of gaining economies of scale on the price of energy. The first framework used by RBC was with the NHS Purchasing and Supply Agency (pasa), which has had various moves to now become Crown Commercial Services. The framework continues to perform well and it is RBC's intention to remain with the suppliers on the framework.

RBC continues to purchase water through Thames Water as the water market is yet to open up to competition. The water industry is due to

enable all business, charity and public sector customers in England to switch their water and sewerage supplier in 2017.

1.8. Working with others

Prior to 2010 the Sustainability Team supported schools directly or through the Education Asset Management Unit on an ad-hoc basis. Communication, data provision and quality was always patchy with schools, and with the prospect of the CRC reporting requirements and potential fines, RBC recruited for a Schools Energy and Carbon Management Officer in 2010, who sat in the Education Asset Management Unit and provided an Energy and Carbon Management SLA to schools. This officer was highly successful and significantly improved communication and the relationships with the schools community.

Reading Transport Ltd have continued to invest in their bus fleet. These investments include electric hybrid vehicles and more recently a fleet of renewably sourced, Compressed Natural Gas (CNG) fuelled buses. This investment included the infrastructure at the bus depot to fuel the vehicles with CNG which has also been made available to external fleet operators, including Reading's taxi operators in conjunction with the Council's Cleaner Vehicle CNG conversion grant scheme. RTL have begun replacing Euro IV vehicles with more efficient Euro VI double deck buses. This substantial investment in the bus fleet has reduced the fuel consumption and associated carbon emissions of the fleet and helped to improve the air quality of the Borough.

1.9. Renewables

In 2011/12 RBC invested in 46 PV solar installations on various buildings across the borough, with a view to generate onsite electricity, reduce electricity purchased from the National Grid, gain income from the Feed In Tariff and from electricity charging and to lead the way in renewable energy. To date, the annual FiT income from these 46 sites is over £115,000, and recharge for supplied electricity is around £20,000, as illustrated in Table 1 below. FiT income from community sites is diverted into the 'Reading Climate Change Partnership project support fund', to support projects that meet the delivery of Climate Change Strategy 2013-2020.

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
PV installations				46		
PV kWh generation				38,295	391,662	458,395
FiT income (not LSP sites)					£ 110,464	£ 115,729

Table 1: Income and electricity generation from the 46 solar installations from the Solar1 programme.

1.10. Water

Between 2006- 2008 RBC took part in the Liquid Assets programme, funded by Thames Water. Surveys were completed on 8 corporate sites, and water reducing measures were undertaken based on the reports recommendations'. In addition 19 schools took part in the same programme, and installed various water saving measures, such as urinal controls, save-a-flush and push taps.

More recently a number of corporate sites have had water surveys undertaken by Thames Water. Following these surveys various water saving activities were completed.

RBC's water consumption has previously been monitored on an annual basis.

Appendix 2

2. Scope of measuring and reporting Reading Borough Council's carbon footprint

The use of energy and water, either directly or indirectly, is far reaching. The carbon emissions (and equivalent) from energy and water use will be reported using the Green house gas (GHG) Protocol, as set out in 'Environmental Reporting Guidelines: including mandatory greenhouse gas emissions reporting guidance' (12 June 2013).

For the purposes of an energy and water management policy and strategy it is important to define the scope of this resource use, so that it can be managed and monitored effectively, and to ensure that actions are achievable. In previous reporting years, through the LACM and NI 185, energy use and carbon emissions from schools and outsources services have been reported within the council's total scope. In more recent years, through the GHG Protocol reporting, outsourced services have been reported in Scope 3, but with limited recognition of their operational distinctiveness from the council.

Following DEFRA's Environmental Reporting Guidelines (June 2013) on defining an organisation's boundary, the most appropriate way to define the scope of the energy & water use of the organisation is by 'Operational control boundary', where by '[y]our organisation reports on all sources of environmental impact over which it has operational control.' Importantly this boundary definition recognises the significance of the ability of the organisation to have the 'full authority to introduce and implement its operating policies at the operation'. By keeping the scope of this policy within this 'Operational control boundary' the council will ensure that any actions will be implementable and achievable.

However, due to the far reaching role of a local authority, RBC has many working relationships with a variety of other organisations which the council has a degree of influence with. Where possible this policy and strategy will attempt to address the energy and water use by these related organisations. The energy use and resulting emissions from these associated activities will be reported in Scope 3 of the carbon footprint.

Figure 2 below illustrates the three scopes of reported carbon emissions from energy use within the GHG Protocol. Energy use and carbon emissions will be reported in Scope 3 where only influence, rather than control, on operations can be exerted. The principal energy users that will be reported within Scope 3 are schools (including community, voluntary aided, diocese, Academy and Free schools) and managed, or outsourced services (included Rivermead Leisure Centre, Academy Sports, Reading Buses and NCP car parks). Appendix 1 provides details of what energy and water is reported within each scope.

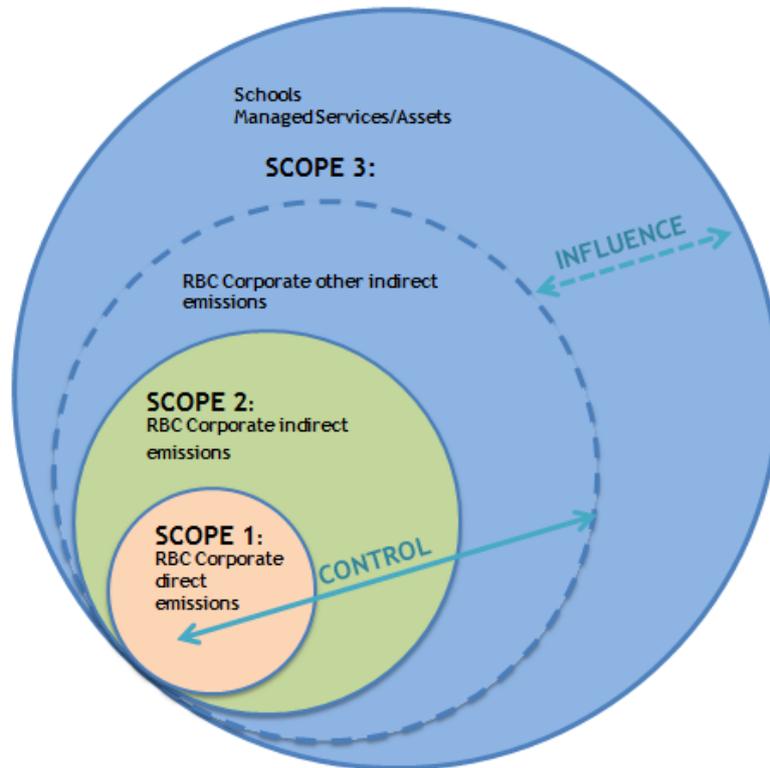


Figure 2: Three scopes of reporting carbon emissions (from energy use) within the GHG Protocol, showing where RBC has control or influence over energy use.

Appendix 3

3. Energy and carbon emissions baseline and progress against target

3.1. Energy use and spend

Reading Borough Council's current corporate energy use is principally through electricity and gas, for buildings and street lighting, with a small volume of fuel oil for heating buildings. Other energy is used to fuel cars for the RBC fleet and business travel. Figure 3 illustrates the annual energy use (kWh) of the authority over the last six years from static sources (buildings and street lighting).

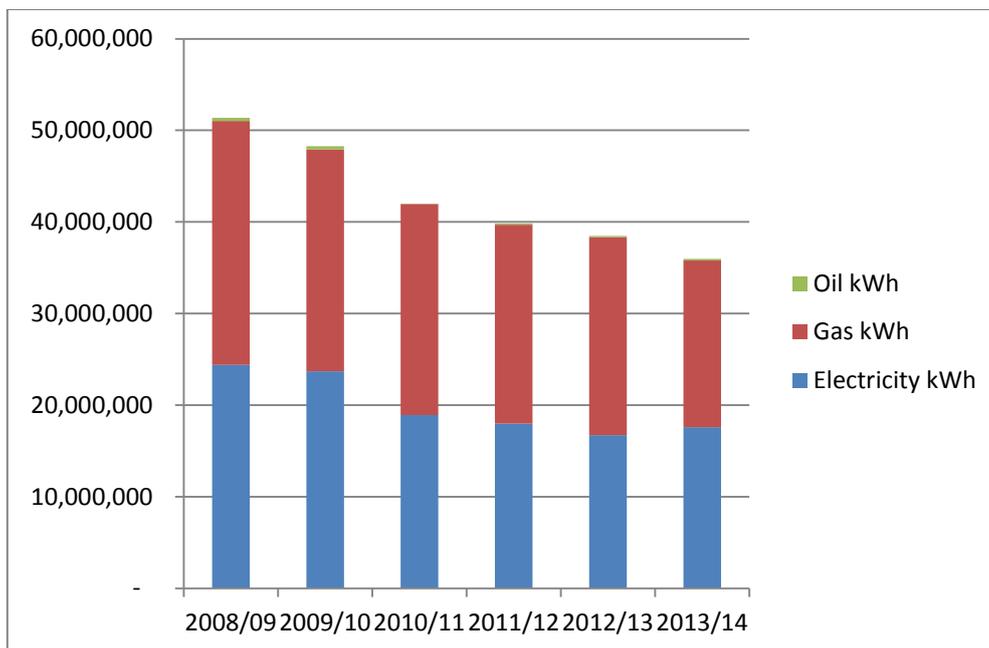


Figure 3: (a) Annual consumption (kWh) by Reading Borough Council (corporate) of electricity, gas and oil

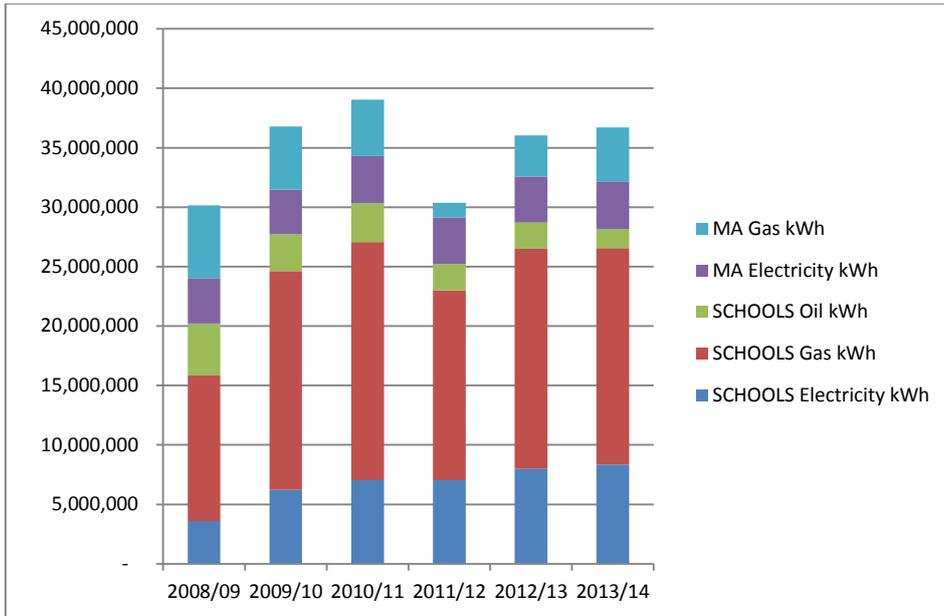


Figure 3: (b) Annual consumption (kWh) by Schools and Managed Assets of electricity, gas and oil

The approximate corporate annual spend on gas and electricity for RBC is around £2.1m (non-commodity elements are not included in this figure). Unit prices for energy have gradually increased over the last six years, as shown in Table 2 below. So although energy use in kWh has decreased, spend on energy has slightly increased due to these price rises, as illustrated in the Figure 4 below. This rising cost of energy puts increasing pressure on financial resources, with the need to make consistent energy savings ever more critical.

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Electricity p/kWh	5.6	5.6	8.3	9.1	9.3	9.58
Gas p/kWh	2.33	2.33	1.6	2.15	2.39	2.46

Table 2: Average unit price of electricity and gas per year, on RBC’s central contracts

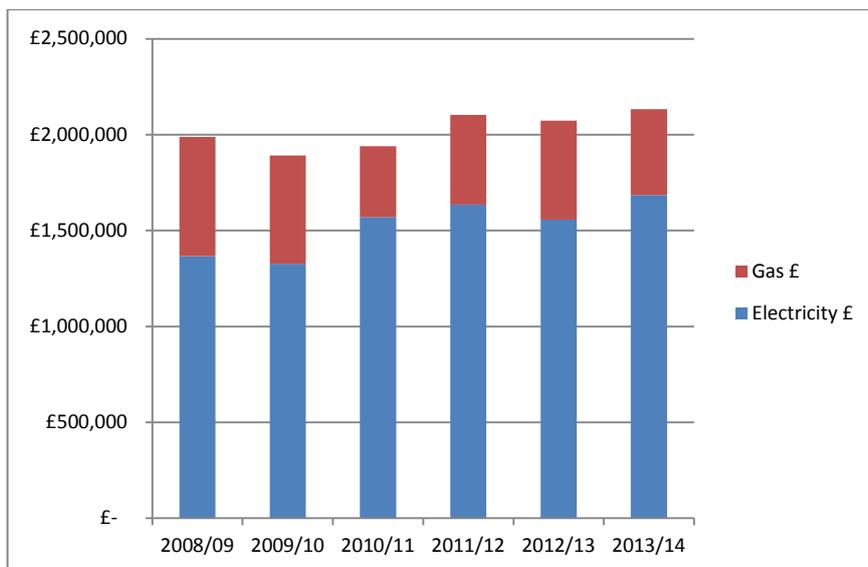


Figure 4: Annual spend on gas and electricity (excluding non-commodity elements) by, in (a) the corporate estate

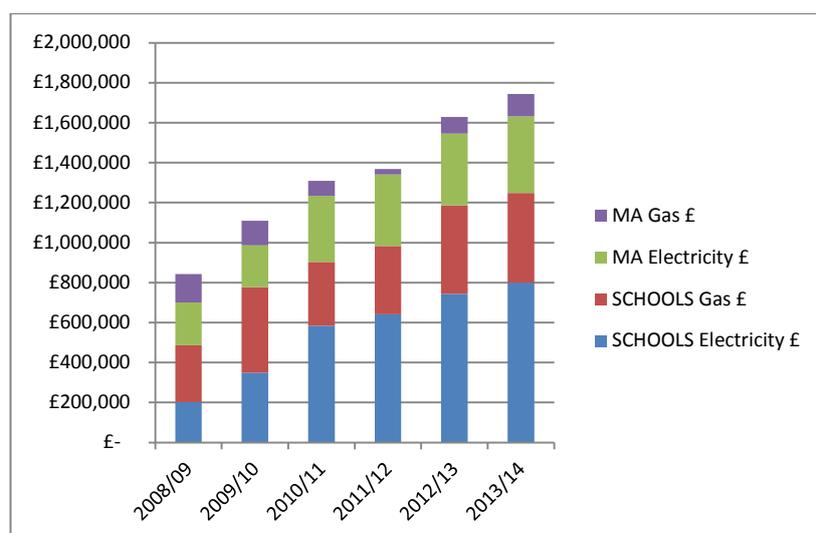


Figure 4: (b) schools and managed assets

3.2. Carbon emissions

Table 3 below displays a breakdown of the annual carbon footprints and Figure 5 illustrates the corporate carbon footprint of the local authority, for the last six years.

		2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
CORPORATE	Electricity tCO2	12,804	12,160	9,396	8,692	8,310	8,508
	Gas tCO2	4,888	4,962	5,036	5,112	4,001	3,353
	Oil tCO2	81	20	7	30	34	38
	Business travel tCO2	363	354	341	300	288	253
	Fleet tCO2	1,625	1,396	1,481	1,439	1,425	1,429
	Car club tCO2	-	0	4	7	5	4
	Total tCO2	19,761	18,892	16,265	15,579	14,063	13,585
	4% annual target	19,761	18,971	18,212	17,484	16,784	16,113
OTHER - SCHOOLS	Electricity tCO2	1,888	3,054	3,389	3,408	3,724	4,384
	Gas tCO2	2,248	3,376	3,678	2,932	3,465	3,352
	Oil tCO2	1,080	773	810	542	422	402
	Total tCO2	5,216	7,203	7,877	6,882	7,611	8,138
OTHER - Managed	Electricity tCO2	2,004	1,833	1,969	1,901	1,939	1,939
	Gas tCO2	1,121	973	869	227	641	837
	Oil tCO2						

	Total tCO2	3,125	2,806	2,838	2,128	2,580	2,776
ALL	Total tCO2	28,102	28,901	26,980	24,589	24,254	24,499
	4% annual target	28,102	26,978	25,899	24,863	23,868	22,914

Table 3: Breakdown of RBC's corporate annual carbon footprint.

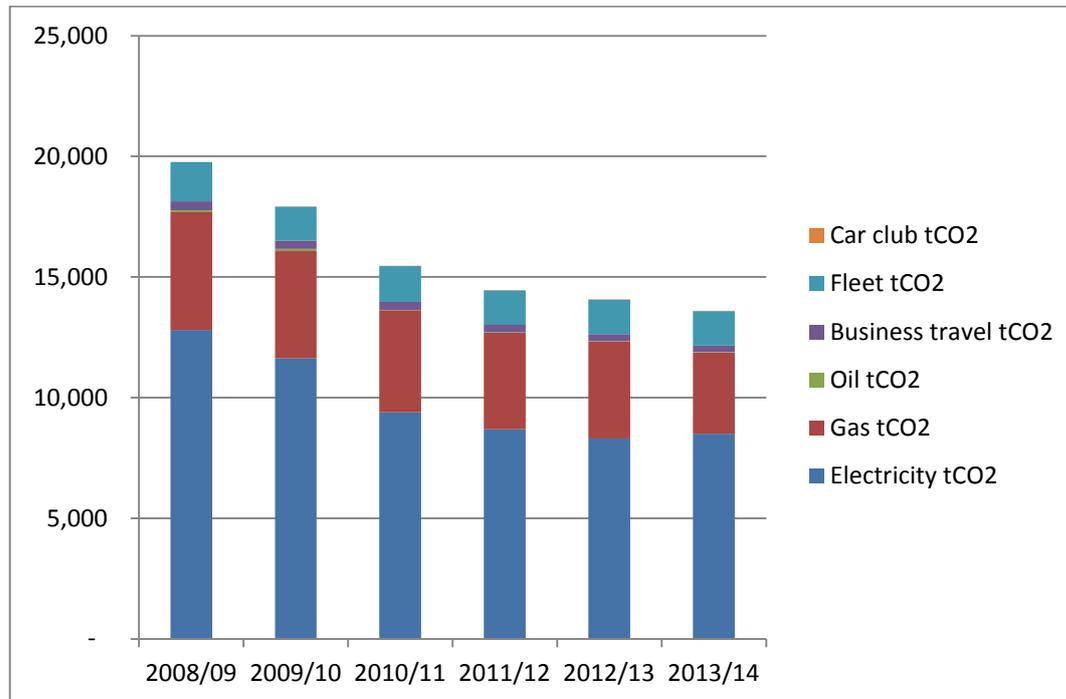


Figure 5: Reading Borough Council's annual carbon footprint, from (a) the corporate estate

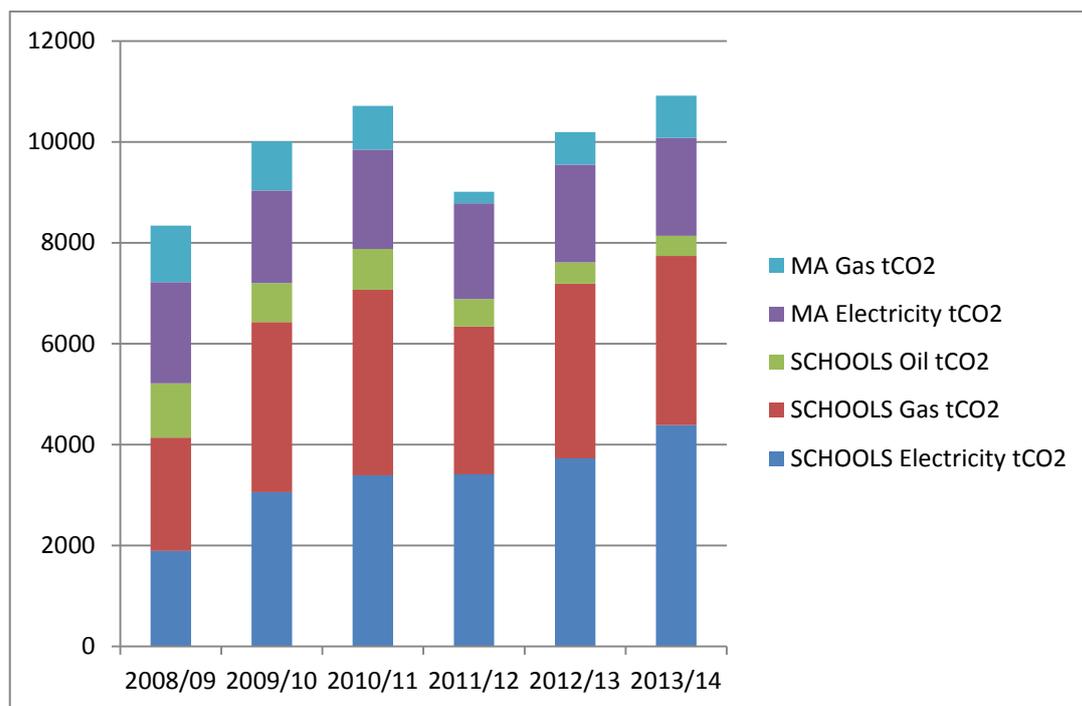


Figure 5: (b) Reading borough schools and managed assets annual carbon footprint

As part of the Council’s continuing commitment to work with others and to better understand and report the wider scope of the organisation’s activities, the carbon emissions from Reading Transport Ltd will now be reported in scope 3 of the greenhouse gas report. Table 4 below provides a breakdown of historic fuel use of Reading Transport’s bus fleet fuel use. With the inclusion of CNG fuelled vehicles in 2012/13, the carbon emissions per kilometre travelled has fallen by 13% over 6 years. Figure 6 illustrates this fall in absolute carbon emissions and carbon emission intensity per kilometre travelled.

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Diesel tCO ₂	9,820	9,996	8,992	8,439	7971	6889
CNG tCO ₂	0	0	0	0	79	299
Total tCO ₂	9,820	9,996	8,992	8,439	8,050	7,188
Km travelled	3,817,389	3,885,546	3,495,589	3,280,318	3,250,816	3,344,522
tCO ₂ /km	0.001068	0.001168	0.001145	0.001134	0.001069	0.000927

Table 4: Annual fleet fuel use and kilometres travelled of Reading Transport Ltd bus fleet.

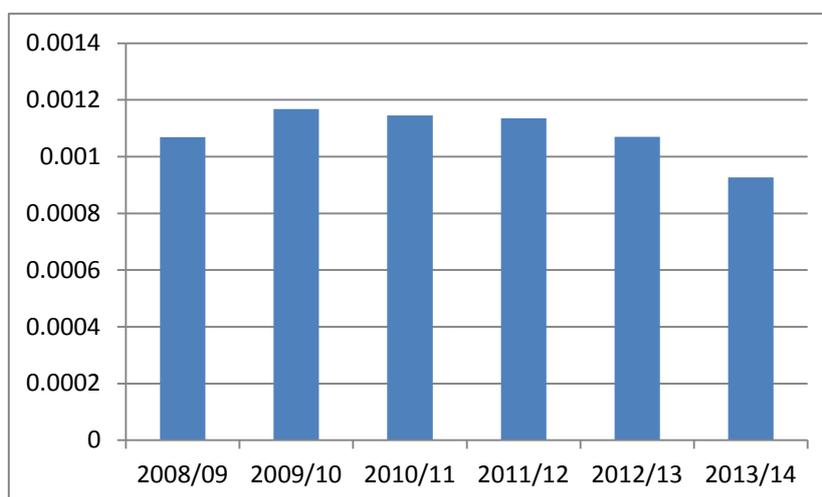


Figure 6: (a) Total annual carbon emissions from Reading Transport Ltd bus fleet

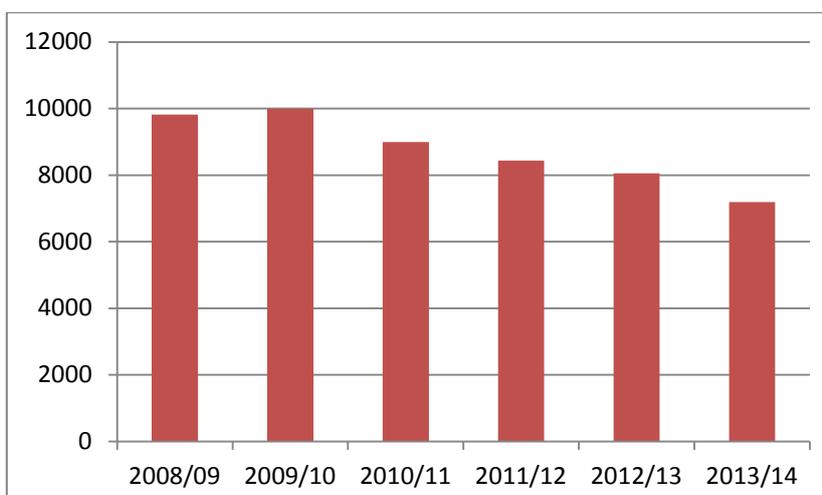


Figure 6: (b) Total carbon emissions per kilometre travelled from Reading Transport Ltd bus fleet

3.3. Avoided costs to date

By taking a simple review of the data, it can be seen that by undertaking these energy efficiency measures significant energy costs have been avoided. Had RBC’s energy consumption continued as Business As Usual (BAU), increasing at 1.5% per year (percentage increase based on assumptions used by Carbon Trust), since 2008/9, then the total annual energy spend would likely be closer to ~£3.2m, rather than ~£2.1m, as illustrated in Figure 7 below.

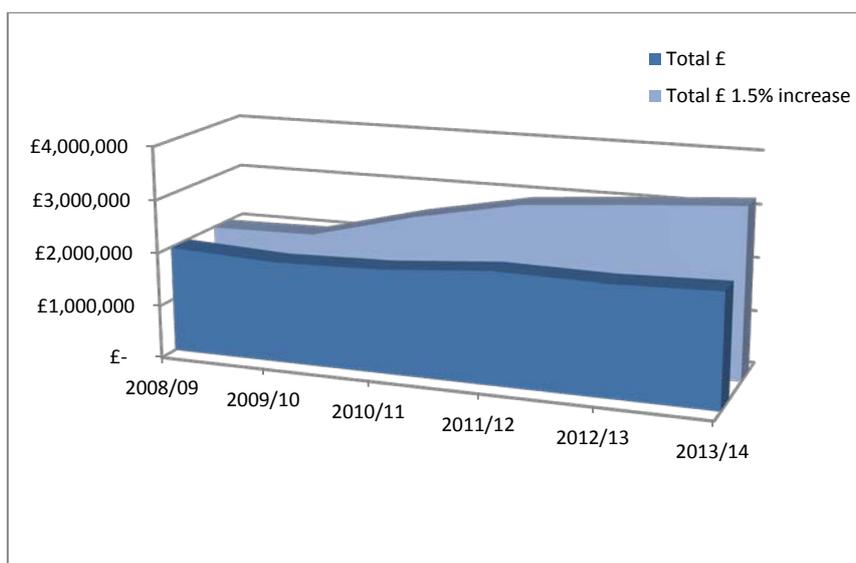


Figure 7: Value at Stake: Actual spend on energy vs BAU spend on energy (assuming 1.5% annual increase of energy consumption) by RBC (corporate).

3.4. Progress against target

RBC’s carbon emissions reduction target was set by the Climate Change Strategy 2008-2013 as 50 % by 2020, or 7 % per year. The 2013/14 carbon footprint for the Council’s corporate activities is now 31.3% lower than the baseline emissions in 2008/09, 10% ahead of target, which is significant progress to meet the 50% reduction target, as illustrated in Figure 8 below. The 2013/14 carbon footprint for the Council’s wider activities (including schools and managed services) is 14.1% lower than the baseline emissions in 2008/09.

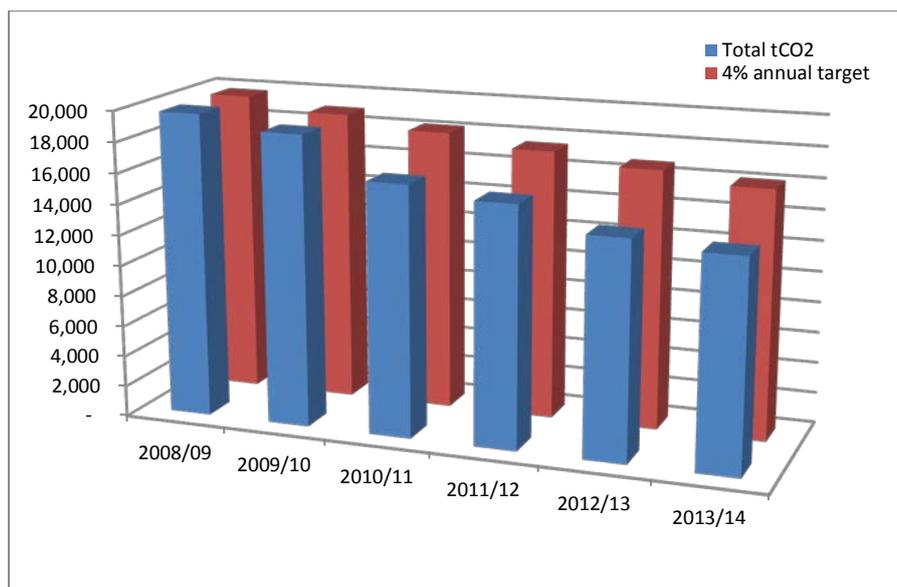


Figure 8: RBC annual corporate carbon footprint vs target carbon footprint, against 2008/9 baseline.

3.5. The 2020 reduction target - savings gap

Initial calculations were made to predict energy and carbon savings made through the most recent investments (new Civic Offices refurbishment, and street lighting), which have totalled 2,400 tCO₂. Predicted electricity generation from planned and installed pv would allow offset of around 839 tCO₂. Should RBC maintain its current energy consumption, and make only these recently identified savings, the carbon footprint would be around 1,300 tCO₂ adrift from its corporate 2020 target, or over 10% above the target emissions, as shown in Figure 9. When taking into account the wider influence of the council, the emissions reductions by these recent projects would see the wider carbon footprint reduce by 30% against its baseline emissions, 20 % off the 2020 target. The aims, objectives and actions set out in this strategy should bridge this savings gap, as illustrated in Figure 10. Details of these proposed reductions is discussed in more detail below.

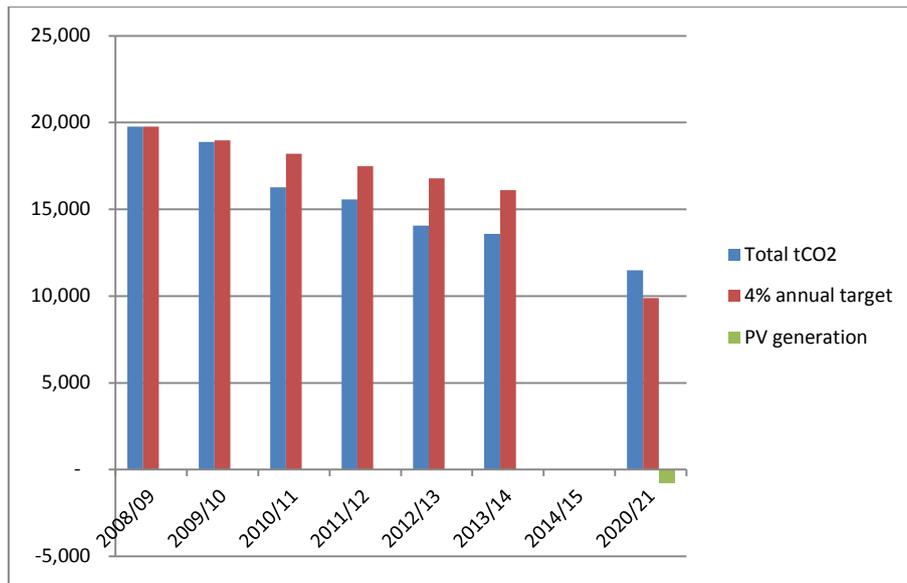


Figure 9: RBC corporate carbon footprint, and 'offset' from pv generation, predicted to 2020/21 based on current predicted savings from in progress projects, compared against 50% reduction target.



Figure 10: RBC corporate carbon footprint predicted to 2020/21 based on predicted savings from the Carbon Plan 2015-2020, compared against the 50% reduction target.

The additional savings predicted from the other proposed work programmes (RE:FIT, additional renewables, general energy management/awareness raising) are predicted to save around 3,400 tCO2, as shown in Figure 11. In combination with the emissions offset through the installed and in progress pv systems, the wider carbon footprint would meet its 50% reduction target, as illustrated in Figure 12.

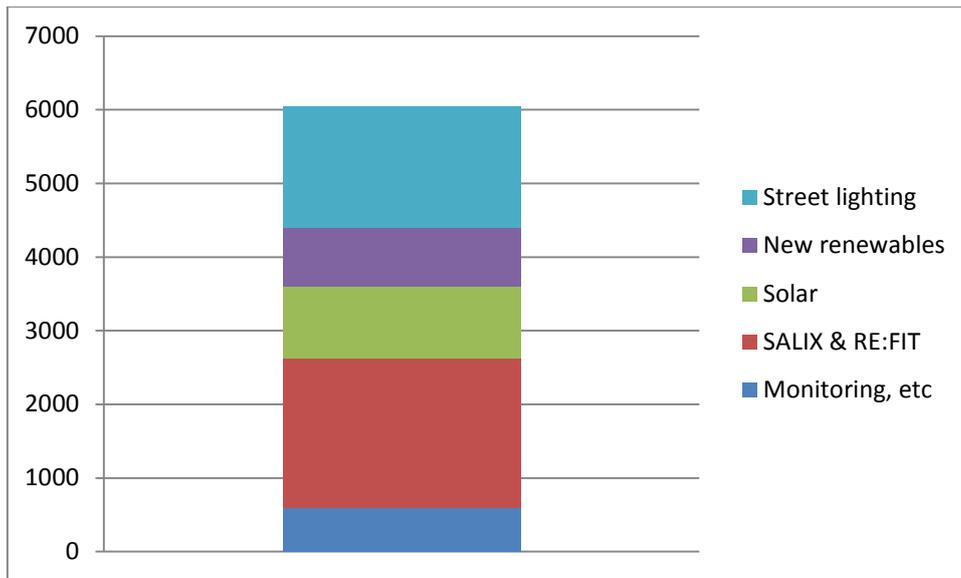


Figure 11: Breakdown of potential carbon emissions savings as proposed in the Carbon Plan 2015-2020 (Note: Street lighting and Solar are carbon savings in progress)

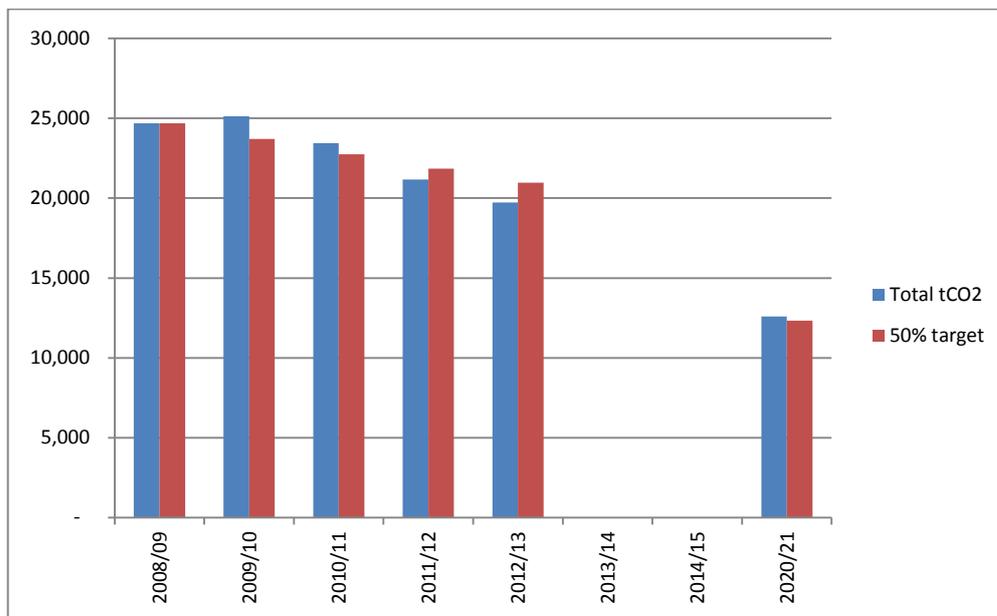


Figure 12: RBC wider carbon footprint predicted to 2020/21 based on predicted savings from the Carbon Plan 2015-2020, compared against the 50% reduction target.

The Carbon Plan sets out the council’s policy and targets on corporate energy, water and carbon management, and identifies actions to achieve these within the time period 2015-2020. The plan sets out actions to ensure the authority is compliant with relevant legislation (such as Energy Performance in Buildings legislation) and national reporting requirements (GreenHouse Gas Protocol). The strategy will assist the council in making energy and water management an integral part of decision making processes, to ensure efficient use of these resources today and in the future.

Appendix 4

4. Likely investment & savings

The key investments identified for further investigation within this Strategy are;

5. Further Salix investment in RBC building estate
6. Full street lighting upgrade across the borough, including bollards and signage
7. Energy Performance Contracting, potentially using the RE:FIT framework, to upgrade key buildings using a 'whole building approach'
8. Further investment in renewable technology to generate additional, long-term income, for example, further pv on corporate buildings, a solar farm and on school expansions

Salix investment will be required to meet Salix Finance investment criteria. Any projects to upgrade street lighting, to undertake energy performance contracting and to install additional renewable technologies will require further business cases to be developed before finances are committed. Figure 13 illustrates the possible scale of investment required over the next 5 years.

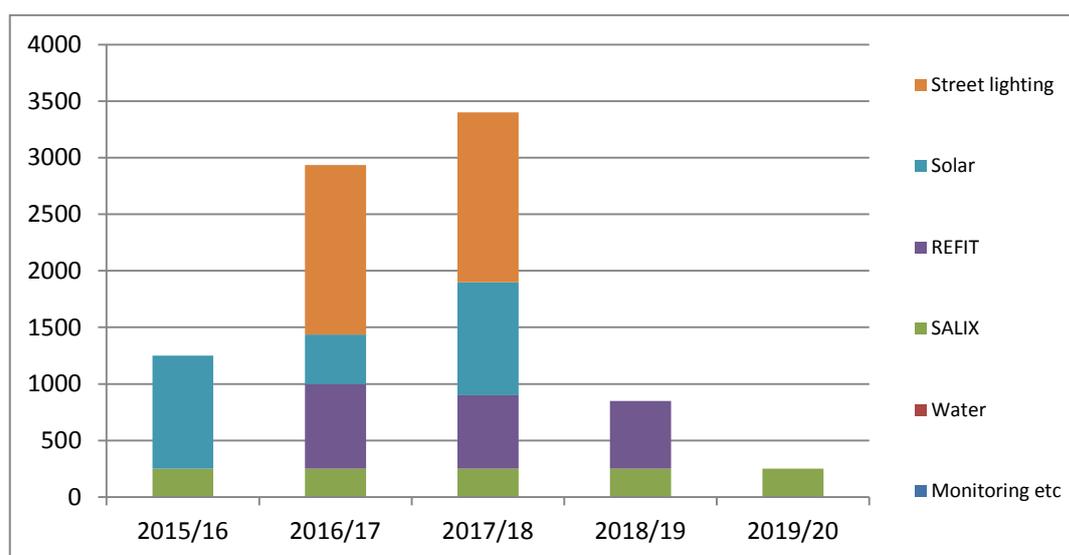


Figure 13: Likely investment required for actions set out in the Carbon Plan 2015-2020.

Following from the the investments and other ongoing energy and water management activities, further potential new financial savings would be realised. Figure 14 below illustrates the potential savings identified within the Carbon Plan, and the timing these savings are likely to be realised, should necessary resources be allocated appropriately. Project management and specialist officers will be necessary for implementation of the significant investment programmes identified. In addition, continued monitoring, awareness raising and contract management will be required to maintain savings and identify futher opportunities.

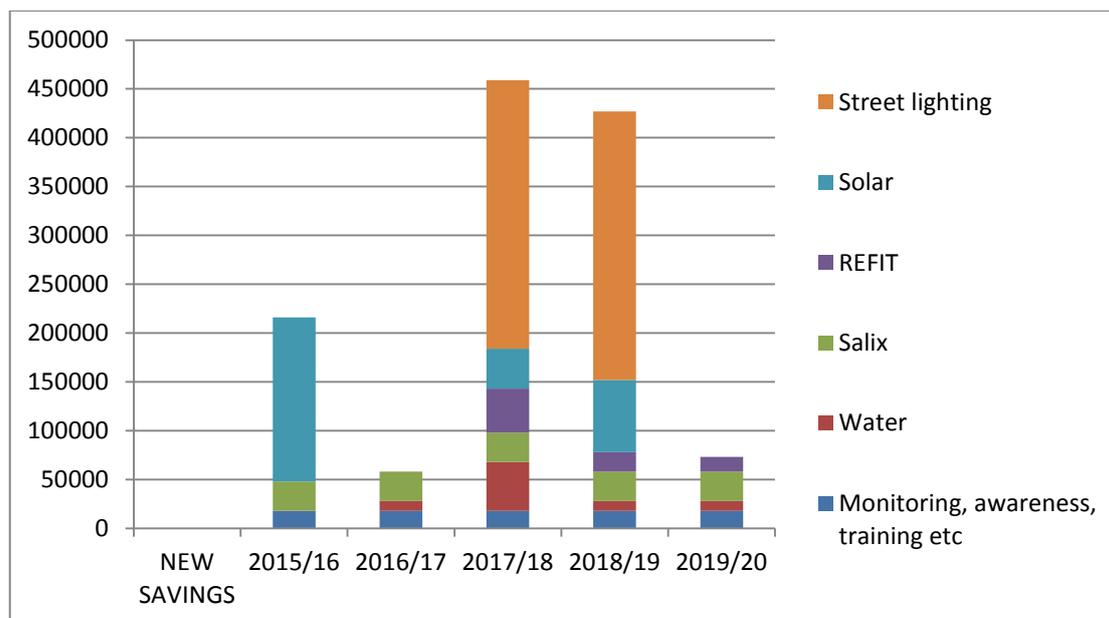


Figure 14: Potential new savings/income from actions set out in the Carbon Plan 2015-2020.

5. Value at Stake

The value at stake represents the total potential cost savings in energy and water that can be obtained through adopting the proposed activity within this strategy.

There is a significant Value at Stake should these proposed savings be realised, and maintained, within the timescale of the Carbon Plan. The potential energy savings are illustrated in Figure 15 below, compared against the 'Business As Usual' scenario, which assumes an annual energy consumption increase of 1.5 % per year, assuming no energy management activity (based on Carbon Trust recommendations) and no unit price increases. Based on these assumptions, by the end of the Carbon Plan period, the actions set out within the Carbon Plan have the potential to avoid costs of over £1.4m (by 2020/21). Should energy prices increase, which over a 5 year period is likely to occur, with the Department of Energy and Climate Change predicting on average an annual increase of 1.7%, these avoided costs would be higher. Furthermore, these savings do not include the potential savings from water, which conservatively could total 20% of costs.

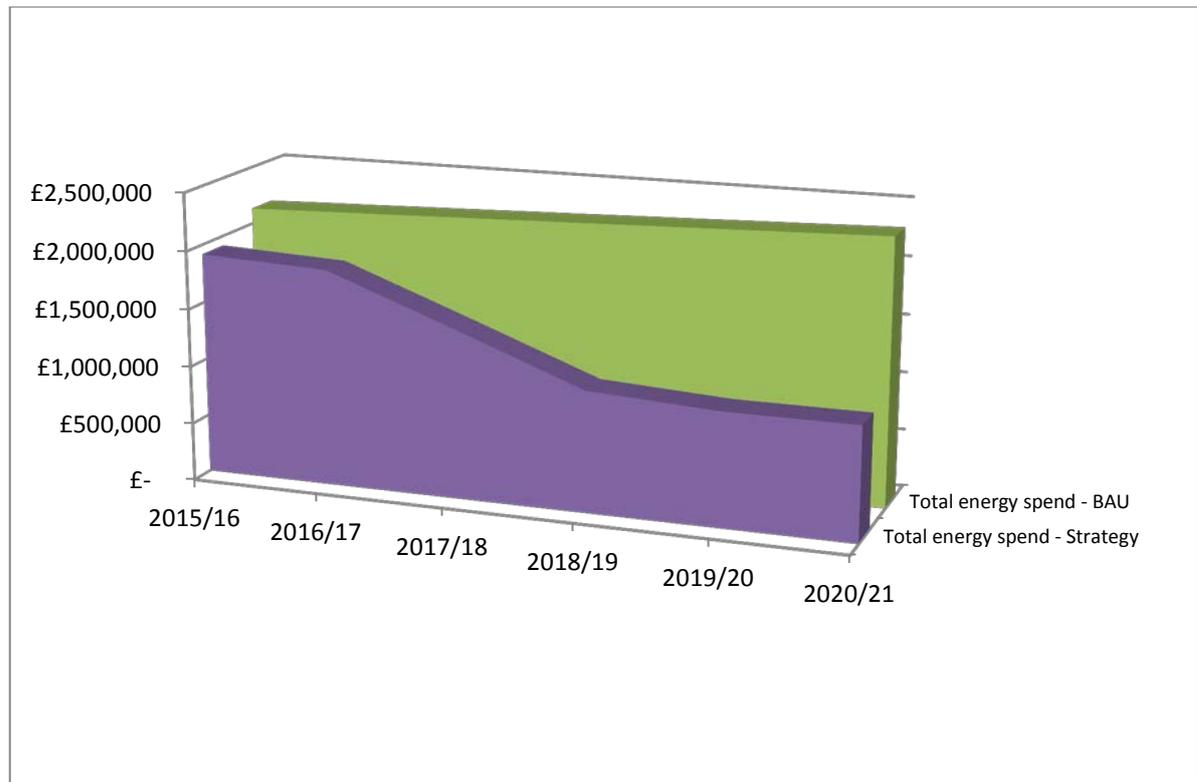


Figure 15: Potential avoided costs from actions set out in Carbon Plan, compared against Business as Usual scenario, assuming a 1.5% annual increase in energy use, based on current energy unit prices.

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