

Carbon management plan

April 2020 – March 2030



Contents

	Page
1. Executive Summary	1
1.1 Summary	1
1.2 Vision	1
1.3 Purpose (Outcome)	1
1.4 Scope of plan	1
1.5 Slough Borough Council Greenhouse Gas emissions by source	2
2. Introduction	4
2.1 Context	4
2.2 Causes of Climate Change	4
2.3 The Impacts of Climate Change	5
2.4 National Policy Drivers	7
2.5 Council Policy Drivers	8
3. Past Successes	11
3.1 LED Street Lighting Project	11
3.2 RE:FIT Programme	11
3.3 Fleet Challenge Programme and Grey Fleet Emissions	11
3.4 Upton Court Park Jubilee Wood forest	12
3.5 New Direct Services Operation and Community Fleet	12
3.6 National Grid Carbon Intensity	12
4. Priorities, Key Actions, Outcomes	13
4.1 Key Outcomes	13
4.2 Priority 1 - Reduce CO ₂ emissions from energy consumption across all Council operations	13
4.3 Priority 2 - Reduce energy consumption revenue costs across all Council operations	18
4.4 Priority 3 - Embed carbon management in the Council's policies and procedures	18
4.5 Priority 4 - Raise awareness of carbon management among staff through the Environmental Strategic Board to reduce carbon emissions and energy consumption	18
4.6 Priority 5 - Incorporate high standards of energy efficiency into new buildings, equipment and contracts	19
4.7 Priority 6 - Key actions - Incorporate carbon intensity into the procurement of goods and services	19
5. Implementation and Monitoring	20
5.1 Governance of the Carbon Management Plan 2020-2030	20
5.2 Finances	20
5.3 The Slough Borough Council Baseline	21
5.4 Data Classification	21
5.5 Data Quality	23
5.6 Progress Reporting	24
5.7 Slough Borough Council's remaining carbon budget	24
6. Glossary of terms	26

7. Appendix 1	27
7.1 SBC Energy Revenue Spend in carbon emissions April 2018-March 2019	27
8. Appendix 2	28
8.1 List of Assets included in the 2018-2019 CO ₂ Baseline	28
9. Appendix 3	31
9.1 Slough Borough Council Corporate Estate Display Energy Certificate Record	31
10. Appendix 4	32
10.1 Carbon Management Plan Slough Schools List June 2020	32
11. Appendix 5	34
11.1 BREEAM assessment weightings	34
12. Appendix 6	35
12.1 Table showing GHG data quality from financial years 2016/17, 2017/18 and 2018/19	35
13. Appendix 7	37
13.1 Slough Borough Council's remaining carbon budget targets by GHG emission source in tCO ₂ e	37

1. Executive Summary

1.1 Summary

'what gets measured gets managed'
(Source of the quote: Peter Drucker)

Slough Borough Council ("SBC" or "the Council") has been developing and introducing interventions aimed at reducing carbon emissions across its corporate estate and its fleet since 2008. The revised Carbon Management Plan describes our current emission levels and looks at how we are going to achieve carbon neutrality by March 2030.

It also describes how SBC will become increasingly energy efficient across the whole corporate estate and sets out how the carbon management process will contribute to the Council's revenue reduction targets in line with the Medium Term Financial Strategy.¹

1.2 Vision

Slough Borough Council aspires to have a carbon neutral and energy efficient corporate estate, fleet and workforce. The Council will play a responsible leadership role to ensure that Slough has a sustainable future, to contribute to the United Kingdom's Net Zero target under the Climate Change Act, and to meet with the future economic challenges of local government.

1.3 Purpose (Outcome)

This document continues the work of the previous Carbon Management Plan (2015-2020) and sets out what SBC will do to mitigate the carbon emissions from Council activities and buildings managed, owned and operated by the Council. The previous plan aimed to reduce carbon emissions by 20% against the 2013/14 baseline, and during the course of the plan the Council was successful in achieving a 32.5% reduction in CO₂e emissions.²

This was achieved by the reduction in carbon intensity of the National Grid, a reduction in electricity use through the street lighting LED replacement project, more energy efficient schools and a reduction in outsourced transport mileage.

This new plan seeks to describe how the Council will reduce carbon emissions, reduce energy demand, avoid significant rising energy and fuel revenue costs and where possible, seek to generate revenue savings over the next 10 years.

The four outcomes of the plan are:

Outcome 1: A 10% reduction of CO₂e net emissions per annum of all Council operations by 2029/30, relative to 2018/19.

Outcome 2: A 100% reduction of CO₂e net emissions by 2029/30 against the 2018/19 baseline.

Outcome 3: A reduction of 10.5 tonnes CO₂e to 0 tonnes per Full Time Equivalent Employee (FTE) by 2029/30.

Outcome 4: A revenue saving of 10% over lifetime of the plan against 2018/19 baseline operating costs for the Council; please refer to Appendix 1.

1.4 Scope of plan

This Carbon Management Plan 2020-2030 spans from the financial year commencing 01 April 2020 to the financial year ending 31 March 2030.

This plan is concerned with:

- 1) All Council assets where the Council pays for the energy and water costs such as corporate offices, community centres, community hubs, libraries, Chalvey Waste Depot, Council car parks (including leisure sites) and the crematorium (See Appendix 2 list of Assets Included in the 2018-19 baseline).

¹ Slough Borough Council, Budget Council Meeting: <http://www.slough.gov.uk/moderngov/ieListDocuments.aspx?CId=168&MId=6401>

² CO₂e represents Carbon Dioxide Equivalent and is a measure representing greenhouse gases as the functionally equivalent amount or concentration of carbon dioxide. Sometimes is expressed as tCO₂e where the 't' represents tonnes.

- 2) All community and foundation schools where the Council maintains a degree of oversight and control on expenditure.
 - 3) All transport used for Council operations such as the Direct Services Operation (DSO) Fleet, waste management (RCVs) and street sweepers, highway maintenance vehicles, housing maintenance vehicles, building management vehicles, community transport vehicles, community warden vans, Council pool vehicles and staff business mileage.
 - 4) All street assets such as street lighting, street and road signage, street furniture, traffic lights, air quality monitoring stations, electric vehicle infrastructure, parking meters.
 - 5) All waste generated from its corporate buildings, including community buildings and hubs.
 - 6) Communal parts of the housing stock only such as stairwell lighting and heating.
 - 7) Council parks, outdoor green spaces and allotments
 - 8) Contractors who provide goods and services to the Council, such as provision of electronic equipment or maintenance services.
 - 9) Any subsidiary or organisations wholly or part owned by Slough Borough Council, such as James Elliman Homes Ltd, and Slough Urban Renewal.
 - 10) Any assets that the Council acquires or activities that the Council engages in following the commencement of the Carbon Management Plan 2020-2030 that falls within the criteria stated above or as agreed by the Environmental Strategic Board (see Section 5.1).
- The plan will also monitor or work with, where possible, Council owned sites that are not operated by the Council including Private Financial Initiatives (PFI) schools, leisure facilities, hotels and retail space. These activities would not fall within scope of Greenhouse Gas (GHG) emission reduction targets as the Council does not operate these sites.

1.5 Slough Borough Council Carbon Emissions

When GHG emissions from the Council for 2018/19 are broken down by source (please refer to Table 1 and Figure 1), it is evident that the greatest contribution comes from energy use in buildings, schools, street assets (signage and street lighting), and transport. It is therefore these four areas we shall focus on, which have the potential to deliver the greatest carbon savings.

Table 1: Slough Borough Council carbon footprint by GHG emissions source 2018/19

Scope	Greenhouse Gas Emission (GHG) Source	GHG Emissions	
		tCO ₂ e	%
Scope 1 ³	Gas consumption	2786.2	27.3
Scope 1	Owned transport	1159.3	11.3
Scope 2 ⁴	Purchased electricity	3983.8	39.0
Scope 3 ⁵	Waste	17.2	0.2
Scope 3	Transport	841.7	8.2
Scope 3	Purchased goods and services	87.4	0.9
Scope 3	Water supply	69.4	0.7
Scope 3	Electricity and gas supply chain	1279.2	12.5
Total		10,224	100.0

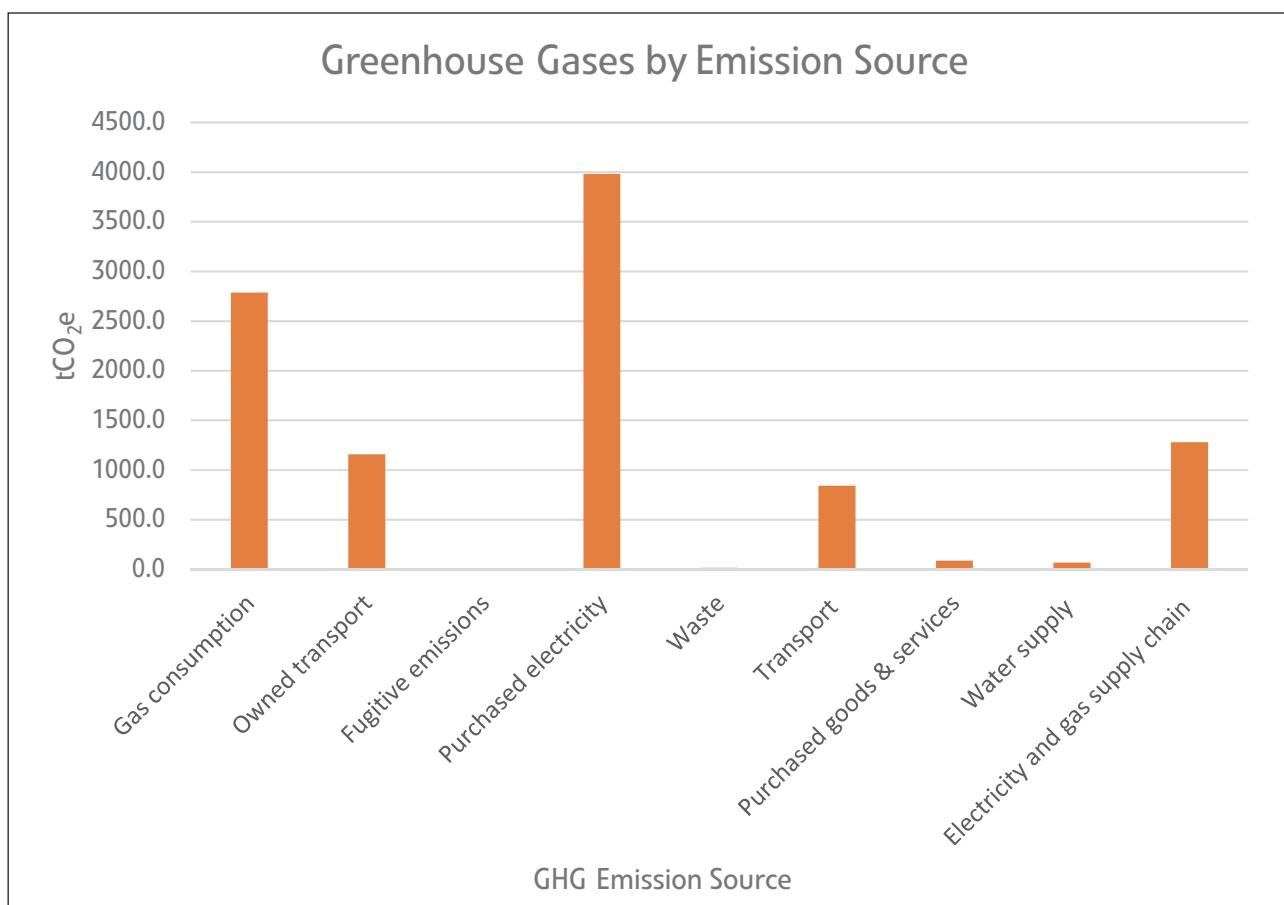


Figure 1: April 2018–March 2019 Carbon Footprint by Emission Source

³Scope 1 GHG emissions are defined as direct emissions from combustion of fuels

⁴Scope 2 GHG emissions are defined as indirect emissions from using energy e.g. electricity

⁵Scope 3 GHG emissions are defined as other indirect emissions e.g. business mileage

2. Introduction

2.1 Context

There is clear evidence to show that climate change is happening. Measurements show that the average temperature at the Earth's surface has risen by about 1°C since the pre-industrial period. Seventeen of the 18 warmest years on record have occurred in the 21st century and each of the last three decades have been hotter than the previous one. This change in temperature has not been the same everywhere; the increase has been greater over land than over the oceans and has been particularly fast in the Arctic.

The UK is already affected by rising temperatures. The most recent decade (2008-2017) has been on average 0.8°C warmer than the 1961-1990 average. All ten of the warmest years in the UK have occurred since 1990 with the nine warmest occurring since 2002.

Although it is clear that the climate is warming in the long-term, it should be noted that temperatures are not expected to rise every single year. Natural fluctuations will still cause unusually cold years and seasons but these events will become less likely.

Along with warming at the Earth's surface, many other changes in the climate are occurring:

- warming oceans
- melting polar ice and glaciers
- rising sea levels
- more extreme weather events

Source: Climate Change Explained DECC website

<https://www.gov.uk/guidance/climate-change-explained#climate-change-now>

2.2 Causes of Climate Change

Rising levels of carbon dioxide and other greenhouse gases, such as methane, in the atmosphere create a 'greenhouse effect', trapping the Sun's energy and causing the Earth, and in particular the oceans, to warm. Heating of the oceans accounts for over nine-tenths of the trapped energy. Scientists have known about this greenhouse effect since the 19th Century.

The higher the amounts of greenhouse gases in the atmosphere, the warmer the Earth becomes. Recent climate change is happening largely as a result of this warming, with smaller contributions from natural influences like variations in the Sun's output.

Carbon dioxide levels have increased by about 45% since before the industrial revolution. Other greenhouse gases have increased by similarly large amounts. All the evidence shows that this increase in greenhouse gases is almost entirely due to human activity. The increase is mainly caused by:

- burning of fossil fuels for energy
- agriculture and deforestation
- the manufacture of cement, chemicals and metals

About 43% of the carbon dioxide produced goes into the atmosphere, and the rest is absorbed by plants and the oceans. Deforestation reduces the number of trees sequestering carbon dioxide and releases the carbon contained in those trees back into the atmosphere.

Rising levels of carbon dioxide and other gases, such as methane and nitrous oxides, in the atmosphere create a 'greenhouse effect', trapping the Sun's energy and causing the Earth, and in particular the oceans, to warm.

Source: Climate Change Explained DECC website
<https://www.gov.uk/guidance/climate-change-explained#climate-change-now>

2.3 The Impacts of Climate Change

We can already see the impacts of climate change and these will become more severe and widespread as global temperatures rise. How great the impacts will become depends upon our success in reducing greenhouse gas emissions.

2.3.1 The effects of rising temperatures on the UK

Even if global temperature increases are limited to 2°C or less, there are projected to be impacts for the UK. Temperatures over land would be expected to increase by more than the 2°C global average. In a 2°C world in the UK there could be a 30% decrease in river flows during 'dry' periods, a 5-20% increase in river flows during 'wet' periods, and between 700 and 1,000 more heat-related deaths per year in South-East England compared to today.

In a 4°C world in the UK impacts become increasingly severe and may not be avoidable through adaptation. For example, damages caused by river, coastal and surface water flooding all increase markedly with 4°C of warming. Residual flood risks remain high under all adaptation scenarios considered, suggesting limits in the amount of risk that can be avoided through investment in flood defences and other responses. Potentially irreversible impacts to the natural environment are projected with 4°C of warming, including risks to species in protected areas and internationally important UK bird populations. Extreme weather events in the UK are also likely to increase with rising temperatures, causing:

- heavier rainfall events - with increased risk of flooding;
- higher sea levels - with larger storm waves putting a strain on the UK's coastal defences;
- more and longer-lasting heat waves.

2.3.2 The effect of warming on rainfall patterns and water supplies

Changing rainfall patterns will affect water supplies. Too much rainfall in a short amount of time in some areas and not enough in other areas will contribute to both flood and drought conditions. We are already seeing increasing numbers of heavy rainfall events, and expect this increase to continue, with greater risk of river and flash flooding.

Mountain glaciers are expected to continue melting which, along with reduced snow cover, will put stress on communities that rely on these as sources of water.

2.3.3 Changes in the oceans

Increasing temperatures and acidification of the oceans are threatening marine ecosystems around the world. Coral reefs, in particular will be at major risk if ocean temperatures keep increasing.

Sea levels will keep rising as the polar ice sheets and glaciers melt and the warming oceans expand. Even small increases of tens of centimetres could put thousands of lives and settlements at risk from coastal flooding during stormy weather.

Coastal cities with dense populations are particularly vulnerable, especially those can't afford flood protection.

2.3.4 The impact of warming on food production

Increased temperatures, changes to rainfall patterns, and an increased risk of extreme weather events will all negatively affect the production of major food crops such as wheat, rice and maize. In tropical and temperate regions, climate change without adaptation will have a negative impact on these crops for local temperature increases of 2°C or more, although some individual locations may benefit. Overall, we expect that warming will cause more negative effects than positive ones on crop production. At higher levels of warming this will cause a growing gap between food demand and supply.

Because trade networks are increasingly global, the effects of extreme weather events in one part of the world will affect food supply in another. For example, floods or droughts that damage crops in Eastern Europe or the US can directly affect the cost and availability of food in the UK.

2.3.5 The impact on ecosystems

Rapid, large changes in global temperatures (4°C or more above the pre-industrial temperature by the end of this century) and changes in rainfall patterns will increase the vulnerability of many species to climate change and may lead to the extinction of entire species. Even with smaller amounts of warming many species will be placed at greater risk. The animals and plants most at risk will be those:

- have no new habitats to move to;
- can't move quickly to new habitats;
- are already under threat from other factors, such as overharvesting or habitat loss and degradation because of human activity.

Extinctions and changes in the number of species in a population will have an enormous impact on food chains. Most ecosystems would struggle to function as they currently do under large changes in climate that happen rapidly within a century or so.

2.3.6 The impact on human health

Climate change is expected to make some existing health problems worse as temperatures increase. Malnutrition could become more widespread as crop yields are affected by increased drought conditions in some regions, leading to reduced food production. Warmer temperatures could increase the range over which disease-carrying insects are able to survive and thrive. Vulnerable people will be at risk of increased heat exposure and the number of deaths due to temperature extremes is expected to increase in the future, although in the long term there will likely be fewer health problems related to cold temperatures.

The amount of people at significant risk from flooding is expected to increase in the future and some studies have shown that there is likely to be an increase in disease relating to worsening air pollution. The populations likely to be most affected by the health impacts of climate change are those that are already hardest hit by climate change, particularly in developing countries.

2.3.7 Poverty

People with low income in both developed and developing countries will be most vulnerable to the impacts of climate change. Decreasing food production, an increase in health issues associated with climate change and more extreme weather will slow economic growth, making it increasingly difficult to reduce poverty.

2.3.8 The impact of extreme weather events globally

Growing populations and increasingly expensive infrastructure are making our societies more vulnerable to extreme weather events. Heat waves and droughts are expected to become more common and more intense over the coming century, and more frequent heavy rainfall events and rising sea levels will increase the risk of floods.

While not all extreme weather events can be directly linked to human influences, we are already seeing the huge impacts on society that extreme weather events can have. The World Meteorological Organization (WMO) reported that between 2001 and 2010 extreme weather events caused:

- more than 370,000 deaths worldwide (including a large increase in heatwave deaths from 6,000 to 136,000) - 20% higher than the previous decade;
- an estimated US \$660 billion of economic damage - 54% higher than in the previous decade.

Research has shown that the record global average temperature and the extreme heatwave in Asia during 2016 would not have happened without warming due to human activity. Human-caused climate change also influenced other events in 2016, including extreme heat in the Arctic, the duration of coral bleaching in the Great Barrier Reef, the increased risk of wildfires in the western US, extreme rainfall in China and drought conditions in South Africa that led to food shortages.

2.3.9 Possible abrupt changes in our climate

Most discussions of climate change look at what is most likely to happen, such as the likely temperature changes if we do, or don't, take action to reduce greenhouse gas emissions.

However, scientists have identified the possibility that with sustained high temperatures major elements of the Earth's climate could be drastically altered. These 'tipping points' in our climate are less likely, but potentially much more dangerous.

While known impacts from small temperature rises could be managed (although this will become increasingly expensive as temperatures increase), passing a tipping point could cause large or abrupt changes, some of which may be effectively irreversible.

For example:

- Arctic permafrost could thaw rapidly, releasing greenhouse gases that are currently 'locked away' and causing further rapid warming;
- the great sheet of ice covering Greenland, which contains enough ice to cause up to 7 metres of sea level rise, could melt almost entirely. While this would take a long time to happen, it is possible that the ice sheet would not be able to regrow after a certain amount of melting occurs.

While such events are considered unlikely, they can't be ruled out, even under relatively low temperature rises of less than 2°C above the pre-industrial temperature. All indications are that, should we pass one of these tipping points, there would be a range of extremely severe and potentially irreversible impacts.

Source: Climate Change Explained DECC website

<https://www.gov.uk/guidance/climate-change-explained#climate-change-now>

2.4 National Policy Drivers

2.4.1 The Climate Change Act and Net Zero

The UK Government considers that global warming must be limited to no more than a 2°C temperature rise above preindustrial times to avoid dangerous impacts.

The UK passed the Climate Change Act 2008 making it the world's first long term legally binding framework, which introduced the target of reducing UK emissions by 80% by 2050, compared to a 1990 baseline.

On 27 June 2019, the UK furthered its commitment to decarbonisation by extending the target to Net Zero making the UK the first major economy in the world to pass laws to end its contribution to global warming by 2050.⁶

Net Zero is widely considered a synonym for Carbon Neutrality, which is defined by the World Resources Institute as "*annual zero net anthropogenic (human caused or influenced) CO₂ emissions by a certain date*".⁷

2.4.2 Paris Agreement

The Paris Agreement sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C. It also aims to strengthen countries' ability to deal with the impacts of climate change and support them in their efforts.

⁶UK Passes Net Zero by 2050 law: [https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-netzero-emissions-law](https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law)

⁷WRI, Glossary of terms: <https://www.wri.org/blog/2015/12/cop21-glossary-terms-guiding-long-term-emissions-reduction-goal>

The Paris Agreement is the first-ever universal, legally binding global climate change agreement, adopted at the Paris climate conference (COP21) in December 2015. The UK is among the 197 Parties to the Paris Convention.

2.4.3 Climate Emergency Declarations

On 1st May 2019, the UK Parliament declared a Climate Emergency. Declaring a Climate Emergency is an acknowledgment of the risks posed to humanity by climate change and the urgent need for action to prevent human caused climate change.

The movement has emerged since October 2018 following the publication of a landmark Intergovernmental Panel on Climate Change report on the impacts of global warming of 1.5°C above pre-industrial levels.⁸

Originated in Australia, the movement spread to the UK in November 2018 when Bristol City Council became the first UK local authority to declare a Climate Emergency. Since then, over half of the UK's principal authorities have declared Climate Emergencies and set targets to become carbon neutral.

2.4.4 Department for Business, Energy and Industrial Strategy

Local authorities in England have been requested by Government to measure and report their GHG emissions from their own estate and operations. As a result SBC is required to calculate its Carbon Emissions on an annual basis and submit this to BEIS in accordance with government advice.⁹

2.4.5 The CRC Energy Efficiency Scheme

The CRC Energy Efficiency Scheme (formerly known as the 'Carbon Reduction Commitment') covers large, non-energy-intensive organisations such as local authorities.

It is the UK government's major driver to improve energy efficiency and cut carbon dioxide (CO₂) emissions in private and public sector organisations that are high energy users, by charging for CO₂ emissions.

SBC participated in Phase 1 of the Carbon Reduction Commitment. However, the council is now below the qualification threshold. This is due to a reduction in the number of Council assets and the removal of state funded schools from the scheme. The Council will continue to monitor whether the Council is required to participate in future phases.

2.4.6 Climate Change Levy

The Climate Change Levy (CCL) is a non-domestic tax on the use of energy including electricity and gas. It is aimed to encourage energy efficiency and reduce GHG emissions (see Table 2).

2.5 Council Policy Drivers

2.5.1 Climate Change Motion

On 23rd July 2019 Slough Borough Council's full cabinet passed a motion titled 'Climate Change'. The motion stated:

This Council notes the UK Government and Local Government Association's declaration of a national 'climate emergency', recognises that there is a growing urgency for national and international action to combat climate change, and commits to developing a Climate Change Strategy and Action Plan that will address the causes and consequences of climate change in Slough by tackling 5 key objectives:

- Reducing emissions from our estate and operations*
- Reducing energy consumption and emissions by promoting energy efficiency measures, sustainable construction, renewable energy sources, and behaviour change*

⁸IPCC, Special Report, Global Warming of 1.5 °C, 2018: <https://www.ipcc.ch/sr15/>

⁹BEIS Environmental Reporting Guidelines, 2019: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/850130/Env-reporting-guidance_inc_SECR_31March.pdf

Table 2: Main taxation rates for Climate Change Levy¹⁰

Taxable commodity	Rate from 1 April 2018	Rate from 1 April 2019	Rate from 1 April 2020	Rate from 1 April 2021
Electricity (£ per kilowatt hour (kWh))	0.00583	0.00847	0.00811	0.00775
Gas (£ per kWh)	0.00203	0.00339	0.00406	0.00465
LPG (£ per kilogram (kg))	0.01304	0.02175	0.02175	0.02175
Any other taxable commodity (£ per kg)	0.01591	0.02653	0.03174	0.03640

- Reducing emissions from transport by promoting sustainable transport, reducing car travel and traffic congestion, and encouraging behaviour change
- Reducing consumption of resources, increasing recycling and reducing waste
- Supporting council services, residents and businesses to adapt to the impacts of climate change.

The objectives of the motion regarding reducing GHG emissions and energy consumption emphasize the need for the Carbon Management Plan to accomplish these objectives. The Climate Change Strategy and Action Plan that is being prepared in accordance with the Climate Change Motion will support the delivery of these objectives also.

2.5.2 2040 Vision

The 2040 Vision is a core Slough Borough Council strategy currently in development. The strategy will lay out the vision for the town up to the year 2040. In line with the UK government's Net Zero targets, the strategy will outline that Slough will be a low carbon town. The Carbon Management Plan 2020-2030 will play a key role by transforming SBC into a carbon neutral local authority.

2.5.3 Transformation Programme and the Our Futures Programme

In 2019, SBC initiated the Transformation Programme.¹¹ The programme's objective is to improve how the Council operates. This was partly in response to continued financial pressures and a desire to grow resilience and independence in our communities. The 'Our Futures Programme', established in June 2019 was setup as a vehicle to deliver the Transformation Programme. One of the 4 core responsibilities includes: "*Consolidate SBC's estate footprint to make best use of physical space and drive smarter working*". This responsibility aligns strongly with the outcomes of the Carbon Management Plan 2020-2030 as reducing the estate footprint correlates strongly with reducing GHG emissions.

2.5.4 COVID-19 Response, Recovery and Renewal Strategy

The COVID-19 global pandemic that led to a government-imposed UK wide lockdown in March 2020 has had a profound impact on local authorities in the UK. In response, SBC is preparing a 'Response, Recovery and Renewal Strategy'. Yet to be published, the strategy has five objectives:

¹⁰UK main taxation rates for Climate Change Levy: <https://www.gov.uk/guidance/climate-change-levy-rates>

¹¹SBC Transformation Programme, Slough Borough Council: <http://www.slough.gov.uk/moderngov/ieDecisionDetails.aspx?Alld=38218>

1. We will keep Critical and Priority functions running to care for and support our residents
2. We will keep our staff safe
3. We will quickly implement the Government's emergency initiatives affecting local residents and businesses
4. We will work in partnership with strategic partners, other public sector organisations, the voluntary sector and community groups to provide services to local people
5. We will prepare for the recovery of the Council and the town

This is relevant to the Carbon Management Plan 2020-2030 as the Council needs to be resilient to recover from the impacts of COVID-19. Reducing corporate GHG emissions and energy costs will support the financial resilience of SBC by reducing its operating costs. In addition, reduction in corporate carbon intensive activities that contribute to poor air quality, such as transport GHG emissions, will support public health.

3. Past successes

The previous Carbon Management Plan between 2015-20 oversaw a 32.5% reduction in CO₂e emissions by 2018/19, relative to the baseline of 2013/14. There were many factors involved in accomplishing this achievement, which include the introduction of the following interventions.

3.1 LED Street Lighting Project

The LED Street Lighting project included the replacement of street lighting with more efficient LED bulbs which has significantly reduced energy costs and associated carbon emissions. Emissions from street lighting were 2,657 tonnes CO₂e in 2014/15 and fell 58% to 1,112 tonnes CO₂e in 2017/18 (see Figure 2).

3.2 RE:FIT Programme

The RE:FIT Programme is an energy efficiency and renewable energy refurbishment scheme. The Council has been enacting the programme to improve the energy efficiency of its corporate building estate. The programme guarantees to reduce energy consumption by at least 20%, reducing carbon emissions and energy costs. The first phase is annually saving SBC £28,053 and 138 tonnes of CO₂.

3.3 Fleet Challenge Programme and Grey Fleet Emissions

This is an ongoing programme with the aim of decarbonising SBC's fleet by promoting low emission vehicles, while reducing revenue expenditure from mileage claims. Introduced in 2017, this project is still in the pilot phase. However, the initial feedback is very positive. The scheme has already avoided 10 tonnes of CO₂ compared to SBC's average grey fleet leading to over £20,000 in savings.

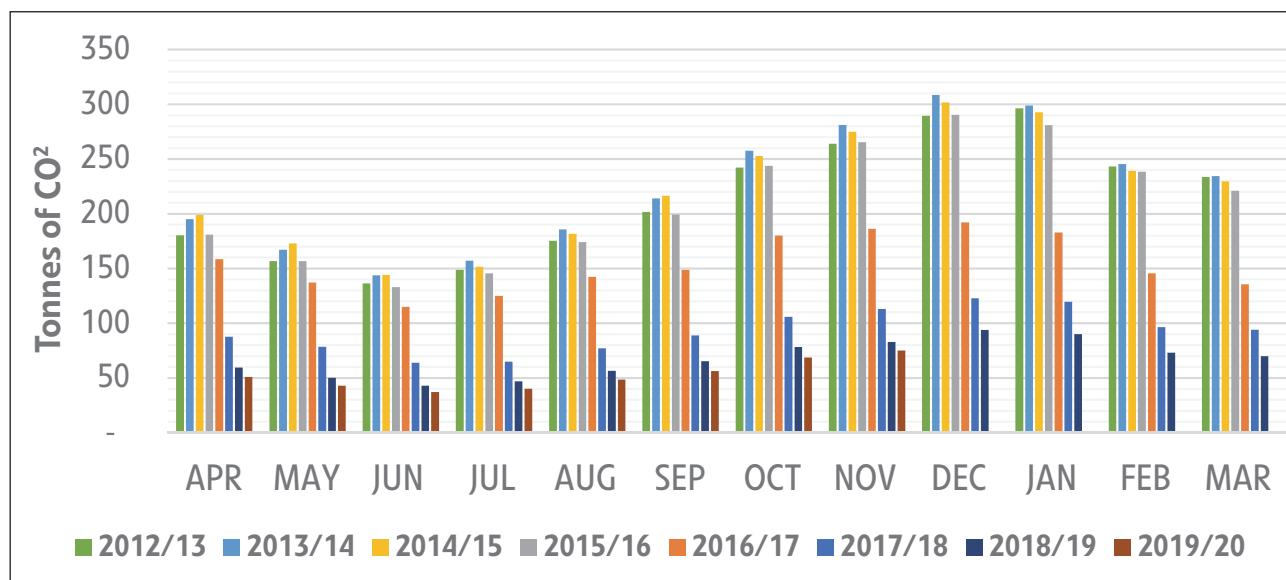


Figure 2: LED Street Light project GHG emission savings from 2012/13 to 2019/20

3.4 Upton Court Park Jubilee Wood forest

As opposed to reducing carbon emissions, this forestry project draws down carbon that can be used as a form of carbon offset. Initiated in 2013, the woodland has sequestered 11 tonnes of CO₂. As the woodland growth accelerates with age, this is forecast to reach over 700 tonnes after 25 years and over 1,300 tonnes after 50 years. For further information on Carbon offsetting please refer to Section 4.2.

3.5 New Direct Services Operation and Community Fleet

In 2018, SBC's DSO, which oversees SBC's waste and refuse collection services, was brought back in house after being previously outsourced to a private sector contractor. As part of this transition, a new fleet of Euro 6 refuse trucks were procured with lower CO₂ emission profiles.¹² In addition, SBC's Community Transport fleet that is used for home to school transport, was replaced with new Euro 6 minibuses reducing the CO₂ emissions fleet profile.

3.6 National Grid Carbon Intensity

Over the last decade, the carbon intensity of the National Grid, which provides Great Britain's electricity, fell substantially. From 2014 to 2019, the carbon intensity of 1 kWh of electricity from the National Grid fell from 0.49 kg CO₂e to 0.26 kg CO₂e, a drop of 52%.^{13,14} This trend was principally caused by a reduction in burning coal for electricity and an increase in renewable energy sources such as wind power and solar photovoltaic (PV). The calendar year of 2019 had the lowest carbon intensity of electricity on record for Britain and the amount of electricity from low carbon renewable energy exceeded that from fossil fuels for the entire year.¹⁵ This progress significantly contributed to reducing SBC's GHG emissions from electricity which reduced by 34.1% from 2013/14 to 2018/19.

¹²Euro 6, Emissions in the automotive sector, European Union: https://ec.europa.eu/growth/sectors/automotive/environment-protection/emissions_en

¹³BEIS, Greenhouse Gas Reporting Factors 2014: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2014>

¹⁴BEIS, Greenhouse Gas Reporting Factors 2019: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019>

¹⁵National Grid Group PLC, 2020: <https://www.nationalgrid.com/britain-hits-historic-clean-energy-milestone-zero-carbon-electricity-outstrips-fossil-fuels-2019>

4. Priorities, Key Actions, Outcomes

4.1 Key Outcomes

Based on the evidence, the outcomes of the plan are to:

Outcome	Purpose and description	Target measures	Date
Outcome 1	A 10% reduction of CO ₂ e net emissions per annum of all Council operations relative to 2018/19	1,022 tonnes of CO ₂ e/yr	Reported each financial year
Outcome 2	A 100% reduction of CO ₂ e net emissions against the 2018/19 baseline by 2029/30	10,224 tonnes of CO ₂ e	By 31st March 2030
Outcome 3	A reduction of 10.5 tonnes CO ₂ e to 0 tonnes per Full Time Equivalent Employee (FTE) by 2029/30	0 tonnes of CO ₂ e/FTE	By 31st March 2030
Outcome 4	A revenue saving of 10% over lifetime of the plan against 2018/19 baseline operating costs for the Council please refer to Appendix 1	£253,136 (10% of £2,531,367 total 2018/19 utility spend)	By 31st March 2030

The outcomes will be achieved by the following priorities:

Priorities	Purpose and description
Priority 1	Reduce CO ₂ emissions from energy consumption across all Council operations
Priority 2	Reduce energy consumption revenue costs across all Council operations
Priority 3	Embed carbon management in the Council's policies and procedures
Priority 4	Raise awareness of carbon management among staff through the Environmental Strategic Board/Green Champions to reduce carbon emissions and energy consumption
Priority 5	Incorporate high standards of energy efficiency into new buildings, equipment and contracts
Priority 6	Incorporate carbon intensity into the procurement of goods and services

4.2 Priority 1 - Reduce CO₂ emissions from energy consumption across all Council operations

The Council's buildings are one of the main contributors to CO₂ emissions and one of the elements the Council has a high degree of control over. Using available information to dispose of inefficient assets and maximise usage of the remaining buildings should be a key consideration when considering the future disposal of assets.

4.2.1 Display Energy Certificates

A Display Energy Certificate (DEC) and advisory report are required for buildings with a total useful floor area more than 250m² that are occupied in whole or part by public authorities and frequently visited by the public.¹⁶ This shows the energy performance of the building based on actual CO₂ emissions recorded over twelve months. This enables identification of sites where there is the greatest opportunity to reduce GHG emissions. SBC corporate estate currently includes 21 sites with a Display Energy Certificate (see Appendix 3).

¹⁶Display Energy Certificates Guidance:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/452481/DEC_Guidance_rev_July_2015_.pdf

4.2.2 Energy Performance Certificates

The Council is required to complete an Energy Performance Certificate (EPC) each time one of its properties is built, sold or rented. It contains information about a property's energy use and typical energy costs, with recommendations on how to reduce energy use and save money. An EPC gives a property an energy efficiency rating from A (most efficient) to G (least efficient) and it is valid for 10 years.

In accordance with the Energy Act 2011, all buildings that do not meet the minimum energy performance standard of Grade E are not allowed to be let until they have been upgraded.

4.2.3 Corporate Landlord

The Corporate Landlord Model aims to make best operational use of corporate buildings through central management. A corporate approach can help raise staff awareness of the most efficient use of energy in buildings and allows facilities management to monitor energy use across the entire asset base. Taking this model further could realise additional carbon savings and any opportunities which can be identified to further centralise facilities management should be explored. We will also use the ongoing asset review to monitor energy consumption, which will help inform future decisions around our assets.

4.2.4 Corporate Energy Management

Corporate carbon and GHG emissions are managed by the Environmental Quality team. Currently corporate energy and water contracts, which cause the majority of SBC's GHG emissions, are managed by Building Management. This includes the ownership of energy usage data and the procurement and management of energy and water contracts with suppliers for the corporate estate.

This division of responsibilities across different departments has created inefficiencies restricting the effective management and delivery of the Carbon Management Plan and related programmes such as the RE:FIT Programme. This situation is being reviewed in order to reduce barriers and streamline the delivery of the Carbon Management Plan 2020-2030.

4.2.5 RE:FIT Programme

The RE:FIT Programme operates through a framework that provides a guaranteed 100% of the energy saving or generation (kWh) via a contractual agreement for the payback period of the project. This key feature is helping to remove risk of failure, plus protecting the Council's investment. Additional benefits include improvements to buildings' operational performance and comfort levels for staff, reductions in building-related complaints and maintenance backlogs, a boost to local investment through local job creation and important reductions in CO₂ emissions.¹⁷

SBC approved a budget of £2.6 million for the RE:FIT Programme and now the council is working on the second phase of delivery. In the first phase, energy efficiency and renewable energy measures were deployed across 11 sites including; offices, community centres, Hatfield car park and Slough Bus Station. For example, the building named New Horizon, occupied by the Community Mental Health Team, had LED lighting installed, energy management systems optimised, and 54 rooftop solar PV panels installed.

4.2.6 The Asset Management Plan

The Asset Management Plan (AMP) has already identified that a greater understanding of the performance of existing assets in terms of their fitness for purpose and operational efficiency is required. Energy efficiency of council assets have been identified in the AMP.

¹⁷RE:FIT Framework, Local Partnerships: <https://localpartnerships.org.uk/our-expertise/re-fit/>

4.2.7 Slough Schools

There are currently 52 schools in Slough though this may change over time, and not all schools are covered by this plan. The schools over which the Council has the greatest control are community and foundation schools (listed in Appendix 4), and budget is devolved to these schools. Schools, however, do not have specific or substantial funding for carbon management activities, but it is in their best interests to reduce energy consumption where possible as this will reduce their operating costs.

4.2.8 Low Emission Strategy 2018-2025

The Low Emission Strategy 2018-2025 has three aims including:¹⁸

- 1) Improve air quality and health outcomes across Slough by reducing vehicle emissions through the accelerated uptake of cleaner fuels and technologies;
- 2) Embed an innovative approach to vehicle emission reduction through integrated policy implementation;
- 3) Provide a platform for inward investment as part of the transition to a low emission economy.

To achieve these aims, objectives have been set that align with the Carbon Management Plan's outcomes including:

- Implement vehicle emission standards through Social Value procurement practices;
- Implement the Fleet Challenge Programme to reduce emissions from the SBC 'grey fleet'.

4.2.9 Slough's Third Local Transport Plan (LTP3) and future Forth Local Transport Plan (LTP4)

Slough's Local Transport Plan is responsible for improving transport services within the borough of Slough and reducing the impact of travel on residents.¹⁹ It is also critical to the development and growth of Slough as it affects housing, employment, shopping, schools and so on. It is guided by UK government policies such as the 2011 White Paper on Local Transport, which highlights the important role that improving local journeys can play in achieving the multiple goals of economic growth and reducing CO₂ emissions. Reducing Slough's corporate transport GHG emissions contributes to this goal. Slough's Third Local Transport Plan is being updated and will be replaced with the Fourth Local Transport Plan in 2021.

4.2.10 Local Transport Plan (LTP3) Parking Strategy

The vision of SBC's Parking Strategy; "*Improve the customer parking experience and in doing so helping to enhance Slough's economic competitiveness*".²⁰ The objectives include supporting the Local Transport Plan's wider objectives to lessen impact on the local environment, and lead to lower CO₂ emissions and air pollutants from vehicle emissions in the borough. This objective further contributes to the Carbon Management Plan 2020-2030's outcomes to reduce corporate transport GHG emissions.

¹⁸Low Emission Strategy 2018-2025, Slough Borough Council: <http://www.slough.gov.uk/pests-pollution-and-food-hygiene/low-emission-strategy-2018-2025.aspx>

¹⁹Local Transport Plan 3, Slough Borough Council: <http://www.slough.gov.uk/council/strategies-plans-and-policies/local-transport-plan-ltp3.aspx>

²⁰Parking Strategy, Local Transport Plan 3, Slough Borough Council: <https://www.slough.gov.uk/downloads/LTP3-SSD-Parking1.pdf>

4.2.11 The Waste Strategy 2015-2030

Waste generated at corporate buildings contributes to the Council's carbon footprint (although this is not measured as part of the Carbon Reduction Commitment). The Recycling Carbon Index shows the carbon benefit of collecting and recycling materials to reuse them as opposed to extracting and processing raw materials. Local authorities will be ranked according to their performance. The Waste Strategy 2015-2030 sets out the borough wide vision to move from waste disposal to waste management, which can also be applied to corporate waste.

4.2.12 Carbon offsetting and Carbon insetting

A carbon offset is a reduction in emissions of carbon dioxide or other GHGs made in order to compensate for ("offset") an emission made elsewhere. There are two forms of market in which carbon offsets can be purchased; the compliance market and the voluntary market. The compliance market enables companies, governments, or other entities to buy carbon offsets in order to comply with caps on the total GHG emissions they are allowed to emit. The voluntary market enables individuals, companies or governments to purchase offsets to mitigate their own GHG emissions voluntarily. SBC, as a Borough Council is not part of a compliance market so if the Council were to offset any GHG emissions it would be through the voluntary market.

Carbon insetting is when an organisation invests in emission reduction projects within the organisations supply chain. This enables the organisation to assume greater control of the carbon reduction process and are more likely to directly gain from the project co-benefits, such as employee engagement. SBC's Upton Court Park Jubilee Wood forest (see Section 3.4), which is a form of carbon offsetting, is also an example of Carbon insetting as it is within the council's supply chain.

There is a wide range of types of carbon offsetting projects to invest in, from forestry to renewable energy. Formal standards exist, recognised by international carbon neutrality standards, that independently verify carbon offsetting projects. Carbon neutrality standards dictate that carbon offsetting is suitable when an organisation's GHG emissions have been reduced as much as possible and that carbon offsetting is an appropriate measure to compensate for the remaining GHG emissions.

The cost of a carbon offset is measured in tonnes of carbon dioxide equivalent (tCO₂e) and depends on a number of variables including the projects type, location, scale and standard. A market assessment published in 2017 identified that the average voluntary carbon offset market price ranged from less than £0.40 tCO₂e to more than £39.60 tCO₂e, with an average £2.38 tCO₂e.²¹ Using this average total, if SBC were to offset their entire GHG emission footprint of 2018/19, which totalled 10,224 tCO₂e, this would total £24,333 not accounting for any potential economies of scale.

Please note that SBC reports GHG emission in accordance with the World Resources Institute Greenhouse Gas Protocol.²² In the event of the Council utilising Carbon offsets it would be in accordance to the World Resources Institute standard.

4.2.13 Key actions

1. Ensure the Corporate Landlord Model covers all Council buildings and that the corporate energy contract, and that the monitoring of energy usage is transferred to the Environmental Quality Team to identify opportunities for contract negotiation, procurement of renewable energy, identification of energy trends, identification of poorly performing buildings (energy hungry), and also informs accommodation decisions.

²¹State of Voluntary Carbon Markets 2017, Ecosystem Marketplace. Initial values were in USD and have been converted to GBP on 11/07/2020.

²²Greenhouse Gas Protocol, World Resources Institute: <https://ghgprotocol.org/>

2. Take all opportunities during refurbishment works to install the most energy efficient plant and use the most energy efficient building operation methods. To include energy efficiency into the Asset Management Plan and develop a sustainable energy model/plan.
3. Work alongside the Asset Management team to ensure that GHG emissions are accounted for when acquiring new assets.
4. Use the Recycling Carbon Index to monitor and improve waste disposal from Council buildings, and implement best practice identified through the Waste Strategy.
5. Identify energy efficiency projects across the Council's buildings suitable for CAPEX funding. This work is ongoing through the RE:FIT Programme.
6. Continue replacing existing street lighting with LED lanterns, capable of being remotely dimmed, to deliver a 70% carbon and revenue saving.
7. Continue replacement of lighting in Council owned car parks with low energy LED lighting.
8. Review SBC's owned transport and identify carbon and revenue savings which could be delivered.
9. Work with community and foundation schools in order to identify projects, funding and best practice to reduce their carbon emissions and energy consumption.
10. Carry out a detailed survey of all Council owned assets gathering data such as floor area and heating systems.
11. Ensure that all Council buildings that are let remain EPC Grade E rated or above and to monitor any future changes in standards.

Table 3: SBC Energy Revenue Spend in carbon emissions April 2018-March 2019

Category	Total Consumption (kWh)	2018/19 Corporate Spend (£)
SCOPE 1 and 2		
Street Lighting		304,607
Electricity Spend (HH and NHH)		1,060,625
All Electricity Suppliers	12,877,101	1,365,232
Total Gas Energy Spend	13,921,522	555,983
Total SCOPE 1 and 2 (Electricity and Gas spend)	26,798,623	1,921,215
SCOPE 3		
Business Mileage		308,753
Water Spend		113,886
Paper Consumption		22,486
Waste SBC Corporate Buildings		77,510
Total SBC Utility Spend		522,634
Total SBC Utility Spend Scope 1, 2 and 3		2,443,849

12. Ensure that all Council buildings that are above 250m² have a Display Energy Certificate.
13. Energy benchmark for all Council assets.
14. Develop an ISO 50001 Energy Management System for the Council operations following a cost-benefit analysis.

4.3 Priority 2 - Reduce energy consumption revenue costs across all Council operations

Like many local authorities, SBC is facing extremely tough financial challenges. Funding to local authorities has reduced following austerity and many grants have stopped, including the central government grant.

The Council spent over £1.9 million on gas and electricity costs in 2018/19 (see Table 3). Reducing energy consumption is one area the Council can save money, leaving more funds for service delivery. This will also result in a reduction in carbon emissions which will help to deliver the outcomes of this plan.

4.3.1 Key actions

SBC shall use an energy broker through the Corporate Energy Contract to ensure the most cost-effective price for energy and:

1. Transfer all corporate buildings to automated meter reading (AMR) to provide more reliable billing.
2. Consider suitability of automated meter reading for water.

4.4 Priority 3 - Embed carbon management in the Council's policies and procedures

All capital Investments above the value of £10,000 are considered by the Capital Monitoring Board as well as all Cabinet reports. These investments already require identification of energy and carbon implications, and mitigations that can be identified, which are signed off at director level.

4.4.1 Key actions

1. Devise a method for assessing and appraising carbon and revenue saving projects which can be adopted corporately by the Capital Strategy Board.
2. Determine how the Carbon Management Plan will fit into the Asset Management Plan.

4.5 Priority 4 - Raise awareness of carbon management among staff through the Environmental Strategic Board to reduce carbon emissions and energy consumption

The Environmental Strategic Board covers energy, waste and transport. It is the Council's principle staff engagement mechanism and was setup in 2020 (see Section 5.1).

Staff travel to, from and during work adds a significant amount of carbon to the Council's overall operations. Staff travel surveys help the Council to identify which schemes will help staff to travel more sustainably.

Funding from the Local Sustainable Transport Fund has already been used to develop a number of projects including:

1. Personalised travel plans for staff.
2. Provision of pool bikes, cycle salary sacrifice scheme, bicycle users group and other promotions.
3. Season ticket loan scheme.
4. Display of walking and cycling maps in key SBC buildings.
5. Staff walking challenge.

4.5.1 Key actions

There are two key actions we intend to follow under priority 4:

1. Use the Environmental Strategic Board to engage staff around carbon management, reducing corporate waste and reducing energy consumption.
2. Provide additional measures to encourage staff to travel more sustainably including cycle training and the implementation of additional staff electric pool cars.

4.6 Priority 5 – Incorporate high standards of energy efficiency into new buildings, equipment and contracts

Sustainability Impact Assessments are currently required as part of procurement practises that the Council carries out. These identify impacts of the given procurement on the Council's carbon footprint, pollution to air, water or land, and impacts on waste management. Bidders can be asked to mitigate the identified impacts as part of their bid.

4.6.1 Key actions

There are three key actions we intend to follow under priority 5:

1. Devise procurement assessment criteria to incorporate high standards of energy efficiency into new buildings, equipment and contracts.
2. Tenderers or bidders will routinely be asked to demonstrate and manage the impact on the Council's carbon emissions as part of any procurement.
3. All SBC new build projects will seek to be built to a minimum BREEAM very good standard (see Appendix 5).

4.7 Priority 6 – Key actions – Incorporate carbon intensity into the procurement of goods and services

Goods and services that the Council purchase fall under Scope 3 GHG emissions. Any activities that are outsourced by the Council fall under this category. This is a major source of GHG emissions that needs to be incorporated into the procurement process. To achieve this, the carbon footprint of procurement activities would need to be calculated and incorporated to the decision making process.

4.7.1 Key actions

There is one key action we intend to follow under priority 6:

1. Tenderers or bidders will routinely be asked to quantify and mitigate the impact on the Council's carbon emissions as part of any procurement.

5. Implementation and Monitoring

The Council's Environmental Strategic Board is the primary monitoring authority for this plan (see Section 5.1). The objective is to manage a sustained reduction in carbon emissions from all relevant Council operations, Council run schools and Council contracted-out services. It also assists in reducing the Council's impact on climate change as well as reducing operational running costs.

The board has representation from relevant departments of the Council and is chaired at the director level.

5.1 Governance of the Carbon Management Plan 2020-2030

The Carbon Management Plan will be governed by the Environmental Strategic Board. There are 4 core aims of the Environmental Strategic Board:

1. To champion, support and enable the successful delivery of SBC's approved environmental and sustainability strategies and plans.
2. To oversee and enable the development of the Climate Change Strategy and Action Plan, aligning it with the 2040 vision for the Council.
3. To monitor and govern the Council's strategic environmental programmes to ensure they are meeting their targets.
4. To discuss and evaluate environmental/climate change projects at a strategic level to determine if they shall proceed to development of a full business case.

The Board meets monthly and is chaired by the CEO. The initial core Membership included:

- Chief Executive (Chair)
- Director Regeneration (Deputy-Chair)
- Service Lead for Regeneration Development
- Service Lead for Major Infrastructure Projects
- Service Lead for Public Health

- Service Lead Communities and Leisure
- Service Lead Environment
- Service Lead Planning and Transport
- One Service Lead from (Children, Learning and Skills)
- One Service Lead from (Finance and Resources)
- Environmental Quality Team Manager (senior reporting officer)
- Senior Carbon Project Officer (reporting officer)

It should be noted that the organisational structure of SBC is scheduled to be reshuffled in late 2020. This is likely to affect the board membership.

5.2 Finances

Financially, the Carbon Management Plan 2020-2030 will contribute to projects that either reduce the operating costs of the Council or produce an income. The delivery of energy efficiency reduction projects, for example the RE:FIT Programme, will enable a reduction in energy costs from corporate buildings. Income can be generated from technologies that will support decarbonisation such as public Electric Vehicle Charging Stations or electricity generated by solar PV panels exported to the National Grid.

Over the duration of the Carbon Management Plan 2020-2030, the UK's energy prices are projected to increase (see Table 4). This will increase the Council's energy related operating costs. In 2018/19, the Council's electricity costs came to £1,365,232 and gas costs totalled £555,983 (see Table 5). If an increase in costs are to be avoided, then the Council's energy consumption must be reduced. A do-nothing approach will therefore continue to add significant revenue cost pressures on the Council budget.

Table 4: BEIS UK energy price central projections between 2020 and 2030²³

Energy Type	Units	2020	2030	Change
UK Wholesale Electricity Prices	p/kWh	5.3	5.9	+12%
Natural gas	p/therm	48.0	63.0	+31%
Petroleum Premium unleaded	p/litre	123.9	135.4	+9%
Petroleum Super unleaded	p/litre	132.2	143.7	+9%

Table 5: Slough Borough Council's Corporate Energy Spend and projected spend by 2030

Category	2018/19 Corporate Spend (£)	Projected 2030 Corporate Spend (£)
Total Electricity Energy Spend	1,365,232	1,529,060
Total Gas Energy Spend	555,983	728,338
Business Mileage	308,753	336,541

An annual budget of £10,000 will be required for supporting consulting services. These services will support annual GHG emission reporting and any specialist consultations that may be required.

Should there be a requirement for any salaried staff positions to deliver the objectives of the Carbon Management Plan 2020-2030, a business case and justification will be presented to the Environmental Strategic Board.

5.3 The Slough Borough Council Baseline

SBC overachieved the target set in the Carbon Management Plan 2015-2020 of 20% reduction of carbon emissions from the 2013/14 baseline. The Council achieved a 33% reduction in annual GHG emissions exceeding the target by 13%. The baseline for the 2018/19 period is 10,224 tCO₂e.

5.4 Data Classification

SBC reports GHG emissions in line with the World Resources Institute: Greenhouse Gas Protocol.²⁴ This requires that GHG emissions are broken down into three scopes (see Figure 3 and Table 6). SBC's GHG emissions are defined by scope in the Table 7 and Table 8 below. Government conversion factors for reporting of GHG emissions are used.²⁵

²³BEIS 2018 Updated Energy and Emissions Projections: <https://www.gov.uk/government/collections/energy-and-emissions-projections>

²⁴Greenhouse Gas Protocol, World Resources Institute: <https://ghgprotocol.org/>

²⁵Government conversion factors for company reporting of greenhouse gas emissions, UK Government: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

Figure 3: Overview of GHG Protocol scopes and emission across the value chain

Source: Bahtia and Ranganathan, 2004

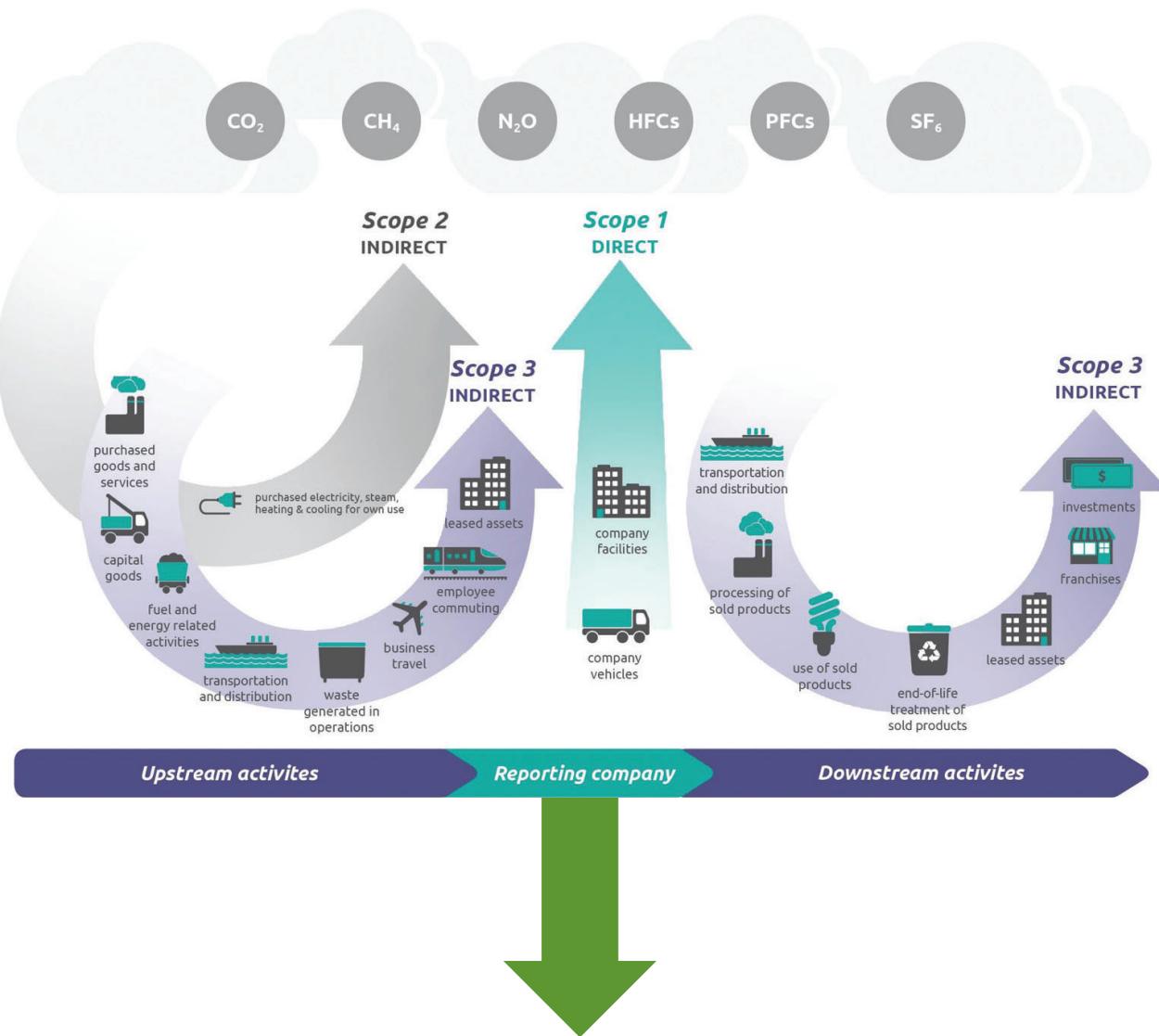


Table 6: Slough Borough Council scope assessment criteria

Scope 1	Scope 2	Scope 3
Gas emissions from SBC assets, communal housing areas and relevant schools	Emissions from electricity in SBC assets, communal housing areas and relevant schools	Emissions from outsourced services
Fugitive emissions from corporate fridges	Street assets e.g. streetlighting	Corporate waste
Business transport		

Table 7: Slough Borough Council GHG Emission data submitted to BEIS for 2018/2019

GHG emissions for period 1 April 2018-31 March 2019	Tonnes of CO ₂ e
Scope 1	3,945
Scope 2	3,984
Scope 3	2,295
Total gross emissions	10,224
Exported renewable electricity reduction	0
Carbon offsets	0
Woodland Carbon Units	0
Total net emissions	10,224

Table 8: Slough Borough Council GHG Emission Intensity Measurements for 2018/2019

Intensity Measurement	Tonnes of CO ₂ e
Intensity measurement - tonnes of CO ₂ e per 000 people served ²⁶	68.4 tCO ₂ e
Intensity measurement - tonnes of CO ₂ e per £m revenue ²⁷	97
Intensity measurement - tonnes of CO ₂ e per FTE ²⁸	10.5 tCO ₂ e
Total Annual Emissions 18/19 baseline	10,224
% reduction from 13/14 baseline	33%

5.5 Data Quality

Data that was collected for the previous Carbon Management Plan (2015-2020) varied in quality and completeness. This applied to; school energy use data, water use and contractor transport use (see Appendix 6). Data was also not collected for refrigerant gases and therefore could not be reported.

In the event of absent data, GHG emissions had to be estimated in accordance with the GHG Protocol. For example, in 2018/19 some road travel was estimated using mileage rather than litres fuel used and types of vehicles were estimated. Similarly, some activity data was estimated from previous years' activity, or other sites' activity. In the case of refrigerants, data was totally absent and could not be estimated.

Accurate and complete records need to be documented to improve GHG emission data quality. Although data estimations enable data gaps to be filled, it decreases the quality of the data compiled for GHG emission reporting. To counteract this, the Carbon Management Plan 2020-2030 will improve data collection methods to ensure greater accuracy in GHG emission reporting.

To improve data collection methods, data resolution will also be enhanced. Improvements in GHG emission and energy data collection will contribute to superior monitoring methods, will enable greater in-depth analysis of GHG emission and energy trends and potentially will identify future opportunities to decarbonise. This could also contribute to SBC adopting the formal Energy Management Standard ISO 50001.²⁹

²⁶Population Projection of Slough: <http://www.slough.gov.uk/council/joint-strategic-needs-assessment/population.aspx>

²⁷Financial Performance (Revenue), Statement of Accounts for the year 2018/19, Slough Borough Council: <http://www.slough.gov.uk/downloads/Draft-statement-of-accounts-2018-19.pdf>

²⁸Data based on 977.27 Full Time Employees, Slough Borough Council

²⁹ISO 50001: Energy Management: <https://www.iso.org/iso-50001-energy-management.html>

5.6 Progress Reporting

There will be two Key Performance Indicators reported to the board on an annual basis in July:

1. The total carbon emissions for Scope 1, 2 and 3 for all Council operations for the preceding financial year (1st April-31st March).
2. The Energy Revenue Spend for Scope 1, 2 and 3 for all Council operations (please refer to Appendix 1).

5.7 Slough Borough Council's remaining carbon budget

This Carbon Management Plan's outcome of an annual 10% reduction in CO₂e net emissions combined with an overall 100% reduction in CO₂e net emissions by 2029/30 can be interpreted that the Council has a finite remaining GHG emission budget. This is represented in Table 9 and Figure 4.

Table 9: Slough Borough Council's remaining GHG Emission Annual Budget

Financial Year	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
% decrease	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Tonnes CO ₂ e	9201.6	8179.2	7156.8	6134.4	5112	4089.6	3067.2	2044.8	1022.4	1.3642E-12

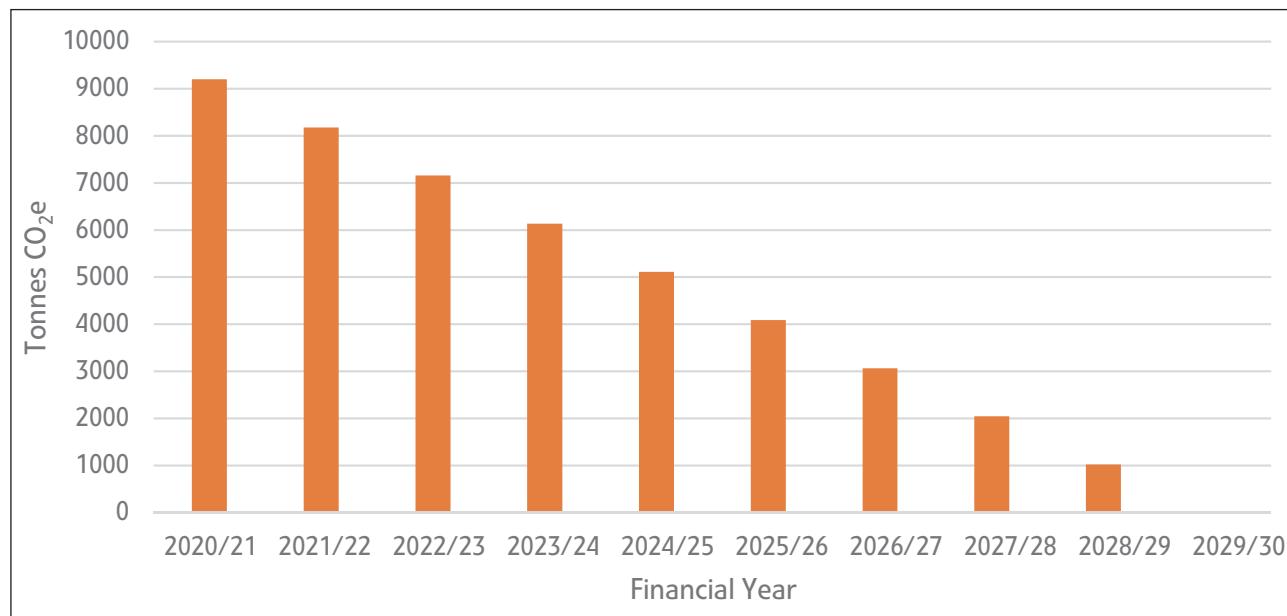


Figure 4: Slough Borough Council's remaining GHG Emission Annual Budget.

Overall from 01 April 2020 to 31 March 2030, Slough Borough Council has a remaining budget of 46,314 tCO₂e.

The remaining carbon budget is broken down into budget targets by GHG emission source (see Figure 5 below). The table representing the targets can be found in Appendix 7.

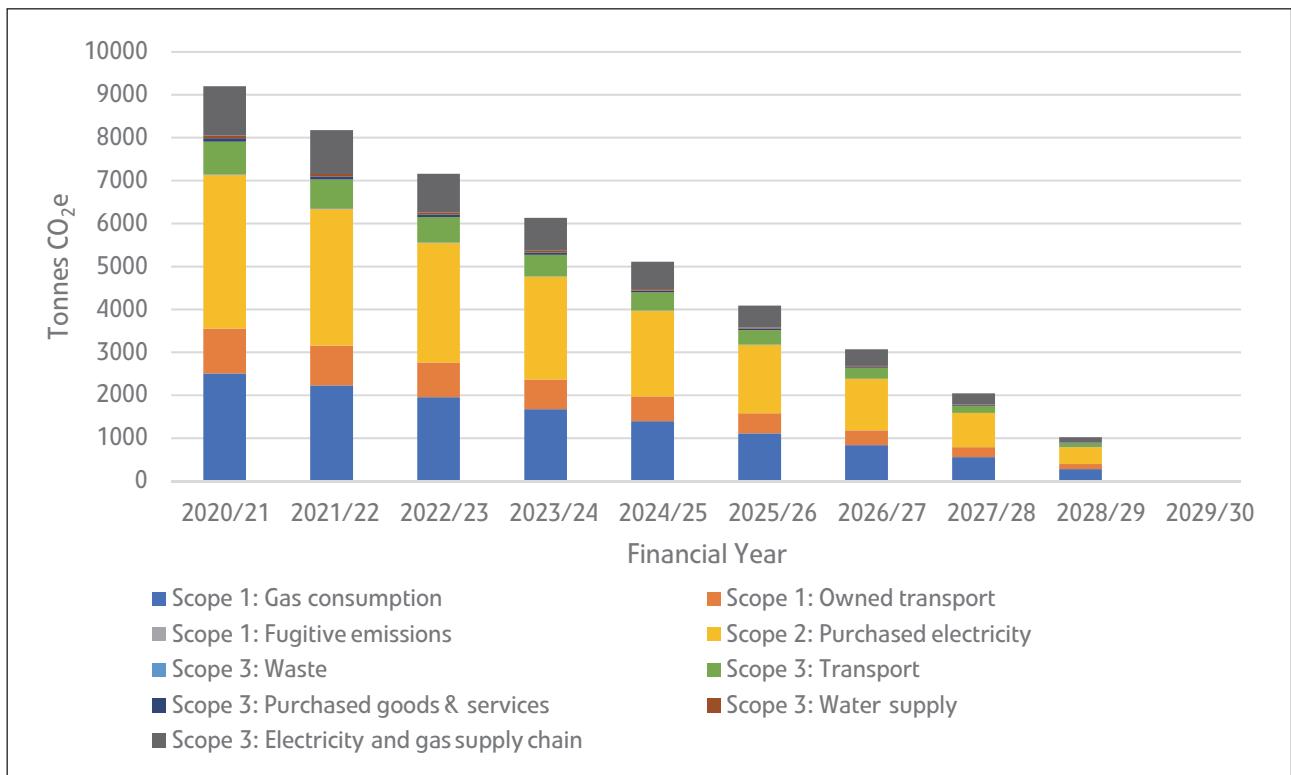


Figure 5: Slough Borough Council's remaining carbon budget targets by GHG emission source in tCO₂e.

6. Glossary of terms

Term	Definition
BEIS	Department for Business, Energy and Industrial Strategy
BREEAM	Building Research Establishment Environmental Assessment Method
Carbon Dioxide (CO₂)	Carbon Dioxide is the most common greenhouse gas and largest contributor to manmade climate change. Its chemical formula is CO ₂ .
Carbon Dioxide Equivalent (CO₂e)	Carbon Dioxide Equivalent is a measure representing greenhouse gases as the functionally equivalent amount or concentration of carbon dioxide. It is represented by as CO ₂ e. Sometimes is expressed as tCO ₂ e where the 't' represents tonnes.
Carbon Neutral	A process or operation that results in no net release of GHG emissions into the atmosphere
Climate Emergency	Acknowledgment of the risks posed to humanity by climate change the urgent need for action to prevent human caused climate change
CMP	Carbon Management Plan
CRC	Carbon Reduction Commitment
DCLG	Department of Communities and Local Government
DEC	Display Energy Certificate
EPC	Energy Performance Certificate
Fossil Fuels	Coal, oil and gas are known as fossil fuels
Greenhouse Effect	Most mainstream scientists believe a human-driven increase in "greenhouse gases" is increasing the effect artificially. These gases include carbon dioxide, emitted by fossil fuel burning and deforestation, and methane, released from rice paddies and landfill sites.
Greenhouse Gases (GHG)	The four most important greenhouse gases-carbon dioxide, methane, nitrous oxide, and fluorinated gases-and options for reducing emissions.
IPCC	International Panel on Climate Change
KPI	Key Performance Indicator
LGA	Local Government Association
MoU	Memorandum of Understanding
MTFS	Medium Term Financial Strategy
Net Zero	A process or operation that results in no net release of GHG emissions into the atmosphere including indirect emissions
RSG	Revenue Support Grant
SALIX Finance Ltd	Salix Finance Ltd. delivers 100% interest-free capital to the public sector to improve their energy efficiency and reduce their carbon emissions.
SBC	Slough Borough Council
Scope 1 Emissions	Direct emissions from combustion of fuels
Scope 2 Emissions	Indirect emissions from using energy e.g. electricity
Scope 3 Emissions	Other indirect emissions e.g. business mileage
UNFCCC	UN Framework Convention on Climate Change

7. Appendix 1

7.1 SBC Energy Revenue Spend in carbon emissions April 2018-March 2019

Category	Total Consumption (kWh)	2018/19 Corporate Spend (£)
SCOPE 1 and 2		
Street Lighting		304,607
Electricity Spend (HH and NHH)		1,060,625
All Electricity Suppliers	12,877,101	1,365,232
Total Gas Energy Spend	13,921,522	555,983
Total SCOPE 1 and 2 (Electricity and Gas spend)	26,798,623	1,921,215
SCOPE 3		
Business Mileage		396,270
Water Spend		113,886
Paper Consumption		22,486
Waste SBC Corporate Buildings		77,510
Total SBC Utility Spend		610,152
Total SBC Utility Spend Scope 1, 2 and 3		2,531,367

8. Appendix 2

8.1 List of Assets included in the 2018-2019 CO₂ Baseline

Building Name	Building Type
Baylis Court Nursery	School
Chalvey Early Years Centre	School
Cippenham Nursery School	School
Lea Nursery School	School
Slough Centre Nursery School	School
Claycots School	School
Penn Wood Primary and Nursery School	School
Wexham Court Primary School	School
Wexham School	School
Elliman Avenue Children's Centre	Children's Centre
Monksfield Way Children's Centre	Children's Centre
Orchard Avenue Children's Centre	Children's Centre
Penn Road Children's Centre	Children's Centre
Romsey Close Children's Centre	Children's Centre
St Andrew's Way Children's Centre	Children's Centre
Vicarage Way Children's Centre	Children's Centre
Wexham Road Children's Centre	Children's Centre
Yew Tree Road Children's Centre.	Children's Centre
Chalvey Grove Childrens Centre	Children's Centre
Arbour Park Community Stadium	Community Buildings
Chalvey Hub	Community Buildings
Cippenham Community Centre	Community Buildings
Weekes Drive Community Centre	Community Buildings
Upton Lee Community Centre	Community Buildings
Westfield Community Centre	Community Buildings
Manor Park Community Centre	Community Buildings
Manor Park Pavilion	Community Buildings
Langley Pavilion	Community Buildings
Chalvey Depot office buildings	Community Buildings
Serena Hall	Community Buildings
Orchard Youth and Community Centre (Creative Academy)	Community Buildings
Mallards	Community Buildings
Langley Library (Hub)	Council Hub
Cippenham Library	Council Hub

Britwell Hub (Hub)	Council Hub
The Curve	Council Hub
Cippenham Library	Libraries
Langley Library	Libraries
The Curve	Libraries
Slough Ice Arena	Leisure Facility
Langley Leisure Centre	Leisure Facility
Salt Hill Activity Centre	Leisure Facility
The Centre, Farnham Road	Leisure Facility
Tennis Courts, Salt Hill Park	Leisure Facility
Eltham Avenue Recreation Ground	Parks Changing Rooms
Harvey Park	Parks Changing Rooms
Kedermister Park	Parks Changing Rooms
Lascelles Park	Parks Changing Rooms
Mercian Recreation Ground	Parks Changing Rooms
Salt Hill	Parks Changing Rooms
Upton Court Park	Parks Changing Rooms
Observatory House	Offices
Landmark Place	Offices
St. Martins Place	Offices
Hawker House	Offices
Elmshott Lane	Car Park
Shelly Close	Car Park
Vicarage Way	Car Park
Herschel MSCP	Car Park
Hatfield MSCP	Car Park
Buckingham Gardens	Car Park
Harrow Market	Car Park
The Grove	Car Park
St. Martins Place, Ground Floor East and West	Children's Services Trust
Britwell Contact Centre	Children's Services Trust
2 Priors Close	Children's Services Trust
Respond, Priors Close	Adult Social Services
Lavender Court, Priors Close	Adult Social Services
Priors Day Services, Priors Close	Adult Social Services
New Horizons, Pursers Court	Adult Social Services
Langley Resource Centre, Common Road	Adult Social Services
Elliman Resource Centre, DAAT	Adult Social Services
Solutions 4 Health (Newborn Health Check)	Adult Social Services

**Carbon management plan
April 2020 - March 2030**

Portacabin, Haymill, Burnham Lane	Adult Social Services
Slough Bus Station	Bus Station
Slough Crematorium and Cemetery - Reception area and book of remembrance	Regulatory Services
Registration Service at The Curve	Regulatory Services
CCTV and Careline Control Centre	Regulatory Services
TS accessing BIG YELLOW storage	Regulatory Services

9. Appendix 3

9.1 Slough Borough Council Corporate Estate Display Energy Certificate Record

Property description	Post code	DEC Rating	DEC expiry
1 Priors-Lavender court	SL1 2BQ	E 121	30.08.25
2 Priors-Breakaway	SL1 2BQ	E 121	30.08.25
3 Priors-Respond	SL1 2BQ	E 121	30.08.25
4 Priors Close	SL1 2BQ	G 251	30.08.25
Britwell Community centre	SL2 2DS	D 92	30.08.20
Cippenham Community Centre	SL1 5DJ	C 57	25.08.25
Cippenham Library	SL1 5RB	C 59	25.08.25
Curve	SL1 1XY	C 58	31.11.21
Elliman Resource Centre	SL2 5DL	D 99	30.08.25
Kedminster Changing Room	SL3 7QL	B 48	30.08.25
Langley Pavilion	SL3 8BS	C 65	30.08.25
Manor Park Community centre	SL2 1NP	E 116	30.08.25
Manor Park Pavilion (Hall)	SL2 1NP	G237	30.08.25
Mercian way changing room	SL1 5LY	B36	30.08.25
New Horizon (Berkshire Healthcare and NHS Trust)	SL2 5BX	C 68	On hold due to refurbishment
Slough Centre nursery school	SL1 3EA	D 84	30.08.25
Slough Crematorium	SL2 5AX	G 595	30.08.25
St Martins Place	SL1 3UF	F149	30.06.21
Upton Lea Community centre	SL2 5JW	D 78	30.08.25
Upton Court park changing room	SL3 7LT	C56	30.08.25
Weekes Drive	SL1 2YN	D 94	30.08.25

10. Appendix 4

10.1 Carbon Management Plan Slough Schools List June 2020

List of Schools by type and number of students in borough of Slough. Last updated on 16/01/2020.

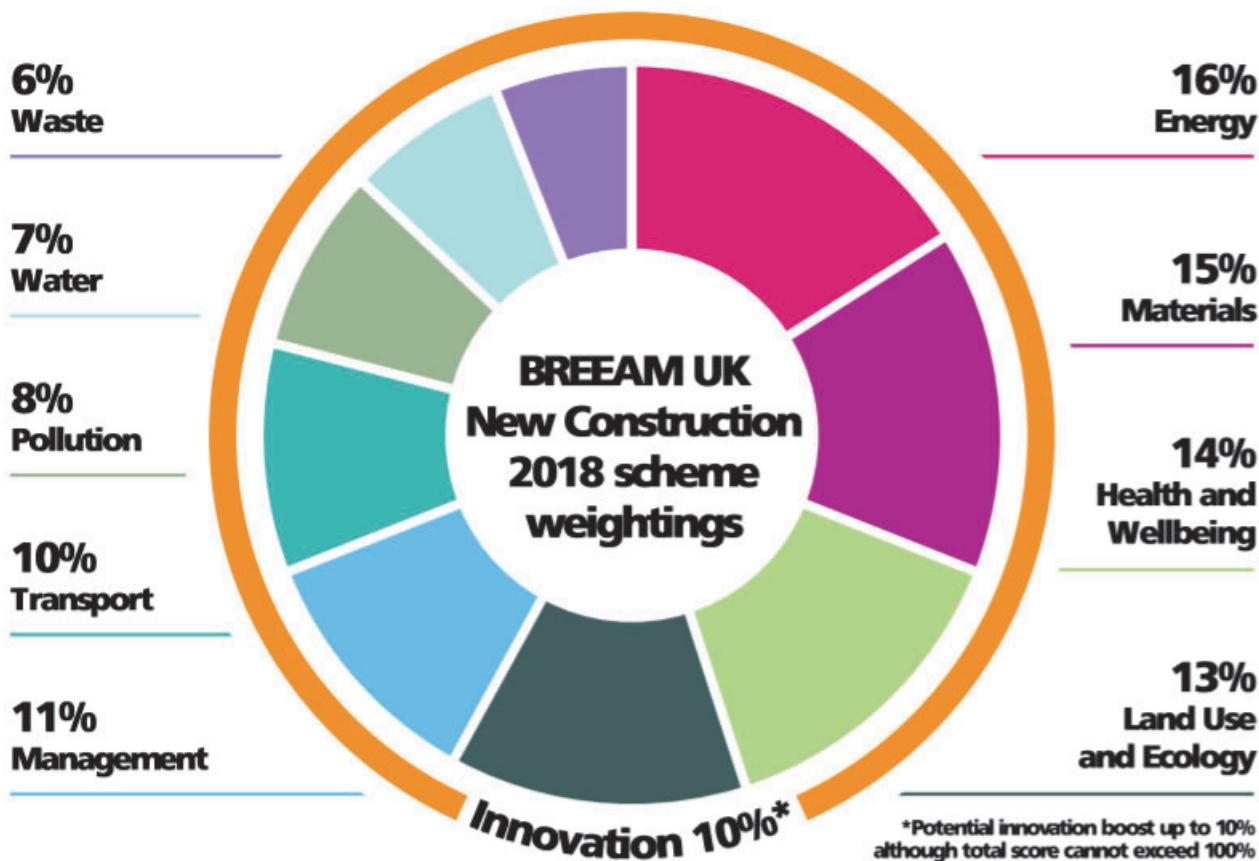
School Name	School Type (at time of census)	Total on Roll (Jan 2020)
Baylis Court Nursery	Community	122
Chalvey Early Years Centre	Community	91
Cippenham Nursery School	Community	119
Lea Nursery School	Community	118
Slough Centre Nursery School	Community	120
STANDALONE NURSERY TOTAL		570
Castleview School	Academy	503
Cippenham Infant School	Academy	256
Cippenham Primary School	Academy	799
Claycots School	Community	1732
Colnbrook CE Primary School	Academy	210
Foxborough Primary School	Academy	233
Godolphin Junior Academy (The)	Academy	472
Holy Family Catholic Primary School	Voluntary Aided	453
Iqra Slough Islamic Primary School	Voluntary Aided	619
James Elliman Academy	Academy	781
Khalsa Primary School	Voluntary Aided	484
Langley Academy Primary (The)	Free School	501
Langley Heritage Primary (The)	Academy	583
Langley Hall Primary Academy	Free School	744
Lynch Hill School Primary Academy	Academy	933
Marish Primary School	Academy	813
Montem Academy	Academy	904
Our Lady of Peace Catholic Primary and Nursery School	Voluntary Aided	587
Penn Wood Primary and Nursery School	Community	719
Phoenix Infant Academy	Academy	301
Pippins School	Foundation	196
Priory School	Foundation	786
Ryvers Primary School	Academy	710
St Anthony's Catholic Primary School	Academy	569
St Ethelbert's Catholic Primary School	Academy	429
St Mary's CE Primary School	Voluntary Controlled	672
Western House Academy	Academy	698
Wexham Court Primary School	Community	704
Willow Primary School	Academy	475

PRIMARY TOTAL		17866
Baylis Court School	Academy	891
Beechwood School	Academy	805
Ditton Park Academy	Free School	972
Eden Girls School	Free School	561
Herschel Grammar School	Academy	1044
Langley Grammar School	Academy	1176
Langley Academy	Academy	1098
Lynch Hill Enterprise Academy	Free School	619
Slough and Eton C of E Business and Enterprise College	Academy	1114
St Bernard's Catholic Grammar School	Voluntary Aided	909
St Joseph's Catholic High School	Academy	983
Upton Court Grammar School	Academy	1044
Westgate School	Academy	1145
Wexham School	Community	844
SECONDARY TOTAL		13205
Grove Academy	Free School	538
ALL THROUGH TOTAL		538
Arbour Vale School	Academy	312
Haybrook College	Academy	140
Littledown School	Academy	34
SPECIAL TOTAL		486
SLOUGH SCHOOLS TOTAL		32665

11. Appendix 5

11.1 BREEAM assessment weightings

Example of BREEAM assessment weightings.³⁰



³⁰BREEAM assessment weightings, BREEAM:
https://www.breeam.com/NC2018/content/resources/output/10_pdf/a4_pdf/print/nc_uk_a4_print_mono/nc_uk_a4_print_mono.pdf

12. Appendix 6

12.1 Table showing GHG data quality from financial years 2016/17, 2017/18 and 2018/19

The table below gives an indication of data quality for each major source of emissions by source and year.

	Actual data		Estimated using data from other years
	Estimated using data from other sites		Estimated using data from third parties

		16/17	17/18	18/19
Scope 1				
Gas - Corporate Buildings				
Gas - Community Schools				
Chalvey Early Years Centre				
Claycots School				
Wexham School				
Cippenham School				
Fridges				
Fleet - Housing Fleet Vans				
Fleet - Community Transport Fleet				
Fleet - DSO Environmental Services (Refuse Fleet)				
Scope 2				
Electricity - Corporate Buildings				
Electricity - Community Schools (other schools)				
Chalvey Early Years Centre				
Claycots School				
Slough Centre Nursery				
Wexham School				
Cippenham School				

Scope 3			
Business Mileage - Council Staff			
Business Mileage - Agency Workers			
Business Mileage - Slough Children's Services Trust			
Outsourced Mileage			
Amey			
Interserve			
Bouygues			
Other providers (Osbourne and Indigo)			
Council Waste			
Paper Usage			
Water			
Leisure Centre and PFI and Foundation schools			
Leisure Centre - Electricity			
Leisure Centre - Gas			
Gas - PFI and Foundation schools			
Arbor Vale School			
Penn Wood Primary			
Beechwood School			
Pippin School			
Electricity - PFI and Foundation schools			
Arbor Vale School			
Penn Wood Primary			
Beechwood School			
Pippin School			

13. Appendix 7

13.1 Slough Borough Council's remaining carbon budget targets by GHG emission source in tCO₂e

GHG Emissions source	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Scope 1: Gas consumption	2508	2229	1950	1672	1393	1114	836	557	279	0
Scope 1: Owned transport	1043	927	812	696	580	464	348	232	116	0
Scope 1: Fugitive emissions	0	0	0	0	0	0	0	0	0	0
Scope 2: Purchased electricity	3585	3187	2789	2390	1992	1594	1195	797	398	0
Scope 3: Waste	15	14	12	10	9	7	5	3	2	0
Scope 3: Transport	758	673	589	505	421	337	253	168	84	0
Scope 3: Purchased goods and services	79	70	61	52	44	35	26	17	9	0
Scope 3: Water supply	62	56	49	42	35	28	21	14	7	0
Scope 3: Electricity and gas supply chain	1151	1023	895	768	640	512	384	256	128	0

Carbon management plan, April 2020 – March 2030