

# GREENHOUSE GAS EMISSIONS REPORT

2014 -15

## 1.0 Summary

This report has been compiled in response to the request of the Department of Energy and Climate Change (DECC) to publish information about the Greenhouse Gas (GHG) emissions for Maidstone Borough Council's estate and operations.

The report uses data collated by MBC as part of its Carbon Management Programme, and covers the period of 1<sup>st</sup> April 2014 to 31<sup>st</sup> March 2015.

The report includes direct emissions from gas and fuel consumption in MBC owned and operated buildings and vehicles (classified as Scope 1) indirect emissions from the consumption of purchased electricity (classified as Scope 2) and indirect emissions related to business travel, which are classified as scope 3.

The Council has set itself a target to reduce emissions of CO<sub>2</sub> by 20% by 2014/15 from a level of 5840 tonnes CO<sub>2</sub> in the baseline year of 2008/09. The data presented in this report show that the level of CO<sub>2</sub> emissions in 2014/15 was 4998 tonnes, which is an **increase** of 207 tonnes on the 2013/14 year. This represents a reduction of 14.9% from the baseline year, with the largest reduction achieved in Scope 1. The reduction in 2013/14 was 18.4%, and therefore, it seemed likely that the overall target of a 20% reduction in CO<sub>2</sub> emissions would be met. However, 2014/15 included some anomalous results, particularly, a large increase in electricity consumption at Mote Park Leisure Centre, which meant that the reduction of 18.4% achieved in 2013/14 has been reduced.

The cumulative total amount of CO<sub>2</sub> emissions saved since the baseline year is now 4081 tonnes.

The Carbon Management Plan sets a target for the cumulative total saving of 5295 tonnes, however this figure assumes that emissions would increase if nothing were done, based on an assumed 0.7% annual increase in demand. If this assumption is factored into the actual savings, the cumulative reduction in CO<sub>2</sub> since 2008/09 would be 5056 tonnes, compared to the target of 5295 tonnes.

## **2.0 Greenhouse Gas Emissions from our Estate and Operations**

Scope 1, Scope 2 and significant Scope 3 emissions have been measured.

Scope 1 includes all natural gas use by Council owned buildings and those operated by the Council. It also includes all emissions from owned or controlled vehicles including the Waste Collection Service and Park and Ride Service.

Scope 2 includes the consumption of all purchased electricity associated with Council operations.

Scope 3 includes all emissions associated with water supply, the transportation of purchased fuels (the Scope 3 emissions associated with Scope 1 emissions), employee business travel by non-owned means, electricity related activities (the Scope 3 emissions associated with the Scope 2 emissions) and the Scope 3 emissions associated with the Biomass Boiler.

## 2.1 GHG Emissions Summary

Table 1 shows a summary of the Greenhouse Gas emissions for the estate and operations of Maidstone Borough Council for the reporting period 1<sup>st</sup> April 2014 to 31<sup>st</sup> March 2015.

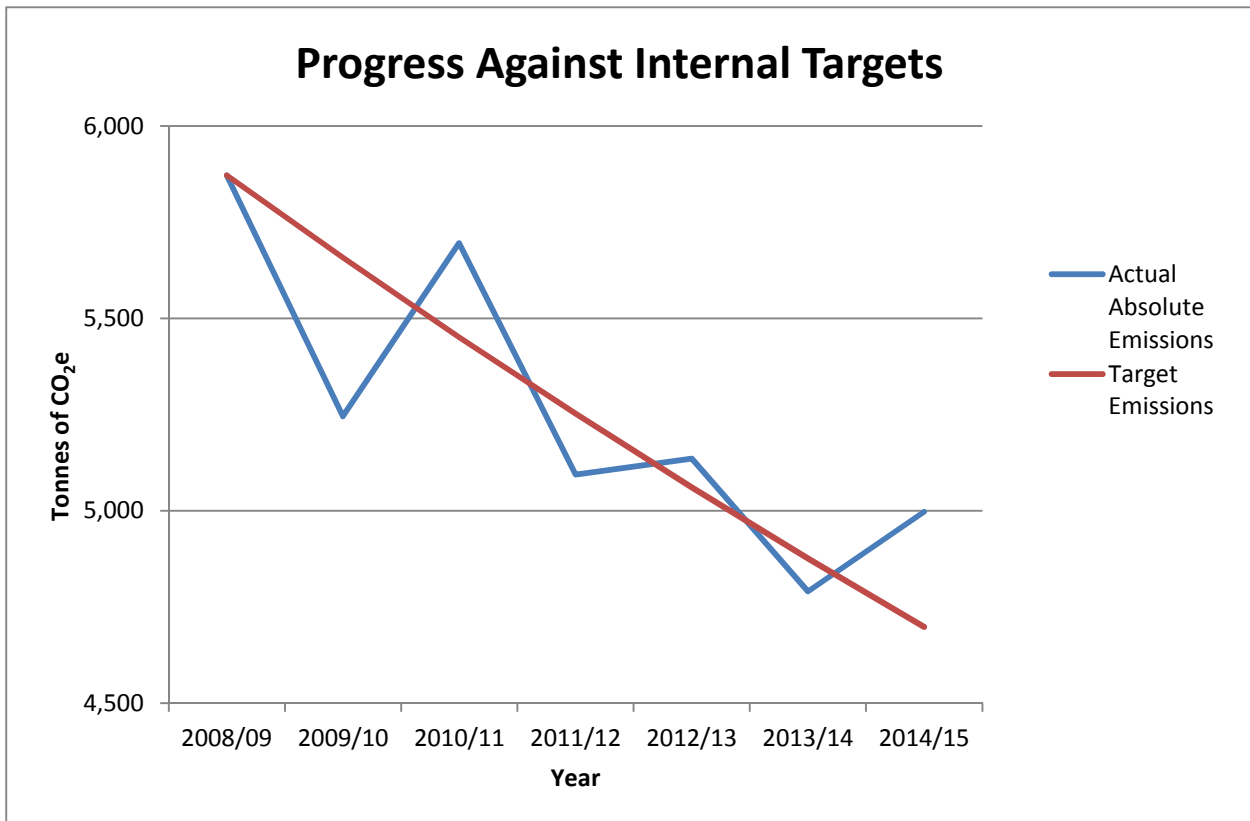
**Table 1: Greenhouse Gas Emissions Data for the period 1<sup>st</sup> April 2014 to 31<sup>st</sup> March 2015**

<b>Maidstone Borough Council – Carbon Emissions</b>								
GHG Emissions for 1 <sup>st</sup> April 2014 to 31 <sup>st</sup> March 2015								
Tonnes CO <sub>2</sub> e								
	2014/15	% Change from Baseline	2013/14	2012/13	2011/12	2010/11	2009/10	2008/09 Baseline Year
Scope 1	2611	24.6	2776	2923	2747	3290	2867	3463
Scope 2	1738	+3.2	1372	1556	1694	1690	1703	1682
Scope 3	649	10.9	643	657	653	715	675	728
Outside of Scope (not included in gross emissions)	107		107	314	99	34	9	7
<b>Total Gross Emissions</b>	<b>4998</b>	<b>14.9</b>	<b>4791</b>	<b>5136</b>	<b>5094</b>	<b>5695</b>	<b>5245</b>	<b>5872</b>
Carbon Offset /Green Tariff	0			0	0	0	0	0
<b>Total Net Emissions</b>	<b>4998</b>	<b>14.9</b>	<b>4791</b>	<b>5136</b>	<b>5094</b>	<b>5695</b>	<b>5245</b>	<b>5872</b>
Intensity Measure (Tonnes of CO <sub>2</sub> e per employee)	10.3		9.6	10.4	10.1	10.5	9.1	10.1

## 2.2 Changes in Emissions

MBC's net Total GHG emissions in 2014/15 were 4998 tonnes CO<sub>2</sub>e which represents an increase of 4.3% on 2013/14 and a 14.9% reduction on the 2008/09 baseline year. This is an increase on the 18.4% reduction achieved in 2013/14, which was mainly caused by a large increase in electricity consumption at Mote Park Leisure Centre, which was due to the CHP plant being out of action for several months.

**Figure 1. Reduction in Actual CO<sub>2</sub>e Emissions, Compared to Target**



### 2.2.1 Greenhouse Gas Reduction Activities

Maidstone Borough Council's Greenhouse Gas reduction activities have been undertaken in accordance with MBC's Carbon Management Plan produced in 2009. The stated aim of the Carbon Management Plan was to reduce MBC's carbon footprint by 3% per year, and to achieve a 20% reduction on the 2008/09 baseline year by 2015. The plan contained 44 actions or projects aimed at reducing CO<sub>2</sub> emissions, most of which were intended to be carried out in the short to medium term, with the remainder being more aspirational or speculative.

The majority of the actions have been completed, and of those which have not been completed, most have been investigated and found not to be presently cost-effective, or otherwise not viable for some reason. Some of these may be revisited in the future.

Some of the most significant actions included demolition of the King Street Multi Storey Car Park and renewal of the waste collection contract to a new service using split bodied vehicles. There has also been an ongoing programme of improvements at the Mote Park Leisure Centre, which has included:-

- A quarterly review of the strategy programming on all environmental controls of the Building Management System in order to optimise consumption.
- Staff training on programming of variable speed drives for Air Handling Units (AHUs) and a review of each unit's programme with a view to reducing electrical consumption without compromising quality of service.
- AHU3 (Leisure Pool) upgraded controls from a standalone unit and integrated into the Building Energy Management System giving a more cohesive approach to balancing air movement plant and reducing waste.
- Installation of pool covers over main fitness pool and 2x Teaching pools.
- Installation of LED lighting through large majority of the centre.

### 2.2.2 Weather corrections

One of the major reasons for the change in emission totals year on year is the weather. If the weather is especially cold, more heating will be required, which can mask the effect of the improvements which would have been achieved.

A correction can be applied which makes possible better comparisons between periods of different temperature. The correction uses the concept of heating degree days.

The concept of degree days is based on the assumption that when the temperature reaches 15.5°C, a building will not require any supplementary heating. If the temperature falls to 14.5 °C on a given day, there is one degree day for that day. If the temperature falls to 13.5 °C for a day, then there are two degree days for that day. If the temperature remains at 13.5 °C for a week, then there are 14 degree days for that week. For a given year, the number of degree days can be compared with a reference period, usually a long term average, and a correction factor can be calculated as

***Weather correction factor = degree days (reference period)/degree days (reporting period)***

Table 2 below shows the number of degree days each year from the baseline year to 2014-15.

It can be seen that the number of degree days in 2014/15 was 1781, and the twenty year average was 2048. The number of degree days in 2013/14 was 1873. Therefore, 2014/15 was milder than average, and slightly milder than the previous year, which was



also milder than average. Using the twenty year average as the reference period, the weather correction factor for 2014/15 would be calculated by

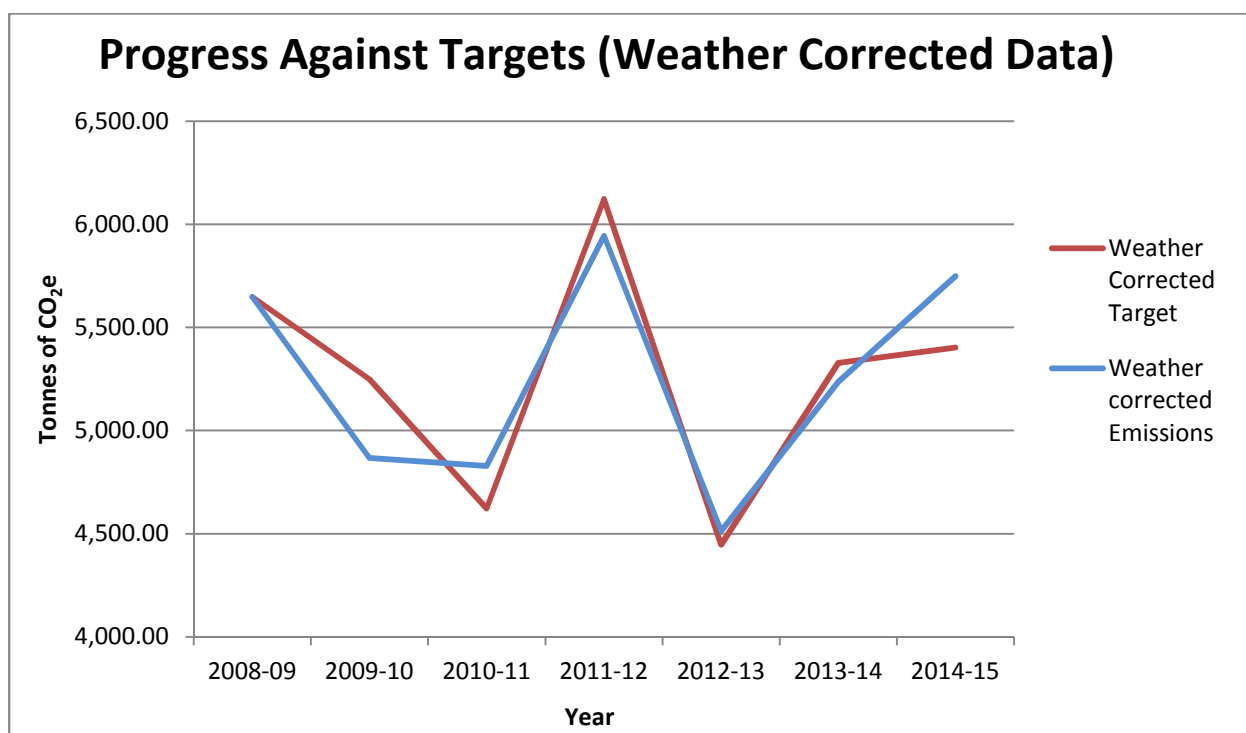
**Weather correction factor = 2048/1781 = 1.150**

Table 2 shows the weather correction factors for all years from 2008-09 to 2014-15

**Table 2 Number of Degree Days and Weather Correction Factors for 2008/09 to 2014/15**

Year	Degree Days	Twenty Year Average	Weather Correction Factor
2008/09	2130	2048	0.962
2009/10	2206	2048	0.928
2010/11	2414	2048	0.848
2011/12	1751	2048	1.167
2012/13	2329	2048	0.879
2013/14	1873	2048	1.093
2014/15	1781	2048	1.150

**Figure 2, Reduction in Weather Corrected CO2 Emissions Compared to Target**



## 2.3 Future Greenhouse Gas Reduction Activities

The majority of actions in the Carbon Management Plan have been completed, and the Plan is due for renewal in 2015. At present, the Council is drafting a Low Emission Strategy aimed primarily at tackling air quality issues within the Borough, however, it is proposed that this will also be the vehicle for managing GHG emissions in future. Thus a new Carbon Management Plan will be developed in 2015 as part of the new Low Emission Strategy.

In support of this new Plan the Council will embark on a series of projects to install renewable energy technology on various buildings within its estate. The Council will also bring forward a policy which enables tenants on its estate, and residents and businesses within the wider borough to take up the environmental and financial benefits of this technology.

The execution of these projects will realise savings for the Council and they will therefore be funded from the allocation for commercial projects within the capital programme. The projects currently completed or approved within this financial year are predicted to reduce carbon emissions >90 tonnes and generate savings >£28,000. Future projects on the Council's estate will be assessed on a case-by-case basis and will be subject to approval by the Policy and Resources Committee.

Table 3: Proposed Renewable Energy Projects

Site	Array size	Annual CO <sub>2</sub> emission reduction
MBC Depot	50kw	21.5 tonnes
Lockmeadow Market	50kw	21.5 tonnes
Vinter's Park Crematorium	14kw	6 tonnes
	4kw	1.7 tonnes
Magnolia House	24kw	10.3 tonnes



### 3.0 Statement of Greenhouse Gas Emissions 2014-15

		Tonnes CO <sub>2</sub> e	Tonnes CO <sub>2</sub> e (weather corrected)
<b>Scope 1</b>	Gas Consumption	1006	1157
	Transport	1605	1845
<b>Total Scope 1</b>		<b>2611</b>	<b>3003</b>
<b>Scope 2</b>	Purchased Electricity	1738	1500
<b>Total Scope 2</b>		<b>1738</b>	<b>1500</b>
<b>Scope 3</b>	Water	14.5	13
	Business Mileage	79.3	78.4
	Transportation of Purchased Fuels	437.8	482.8
	Extraction, Production and Transportation	117.3	128.2
<b>Total Scope 3</b>		<b>649</b>	<b>702.4</b>
<b>Grand Total</b>		<b>4998</b>	<b>5236.4</b>

## **Appendix 1: Explanatory notes**

### **1: Greenhouse Gases.**

Greenhouse gas (GHG) emissions are reported in tonnes of carbon dioxide equivalent (CO<sub>2</sub>e). All of the greenhouse gases covered by the Kyoto Protocol are included, namely carbon dioxide (CO<sub>2</sub>), methane CH<sub>4</sub>, nitrous oxide (N<sub>2</sub>O) perfluorocarbons (PFCs) hydrofluorocarbons (HFCs), and sulphur hexafluoride (SF<sub>6</sub>)

Different gases have different abilities to trap heat in the atmosphere, otherwise known as their global warming potential. In order to present greenhouse gas emissions as a simple single number, the global warming potentials of the other gases are used to calculate the mass of CO<sub>2</sub> which would trap the same amount of heat, which is known as its CO<sub>2</sub> equivalent (CO<sub>2</sub>e).

The CO<sub>2</sub> equivalents for all the gases are totalled up to give a single CO<sub>2</sub> equivalent. The most significant gases in the Council's operations are carbon dioxide, methane and nitrous oxides from the burning of fossil fuels.

### **2: Classifying Greenhouse Gas Emissions**

#### **Scope 1 (Direct emissions)**

Activities owned **or** controlled by the council that release emissions straight into the atmosphere (e.g. combustion in owned or controlled boilers and vehicles).

#### **Scope 2 (Energy indirect)**

Emissions being released into the atmosphere associated with the consumption of purchased electricity. These are indirect emissions that are a consequence of the council's activities but which occur at sources we do not own or control.

#### **Scope 3 (Other indirect)**

Emissions that are a consequence of the council's actions, which occur at sources we do not own or control and which are not classed as scope 2 emissions (e.g. business travel in vehicles not owned or controlled by the council). Transmission and distribution losses associated with purchased electricity are also included under this scope.

### **3: Inclusions**

Direct GHG emissions and indirect GHG emissions (from electricity consumption) have been reported from council-owned buildings and vehicles. This includes council-owned buildings that are leased to other organisations or are under the operational control of outsourced services (e.g. leisure centres).

Scope 3 emissions currently include business travel by private car and rail travel.

#### 4: Current exclusions

Emissions from the following sources have not been reported:

- Fugitive emissions (e.g. air conditioning and refrigeration leaks) (Scope 1)
- Waste disposal (Scope 3)

Appropriate data is not currently available for the above emissions sources. Emissions from air conditioning and refrigeration units in office buildings were excluded due to the cost of data collection. These are not considered to be material as they will account for less than 0.5% of total scope 1 and 2 emissions. Work is ongoing to include business travel by all modes, waste disposal and employee commuting in future reporting, the latter represents a significant source of scope 3 emissions.

#### 5: Conversion Factors

The greenhouse gas emissions associated with stationary and transport sources are then calculated by converting this activity data using documented conversion factors.

Activity data (e.g. total kWh) x Emission factor = GHG emissions

The conversion factors that relate to 'Total kg CO<sub>2</sub>e' are those used to calculate greenhouse gas emissions for this report.

#### 6: Baseline Year

Greenhouse gases have been reported with reference to a baseline year, which makes it easier to compare emissions over time. The baseline year is 2008/09 which is consistent with the Carbon Management Plan To track performance over time the base year emissions may need to be recalculated to enable a meaningful comparison of current and historic emissions. The baseline emissions will be recalculated as new (additional) datasets become available for the base year, where there is a discovery of significant or collectively significant errors, or as required by updates to emissions factors.