

## **COUNCIL'S PROGRESS TO ADDRESS CLIMATE CHANGE THROUGH EMISSIONS REDUCTIONS**

### **1 Purpose**

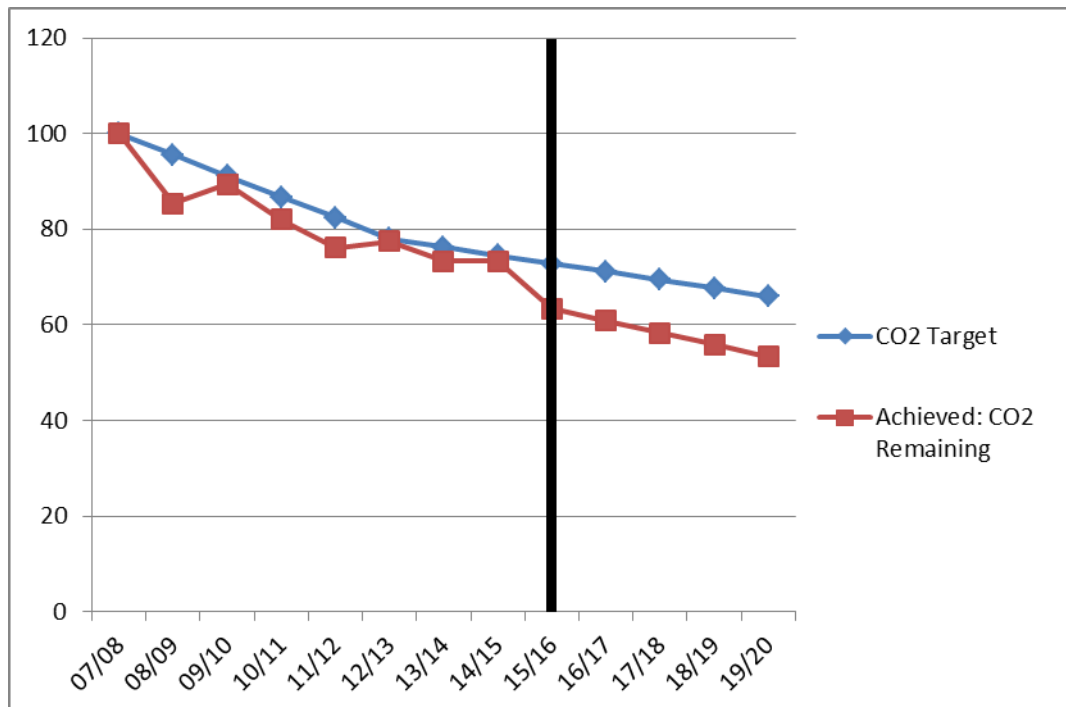
- 1.1 To update Environment and Living Scrutiny members on achievements towards reducing Carbon Dioxide (CO<sub>2</sub>) and Greenhouse Gas (GHG) emissions against agreed Climate Change reduction targets.

### **2 Recommendations**

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| <ol style="list-style-type: none"><li>2.1 That Committee members note the position and that the officers be asked to continue to work towards seeking reductions in the Council's carbon footprint in order to continue to address climate change and assist the Council to achieve significant financial savings to help sustain its operations.</li></ol> |
|---|

### **3 Executive summary**

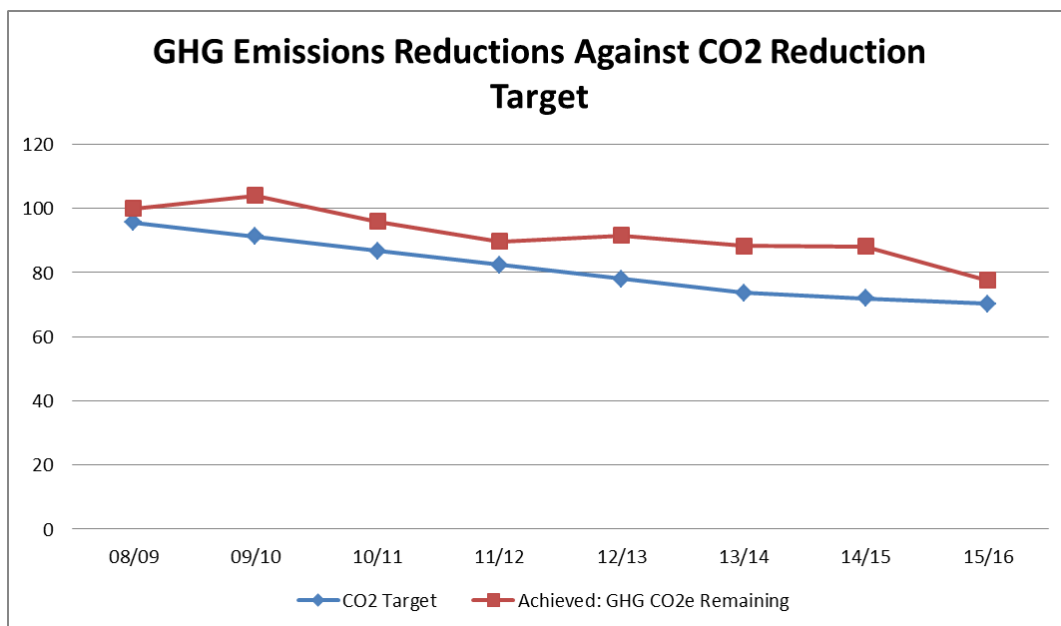
- 3.1 This report is to update the Committee on the Council's progress made towards the achievement of CO<sub>2</sub> emissions against our target (see appendix 2). It also refers to reductions made against all green house gases for which the Council does not have a target (see appendix 3) but for which the Council is obligated to report to Government upon.
- 3.2 The Council committed to tackling Climate Change in 2008 following the production and publication of its first Carbon Management Plan. This proposed and committed the Council to a target of 22% reduction in CO<sub>2</sub> emissions by 2013. The Council also formally adopted the Nottingham Declaration on Climate Change in 2009.
- 3.3 Since then, the Council has made large strides towards the addressing of achievement of these targets through energy and fuel reductions across our estate and fleet.
- 3.4 After achieving the target 22% CO<sub>2</sub> reduction one year early in 2012, the Council set an ambitious annualised target with a focus to reach a 34% CO<sub>2</sub> reduction by 2020 (placing the Council in line with the Central Government target).
- 3.5 The most recent independently audited (by the National Energy Foundation) figures, demonstrate that the Council has exceeded this target a full four (4) years early.
- 3.6 The graph below sets out the achievement at April 2016 (vertical black line) of a 36.6% reduction in CO<sub>2</sub> emissions. This means that the Council is now 63.4% away from achieving its zero carbon ambition and amongst the most successful Councils in the country in this regard.
- 3.7 *Graph of targets against actuals:*



- 3.8 The graph sets out the target set in 2008 and the target revised again in 2013 following the early achievement of the first target. The black vertical line shows the point at which data is provided until (April 2016). The blue line shows the Council's target for Carbon reduction. As can be seen, the red line is the actual carbon reductions achieved to this point. The vertical axis shows 100 as 100% or 7,753 tonnes of CO<sub>2</sub> (which was the Council's total carbon footprint at its baseline year of 2008), reducing year on year. The graph has been extended to 2020 (the Council's target year) and extrapolated between 2016 and 2020 based on a 2.5% year on year saving to that point.
- 3.9 In the period 2007/8 to 2015/16, the Council's CO<sub>2</sub> emissions have been driven down from 7,753 tonnes to just 4,913 tonnes. A full 36.6% reduction amounting to a saving of 2,840 tonnes or 2.84 million kg of CO<sub>2</sub>. According to the US EPA, that's the equivalent emissions of 37.6 tankers full of petrol consumed. As has been discussed, energy and fuel savings have a direct correlation to carbon savings and cost savings. As such, this carbon reduction has also delivered an annual financial saving of over £240,000 in energy costs savings to the Council.
- 3.10 The Council has also been reducing its basket of greenhouse gas (GHG) emissions (Carbon Dioxide CO<sub>2</sub>, Methane CH<sub>4</sub>, Nitrous Oxide N<sub>2</sub>O, Hydrofluorocarbon HCFC-22, Perfluorocarbon CF<sub>4</sub> and Sulphur Hexafluoride SF<sub>6</sub>) commonly termed greenhouse gas emissions or CO<sub>2</sub> equivalents (CO<sub>2</sub>e). Clearly the Council has a more limited ability to control many of these GHG emissions, Methane for example, a powerful GHG is derived from such areas as farming and landfill. Sulphur Hexafluoride is used extensively within circuit breakers in sub stations and whilst it leaks in small amounts, it has a global warming potential some 22,800 times greater than CO<sub>2</sub>.
- 3.11 The graph below sets out the achievement, also to April 2016 but from a baseline of 2008/09 as prescribed by Central Government.
- 3.12 Because the Council has never had a specific target by which to reduce GHG emissions, the blue line representing the aforementioned CO<sub>2</sub> emission target has been inserted merely for reference. Actual GHG reductions (red line) over

the period from 2008/09 have reduced from 6,826 tonnes to 5,542 tonnes; a reduction of 1,284 tonnes. This is equivalent greenhouse gases emitted by an average family car driving 3,077,306 miles.

3.13 Graph showing GHG Emissions against the Council's CO<sub>2</sub> Target:



3.14 As can be seen above, the GHG reductions are again beginning to move towards the Council's CO<sub>2</sub> target. Given that GHG emissions account for the equivalent of these six major greenhouse gases, this is most encouraging.

3.15 The savings have been delivered based on a range of activities. These have included installations of energy efficient technologies across our estate, the enhanced control of equipment and better use of metered data along with the control of vehicle emissions through the introduction of the car fleet.

#### 4 Supporting Information

4.1 The tables below set out the numbers behind the graphs. Table 1 shows CO<sub>2</sub> reduction figures:

4.2 The table shows 36.6% reduction achieved against what was a 27% target by 2016. It also demonstrates the potential of a remaining 63.4% of CO<sub>2</sub> available to be reduced.

CO <sub>2</sub> Tonnes	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Stationary	5205	2584.2	2662.9	1787.2	1501.6	1884.1	1527.5	2056	1564.1
Leisure	0	2444	2405.1	2756.7	2694.7	2565.1	2830.1	2482.8	2215.1
Fleet	2548	1472.8	1736.9	1707.1	1619	1570.4	1503.7	1455.1	1412.1
Business Mileage	0	123.9	122.3	107.7	92.7	84.2	77	80.9	46.5
Total CO <sub>2</sub>	7753	6624.9	6927.2	6358.7	5908	6103.8	5938.3	6074.8	5237.8
Carbon Offset from Renewables	0					93.9	251	393.5	324.5
Total Inc Carbon Offset	7753	6624.9	6927.2	6358.7	5908	6009.9	5687.3	5681.3	4913.3
Green Tariff (not used in calculation)		906.3	548.6	76.1	408.4	605.8	964.5	725.2	442.4
Target Reduction	0	4.4	8.8	13.2	17.6	22	24	25	27
Percentage Reduction from 07/08 baseline		14.6	10.7	18.0	23.8	22.5	26.6	26.7	36.6
Percentage Reduction from 08/09 baseline			-4.6	4.0	10.8	9.3	14.2	14.2	25.8
Percentage Reduction from 09/10 baseline				8.2	14.7	13.2	17.9	18.0	29.1
CO <sub>2</sub> Tonnes	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
CO <sub>2</sub> Target	100	95.6	91.2	86.8	82.4	78.0	76.3	74.6	72.9
Achieved: CO <sub>2</sub> Remaining	100	85.4	89.3	82.0	76.2	77.5	73.4	73.3	63.4

4.3 Table 2 shows GHG reduction figures for the period from 2008/19 (the baseline year for GHG emissions):

CO2e Tonnes	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Scope 1	3222.54	3444.56	3352.04	3007.39	3157.1	3283.84	2981.31	3091.52
Scope 2	3082.5	3150.22	2715.66	2623.62	2684.44	2405.24	2807.3	2060.67
Scope 3	1367.69	1384.62	1298.57	1252.32	1268.41	1315.68	1337.93	1103.62
<b>Total CO2</b>	<b>7672.73</b>	<b>7979.4</b>	<b>7366.27</b>	<b>6883.33</b>	<b>7109.95</b>	<b>7004.76</b>	<b>7126.54</b>	<b>6255.81</b>
Carbon Offset from Renewables	0				87.6	232.8	364.8	302.18
<b>Total Inc Carbon Offset</b>	<b>7672.73</b>	<b>7979.4</b>	<b>7366.27</b>	<b>6883.33</b>	<b>7022.35</b>	<b>6771.96</b>	<b>6761.74</b>	<b>5953.63</b>
Green Tariff (not used in calculations)	846.75	511.74	70.89	378.62	565.04	894.71	672.4	411.93
<b>Target Reduction</b>	<b>0</b>	<b>4.4</b>	<b>8.8</b>	<b>13.2</b>	<b>17.6</b>	<b>22</b>	<b>24</b>	<b>25</b>
<b>Total</b>	<b>6825.98</b>	<b>7467.66</b>	<b>7295.38</b>	<b>6504.71</b>	<b>6457.31</b>	<b>5877.25</b>	<b>6089.34</b>	<b>5541.7</b>
Out of scope						38.22	35	48
<b>Percentage Reduction from 07/08 baseline</b>		<b>-4.0</b>	<b>4.0</b>	<b>10.3</b>	<b>8.5</b>	<b>11.7</b>	<b>11.9</b>	<b>22.4</b>
<b>Percentage Reduction from 08/09 baseline</b>			<b>7.7</b>	<b>13.7</b>	<b>12.0</b>	<b>15.1</b>	<b>15.3</b>	<b>25.4</b>
<b>Percentage Reduction from 09/10 baseline</b>				<b>6.6</b>	<b>4.7</b>	<b>8.1</b>	<b>8.2</b>	<b>19.2</b>
CO2 Tonnes	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
<b>CO2 Target</b>	<b>95.6</b>	<b>91.2</b>	<b>86.8</b>	<b>82.4</b>	<b>78.0</b>	<b>73.6</b>	<b>71.9</b>	<b>70.2</b>
<b>Achieved: GHG CO2e Remaining</b>	<b>100</b>	<b>104.0</b>	<b>96.0</b>	<b>89.7</b>	<b>91.5</b>	<b>88.3</b>	<b>88.1</b>	<b>77.6</b>

## 5 Reasons for Recommendation

The report serves as an update to members on the energy and carbon report delivered in December 2016 and asks members to note the position. The report requests that the officers be asked to continue to work towards seeking reductions in the Council's carbon footprint in order to continue to address climate change but in the knowledge that the resources within the Sustainability Team will be reduced as part of the restructure of the Council.

## 6 Resource implications

There are no direct additional resource implications relating to this report other than those already funded. All in house energy efficiency measures are funded through the Salix ring fenced energy fund which is a 0% loan from Government matched by the Council. This fund has already recycled four (4) times and continues to deliver proven savings of over £240,000 per annum.

Contact Officer  
Background Documents

Alan Asbury 01296 585112  
Environment and Living Scrutiny Energy Report December 2016

# Carbon dioxide emission analysis 2015-16

A NEF report for



Prepared for Robert Smart and Alan Asbury

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## OUR CONTACT DETAILS

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## 1. EXECUTIVE SUMMARY

This report outlines the carbon dioxide emissions resulting from Aylesbury Vale District Council operations for the full financial year 2015-16. Base year is 2008/09 as per revision in 2012 which also include 2007/08 emissions for reference.

In this report, all emissions are provided in tonnes of Carbon Dioxide (tCO<sub>2</sub>) and utilise the carbon conversion factors defined by the government in June 2015- from the excel table entitled “conversion factors 2015 – Full set” (<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2015>). Please note that these emissions are true values and not corrected for weather differences.

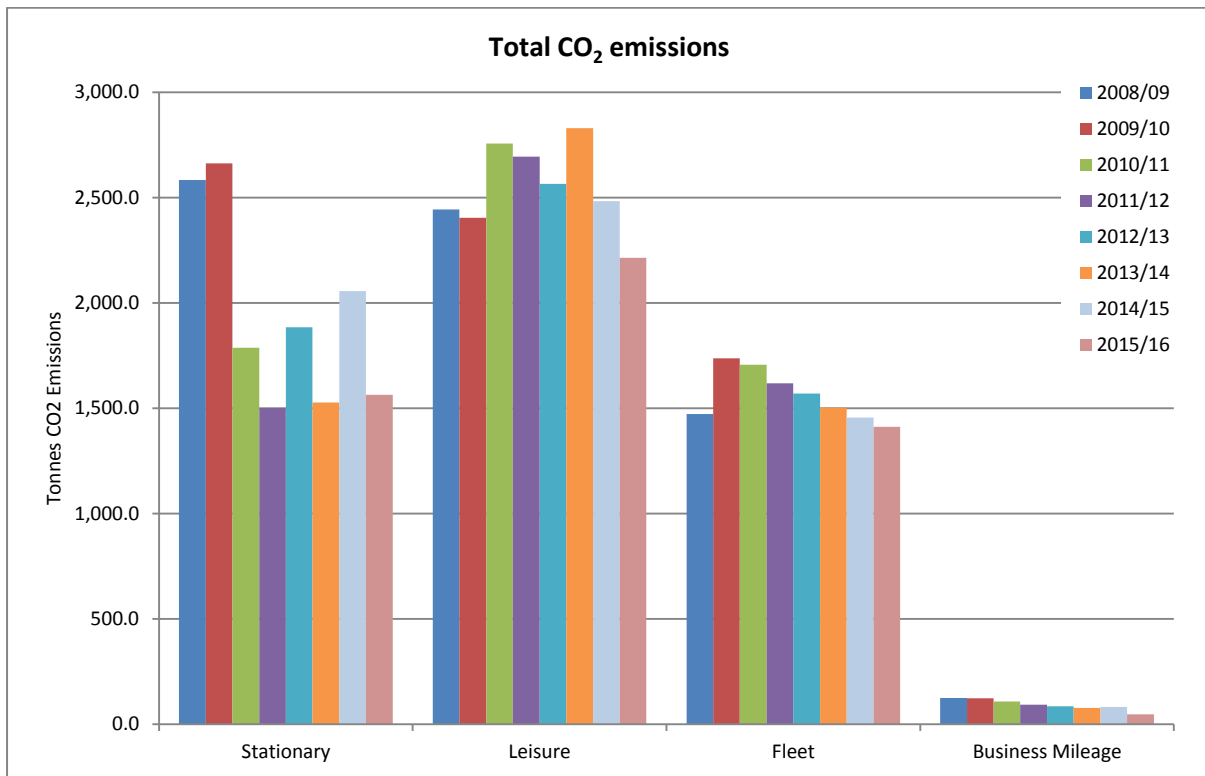
This report covers the council’s carbon dioxide emission based on four activity sectors as described below from, 2007/08 to 2015/16:

- Stationary: includes corporate buildings (offices), car parks, community centres, pavilions, toilets and some miscellaneous sites (water fountains etc.)
- Leisure
  - Aqua Vale Centre
  - Swan Pool
  - Waterside Theatre
- Fleet
  - AVDC own fleet
  - SITA Waste vehicles
  - JOC Ground maintenance vehicles
- Business Mileage. Staff travelling with their vehicles for business purposes.

**Table 1:** Summary 2015/16 emissions compared against previous years.

Tonnes of CO <sub>2</sub>	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
<b>Stationary</b>	5,205.0	2,584.2	2,662.9	1,787.2	1,501.6	1,884.1	1,527.5	2,056.0	1,564.1	-39%	-24%
<b>Leisure</b>		2,444.0	2,405.1	2,756.7	2,694.7	2,565.1	2,830.1	2,482.8	2,215.1	-9%	-11%
<b>Fleet</b>	2,548.0	1,472.8	1,736.9	1,707.1	1,619.0	1,570.4	1,503.7	1,455.1	1,412.1	-4%	-3%
<b>Business Mileage</b>		123.9	122.3	107.7	92.7	84.2	77.0	80.9	46.5	-62%	-43%
<b>TOTAL</b>	<b>7,753.0</b>	<b>6,624.9</b>	<b>6,927.3</b>	<b>6,358.7</b>	<b>5,908.0</b>	<b>6,103.8</b>	<b>5,938.3</b>	<b>6,074.8</b>	<b>5,237.7</b>	<b>-21%</b>	<b>-14%</b>
<b>Carbon offset from renewable</b>						93.9	251.0	393.5	324.5		
<b>TOTAL inc carbon offset</b>	<b>7,753.0</b>	<b>6,624.9</b>	<b>6,927.3</b>	<b>6,358.7</b>	<b>5,908.0</b>	<b>6,009.9</b>	<b>5,687.3</b>	<b>5,681.3</b>	<b>4,913.2</b>	<b>-26%</b>	<b>-14%</b>
<b>Green tariff</b>		906.3	548.6	76.1	408.4	605.8	964.5	725.2	442.4		





**Figure 1:** Total CO<sub>2</sub> emission contribution per business activity for 2015/16 compared against previous years. (Omitting 2007/08 from graph due to combined information)

**Comments:**

AVDC baseline for Carbon emission reporting is 2008/09.

Over the past eight years, Aylesbury Vale District Council has reduced its total carbon emissions from all sources by 26% compared to 2008/09 this is including carbon offset from renewables/ self-generation of electricity, but not including the benefit of the Green tariff contracts.

The Council reduction target is to maintain a 2.5% reduction per year, every year up to 2020. This year the Council has achieved a 14% reduction compared to 2014-15

A large number of sustainable systems have been installed since 2012/13. These are mainly within leisure centres and office blocks. Solar photovoltaic (PV) panels and thermal, air source heat pumps installed at Gateway offices and a Combined Heat and Power unit at the Aqua Vale centre. Another set of solar PV panels have been installed at the Hawkslade Community centre (10kWp) (Oct 2014)

Electricity generated through the solar PV units, totalise a saving of 324.5 tCO<sub>2</sub> .

Hence with the inclusion of the renewable elements, AVDC has reached an overall reduction of 37% below 2007-08 level of carbon dioxide emission.

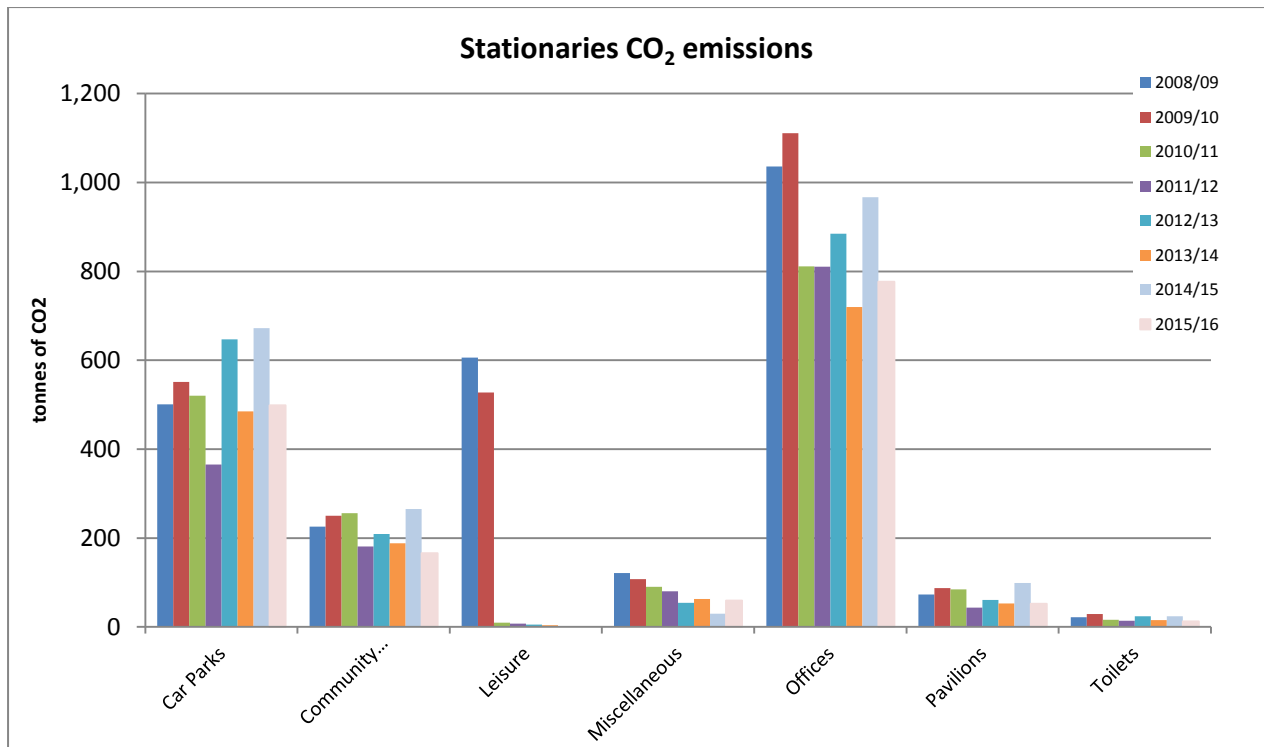
Electricity supplied to corporate buildings under a green contract from renewable sources, was secured for Non-Half-Hourly supply (NHH) sites until end of 2016 however Half-Hourly supply (HH) sites were moved to normal electricity contract in October 2015. The total of 442.4 tCO<sub>2</sub> avoided emissions has been achieved this year. Details are included within Stationary section of the report under “green tariff”.

## 2. STATIONARY

The council collates meter reading data in order to calculate the electricity and gas consumed in its corporate/stationary buildings. The recorded consumptions are unified into kWh in order to apply the carbon conversion factors defined by the Government in June 2015 “conversion factors 2015 – Full set”.

**Table 2:** Summary 2015/16 emissions compared against previous years.

Tonnes of CO <sub>2</sub>	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
<b>Car Parks</b>	501.0	551.0	520.0	365.0	647.0	485.0	672.4	499.0	0%	-26%
<b>Community Centres</b>	226.0	250.0	256.0	181.0	209.0	188.0	264.9	165.6	-27%	-37%
<b>Leisure</b>	606.0	528.0	9.0	7.0	5.0	4.0	0.0	-		
<b>Miscellaneous</b>	121.0	107.0	90.0	80.0	54.0	62.0	29.6	59.2	-51%	100%
<b>Offices</b>	1,036.0	1,111.0	811.0	811.0	884.0	720.0	966.5	776.4	-25%	-20%
<b>Pavilions</b>	73.0	87.0	84.0	43.0	61.0	53.0	98.8	52.0	-28%	-47%
<b>Toilets</b>	22.0	29.0	16.0	14.0	24.0	15.0	23.8	12.0	-45%	-49%
<b>Total</b>	<b>2,584.0</b>	<b>2,663.0</b>	<b>1,787.0</b>	<b>1,502.0</b>	<b>1,884.0</b>	<b>1,528.0</b>	<b>2,056.0</b>	<b>1,564.1</b>	<b>-39%</b>	<b>-24%</b>
<b>Solar saving</b>					2.2	4.2	6.5	7.7		
<b>Green Tariff</b>	906.3	549.0	76.1	408.0	605.8	964.5	725.2	442.4		



**Figure 2:** Total CO<sub>2</sub> emission contribution per facilities for 2015/16 compared against previous years.

### **Comments:**

A solar photovoltaic and a solar thermal system were installed at the Gateway Offices in July 2012. The Solar PV (10kWp) array is expected to generate 8,000 kWh/annum. Over the past four years the PV array has generated an average of 7,650kWh per year.

Within the past year (Oct 14) another set of solar photovoltaic panels have been installed at the Hawkslade Community centre (10kWp), for its full year of operation this PV array has generated 9,003 kWh. Total self-generated electricity amounts to 16,835 kWh for 2015-16.

The “Leisure” section within the stationaries has included the Old Gaol museum and the Civic Centre. Both establishments are no longer part of the reporting list for carbon management however the section remains to show past influence.

Car parks related emissions decreased significantly compared to last year -26%. This year Friarscroft car park is showing higher energy consumption. Waterside MSCP reported the same level of consumption as last year however Upper Hundreds car park reported energy consumption has reduced by half. The lighting refurbishment, in place at Upper Hundreds MSCP (2013-14) and Hampden House MSCP demonstrate the potential reductions in emissions possible, as this work continues.

Most Community Centres have achieved reduction in their gas and electricity consumptions However Bedgrove Buildings gas consumption increased by a significant amount (100 MWh).

Most offices have decreased their energy consumption this year. However the High Street Offices, electricity consumption continues to increase despite energy measure installed.

For the public conveniences there is a decrease in energy consumption.

Miscellaneous energy use: three new car parks and street lighting have been included within the reporting list. The feeder pillar, The Academy, reported 81 MWh of electricity consumption compared to 4MWh last year.

Overall carbon emissions related to Stationary for this financial year 2015/16 have decreased by 24% compared to 2014/15.

Green tariff and renewable energy provision for the corporate buildings respectively amount to 891,247 kWh and 16,834.8 kWh, totalising a carbon offset of 442.4 and 7.72 tCO<sub>2</sub>.

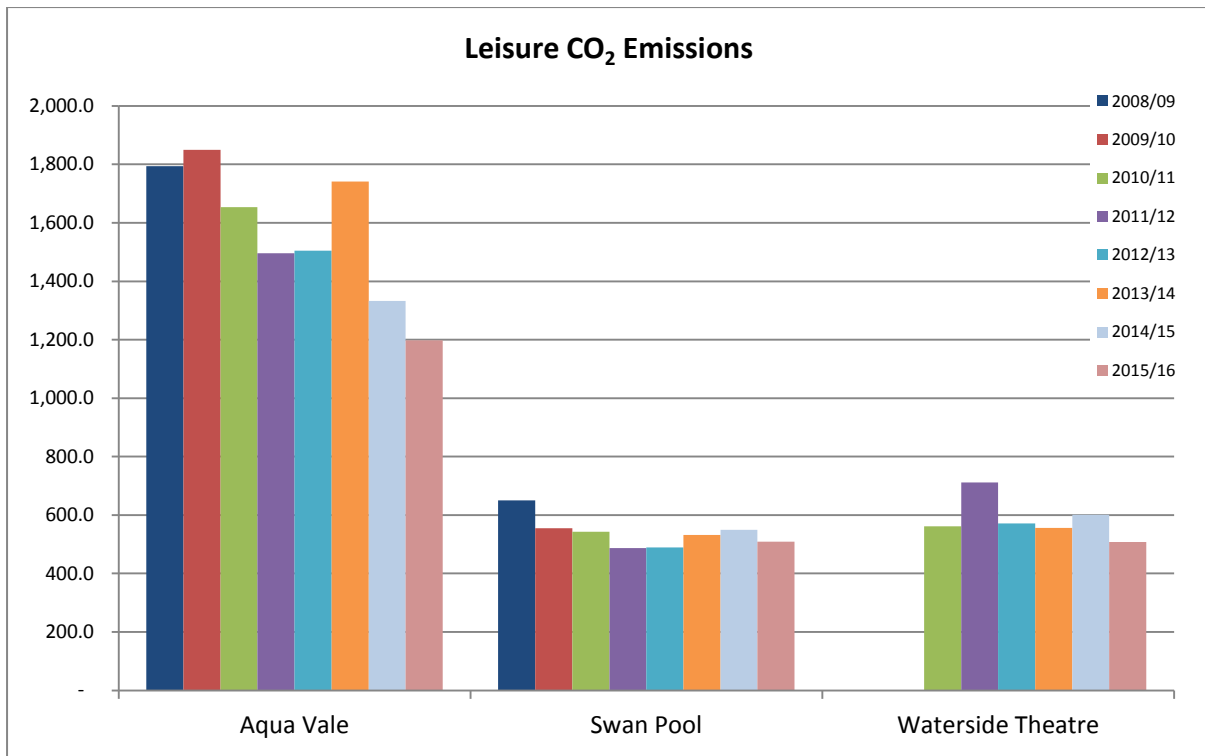
### 3. LEISURE

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The council collates the recordings of meter readings in order to calculate the electricity and gas consumption in its Leisure centres. The recorded consumptions are unified into kWh in order to apply the carbon conversion factors.

**Table 3:** Summary 2015/16 emissions compared against previous.

Tonnes of CO <sub>2</sub> updated to 2013 emission factor	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
Aqua Vale	1,793.9	1,849.7	1,653.2	1,496.0	1,504.1	1,741.6	1,332.8	1,197.8	-33%	-10%
Swan Pool	650.1	555.4	542.4	487.0	489.4	532.0	549.3	509.5	-22%	-7%
Waterside Theatre			561.1	711.7	571.5	556.4	600.8	507.8		-15%
<b>TOTAL</b>	<b>2,444.0</b>	<b>2,405.1</b>	<b>2,756.7</b>	<b>2,694.7</b>	<b>2,565.1</b>	<b>2,830.1</b>	<b>2,482.8</b>	<b>2,215.1</b>	<b>-9%</b>	<b>-11%</b>
Carbon offset CHP unit electricity generation					91.8	246.8	387.0	316.2		-18%
<b>TOTAL</b>					<b>2,473.3</b>	<b>2,583.3</b>	<b>2,095.8</b>	<b>1,898.9</b>		<b>-9%</b>



**Figure 3:** Total CO<sub>2</sub> emission contribution per centre 2015/16 compared against previous years.

**Comments:**

This year the Aqua Vale centre related emissions have decreased by 10% compared to last year

Swan pool related emissions are showing a reduction of 7% compared to last year. Last year Intensive refurbishment was planned for the centre. The reduction may largely be attributed to this.

Waterside theatre energy data were much lower than last year. Waterside theatre related emissions show a reduction of 15%.

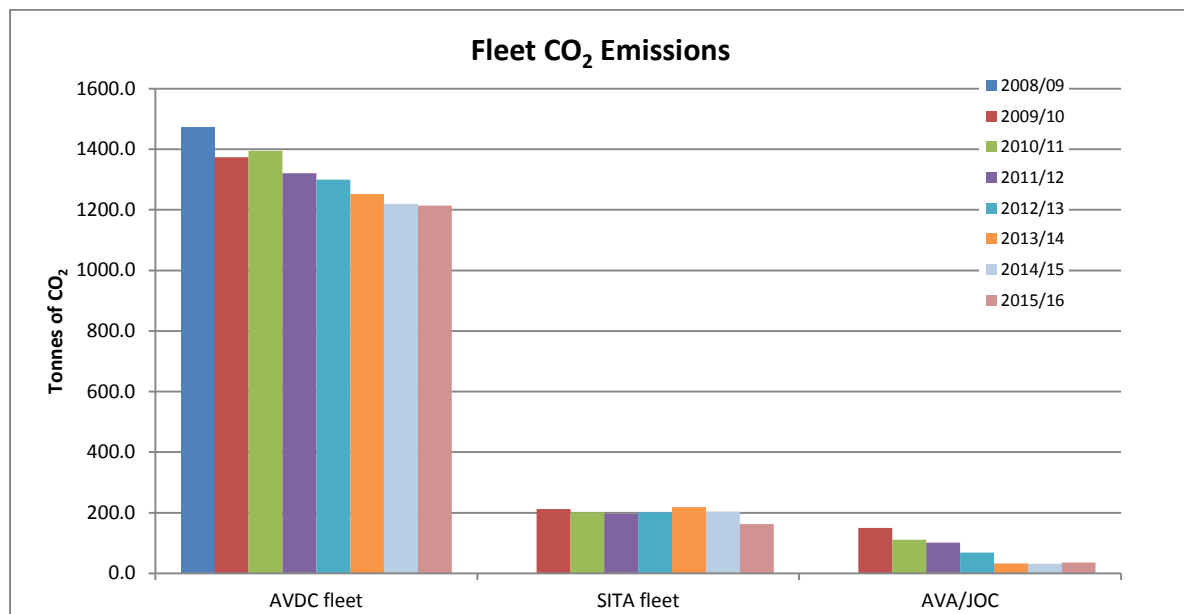
Carbon offset is calculated from the electricity generated via the Combined Heat and Power installed at the Aqua Vale centre.

## 4. FLEET

For the council's fleet, the data received collates the amount of fuel used by the different vehicles in use by AVDC and contractors staff. Carbon dioxide emissions are evaluated by applying respective conversion factors to the fuel consumption.

**Table 4:** Summary of fleet related emissions for 2015/16 compared against previous years.

Tonnes of CO <sub>2</sub>	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
<b>AVDC fleet</b>	1,472.8	1,373.8	1,394.5	1,320.8	1,299.9	1,252.5	1,219.6	1,213.9	-18%	0%
<b>SITA fleet</b>		212.8	201.7	196.8	201.9	218.4	204.4	162.8		-20%
<b>AVA/JOC</b>		150.4	110.8	101.4	68.6	32.8	31.2	35.4		13%
<b>TOTAL</b>	<b>1,472.8</b>	<b>1,736.9</b>	<b>1,707.1</b>	<b>1,619.0</b>	<b>1,570.4</b>	<b>1,503.7</b>	<b>1,455.1</b>	<b>1,412.1</b>	<b>-1%</b>	<b>-3%</b>



**Figure 4:** Total CO<sub>2</sub> emissions contribution per fleet 2015/16 compared against previous years.

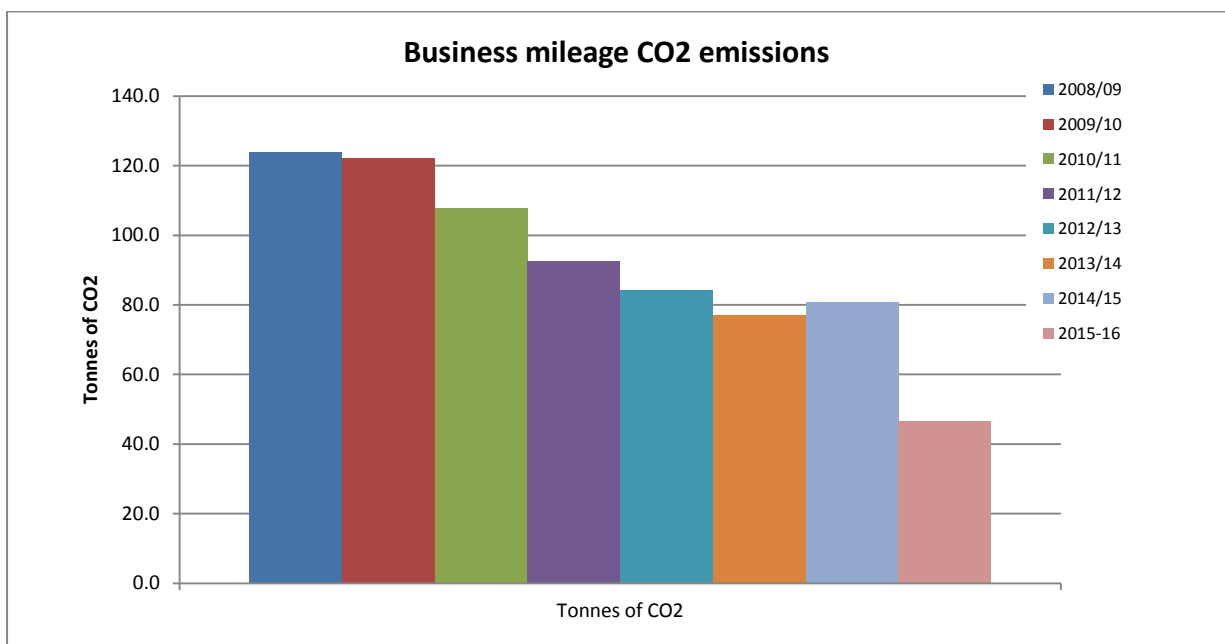
**Comments:** A minimal reduction of 3% in emissions, compared to last year.

## 5. BUSINESS MILEAGE

Emissions from the council's business mileage were reported more accurately, however still totalised under unknown fuel and average engine size.

**Table 5:** Summary 2014/15 emissions compared against previous years.

Tonnes of CO2	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
<b>Business mileage</b>	123.9	122.3	107.7	92.7	84.2	77.0	80.9	46.5	-62%	-43%



**Figure 5:** Total CO2 emission contribution for 2015/16 compared against previous years.

### **Comments:**

This year the calculation shows a decrease in business mileage emissions by 43% compared to last year. This year's mileage reporting included the use of two electrical fleet cars which totalised 8,683 miles, amounting to 5.5% of the total mileage completed.

Although important, this area of emissions still provides the smallest opportunity for CO<sub>2</sub> emission reductions.

## 6. GAS NORMALISATION

Degree days are a simplified form of historical weather data. They are commonly used in monitoring and targeting to model the relationship between energy consumption and outside air temperature.

Heating degree days (HDD) are used for calculations that relate to the heating of buildings.

Heating degree-day figures come with a "base temperature", and provide a measure of how much (in degrees), and for how long (in days), the outside temperature was below that base temperature. In the UK, the most readily available heating degree days come with a base temperature of 15.5°C.

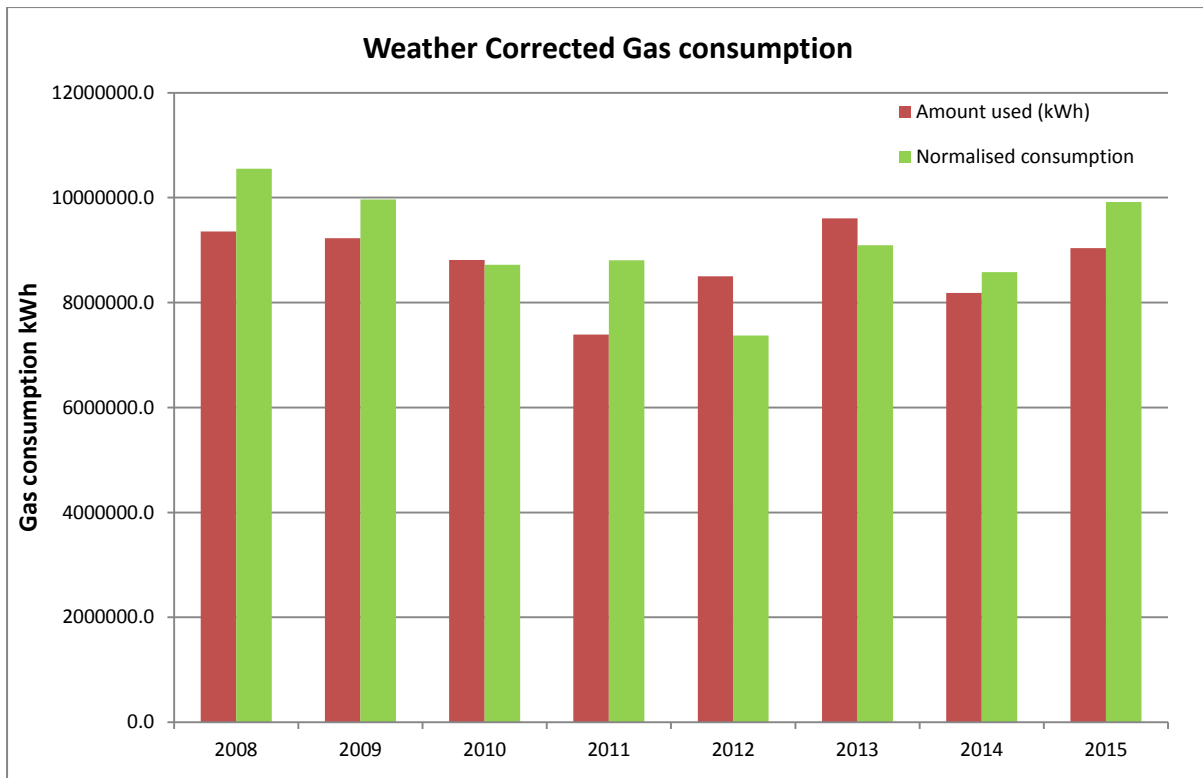
Heating degree days are often used to normalize the energy consumption of a heated building so that, in theory, the normalized figures can be compared on a like-for-like basis. The simplest way to normalize energy-consumption figures is to calculate the kWh per degree day. Simply divide each kWh figure by the number of degree days in the period over which that energy was used, in this report each year's consumption is divided by the respective yearly HDD. In theory, dividing by the degree days factors out the effect of outside air temperature, so you can compare the resulting kWh per degree day figures fairly.

The normalized kWh, results from multiplying the kWh per degree day figures by a single "average year" degree-day value (in this case I used 2,167 degree days as the multiplier - an average-year value calculated from the last 20 years' worth of degree-day data from the Midlands UK region [source <http://vesma.com/ddd/regular.htm>]). This gives you normalized equivalents of the original kWh figures which can, in theory, compare fairly.

**Table 6:** Calculation table per year:

Year	Amount used (kWh)	Number of degree days (DD)	kWh per DD	Normalised consumption (2,167 - 20 yrs avrg HDD Midlands)
2008	9,354,131.0	1,921	4,869.4	10,552,005.1
2009	9,228,785.7	2,007	4,598.3	9,964,513.5
2010	8,810,264.1	2,189	4,024.8	8,721,718.8
2011	7,393,746.0	1,819	4,064.7	8,808,272.4
2012	8,501,457.0	2,498	3,403.3	7,374,962.9
2013	9,608,289.5	2,290	4,195.8	9,092,211.0
2014	8,186,543.0	2,067	3,960.6	8,582,602.2
2015	9,040,925.4	1,976	4,575.4	9,914,820.5





**Figure 6:** Gas consumption actual vs corrected (normalised) consumption.

The gas consumption over the past 8 years averages 8,765 MWh with a normalised consumption averaging 7,715 MWh.

The **Figure 6** demonstrates that across its corporate buildings AVDC is keeping below the normalised consumption referring to the weather in the Midlands.

This gives the ability to monitor and target in the following field:

- Calculate and track budget accurately
- Assess savings achieved by energy efficiency measures
- Detect abnormal consumption caused by hidden faults or human error

## 7. RECOMMENDATION

- Green tariff contracts for NHH and HH sites ended in March 2016. If Green contracts are not pursued, it would be valuable when procuring energy to assess competitor's energy mix and report emissions using provider own emission factor (market base calculation).
- Continue Investment in smart cars and electric vehicle fleet for staff business mileage
- Bedgrove Buildings – an investigation of gas consumption would be beneficial as its consumption more than doubled compared to last year.
- Feeder Pillar - The Academy, the increase in consumption from 4.5 MWh last year to 81.6 MWh is quite significant to request an investigation. It is to be noted that this is also a new addition compared with 2013-14 data collection.

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# Green House Gases Analysis 2015/16

A NEF report for



Prepared for Robert Smart & Alan  
Asbury

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## 1. INTRODUCTION

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This report outlines the Greenhouse Gas (GHG) emissions resulting from Aylesbury Vale District Council operations according to Emission reporting guidance. All reported emissions are expressed in tonnes of Carbon dioxide equivalent (tCO<sub>2</sub>e) and utilise the conversion factors defined by DEFRA in “June 2015-environmental reporting guidance and the GHG-conversion-factors web based tool”. The Kyoto Protocol and the second assessment report of the Intergovernmental Panel on Climate Change (IPCC) covers six main GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), hydrofluorocarbons (HFCs), nitrous oxide (N<sub>2</sub>O), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>). These define the GHG emissions reported as tonnes of CO<sub>2</sub> equivalents (CO<sub>2</sub>e) using Global Warming Potential (GWP) factors.

Aylesbury Vale District Council reports on GHG emissions from council operations in the following sectors: corporate buildings, leisure centres, business travel, owned and contracted fleet. Emissions are calculated based on data provided for the heating and electricity supply to buildings and leisure centres, amount of fuel used by waste/ recycling/ maintenance activities from council-owned fleet and sub-contracted services, along with mileage claimed for staff business travel.

The GHG emissions are categorised between Scopes 1 – 3, where;

**Scope 1 (Direct emissions):** GHG emissions from combustion in owned or controlled boilers, furnaces, vehicles. This includes natural gas or other types of fuel to heat buildings, whose carbon dioxide emissions have been calculated on the basis of the gross calorific value (CV) according to DEFRA guidelines. This scope also includes travel undertaken in vehicles owned or controlled by Cherwell District Council (fleet).

**Scope 2 (Indirect emissions):** Emissions from purchased electricity “generation” for council-owned buildings. Compared with previous years this section has been divided into two different parts – one from electricity generation, which are reported within Scope 2, and a second one from Transmission & Distribution which are counted within Scope 3 (Detailed in Table 2).

**Scope 3 (Indirect - labelled Well to Tank [WTT]):** Emissions occurring at sources which the council do not own or control and which are not classed as Scope 2 emissions. Emissions from miles travelled for business purposes in staff owned vehicles, contracted services with no control and emissions from extracting, processing and transporting of fuel. This year Scope 3 includes emissions from Electricity “Transmission & Distribution” (T&D) as well as the WTT for the generation and WTT for T&D.

**All scopes has been removed:** Going forward users will be required to report using factors that are specifically categorised in the 3 main scopes, Scope 1, 2 and 3, (plus outside of scopes). Users may need to update historic reporting to ensure comparison is possible.

**Outside of Scopes biogenic portion to diesel and petrol scope 1 factors from ‘average biofuel blend:** The 2013 conversion factor release is the first year in which the biogenic conversion factors for forecourt fuel have been made available to organisations to ensure they fully report their emissions from blended forecourt fuel sources.

## 2. SUMMARY – GHG EMISSIONS

**Table 1:** AVDC GHG emissions by scopes

Tonnes of CO <sub>2</sub> e	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	% change from 08/09	% change from 14/15
<b>Scope 1</b>	3,222.54	3,444.56	3,352.04	3,007.39	3,157.10	3,283.84	2,981.31	3,091.52	-4%	4%
<b>Scope 2</b>	3,082.50	3,150.22	2,715.66	2,623.62	2,684.44	2,405.24	2,807.30	2,060.67	-33%	-27%
<b>Scope 3</b>	1,367.69	1,384.62	1,298.57	1,252.32	1,268.41	1,315.68	1,337.93	1,103.62	-19%	-18%
<b>TOTAL</b>	<b>7,672.73</b>	<b>7,979.40</b>	<b>7,366.28</b>	<b>6,883.32</b>	<b>7,109.95</b>	<b>7,004.76</b>	<b>7,126.54</b>	<b>6,255.81</b>	<b>-18%</b>	<b>-12%</b>
Carbon Offset					87.6	232.8	364.8	302.18		-17%
Green tariff	846.75	511.74	70.89	378.62	565.04	894.71	672.40	411.93	-51%	-39%
<b>TOTAL</b>	<b>6,825.97</b>	<b>7,467.66</b>	<b>7,295.39</b>	<b>6,504.70</b>	<b>6,457.29</b>	<b>5,877.21</b>	<b>6,089.31</b>	<b>5,953.63</b>	<b>-19%</b>	<b>-9%</b>
Out of Scope						38.22	35.41	47.66		35%

## 3. SUPPORTING NOTES

- 1. Organisation info:** Aylesbury Vale District Council, Buckinghamshire, England. Council offices, 66 High Street, Aylesbury, Bucks, HP20 1SD.
- 2. Reporting period:** 1 April 2015 - 31 March 2016
- 3. Reporting tool:** Government Environmental Reporting Guidelines and “June 2015-GHG-conversion-factors web based tool”.
- 4. Change in emissions:** Total GHG emissions have reduced by 870 tCO<sub>2</sub>e compared to last year 14/15; as a percentage this is a reduction of 12%. This year renewable installations have generated a saving in emissions of 302.2 tCO<sub>2</sub>e which is a lower achievement than 364.8 tCO<sub>2</sub>e in 14/15. The green tariff contracts were reconsidered through the year which resulted with the Half-Hourly sites ending renewable energy supply by Oct 15. The Non-Half-Hourly sites continued until end March 2016.
- 5. Since base year:** The GHG emissions have decreased by 18% from 2008/09 and 22% from 2009/10 (not shown in the table above). This does not include the reduction from renewables.
- 6. Additional information:**
  - a. Corporate buildings/ stationaries:** The LED refurbishment measures at the main offices took place throughout 2015-16.
  - b. The waste and recycling service:** This is based on the waste/ recycling collection by the council fleet, not for the treatment of waste or recycled materials.

- c. **Leisure Facilities:** The Combined Heat and Power unit installed at the Aqua Vale leisure electricity generation has amounted to 636,969 kWh this year. Slightly lower than last year due to maintenance shutdown.
- d. **Carbon Offset:** Carbon offset started in July 12 with the installation of solar PV at Gateway Office. Followed in October 2014 with a new solar photovoltaic systems of 10 kWp installed at Hawkslade community centre. This year full benefit of self-generation via solar PV totalised 16,834 kWh of electricity and reduced emissions by 7.8 tCO<sub>2</sub>e. The CHP unit at the Aqua Vale centre, generated this year 636,969 kWh of electricity, avoiding 294.4 tCO<sub>2</sub>e.
- e. **Green Tariff:** Some of the Electricity contracts were renegotiated through 2015-16. The total emissions avoided via the “green” supply amounts to 411.9 tCO<sub>2</sub>e.
7. **Approach:** Council has followed the Government’s Guidance on how to measure and report greenhouse gas emissions.
8. **Operational scopes:** Council has measured its scope 1, 2 and significant scope 3 emissions

**Table 2:** Detailed operational scopes

Tonnes of CO <sub>2</sub> e	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
<b><u>Scope 1</u></b>								
Gaseous Fuel	1,732.7	1,694.4	1,631.7	1,369.4	1,574.6	1,768.3	1,514.3	1,667.6
Liquid Fuel	1,489.9	1,750.2	1,720.3	1,637.9	1,582.5	1,515.5	1,467.0	1,423.9
<b>Total scope 1</b>	<b>3,222.5</b>	<b>3,444.6</b>	<b>3,352.0</b>	<b>3,007.4</b>	<b>3,157.1</b>	<b>3,283.8</b>	<b>2,981.3</b>	<b>3,091.5</b>
<b><u>Scope 2</u></b>								
Electricity generation	3,082.5	3,150.2	2,715.7	2,623.6	2,684.4	2,405.2	2,807.3	2,060.7
<b>Total scope 2</b>	<b>3,082.5</b>	<b>3,150.2</b>	<b>2,715.7</b>	<b>2,623.6</b>	<b>2,684.4</b>	<b>2,405.2</b>	<b>2,807.3</b>	<b>2,060.7</b>
<b><u>Scope 3</u></b>								
Liquid Fuel business	182.9	123.0	108.4	93.3	84.7	75.7	81.4	46.7
Electricity T&D	239.7	249.4	218.7	224.2	212.1	205.7	245.5	170.1
WTT Elect generation	428.0	427.0	363.3	372.8	402.6	379.7	427.5	307.1
WTT Elect T&D	33.3	33.9	29.3	31.9	31.8	32.4	37.4	25.4
WTT Gaseous fuel	168.3	165.7	168.6	141.5	162.7	270.0	203.3	224.5
WTT Liquid Fuel	315.6	385.7	410.4	388.6	374.5	352.2	342.9	329.8
<b>Total scope 3</b>	<b>1,367.7</b>	<b>1,384.6</b>	<b>1,298.6</b>	<b>1,252.3</b>	<b>1,268.4</b>	<b>1,315.7</b>	<b>1,337.9</b>	<b>1,103.6</b>
<b><u>Total emissions</u></b>	<b>7,672.7</b>	<b>7,979.4</b>	<b>7,366.3</b>	<b>6,883.3</b>	<b>7,110.0</b>	<b>7,004.8</b>	<b>7,126.5</b>	<b>6,255.8</b>
Carbon Offset					87.6	232.8	364.8	302.2
Green Tariff	846.8	511.7	70.9	378.6	565.0	894.7	672.4	411.9
<b><u>Overall Total</u></b>	<b>6,826.0</b>	<b>7,467.7</b>	<b>7,295.4</b>	<b>6,504.7</b>	<b>6,457.3</b>	<b>5,877.2</b>	<b>6,089.3</b>	<b>5,541.7</b>
Liquid (bio)fuel out of scope						38.2	35.4	47.7
<b>Outside scope</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>38.2</b>	<b>35.4</b>	<b>47.7</b>

9. **Base year:** 2008/09 has been the reporting base year for the past 5 years.
10. **Targets:** The Council has achieved an 18% reduction in its GHG emissions since base year 2008-09 without including carbon offset from renewable installations or green tariff.
11. **Council contact** is Rob Smart, Sustainable Officer on 01296 585112. Email: [RSmart@aylesburyvaledc.gov.uk](mailto:RSmart@aylesburyvaledc.gov.uk)
12. **External Assurance:** AVDC GHG emission analysis has been carried out by an external organisation, The National Energy Foundation NEF ([Viviane.boyd@nef.org.uk](mailto:Viviane.boyd@nef.org.uk)) on behalf of the Council.