The Highland Council

Planning, Development & Infrastructure Committee

2 November 2016

Agenda Item	**13.i**
Report No	**PDI/ 66/16**

Annual Progress Report on the Carbon Management Plan, 2015/16

Report by Director of Development & Infrastructure

Summary

This report reviews the Council's performance in meeting the targets outlined in the Carbon Management Plan 2013 - 2020 (CMP) for 2015/16. In 2015/16, carbon emissions decreased 0.3% or 176 tonnes CO_2 equivalent (tCO_2e) compared to 2014/15. Against the base-line year of 2011/12 carbon emissions have decreased by 5%. The target reduction over that period is 12%.

The small decrease from the previous year arises from reductions in emissions from energy, staff travel, internal waste and street lighting, which were greater than increases in emissions from water consumption and fleet.

While carbon emissions have only decreased slightly in 2015/16 compared to the previous year, total costs have decreased by 7%, saving £1.43m, with total costs falling from £19.28m (2014/15) to £17.85m (2015/16). This is primarily due to decreasing fuel and energy usage / costs.

Costs since 2011/12 have fallen by 11%; however, due to fluctuations in pricing, this downward trend may not continue without concerted efforts to reduce energy consumption across the organisation.

Additionally, costs through the Carbon Reduction Commitment Energy Efficiency scheme (CRC payments and known as carbon tax) were £702,343 in 2015/16, decreasing slightly from £710,143 in 2014/15.

Actions to further improve performance on emissions reductions are proposed for Members to approve.

1. Background

1.1 The Council's progress to reduce its carbon emissions is monitored through its Carbon Management Plan (CMP). This sets out a strategy for reducing carbon emissions and associated costs from those activities that Highland Council can monitor and influence. The Council has a good track record for reducing carbon emissions. Under the previous CMP, the Council reduced its carbon emissions by 12% between 2007/8 and 2011/12, meeting its target of 3% per annum. The Council is currently reporting against the third iteration of its CMP, with a target of a 3% per annum reduction for the period 2013-2020.

1.2 Move to required climate change reporting to Scottish Government
The Highland Council has been a voluntary signatory of Scotland's Climate Change Declaration (SCCD) and has committed to tackling climate change. The Climate Change (Scotland) Act 2009 set national targets for the reduction of carbon emissions, and Highland Council has been identified as a "Major Player" in ensuring these targets are met. For the previous eight years, the Council has prepared and submitted voluntary reports to SCCD.

1.3 The Scottish Government recently passed an amendment to the Climate Change (Scotland) Act 2009 which statutorily requires public sector organisations to report on carbon emissions and actions undertaken to tackle climate change, from reporting year 2015/16 (i.e. the current reporting year). This change has impacted how the Council collects and analyses carbon emissions data, and has imposed a firm deadline for the submission of annual reports i.e. the last working day in November, for reporting on the previous financial year. As a result, there will be more external and public scrutiny of the Council's carbon emissions, as well as the activities undertaken by the Council to address climate change.

1.4 Through the Council's Programme, Highland First, the Council is committed to "*Helping communities reduce their energy use and costs.*" An important aspect of achieving this commitment will be to review the Council's Carbon Management Plan to align with available resources.

1.5 In addition, the Scottish Government's target of reducing carbon emissions by 42% by 2020 was achieved in reporting year 2014/15. This is likely to result in a more ambitious 2020 target being set in revised legislation during the 2017 Parliamentary session, which will naturally require the Council to revise its own targets in respect of reducing greenhouse gas emissions at an accelerated rate.

1.6 Recruitment to the Climate Change team following staffing changes was completed in August 2016. Until March 2016, there were three members of the team, but this was reduced to two in 2016/17. Whilst this has reduced the scope and range of work which can be undertaken, the team will work with all services across the Council in 2016/17 to ensure progress in meeting Carbon Management Plan targets detailed in this report.

2. Summary of overarching trends

2.1 The Council's carbon emissions have decreased by 5% over the past four years, against a target reduction of 12% over that period. This puts the Council 7% behind where it needs to be in respect of carbon emissions reduction, and to get back on target, a 10% reduction will be required in 2016/17. There was no material decrease in emissions in 2015/16 compared to 2014/15, Figure 1 and **Appendix 1**. It should be noted that annual carbon emissions can fluctuate for a variety reasons other than success or failure of the measures implemented. The prolonged cool and wet conditions in 2015/16 may have resulted in continued steady demand for heating across the Council. Heating is one of the biggest energy demands, and consequently one of the most significant sources of carbon emissions for the Council.

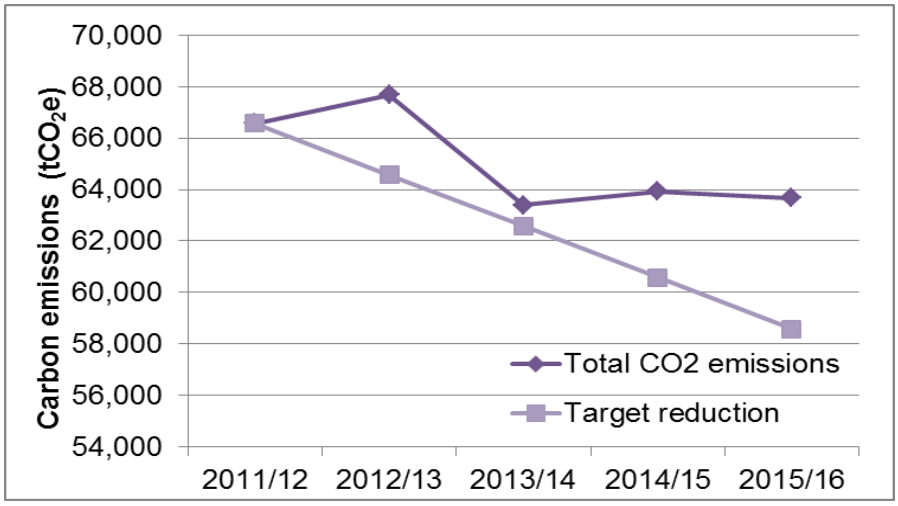

Figure 1: Highland Council carbon emissions (tCO_2e), 2011/12 – 2015/16

2.2 There are six sectors included in the CMP: Energy use in buildings; Staff travel; Fleet; Waste; Street lighting; and Water. Table 1 summarises the Council's carbon emissions and target reductions for each of these sectors.

Table 1: Carbon emissions (tCO_2e), 2011/12 – 2015/16.

Sector	Target	Baseline emissions (2011/12)	Emissions Saving Target	Actual Emissions Savings achieved	Change in Emissions 2011/12 – 2015/16
	(%)	Tonnes CO_2e			(%)
Energy use in Buildings	-3 p.a.	42,894	-5,147	-598	-1.4
Staff Travel		3,200	-384	-871	-27
Fleet		9,459	-1,132	-2,079	-22
Internal Waste (including recycling)		1,262	-151	-42	-3
Street Lighting		9,591	-1,151	+311	+3
Water		412	-49	+126	+31%
Total	**- 12%**	**66,818**	**-7,988**	**-3,153**	**-5%**

2.3 Energy use in buildings accounts for the largest proportion of council emissions (66%), followed by street lighting (16%) and fleet emissions (12%), Figure 2.

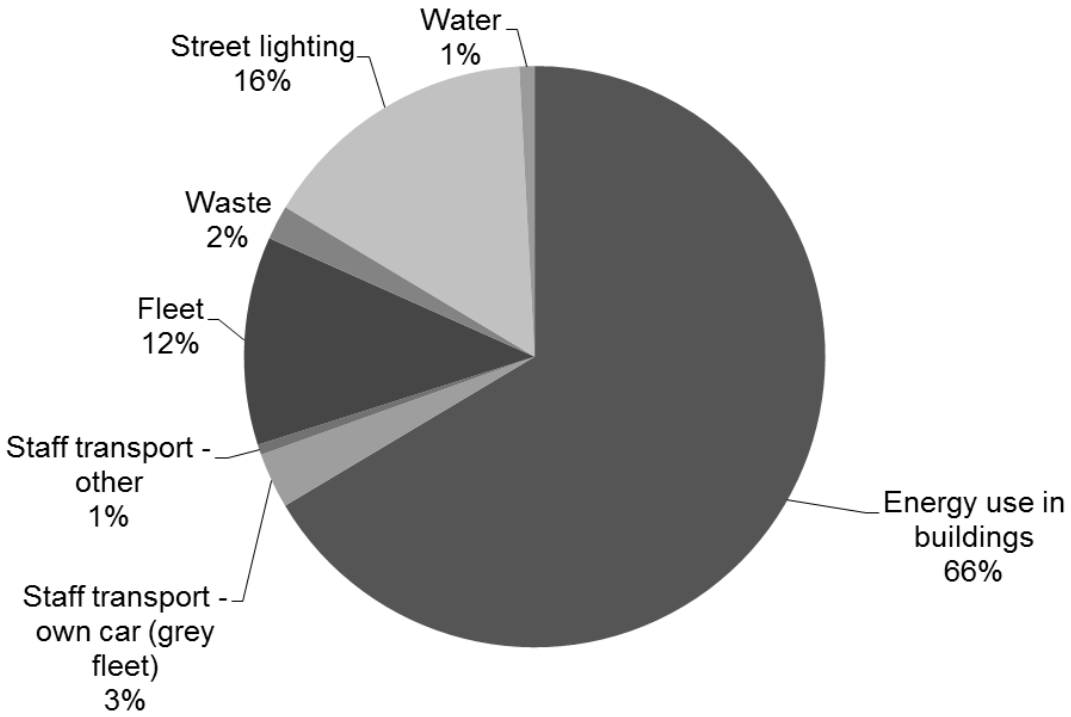

Figure 2: Carbon emissions by sector (2015/16)

2.4 Staff travel, fleet and water account for a much larger percentage of costs than their carbon emissions would suggest as shown in Figure 3. Reductions in these areas have largely been driven by budget savings and work to encourage business travel only when face to face meetings are essential.

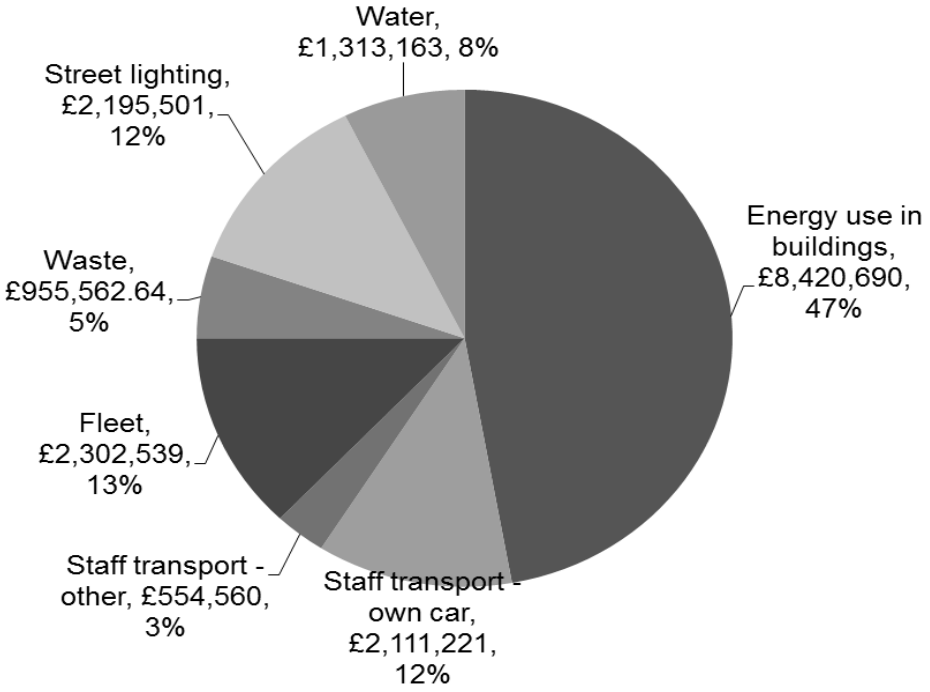

Figure 3: Costs by sector (2015/16)

2.5 Total costs associated with the carbon emissions included in the CMP are outlined in **Appendix 2**. Overall, costs have decreased 7% (£1,426,783) in 2015/16 compared to 2014/15, primarily as a result of falling energy and fuel prices, in combination with some reduced consumption.

2.6 Fleet fuel usage has increased 6% since 2011/12, but costs have reduced by 24% (£712,407). Similarly, total staff travel costs have reduced by £960,322 (27%) since the baseline year, because of a 28% reduction in the amount of business mileage claimed by staff travelling in their own car (saving £848,948 compared to 2011/12). There has been a 19% decrease in staff travel by other means (public transport and car hire) saving £111,374 over the same period. Car hire mileage has reduced 23% (278,760 miles) saving £114,278, a 20% reduction in costs compared to 2011/12. Water costs have increased by 9% (£109,242) as a result of consumption increasing by 30% (247,475 m^3) in 2015/16 compared to 2011/12.

2.7 There are additional costs to the Council relating to carbon emissions under payments required by the Carbon Reduction Energy Efficiency Scheme (CRC). Despite a reduction in carbon emissions from 2011/12 to 2015/16, there has been a 38% increase in CRC tax due to a steep increase in the unit price from 2014/15. This increase would have been higher if the Council had not prepaid for the majority of its offset credits in advance, securing a lower price per credit. The Council can mitigate the impact of further unit price increases on its CRC payments by reducing its carbon emissions.

2.8 The Council's performance in 2015/16 can be summarised as follows:

- the Council's carbon emissions have reduced by 186tCO_2e in 2015/16 compared to 2014/15 and have decreased by 5% compared to 2011/12 (against a target reduction over the period of 12%). This puts the Council 7% behind target;
- the Council's targets will likely require to be revised upwards if the Scottish Government enacts new climate change legislation in 2016/17, as is widely expected (discussed at para 1.5);
- compared to 2011/12, carbon emissions from energy use, staff travel, waste and fleet have decreased, whilst emissions from water and street lighting have increased;
- total costs decreased by 7% from £19.28m (2014/15) to £17.85m (2015/16), saving £1.43m. However, increases in the cost of energy and fuel could potentially reverse this downward trend in 2016/17; and
- achievements and positive changes that have occurred in 2015/16 include:
    a. the Council avoided an even higher CRC payment by pre-paying for the majority of its offset credits in advance;
    b. the Council's investment in biomass has helped to support the region's emerging biomass economy and supply chain;
    c. the Council generated income of £622,822 in Renewable Heat Incentive and £77,939 in Feed-in Tariff payments in 2015/16;
    d. business travel by staff has decreased 27% in 2015/16 compared to the baseline year, saving £960,322;
    e. business travel by staff in their own car has decreased 34% in 2015/16 compared to the baseline year, saving £702,663;
    f. business travel by staff using hire cars has decreased by 23%, saving £114,278 compared to the baseline year; and
    g. significant decreases in fuel consumption by the Council's fleet, reducing carbon emissions by 22% and costs by £1.6m since the baseline year.

2.9 It is important to note that various projects to reduce carbon emissions and energy consumption are currently in progress, and these include the following:

- Unified Communications – improved video conferencing (VC) is being implemented in all main offices, with a roll-out of a VC desktop service to follow in 2017. This should significantly reduce staff and Member travel to meetings;
- ICT Transformation – the rollout of the new ICT estate will be more efficient, thus reducing carbon emissions and costs;
- Paper Lite Committees – new ICT devices have been deployed to 53 Members, which will remove the need to print and post committee papers in current quantities;
- Heating System Upgrades – there is a continuing programme to replace oil-fired heating systems with biomass boilers across our estate;
- Top 10 Energy Consuming Buildings – the Climate Change team is working with colleagues in Energy & Sustainability, Care & Learning and the Corporate Improvement team to develop projects and strategies to reduce energy and water consumption in our highest consuming sites (**Appendix 3)**. Support for the proposals set out in the Carbon CLEVER Capital Programme paper (Item 13(ii) on the 2nd November, 2016 PDI Committee agenda) will ensure that projects to improve the energy efficiency of our buildings are supported, and this will help to meet CMP targets. In addition, the Climate Change team will work closely with the Energy & Sustainability team to expedite delivery of the Energy Efficiency Action Plan, which was approved by Members at PDI Committee on 11th May 2016;
- Green Ambassador Network – work is underway to refresh, re-engage and retrain the Green Ambassador network. This will assist in the delivery of low carbon procedures and training to ensure that resource efficiency is promoted to all staff; and
- Behaviour Change – the Climate Change team will develop behaviour change interventions to reduce energy consumption across the estate, through utilisation of the Scottish Government's ISM (Individual, Social & Material) Behaviour Change tool. The tool considers all of the contexts which shape people's behaviours, and by understanding these contexts and the multiple factors within them that influence the way people act every day, more effective policies and interventions can be developed.

2.10 A more detailed breakdown of the Council's performance in respect of energy use in buildings, staff travel, fleet, waste, street lighting, water, and community emissions, can be found at **Appendix 4**.

3. Implications

3.1 Resource

3.1.1 The CMP helps the Highland Council to monitor its practices, become more efficient, and reduce costs. Achieving the targets of the CMP requires a series of projects and actions to be delivered, many of which will have an associated cost. These projects are part of the Council's capital budget and are reviewed on a case by case basis to ensure they achieve best value for money.

3.1.2 There are financial risks relating to the cost of energy. Oil, gas and electricity are known to have particularly volatile prices, and the more energy the Council consumes, the greater the risk of rising costs impacting the Council's budget, and consequently its ability to provide essential services. Total costs through the CRC scheme in 2015/16 were £702,343 and this is expected to continue to rise in the future. This will place additional pressure on Council finances to meet these obligations, particularly if energy use is not reduced.

3.3 Legal
The Council has a duty to assist Scotland achieve its national carbon emission reduction targets as set out by the Climate Change (Scotland) Act 2009, to reduce emissions of greenhouse gases by at least 42% by 2020 and at least 80% by 2050. Mandatory required reporting under the revised Public Bodies Climate Change Duties will be required from 2015/16, and is reported at Item 13(iii) of the 2nd November, 2016 PDI Committee agenda.

3.4 Climate Change/ Carbon CLEVER
By reducing its carbon emissions, the Highland Council is helping the region mitigate its impacts on climate change.

3.5 Risk Implications
There is a reputational risk to the Council for not achieving the targets of the CMP. In addition, increases in energy and fuel costs will have increased revenue cost implications for the Council, (should consumption remain static), and increased promotion and use of High Life Highland facilities, including community schools, will inevitably lead to more consumption.

3.6 Gaelic, Rural and Equality
There are no Gaelic, rural or equality implications arising from this report.

Recommendations

Members are asked to note that remedial action to improve performance is being refocused on areas where emissions and costs are highest and increasing, if we are to meet our 15% reduction target in 2016/17. This means:

- a programme of measures, as detailed at para 2.9, will be rolled out to ensure progress towards meeting targets set out in the CMP is achieved in 2016/17; and
- acceleration of progress which has already been achieved to reduce staff travel and fleet carbon emissions will continue. Further reductions in staff travel will require additional promotion of video conferencing, and the Climate Change team will work with the Travel Desk to ensure that grey fleet mileage and car hire is minimised.

Designation: Director of Development & Infrastructure
Date: 13 October, 2016
Author: Keith Masson, Climate Change Officer
Background Data:
Energy use in buildings: Eddie Boyd, Eric Dodd, Michael O'Donnell
Staff travel: Chrystal Beaton, Lucy Lallah, Jackie McNeish
Waste: Andy Hume, Michael Robb
Fleet: Susan Morrison
Street lighting: Robin Pope, John Allan
Water: Michael O'Donnell, Michael Fraser

Appendix 1: Highland Council carbon emissions, 2011/12 to 2015/16

	CO_2e emissions (tonnes)					Change in CO_2 emissions
	Baseline 2011/12	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2011/12 – 2015/16**
Energy Use in Buildings						
Electricity	27,440	28,349	28,066	28,697	29,421	+7%
Gas	4,235	5,569	4,805	5,340	5,506	+30%
Oil	11,219	10,197	7,460	8,760	7,369	-34%
Total:	**42,894**	**44,115**	**40,330**	**42,797**	**42,296**	**-1%**
Staff Business Travel						
Business Miles	1,873	1,548	1,409	1,339	1,241	-34%
Lease Miles	294	312	328	312	319	+9%
Training Miles	58	77	66	68	48	-17%
Equivalent Car Hire Miles	236	176	143	137	164	-31%
Member Miles	148	131	131	119	129	-13%
Support Workers	10	9	10	4	13	+30%
Re-located Miles	121	91	70	75	52	-57%
Car Hire	385	363	493	267	296	-23%
Bus and Coach	3	4	10	3	1	-67%
Ferry	1	2	1	1	1	0%
Plane	40	41	67	20	35	-13%
Taxi	0	0	0	0	0	0%
Train	33	29	48	36	30	-9%
Total:	**3,200**	**2,783**	**2,776**	**2,381**	**2,327**	**-27%**
Fleet						
Petrol	79	80	79	69	62	-22%
Diesel	8,469	8,117	7,721	5,650	5,616	-34%
Gas Oil	886	1255	959	1,027	1,702	+92%
Total:	**9,459**	**9,452**	**8,759**	**6,746**	**7,380**	**-22%**
Internal Waste*						
Landfill waste (non-schools)	372	360	416	581	395	+6%
Mixed recycling (non-school)	4	5	5	8	5	+25%
Landfill waste (schools)	874	691	815	814	808	-8%
Mixed recycling (schools)	13	10	11	11	12	-8%
Total:	**1,262**	**1,065**	**1,247**	**1,414**	**1,220**	**-3%**
Street Lighting	**9,591**	**9,885**	**9,792**	**10,025**	**9,902**	**+3%**
Water	**412**	**370**	**496**	**478**	**538**	**+31%**
TOTAL	**66,818**	**67,670**	**63,401**	**63,841**	**63,665**	**-5%**

	Emissions increase

*Estimated data

Appendix 2: Costs associated with carbon emissions, 2011/12 to 2015/16

	Cost (£)					Change in cost (%)
	Baseline 2011/12	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2011/12–2015/16**
Energy Use in Buildings						
Electricity	4,805,674	5,464,789	6,027,834	6,285,356	6,474,910	+35%
Gas	559,027	831,775	845,305	880,250	839,900	+50%
Oil	3,045,328	2,791,681	1,817,258	1,758,067	1,105,880	-64%
Total:	**8,410,029**	**9,088,245**	**8,690,397**	**8,923,673**	**8,420,690**	**0%**
Staff Business Travel						
Business Miles	2,273,554	2,258,071	2,062,180	1,949,511	1,570,891	-31%
Lease Miles	120,367	131,245	137,449	124,704	106,687	-11%
Training Miles	39,163	51,862	44,939	45,937	32,786	-16%
Equivalent Car Hire Miles	228,372	72,964	136,487	61,661	158,892	-30%
Member Miles	198,506	188,084	187,145	170,140	185,262	-7%
Support Workers	14,692	12,310	14,466	5,498	19,179	+31%
Re-located Miles	85,512	63,692	49,098	55,192	37,524	-56%
Car Hire	559,570	430,920	702,920*	363,063	443,371	-21%
Bus and Coach	3,105	4,925	10,090	1,824	881	-72%
Ferry	3,610	3,170	5012	3243.22	4,271	+18%
Plane	44,168	40,644	81,931	30,564	32,388	-27%
Taxi	164	462	110	314	365	+123%
Train	55,317	59,801	151,606	77,407	73,283	+32%
Total:	**3,626,106**	**3,829,745**	**3,583,434**	**2,889,058**	**2,665,780**	**-26%**
Fleet						
Petrol	39,134	39,953	38,789	38,842	25,745	-34%
Diesel	3,664,896	3,542,508	3,302,019	2,734,456	1,957,384	-47%
Gas Oil	207,936	288,929	212,259	187,046	319,410	+54%
Total:	**3,911,966**	**3,871,390**	**3,553,067**	**2,960,345**	**2,302,539**	**-41%**
Internal Waste (collection and disposal costs, not including landfill tax)						
Landfill waste (non-schools)	170,520	173,027	230,042	347,193	242,563	+42%
Mixed recycling (non-school)	24,462	44,185	56,818	91,431	62,301	+155%
Landfill waste (schools)	370,716	381,160	458,362	511,239	508,957	+37%
Mixed recycling (schools)	113,824	109,036	128,972	136,542	141,741	+25%
Total:	**679,521**	**707,407**	**874,194**	**1,086,406**	**955,563**	**+40%**
Street Lighting	**1,794,867**	**2,316,706**	**2,270,227**	**2,216,616**	**2,195,501**	**+22%**
Water *	**1,667,973**	**1,662,253**	**1,533,631**	**1,203,921**	**1,313,163**	-21%
TOTAL	**20,087,459**	**20,924,151**	**20,504,950**	**19,280,019**	**17,853,236**	**-11%**
CRC tax	509,832	453,450	424,560	710,143	702,343	+38%

	Cost increase

***data currently under review**

Appendix 3: Highest energy consuming buildings, 2015/16.

	Building[1]	Total consumption (kWh)	% Total Highland Council*
1.	Tain Royal Academy	3,918,707	2.91
2.	Alness Academy	3,622,053	2.69
3.	Lochaber High School	3,477,368	2.58
4.	Wick High School	2,826,095	2.10
5.	Nairn Academy	2,813,770	2.09
6.	Highland Council HQ	2,803,100	2.08
7.	Charleston Academy	2,500,264	1.86
8.	Inverness High School	2,456,645	1.82
9.	Inverness Royal Academy[2]	2,235,377	1.66
10.	Grantown Grammar School	1,979,507	1.47
	Total	**28,632,886**	**24.70**

[1]List excludes PPP properties
[2]Inverness Royal Academy was recently rebuilt
*Total electricity, oil, and gas consumption in 2015/16 was 115,907,114 kWh.

Appendix 4: Detailed Breakdown of Performance Against CMP Targets

Energy use in buildings

Progress in this sector is fundamental to ensure the overall targets of the CMP are achieved. In 2015/16, carbon emissions related to energy use in buildings decreased by 1% (501 tCO_2e) relative to 2014/15, Appendix 1. This relatively modest decrease is most likely due to another cool and wet winter and spring in 2016, resulting in a static demand for heating across the Council. Over the baseline year of 2011/12, emissions from energy use in buildings have decreased 1.4% (598 tCO_2e).

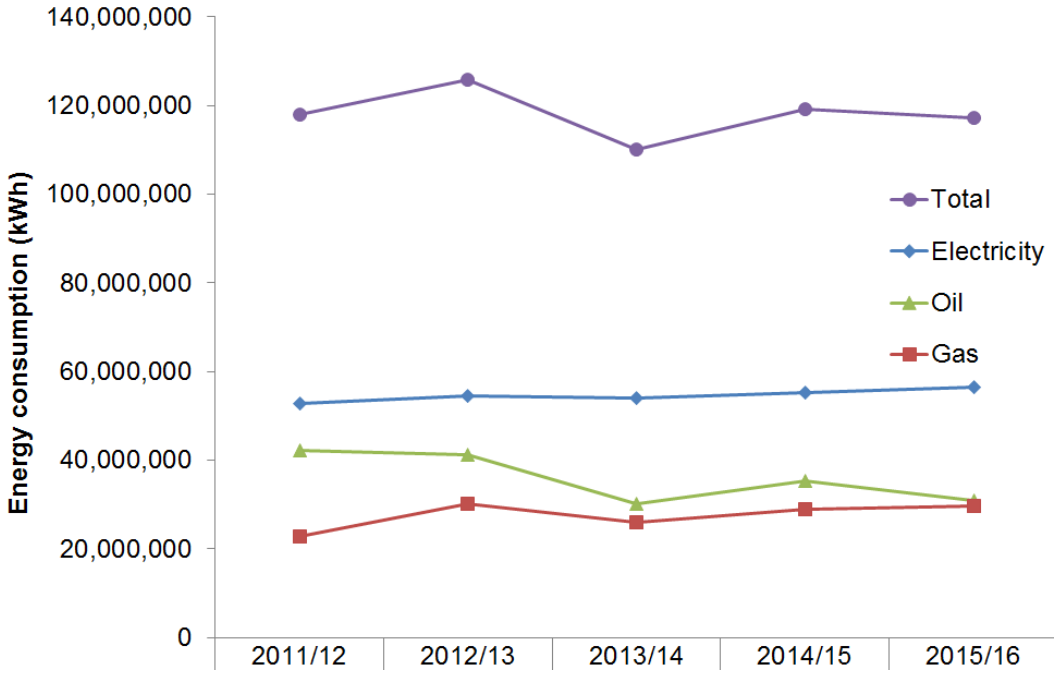

Figure 4: Energy consumption in buildings, by fuel type, 2015/16

Energy use in Public Private Partnership (PPP) properties is within the scope of the CMP, and it is important to note that energy use in PPP properties has been increasing - this is impacting the Council's progress towards energy reduction targets. The 14 PPP properties account for 11% of energy use across the Council estate, and therefore have a significant impact on overall energy trends. Energy use in PPP properties has increased by 4% in 2015/16 compared to 2014/15, and is 8% higher than the baseline year (2011/12).

The effect of fluctuations in the cost of energy can also be noted in the CMP data. For example, electricity usage has increased by 7% between 2011/12 and 2015/16, but costs have increased by 27% over the same time period. Continuing efforts to reduce energy consumption and where possible increase the Council's capacity to generate its own energy through renewables will reduce the impact of rising energy costs on the Council. This is especially important given that non-energy costs (i.e. contracts for difference, capacity market supplier charges, transmission network use of system etc) currently account for around 55% of electricity costs, but this is likely to increase to 70% by 2018/19. This is expected to place significant budget pressures on the Council, and places even greater importance on reducing consumption across our estate.

The Council has been investing in renewable energy in its own estate for

over a decade. The major focus of this has been the replacement of carbon intensive oil and electric based heating systems with renewable heating systems such as biomass boilers. These are considered to be near carbon neutral, as the trees which are used for fuel are re-planted, maintaining a continuous carbon cycle. In 2015/16, 18% of the energy used in the Highland Council's buildings came from biomass heating. Since 2011/12 carbon emissions from oil use have reduced 34%, and costs from purchasing heating oil have decreased by £1,939,448. This investment in biomass has helped to support the region's emerging biomass economy and supply chain.

The Council has over 17MW installed capacity of renewable energy technologies in its estate, as noted in Table 2. The Council generated income of £622,822 in RHI (Renewable Heat Incentive) and £77,939 in FIT (Feed-in Tariff) payments in 2015/16 as a result of these installations.

Table 2: Highland Council Installed Renewables, 1st April, 2016.

Renewable Energy Technology	Installed Capacity (kW)
Biomass	16,198
Ground Source Heat Pump	564
Solar Photo Voltaics	440
Wind	6
Air Source Heat Pump	208
Solar Thermal	25
Total	**17,471**

Notable projects completed this year to improve energy efficiency and reduce reliance on fossil fuels include the installation of biomass heating systems at Golspie High School, Ullapool High School, Noss Primary, Caol Campus, Wick Offices, and the installation of building management systems. 165 daily readings from biomass sites are obtained via an ISTA system, as well as continued growth in our automatic meter reading system. These measures will save the Council money on future energy bills, and generate income through RHI payments. By replacing expensive electric heating systems with alternatives, such as the combined heat and power system installed in Nairn Academy, there will also be a reduction in the Council's CRC payments, contributing to cost savings.

At a meeting of the Planning, Development & Infrastructure Committee on 11th May, 2016, Members approved an Energy Efficiency Action Plan (EEAP) which identifies various improvements and proposals required to reduce annual energy consumption and costs across the Council's estate. It is proposed that the Climate Change team works closely with the Energy & Sustainability team to expedite delivery of the EEAP.

Understanding and continuing the decrease in energy consumption

Weather

A key variable that drives energy consumption across the Council estate is weather. An analysis of temperature across the Highlands for 2015/16 indicates it was not a particularly cold winter, and based on temperature alone, heating demand should not be much different in 2015/16 than

2014/15. However, rainfall in Highland over winter 2015/16 was significantly higher than average (see Figure 5), and this has likely resulted in continued high consumption, as buildings would be heated to a higher level than usual due to staff/ pupils being wet or due a perception of it being colder than it was due to the increased rainfall and overcast conditions. A significant proportion of the heating demand during 2015/16 may therefore be due to the weather; this may not be particularly unusual going forward, with a likely impact of climate change being wetter winters in the Highlands.

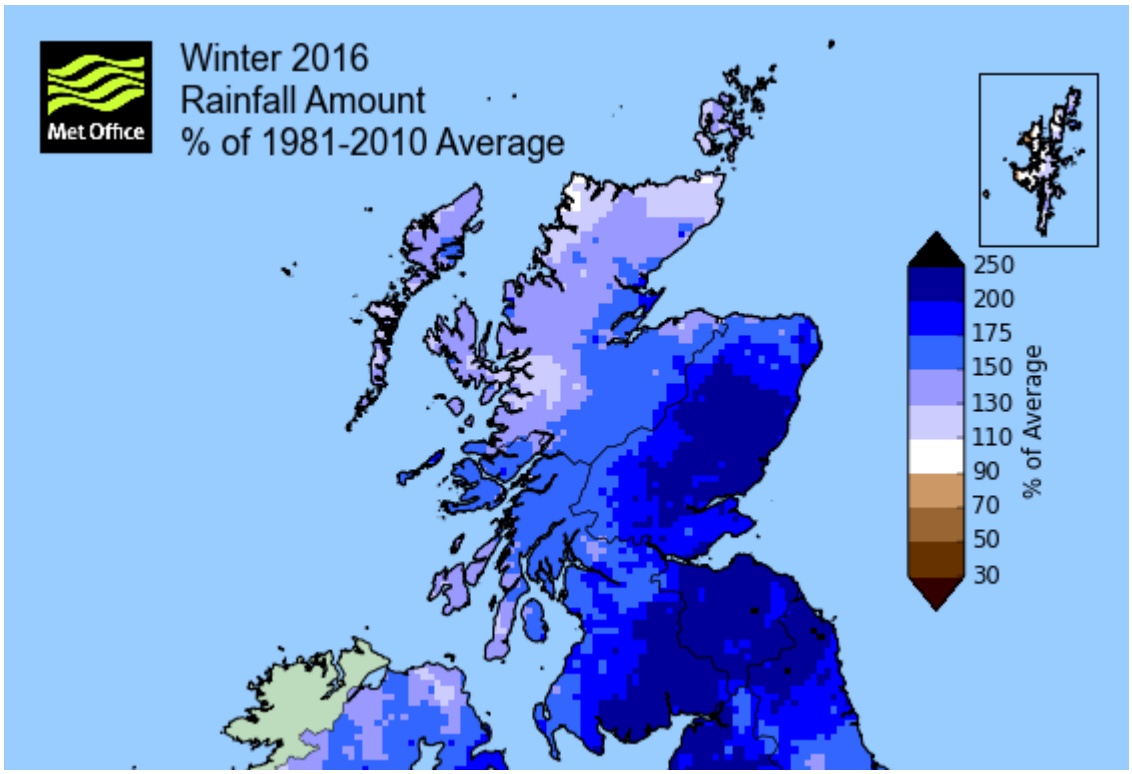

Figure 5. Rainfall map for the North of UK for Winter 2015/16 (December, January, and February).

Staff behaviour

Staff behaviour can influence energy demand. It is commonly quoted that an engaged workforce can reduce energy consumption by up to 10%. On the other hand, a disengaged workforce can increase energy consumption. Whilst the Council has had a significant corporate drive to reduce costs across areas such as staff travel, where budgets are devolved to teams and a vested interest lies in reducing miles travelled, campaigns regarding energy use have been more sporadic, and may be less effective given that the energy budget is centralised. Re-engaging the workforce could help to reduce energy consumption across the Council, saving money, reducing carbon emissions, and resulting in the Council paying less CRC tax.

Preliminary work on staff engagement campaigns, including a refresh of the Green Ambassador network, has been undertaken by the Climate Change team, and this will be a priority going forward. An action plan to reduce energy consumption across our estate will be developed in collaboration with the Council's Energy & Sustainability team, utilising the Scottish Government's ISM (Individual, Social & Material) behaviour change model.

Focus on a site by site basis

In previous versions of the Carbon Management Plan, a higher focus has been placed upon Council sites with the highest energy consumption. This will be reintroduced to refocus efforts. The top 10 energy consuming buildings, which together account for 24.70% of the Council's total electricity, gas, and oil consumption, can be found in **Appendix 3**. Nine of these ten buildings are schools, with the other being Highland Council HQ. By focusing on these ten buildings, nearly one quarter of the Council's energy consumption from oil, gas and electricity in buildings could be targeted.

The Council also holds data on the expected energy performance of its buildings. Analysis could indicate how buildings are performing against this, and an action plan developed to address discrepancies.

There are many potential measures that could be used to reduce energy demand and improve energy efficiency, with a range of lead times and costs. Some examples are listed in Table 3. Many of these measures are low cost, or require changes in behaviour supported by relevant internal Council policies.

Table 3. Measures to reduce energy consumption in Council buildings

	Reducing energy demand	**Improving energy efficiency**
Lighting	• Switching off lights when not in use • Rationalising street lighting estate	• Upgrade old fittings • Upgrade to LED lighting
Heating	• Operate buildings closer to recommended temperatures • Work with staff to ensure heating is set correctly • Limit use of supplementary heaters • Ensure heaters are not blocked or covered	• Provide better heating controls • Implement limits on changes to heating systems • Move to more efficient heating types • Fit door closers • Draught proofing
Power	• Limit appliances • Switch off appliances and computers when not in use	• Install water boilers • Use Combined Heat and Power where possible • Install renewables to help offset energy demand
Behaviour	• Switch off campaign • Refresh Green Ambassador network to promote energy efficient behaviours	

An action plan combining these measures with the highest energy consuming sites within the Council's estate will be developed in 2016/17 to target remedial action and reduce energy consumption in buildings.

Capital spend

As part of the Council's capital budget, a programme of investment is occurring to improve the energy efficiency of Council properties, and to replace inefficient expensive oil heating systems with renewable alternatives.

In 2015/16, £2.86m was spent by the Council on energy improvement measures. Many of these projects are spend-to-save initiatives, saving the Council future revenue costs.

Office rationalisation

The Council's office rationalisation programme will continue to reduce the number of properties that the Council owns, operates and heats. This will reduce energy costs to the Council.

PPP properties

Energy use in PPP properties has increased by 4% in 2015/16, compared to 2014/15, and is 8% higher than the baseline year (2011/12). This situation should continue to be monitored, and a programme of engagement developed to reverse this trend.

Staff Travel

Staff travel mileage has decreased by 27% (2,793,094 miles) from 10,473,109 miles (2011/12) to 7,680,015 miles (2015/16). Business travel by staff in their own car ('grey fleet' mileage) has decreased 34% (2,019,948 miles) in 2015/16 compared to the baseline year, saving £702,663.

Staff travel by public transport and by hire car decreased by 19% in 2015/16 compared to 2011/12, with costs reduced by £111,374 (17%). This reduction is most likely a result of staff responding to the need for increased savings and adjusting their travel priorities as a result. There was, however, an increase in mileage of 5% in 2015/16 compared to 2014/15, with an associated increase in costs of 16% (£78,144). Car hire mileage has reduced 23% (278,760 miles) saving £114,278, a 20% reduction in costs compared to 2011/12. However, there was an increase in car hire mileage of 92,395 miles (11%) compared to 2014/15, with an increase in costs of £80,308 (22%). This situation will continue to be monitored; managers will be asked to remind their staff of the travel hierarchy, and to only travel when face to face meetings are absolutely essential.

Fleet

There have been significant decreases in fuel consumption by the Council's fleet, resulting in a 22% decrease in carbon emissions compared to 2011/12. This has helped to reduce fuel spend by £1,609,427 compared to 2011/12. Falling fuel prices will have also contributed to the decrease in costs. Diesel use, which contributes the majority of fleet carbon emissions, has fallen 34% compared to 2011/12. This decrease has been achieved by the installation of more efficient Euro 6 standard engines, route optimisation and some withdrawal of services due to budget pressures. Gas oil consumption has increased 92% in 2015/16 compared to 2011/12 (66% increase compared to 2014/15). Gas oil is used to fuel the gritting fleet, with winter conditions largely dictating gas oil use each year.

Waste

Both waste going to landfill and recycling volume from Council sites have decreased in 2015/16, with an overall decrease of 3% compared to 2011/12. Landfill waste arising from non-school properties has seen the largest decrease of 32% compared to 2014/15, but a 6% increase compared to the baseline year, with costs increasing by £72,043 compared to 2011/12.

Estimates of waste volume are conducted using industry-wide best practices, but still have the potential for significant inaccuracies due to assumptions in the methodology. The methodology calculates the volume of waste generated by multiplying the size of the bins by the number of collections, and then using these to estimate weight. The method assumes that every bin is completely full when it is emptied, which may not be the case. It then assumes a standard factor to convert the bin volume to tonnes of waste which may also not be accurate.

Work by the Council's Waste Management team indicates that the actual density may actually be half that assumed in the calculations used here. This indicates that there are a number of sites where the number of bins provided is too high and should be reviewed to reduce costs. It also means that the carbon emissions estimates associated with waste are likely to be too high. It is not currently possible to directly calculate the tonnage of waste arising from Council activities as the Council's own waste is not segregated from general municipal collections.

The process for approving new or additional waste collection provision (that is, number of bins or number of collections per week) at schools or Council offices does not normally include an audit of existing capacity. For example if a recycling bin is added, a general waste bin is not normally taken away so overall capacity increases whilst the volume of waste generated may have stayed the same. Working with Facilities Management staff and the Waste Management Team to better assess waste provision will help to reduce the Council's spend on waste services.

Street lighting

Carbon emissions from street lighting in 2015/16 have decreased 1% (123 tCO_2e) compared to 2014/15, largely due to the replacement of some street lighting stock with more energy efficient LEDs, and despite the overall street lighting estate having grown over that period.

LED street lights typically save 40-60% of the energy used by conventional sodium lights. A £16 million project in the Council's capital programme is to change the majority of the Council's street lighting stock to energy efficient LEDs by 2020/21. It is estimated that by the end of the project, approximately £1 million will be saved per year in reduced energy costs at current electricity prices, approximately halving the Council's energy costs for street lighting. In addition, reductions in energy use from street lighting will reduce future costs associated with CRC. The Climate Change team will work with street lighting colleagues throughout 2016/17 to identify opportunities to expedite delivery of LED lighting upgrades, as well as options to rationalise street lighting and whether there is scope to potentially reduce illuminated hours.

Water – all sites

Water usage increased by 11% in 2015/16. Costs have also increased 9% (£109,242). Whilst carbon emissions relating to water use only account for 1% of the Council's overall carbon emissions, the associated costs account for 8% of the activity scoped into the CMP. Reducing water consumption is therefore important for saving costs.

Community Emissions
The CMP includes some measures of Highland-wide carbon emissions, reported under the community emissions sector. This includes energy use in council housing, and municipal and household waste estimates. These emissions do not have reduction targets set against them, as the Council has no direct control over them.

Energy use in council housing
The Council is responsible for 13,899 Council houses with total carbon emissions related to energy use of 52,297 tCO_2e, 2015/16. This figure is based on an estimate from the energy performance certificates of the housing stock, which have not been recently updated.

Whilst the Council is not directly responsible for the emissions relating to Council houses, the Council is committed to improving the energy efficiency of Council houses to help alleviate fuel poverty, with reduced carbon emissions hopefully being a co-benefit.

Scottish Government has announced a new Energy Efficiency Standard for Social Housing (EESSH) to be reached by 2020, which supersedes the Scottish Housing Quality Standards (SHQS), with more stringent standards to be achieved. Council housing stock has been being assessed and is currently 65% compliant with EESSH. The Council is investing £4.3m in 2016/17 towards improving the energy efficiency of its housing stock.

The Council recently won 'Project of the year' in the National Green Deal and ECO Awards 2015 for its partnership programme with energy provider E.ON, bringing major energy savings to hard-to-treat properties in areas of high fuel poverty. The £7.4m Home Energy Efficiency Project – Area Based Scheme (HEEP-ABS) has reached around 1,111 homes in the Highlands. It has saved in excess of 63,000 tonnes of carbon, employed around 98 people and secured a £4.9m contribution in Energy Company Obligation funding from E.ON.

Municipal and Household Waste
In 2015/16, 45% of household waste was recycled. This has remained fairly constant since 2011/12, although municipal recycling has increased from 39% in 2011/12 to over 42% in 2015/16. Municipal waste going to landfill has decreased 8% compared to the 2011/12 baseline year. Despite accounting for only 55% of waste by weight, landfilled waste accounts for 95% of carbon emissions arising from waste. The recent expansion of the types of waste included in kerb-side recycling in 2015/16 will help to further reduce the amount of landfilled waste in the future.

Table 4. Municipal and household waste emissions, 2015/16.

Household waste				
Waste and treatment	**Weight**		**Carbon emissions**	
	(tonnes)	**(%)**	**(tonnes)**	**(%)**
Recycled/Composted	58,459	44.8	1,228	5.6
Landfilled	71,921	55.2	19,952	94.4
Energy from Waste	29	0.02	1	0.0
Total	**130,409**		**22,085**	
Municipal waste (*Municipal waste includes all waste collected by the Council arising from household and business collections*)				
Waste and treatment	**Weight**		**Carbon emissions**	
	(tonnes)	**(%)**	**(tonnes)**	**(%)**
Recycled/Composted	59,854	42.1	1,257	5.0
Landfilled	82,431	57.9	23,905	95
Energy from Waste	29	0.02	1	0.0
Total	**142,314**		**25,163**	