Agenda item	**10 ii**
Report no	**EDI 08/17**

HIGHLAND COUNCIL

Committee: Environment, Development and Infrastructure Committee

Date: 8 November 2017

Report Title: Annual Progress Report on the Carbon Management Plan, 2016/17

Report By: Director of Development and Infrastructure

1 Purpose/Executive Summary

1.1 This report reviews the Council's performance in meeting the targets outlined in the Carbon Management Plan 2013 - 2020 (CMP) for 2016/17. In 2016/17, carbon emissions decreased 6% or 4,021 tonnes CO_2 equivalent (tCO_2e) compared to 2015/16. Against the base-line year of 2011/12 carbon emissions have decreased by 7%. The target reduction over that period is 15%.

1.2 The decrease from the previous year arises from reductions in emissions from energy, fleet and street lighting.

1.3 While carbon emissions have decreased 6% in 2016/17 compared to the previous year, total costs have decreased by 1%, saving an additional £179k, with total costs falling from £18.55m (2015/16) to £18.37m (2016/17). This is primarily due to decreasing fuel and energy usage.

1.4 Costs since 2011/12 have fallen by £1.8m, equivalent to 9%; however, due to fluctuations in pricing, this downward trend may not continue without concerted efforts to reduce energy consumption, staff travel and waste across the organisation.

1.5 Additionally, we have also seen a reduction in costs through the Carbon Reduction Commitment Energy Efficiency scheme (CRC payments and known as carbon tax), which were £545,726 in 2016/17, down from £702,343 in 2015/16.

1.6 Actions to further improve performance on emissions reductions are proposed.

2 Recommendations

2.1 Members are asked to agree that remedial action to improve performance to refocus on areas where emissions and costs are highest and increasing. These are:

- a programme of measures, as detailed at para 5.1, is being rolled out to expedite progress towards meeting targets set out in the CMP in 2017/18; and
- revision and update of the Carbon Management Plan to set out a carbon reduction pathway through to 2023, taking in to account the Council's new programme plan and Scottish Government ambition as detailed in the new Climate Change Bill.

3 Background

3.1 The Council's progress to reduce its carbon emissions is monitored through its Carbon Management Plan 2013 - 2020 (CMP). This sets out a strategy for reducing carbon emissions and associated costs from those activities that the Council can monitor and influence. The Council has a good track record in 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 (21% by 2020).

3.2 Move to required climate change reporting to Scottish Government:
The Climate Change (Scotland) Act 2009 set national targets for the reduction of carbon emissions, and under the legislation, The Highland Council has been identified as a 'Major Player' in ensuring these targets are met.

3.3 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. The Council's first mandatory report was submitted in November 2016. The change to mandatory reporting 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.

3.4 Through the Council's programme, *Highland First*, which is the programme relevant to the current reporting year, the Council is committed to '*Helping communities reduce their energy use and costs'.* An important aspect of achieving this commitment is to review the Council's Carbon Management Plan to align with available resources as well as increased ambition from the Scottish Government, as detailed at para 3.6 below.

3.5 The Scottish Government's target of reducing carbon emissions by 42% by 2020 was achieved in reporting year 2014/15. In 2017, Scottish Ministers consulted on proposals to set new targets to cut CO_2e emissions by 90% by 2050, with a new interim reduction target of 56% by 2020. The Council's response to this consultation can be found here.

3.6 The Scottish Government published a draft of its third Climate Change Plan in January 2017, with a final version of the plan expected in early 2018. The Highland Council will likely need to review and revise its own targets upwards under its Carbon Management Plan whilst developing new projects and initiatives in order to support national emissions reduction targets.

4 Summary of overarching trends

4.1 Carbon Emissions

4.1.1 The Council's carbon emissions have decreased by 7% over the past six years, against a target reduction of 15% over that period. This puts the Council 8% behind where it needs to be in respect of carbon emissions reduction, and to get back on target under current CMP targets, an 11% reduction will be required in 2017/18. Given the Council's progress to date, it is unrealistic to expect that this target will now be achieved and it is therefore proposed that the Council's ambition and targets are revised under a new CMP. There was a 6% decrease in emissions in 2016/17 compared to 2015/16, as detailed at 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 measures implemented. The mild and dry winter in 2016/17 may have resulted in reduced 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.

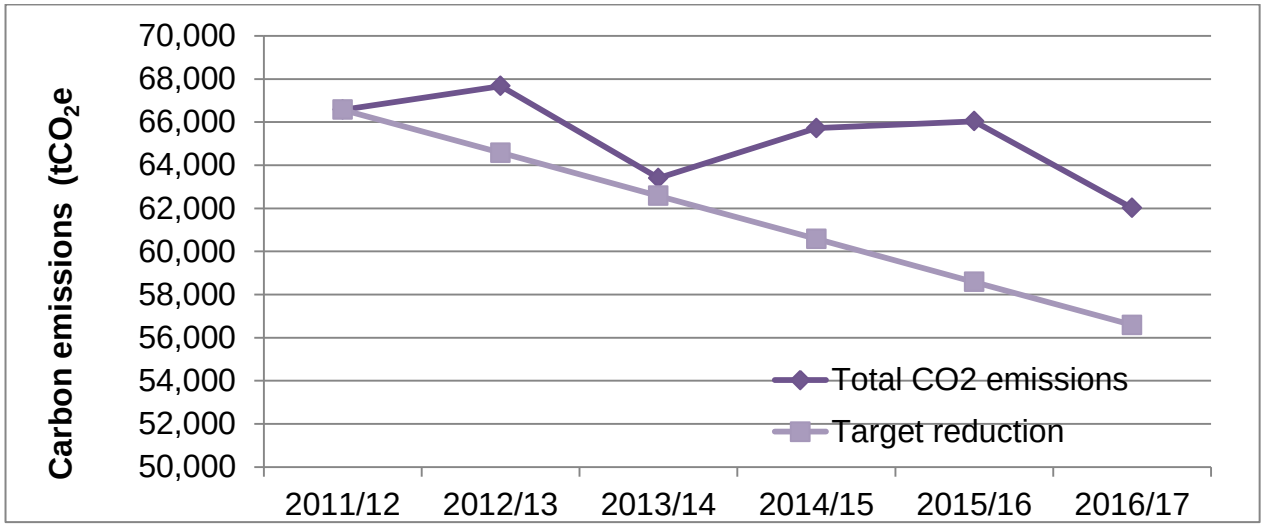

Figure 1: Highland Council carbon emissions (tCO_2e), 2011/12 – 2016/17

4.1.2 There are six sectors scoped into 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 – 2016/17.

Sector	Target	Baseline emissions (2011/12)	Emissions Saving Target	Actual Emissions Savings achieved	Change in Emissions 2011/12 – 2016/17
	(%)	Tonnes CO_2e			(%)
Energy use in Buildings	-3 p.a.	42,894	-6,434	-2,470	-6
Staff Travel		3,200	-480	-826	-26
Fleet		9,459	-1,419	-1,118	-12
Internal Waste (including recycling)		1,262	-189	-24	-2
Street Lighting		9,591	-1,439	-463	-5
Water		412	-62	+126*	+31%*
Total	**- 15%**	**66,818**	**-10,023**	**-4,797**	**-7%**

*Water data is not available for reporting year 2016/17, as detailed at para 2.11 below. Therefore, these figures reflect the position as stated for reporting year 2015/16.

4.1.3 Energy use in buildings accounts for the largest proportion of council emissions (63%), followed by street lighting (16%) and fleet emissions (15%), Figure 2.

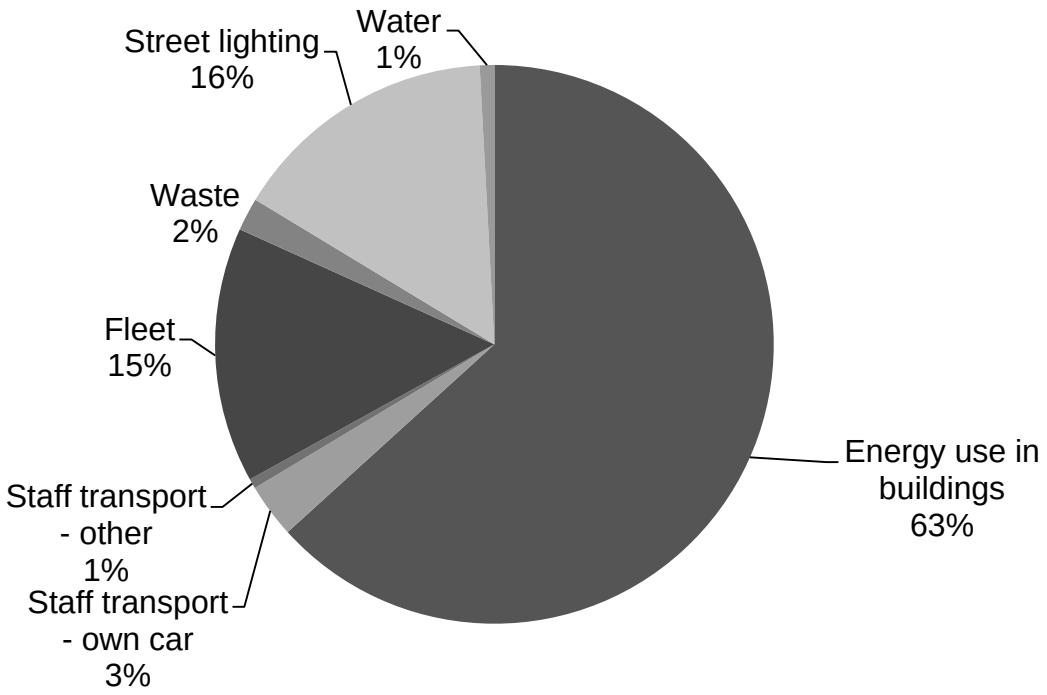

Figure 2: Carbon emissions by sector (2016/17)

4.1.4 High Life Highland operations are scoped in to the CMP 2013-2020. As part of the rationalisation of leisure services in the Highlands, resulting in the transfer of Inverness Leisure to Highlife Highland, responsibility for the Inverness Leisure utilities has rested with the Council from 2016/17 onwards.

4.1.5 The inclusion of Inverness Leisure in this year's reporting has introduced a significant additional energy consuming facility to the mix, which used 785MWh of electricity and 9,000MWh of gas in 2016/17 with associated carbon emissions of 2,077tCO2e. As a result, it has become the highest energy consuming building in the Council's estate (see **Appendix 3**), accounting for 3.3% of total emissions as well as 3.1% of total gas and electricity costs. Were Inverness Leisure to be excluded from this year's data, on a like-for-like comparison basis with 2015/16, carbon emissions would have been a further 2,077tCO_2e lower, meaning the Council would have reduced total emissions by 10% against the baseline year of 2011/12 and be 5% behind target.

4.1.6 The Energy and Sustainability team continues to transition the Council to more sustainable energy through replacement of inefficient systems with biomass boilers, combined heat and power and air source heat pumps, where feasible. The team has managed a year-on-year reduction in oil consumption of 21% by shifting Council buildings to biomass and other renewable energy sources, which has resulted in a CO_2e saving of 1,852tCO_2e.

4.1.7 Carbon emissions from street lighting in 2016/17 have decreased 8% (774 tCO_2e) compared to 2015/16, 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. The street lighting LED program is due to be delivered by 2019 with approximately 80 to 90% of lighting stock being converted, delivering an energy saving of 50%, equating to annual carbon emissions savings of ~4,500tCO_2e and cost savings of over £1m per annum. Currently, around 28% of the street lighting estate has been converted and increased installation rates in 2017/18 will be achieved through temporary fixed term operatives to aid delivery.

4.1.8 Energy use in Public Private Partnership (PPP) properties is within the scope of the CMP. Energy use in PPP properties has been increasing - the 14 PPP properties accounted for 11.8% of energy use across the Council estate in 2016/17, 14% of total emissions (8,683tCO_2e), and therefore have a significant impact on overall energy trends. Energy use in PPP properties has increased by 2.9% in 2016/17 compared to 2015/16, and is 10.7% higher than the baseline year (2011/12). Despite monthly meetings between Council officers and facilities staff from the PPP

properties, there appears to be little impact on overall consumption and emissions. Going forward, the Climate Change team will regularly attend these meetings to influence and encourage a reduction in consumption and emissions.

4.1.9 It is important to note that a major factor influencing the carbon emissions figures in this report is the conversion factors used to calculate emissions. The Council converts units such as miles, kWh, tonnes of waste or litres of fuel into CO_2 equivalents (CO_2e) by using specific conversion factors taken from DEFRA's 'Environmental Reporting Guidelines for Company Reporting on Greenhouse Gas Emissions' from the baseline year, 2011/12. Whilst these conversion factors are updated annually to take into account changes to behaviours and technologies relating to renewables, energy efficiency, vehicle types and fuel economy and have changed considerably from the baseline year, it was decided that for the purposes of the CMP 2013-2020, the conversion factors from 2011/12 would be used to ensure consistency in reporting. However, if the DEFRA conversion factors for 2016/17 were used for the current reporting year, the Council's total carbon emissions would have been 57,241tCO_2e, putting us just 446tCO_2e, or 1%, behind our target. This will therefore be an important consideration when revising and updating targets under a new CMP.

4.2 Costs

4.2.1 Staff Transport, Fleet and Water account for a much larger percentage of costs than their carbon emissions would suggest, as shown in Figure 3.

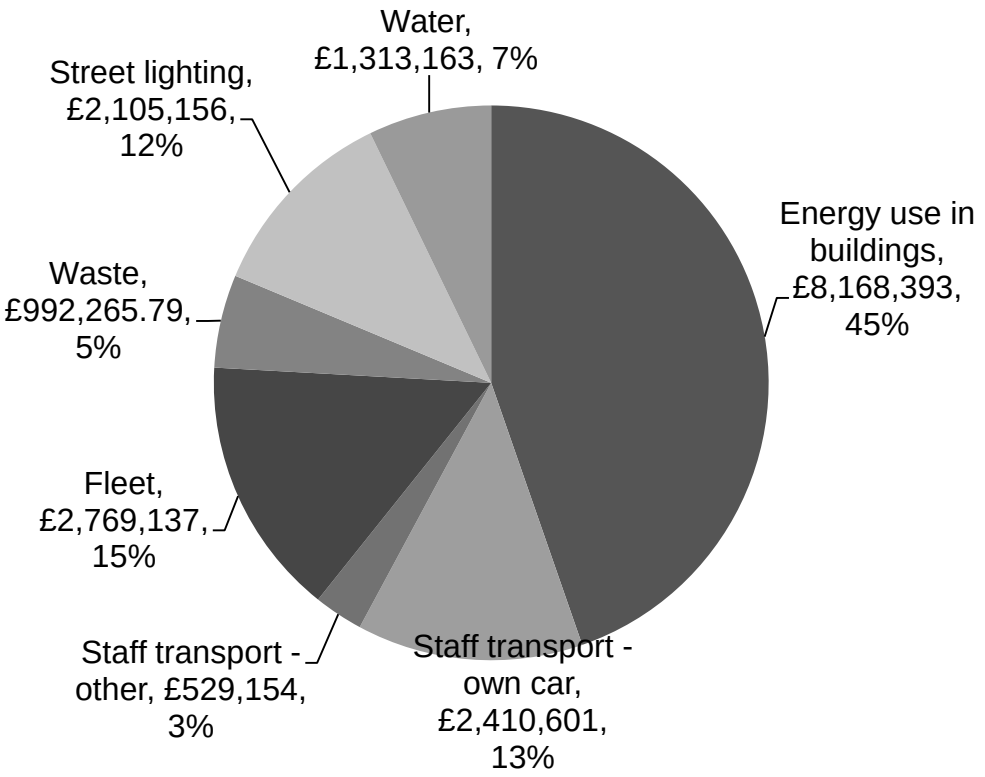

Figure 3: Costs by sector (2016/17)

4.2.2 Total costs associated with the carbon emissions scoped into the CMP are outlined in **Appendix 2**. Overall, costs have decreased 1% (£267,364) in 2016/17 compared to 2015/16, primarily as a result of continued low fuel prices / reduced energy consumption, and despite the inclusion of Inverness Leisure in this year's figures. However, overall, the Council has achieved a 9% (£1.8m) reduction in costs since the baseline year of 2011/12.

4.2.3 Fleet fuel usage has decreased by 12% since 2011/12, whilst costs have reduced by 29% (£1,142,830). This reduction reflects a reduced number of fleet vehicles, more efficient vehicles and improved fleet management. It should be noted that the fleet figures reported in 2014/15 and 2015/16 did not include diesel use from the VECTEC diesel card system used by a number of fleet staff. These figures and the associated emissions have been updated in **Appendices 1 and 2** to provide accurate like-for-like comparisons with this year's data.

4.2.4 Total staff travel costs have reduced by £690,324 (19%) since the baseline year, largely as a result of a 27% reduction in the amount of business mileage claimed by staff travelling in their own car (saving £549,258 compared to 2011/12). There has been a 21% decrease in staff travel by other means (public transport and car hire) saving £141,066 over the same period. Car hire mileage has reduced 22% (266,037 miles) saving £158,766, a 28% reduction in costs compared to 2011/12.

4.2.5 It is important to note that water data was not available for 2016/17 due to technical issues with Anglian Water's reporting software. Therefore, 2015/16 data has been included for reporting purposes. Updated water data will be presented to a later Committee, as and when the Anglian Water reporting issue has been resolved. This issue is affecting all local authorities supplied by Anglian Water.

4.2.6 There are additional costs to the Council relating to carbon emissions from its electricity and gas consumption under payments required by the Carbon Reduction Energy Efficiency Scheme (CRC), a mandatory carbon emissions reporting and pricing scheme. Despite a reduction in carbon emissions from 2011/12 to 2016/17, there has been a 14% increase in CRC tax due to a steep increase in the unit price from 2014/15 onwards. However, there was a 22% decrease on the CRC credits prepaid in 2016/17 (£545,726) compared with 2015/16 (£702,343). This decrease is a reflection on the Council reducing its carbon emissions. In addition, by prepaying for the majority of Council offset credits in advance, the Council was able to secure a lower price per credit. The Council can mitigate the impact of further unit price increases on its CRC payments by reducing it consumption of electricity and gas, thus accelerating its carbon emissions reduction.

4.2.7 The Council's performance in 2016/17 can be summarised as follows:

- the Council's carbon emissions have reduced by 4,021tCO_2e in 2016/17 compared to 2015/16 and have decreased by 7% compared to 2011/12 (against a target reduction over the period of 15%). This puts the Council 8% behind target;
- the inclusion of Inverness Leisure within this year's reporting has resulted in 2,077tCO_2e of additional carbon emissions, as well as additional costs of £220k;
- compared to 2011/12, carbon emissions from energy use, staff travel, street lighting and fleet have decreased, whilst emissions from waste have increased (water data for 2016/17 is not currently available, as discussed at para 2.9);
- total costs decreased by 1% from £18.55m (2015/16) to £18.28 (2016/17), saving £267k. However, increases in the cost of energy and fuel could potentially reverse this downward trend in 2017/18;
- if the DEFRA conversion factors for 2016/17 were used for the current reporting year, the Council's total carbon emissions would have been 57,241tCO_2e, putting us just 446tCO_2e, or 1%, behind our CMP target; and
- achievements and positive changes that have occurred in 2016/17 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 generated income of £980,000 in Renewable Heat Incentive and £57,300 in Feed-in Tariff payments in 2016/17 (see **Appendix 4**);
    c. use of electricity, gas and oil in buildings has decreased 3.8% compared with the baseline year, while biomass use has increased 297% since the baseline year, which has helped reduce the carbon emissions from oil usage by 48% compared to 2011/12;
    d. the Council's investment in biomass has helped to support the region's biomass economy and supply chain;
    e. business travel by staff has decreased 25% in 2016/17 compared to the baseline year, saving £690,324;
    f. business travel by staff in their own car has decreased 27% in 2016/17 compared to the baseline year, saving £549,258;
    g. business travel by staff using hire cars has decreased by 22%, saving £158,766 compared to the baseline year;
    h. significant decreases in fuel consumption by the Council's fleet, reducing carbon

emissions by 12% and costs by £1.14m since the baseline year.

5 Carbon Reduction & Efficiency Projects

5.1 It is important to note that various projects to reduce carbon emissions and energy consumption within the Council's estate are currently underway, and these include the following:

- revise and Update Carbon Management Plan – it will be important to revise and update the Council's Carbon Management Plan to reflect changes in national and international legislation and new DEFRA conversion factors, as well as to help deliver on commitments set out in the Council's new programme. Work is underway to review targets and progress to date, and it is proposed that a new draft CMP be taken to a meeting of The Highland Council for approval in 2018/19;
- Unified Communications – improved room-based video conferencing (VC) solutions have been deployed to various offices including HQ, Inverness Town House, Dingwall, Nairn, Grantown, Kingussie, Fort William, Portree, Golspie, Wick, with a roll-out of a VC desktop service to follow in 2017. This should significantly reduce staff and Member travel to meetings in 2017/18;
- ICT Transformation – the rollout of the new ICT estate will be more efficient, thus reducing carbon emissions and costs;
- Local Voices, Highland Choices – we will seek opportunities to collaborate with colleagues and work with communities in Highland to support the Council's programme commitment in respect of mitigating against and adapting to climate change;
- paper lite committees – new ICT devices have been deployed to all 74 Members, which will remove the need to print and post committee papers for the majority;
- heating system upgrades – there is a continuing programme to replace oil-fired heating systems with biomass boilers across our estate;
- LED Lighting Upgrades – with support from the Carbon CLEVER capital budget, work is underway to upgrade lighting fixtures at HQ and other Council offices which will result in savings of ~£50,000 annually whilst reducing emissions by around 150tCO_2e. Further support for LED upgrades throughout the Council's estate would expedite both financial and carbon savings;
- 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;
- communication with majority of high-consuming Council sites to raise awareness of energy consumption, to encourage energy saving behaviour and the sharing of good practice. There will be three different communication strategies and data gathering exercises focusing on the following:
    - those sites demonstrating <10% increase in energy consumption from the previous financial year;
    - sites where energy use has stagnated; and
    - those who have reduced consumption by more than 10% to help identify good practice which can be rolled out across organisation;
- remote water monitoring pilots – various pilots are underway and are to continue with a view to identifying how these can be integrated into the future target operating model for water monitoring across the estate. If successful, the model could also be extended to include remote energy management, such as adjusting thermostats or turning heating on or off;
- water circulation pilot – an intelligent water circulation pilot will be undertaken at one of our more challenging sites, Newtonmore Primary, to identify if energy savings can be realised. There is potential for this to be extended to other sites, if successful;
- grey fleet review – a peer review of the Council's grey fleet is currently underway to identify opportunities to reduce carbon emissions and costs;
- Green Ambassador Network – work is underway to refresh, re-engage and retrain a Green Team made up of staff throughout the Council estate. This will assist in the delivery of low carbon processes and training to ensure that resource efficiency is

promoted to all staff. Management of the network will be a collaborative undertaking between the Climate Change Team and the Energy and Sustainability Team. There will also be assistance from a number of subject-matter experts throughout the Council's workforce. Recruitment of the new Green Ambassador network is to occur in October 2017, followed by a launch event and training later this year;

- 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 and 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;
- auto-hibernate – the ability to set computers to auto-hibernate after a set period of inactivity to reduce standby energy use from 6w to 0w per hour. No work is lost and device restarts with user login information. A pilot in the school estate has been proposed with details still being finalised with Wipro;
- expedited roll-out of LED street lighting – in 2017/18 additional staff will be employed to expedite the LED Street lighting project rollout;
- Highland Climate Challenge – following a successful pilot at 9 Highland primary schools resulting in a carbon saving of 63tCO_2e, work is underway to enable a wider roll-out of the Highland Climate Challenge, an online application that teaches pupils about energy, sustainability and climate change while motivating them to make reductions to their carbon footprint. Given the high percentage of consumption and emissions which come from the Council's school estate, this tool will be important not only in terms of awareness-raising, but also in achieving measurable cost and emissions reductions; and
- carbon budgeting – The Council is investigating opportunities around establishing service-level carbon budgets to assist with carbon reductions across the estate. Aberdeenshire Council has successfully implemented a carbon budget seeking 5% carbon savings within each of its services.

6 Implications

6.1 Resource

6.1.1 The Carbon CLEVER initiative has been allocated a capital budget of £0.5million per annum from 2016/17 to 2022/23. 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. Many of 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. In addition, the existing Carbon CLEVER capital budget of £500k per annum should be maintained if targets are to be met.

6.1.2 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 2016/17 were £545,726 which is a considerable reduction on the previous year and is largely based on increased biomass use and reduced oil consumption.

6.2 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 annual reporting under the revised Public Bodies Climate Change Duties is now required, and will be reported to Places Committee on 8th November 2017.

6.3 Community (Equality, Poverty and Rural) – There are no Community implications arising from this report.

6.4 Climate Change/Carbon Clever - By reducing its carbon emissions, The Highland Council is helping the region mitigate its impacts on climate change, thus supporting national carbon

reduction targets as set out in the Climate Change (Scotland) Act 2009.

6.5 Risk

6.5.1 Climate change is now recognised as a corporate risk, and it is therefore important that its impacts are properly assessed in the Council's work going forward.

6.5.2 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, as well as community schools, will inevitably lead to more consumption.

6.5.3 As a result of the decision at Community Services Committee on 3 November 2016 to bring grass cutting services in-house for 2017/18, it is anticipated that there will be a significant increase in fleet fuel usage as well as vehicle and equipment hire costs from 2017/18 onwards.

6.5.4 As of July 2017, charging for domestic brown bin collections was introduced. It is anticipated that less green waste will now be collected, as approximately only 50% of households have taken up this scheme to date. Whilst householders have the option to take their green waste to recycling centres, there is a risk green waste will end up in the landfill collections, and the recycled/composted tonnage will reduce. This will have an impact on emissions as well as an increase in landfill tax.

6.6 Gaelic - There are no Gaelic implications arising from this report.

Designation: Director of Development and Infrastructure

Date: 19 October 2017

Authors: Heidi de Haas, Climate Change Coordinator
Keith Masson, Climate Change Officer

Background Papers: Carbon Management Plan 2013-2020

Background Data:
Energy use in buildings: Eddie Boyd, Eric Dodd, Michael O'Donnell, Michael Fraser, Richard Bamborough, Alison McDonald
Staff travel: Marie Eadie, Anne McLean, Lynsey Graham
Waste: Andy Hume
Fleet: Susan Morrison, Colin Duncan, Linda Munro, Jonathan Saxby
Street lighting: John Allan
Water: Michael O'Donnell

Appendix 1

Highland Council carbon emissions, 2011/12 to 2016/17

	CO_2e emissions (tonnes)						Change in CO_2 emissions
	Baseline 2011/12	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2011/12 – 2016/17**
Energy Use in Buildings							
Electricity	27,440	28,349	28,066	28,697	29,421	27,841	1%
Gas	4,235	5,569	4,805	5,340	5,506	6,755	60%
Oil	11,219	10,197	7,460	8,760	7,680	5,828	-48%
Total:	**42,894**	**44,115**	**40,330**	**42,797**	**42,608**	**40,424**	**-6%**
Staff Business Travel							
Business Miles	1,873	1,548	1,409	1,339	1,241	1,339	-29%
Lease Miles	294	312	328	312	319	333	13%
Training Miles	58	77	66	68	48	0	-100%
Equivalent Car Hire Miles	236	176	143	137	164	158	-33%
Member Miles	148	131	131	119	129	117	-21%
Support Workers	10	9	10	4	13	14	40%
Re-located Miles	121	91	70	75	52	43	-64%
Car Hire	385	363	493	267	296	300	-22%
Bus and Coach	3	4	10	3	1	2	-33%
Ferry	1	2	1	1	1	0	-100%
Plane	40	41	67	20	35	39	-3%
Taxi	0	0	0	0	0	0	0%
Train	33	29	48	36	30	31	-6%
Total:	**3,200**	**2,783**	**2,776**	**2,381**	**2,329**	**2,376**	**-26%**
Fleet							
Petrol	79	80	79	69	62	62	-22%
Diesel	8,469	8,117	7,721	7,530*	7,679*	7440	-12%
Gas Oil	886	1255	959	1,027	1,702	814	-8%
Total:	**9,459**	**9,452**	**8,759**	**8,626***	**9,443***	**8,316**	**-12%**
Internal Waste							
Landfill waste (non-schools)	372	360	416	581	395	409	10%
Mixed recycling (non-school)	4	5	5	8	5	6	50%
Landfill waste (schools)	874	691	815	814	808	812	-7%
Mixed recycling (schools)	13	10	11	11	12	12	-8%
Total:	**1,262**	**1,065**	**1,247**	**1,414**	**1,220**	**1,238**	**-2%**
Street Lighting	**9,591**	**9,885**	**9,792**	**10,025**	**9,902**	**9,128**	**-5%**
Water	**412**	**370**	**496**	**478**	**538**	**538****	**31%**
TOTAL	**66,818**	**67,670**	**63,401**	**65,721**	**66,040**	**62,020**	**-7%**

	Emissions increase

* Updated to include VECTEC figures previously not included.

**Estimated data

Appendix 2

Costs associated with carbon emissions, 2011/12 to 2016/17

	Cost (£)						Change in cost (%)
	Baseline 2011/12	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**2011/12–2016/17**
Energy Use in Buildings							
Electricity	4,805,674	5,464,789	6,027,834	6,285,356	6,474,910	6,298,774	31%
Gas	559,027	831,775	845,305	880,250	839,900	777,531	39%
Oil	3,045,328	2,791,681	1,817,258	1,758,067	1,105,880	1,092,088	-64%
Total:	**8,410,029**	**9,088,245**	**8,690,397**	**8,923,673**	**8,420,690**	**8,168,393**	**-3%**
Staff Business Travel							
Business Miles	2,273,554	2,258,071	2,062,180	1,949,511	1,570,891	1,950,074	-14%
Lease Miles	120,368	131,245	137,449	124,704	106,687	98,180	-18%
Training Miles	39,164	51,862	44,939	45,937	32,786	137	-100%
Equivalent Car Hire Miles	228,372	72,964	136,487	61,661	158,892	157,069	-31%
Member Miles	198,506	188,084	187,145	170,140	185,262	167,380	-16%
Support Workers	14,692	12,310	14,466	5,498	19,179	20,294	38%
Re-located Miles	85,512	63,692	49,098	55,192	37,524	17,467	-80%
Car Hire	557,649	429,686	696851	363,063	443,371	398,883	-28%
Bus and Coach	3,105	4,925	10,090	1,824	881	1,024	-67%
Ferry	3,610	3,170	5012	3243.22	4,271	2,167	-40%
Plane	44,168	40,644	81,931	30,564	32,388	40,649	-8%
Taxi	164	462	110	314	365	69	-58%
Train	55,317	59,801	151,606	77,407	73,283	86,362	56%
Total:	**3,624,181**	**3,316,916**	**3,577,364**	**2,889,058**	**2,665,780**	**2,939,755**	**-19%**
Fleet							
Petrol	39,134	39,953	38,789	38,842	25,745	25,729	-34%
Diesel	3,664,896	3,542,508	3,302,019	2,789,058	2,655,095	2,614,911	-29%
Gas Oil	207,936	288,929	212,259	187,046	319,410	128,497	-38%
Total:	**3,911,966**	**3,871,390**	**3,553,067**	**3,014,946**	**3,000,250**	**2,769,137**	**-29%**
Internal Waste (collection and disposal costs, not including landfill tax)							
Landfill waste (non-schools)	170,520	173,027	230,042	347,193	242,563	256,240	50%
Mixed recycling (non-school)	24,462	44,185	56,818	91,431	62,301	64,610	164%
Landfill waste (schools)	370,716	381,160	458,362	511,239	508,957	522,226	41%
Mixed recycling (schools)	113,824	109,036	128,972	136,542	141,741	149,190	31%
Total:	**679,521**	**707,407**	**874,194**	**1,086,406**	**955,563**	**992,266**	46%
Street Lighting	**1,794,867**	**2,316,706**	**2,270,227**	**2,216,616**	**2,195,501**	**2,105,156**	17%
Water *	**1,667,973**	**1,662,253**	**1,533,631**	**1,203,921**	**1,313,163**	**1,313,163**	-21%
TOTAL	**20,088,537**	**20,962,917**	**20,498,880**	**19,334,620**	**18,550,947**	**18,283,584**	-9%
CRC tax	479,441	453,450	424,560	710,143	702,343	545,726	14%

Cost increase

*water data unavailable for 2016/17 so estimate based on 2015/16 figures

Appendix 3

Highest Energy Consuming Buildings (electricity, gas and oil), 2016/17.

	Building[1]	Total consumption (kWh)	% Total Highland Council*
1.	Inverness Leisure[2]	**9,793,480**	9.79
2.	Alness Academy	**3,244,772**	3.24
3.	Wick High School	**2,850,393**	2.85
4.	Highland Council Headquarters	**2,670,362**	2.67
5.	Charleston Academy	**2,369,708**	2.37
6.	Nairn Academy	**2,219,937**	2.22
7.	Tain Royal Academy	**2,140,801**	2.14
8.	Inverness High School	**2,097,420**	2.10
9.	Grantown Grammar School	**1,785,502**	1.78
10.	Lochaber High School	**1,522,678**	1.52
	Total	**30,695,053**	**30.48**

[1]List excludes PPP properties
[2]2016/17 is the first year we have reported on Inverness Leisure emissions, as per para 2.4.
*Total electricity, oil, and gas consumption in 2016/17 was 100,036,715 kWh (excluding PPP properties).

Appendix 4

Detailed Breakdown of Performance Against CMP Targets

Energy use in buildings

Given that energy use in our buildings accounts for 63% of total annual emissions, progress in this sector is vital if the overall targets of the CMP are to be achieved. In 2016/17, carbon emissions related to energy use in buildings decreased by 4.4% (2,185 tCO_2e) relative to 2015/16, Appendix 1. Over the baseline year of 2011/12, emissions from energy use in buildings have decreased 5.7% (2,471 tCO_2e). Note that this decrease is despite the inclusion of Inverness Leisure within reporting for the first time, as referenced at para 2.4.

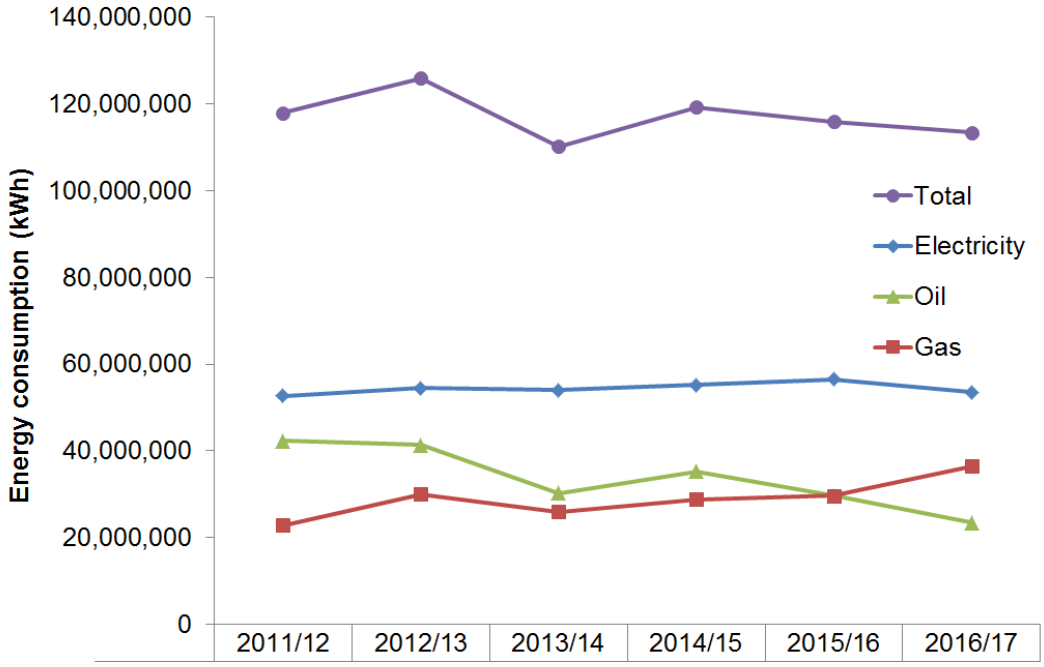

Figure 4: Energy consumption in buildings, by fuel type, 2016/17

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 11.8% 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 2.9% in 2016/17 compared to 2015/16, and is 10.7% higher than the baseline year (2011/12). Despite monthly meetings between Council officers and facilities staff from the PPP properties, there is little impact on overall consumption and emissions. Going forward, the Climate Change team will regularly attend these meetings to try to bring down consumption and emissions.

The effect of fluctuations in the cost of energy can also be noted in the CMP data. For example, electricity usage has increased by 1.5% between 2011/12 and 2016/17, but costs have increased by 31% 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 budgetary pressures on the Council, and increased emphasis and leadership is required to support reduced 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 2016/17, 24% of the energy used in the Highland Council's buildings came from biomass heating. Since 2011/12 carbon emissions from oil use have reduced by 49%, and costs from purchasing heating oil have decreased by £2,041,601. This investment in biomass has helped to support the region's biomass economy and supply chain.

The Council has over 21MW installed capacity of renewable energy technologies in its estate, as noted in Table 2. The Council generated income of £980,000 in RHI (Renewable Heat Incentive) and £57,300 in FIT (Feed-in Tariff) payments in 2016/17 as a result of these installations. FIT payments have reduced as two of the sites were lost in building works (Inverness Royal Academy and Wick High School) and though the new replacement systems may have the same capacity, they are not eligible for the same level of funding.

Table 2: Highland Council Installed Renewables, 1st April, 2017.

Renewable Energy Technology	Installed Capacity (kW)
Biomass	20,214
Ground Source Heat Pump	490
Solar Photo Voltaics	464
Wind	6
Air Source Heat Pump	349
Solar Thermal	25
Total	**21,548**

Notable projects completed this year to improve energy efficiency and reduce reliance on fossil fuels include the installation of biomass heating systems at Kinlochbervie, Gairloch Primary and Secondary, Culloden Library & Centre, as well as Dingwall, Bridgend, Alness, Rosebank, Obsdale, Alness, Bonar Bridge & Farr (Bettyhill) Primaries.

More than 165 daily readings from biomass boilers, (with some sites having more than one boiler) are obtained via an ISTA system, and there has been continued growth in our automatic meter reading system. These measures, coupled with staff engagement and behaviour change initiatives, will save the Council money on future energy bills, whilst generating income through RHI payments. By replacing expensive electric heating systems with alternatives, such as the combined heat and power system installed in Drakies and Crown Primaries and the air source heat pump installed at Phipps Hall in Beauly, there will also be a reduction in the Council's CRC payments, contributing to cost savings.

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 2016/17 indicates it was a particularly mild winter (see Figure 5), and based on temperature alone, heating demand should be less in 2016/17 than 2015/16. In addition, rainfall in Highland over winter 2016/17 was also significantly lower than average (see Figure 6). With a

mild and dry winter, energy consumption in buildings would be expected to be lower, and this has been reflected in the consumption data for 2016/17.

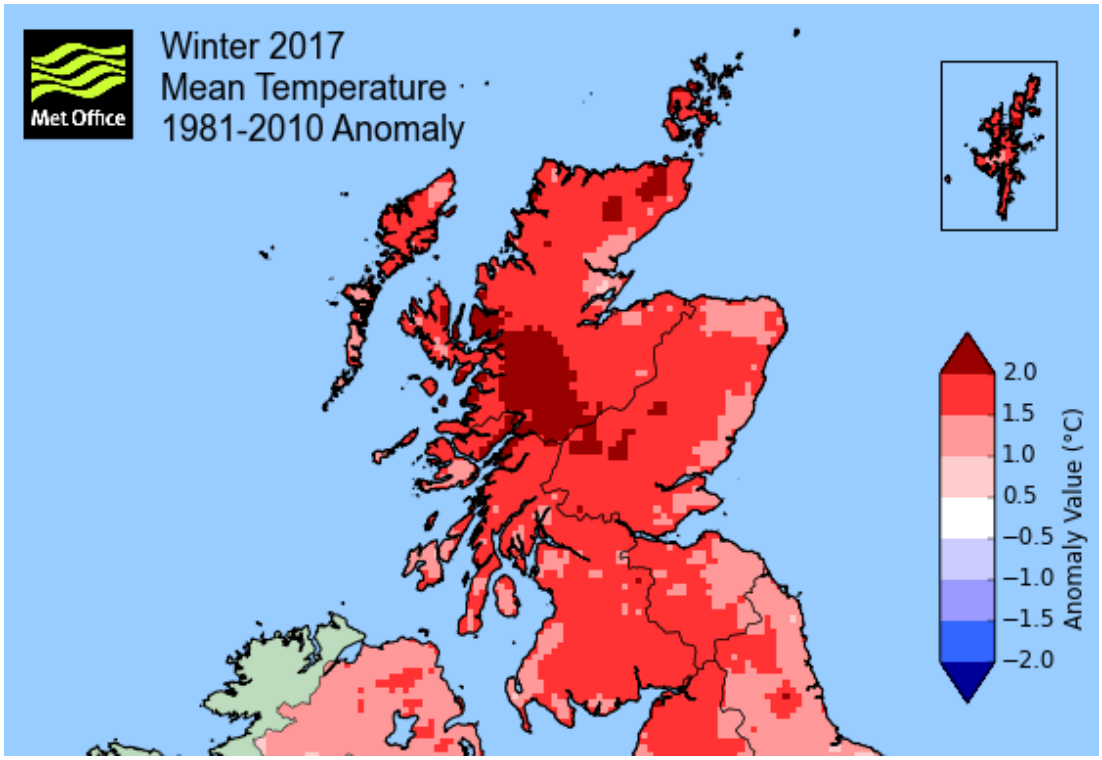

Figure 5. Temperature map for North of UK for Winter 2016/17 (December, January and February).

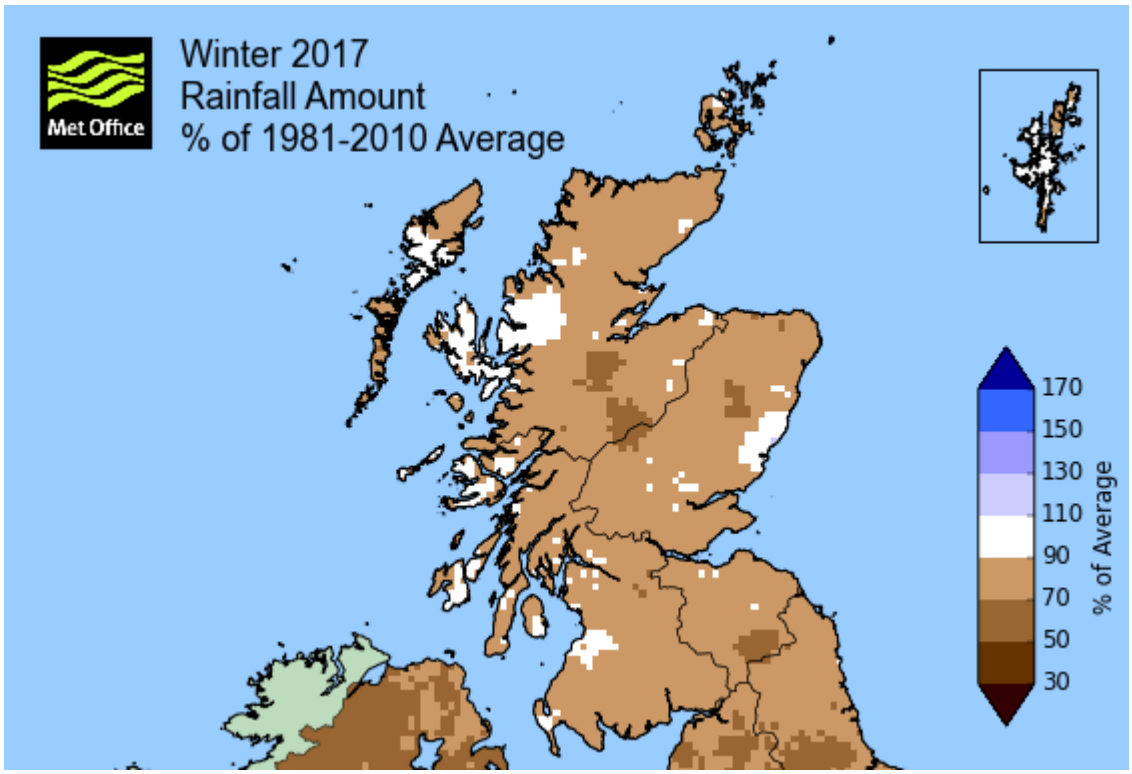

Figure 6. Rainfall map for the North of UK for Winter 2016/17 (December, January, and February).

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. Employee

engagement in resource efficiency and carbon reduction can help change behaviour in the workplace, to help reduce unnecessary energy consumption, cut carbon emissions and realise significant savings. However, 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 there are no direct incentives to reduce consumption on a site-by-site basis. 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 as well as the creation of a Member-led Climate and Energy Working Group, has been undertaken by the Climate Change team, and these initiatives will be a priority going forward in collaboration with colleagues from the Energy & Sustainability team.

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 30.48% of the Council's total electricity, gas, and oil consumption, can be found in **Appendix 3**. Eight of these ten buildings are schools, with the others being Highland Council HQ and Inverness Leisure. By focusing on these ten buildings, nearly one third of the Council's energy consumption from oil, gas and electricity in buildings can be targeted.

Energy data captured for each Council site allows comparison for year-on-year consumption, so the sites which are reducing their energy consumption as well as sites increasing energy consumption can be effectively monitored. Through an awareness raising campaign, officers will be contacting Responsible Premises Officers (RPOs) for sites and engaging with them based on which of three different groupings their building falls under:

- over 10% increase in energy consumption from the last financial year,
- stagnation of energy consumption, and
- more than 10% decrease in energy consumption.

The Council also holds data on the expected energy performance of its buildings. Analysis of this data could indicate how buildings are performing against expectations, 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	• Provide better heating controls • Implement limits on changes to heating systems • Move to more efficient heating

	• Limit use of supplementary heaters • Ensure heaters are not blocked or covered • Train Responsible Premises Officers to spot opportunities to reduce demand.	types • Fit door closers • Draught proofing
Power	• Limit appliances • Switch off appliances and computers when not in use • Reduce consumption during TRIAD periods to minimise costs in the next financial year • Educate staff about associated costs of running equipment	• 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 2017/18 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 and expensive oil heating systems with renewable alternatives. In 2016/17, £3.64m was spent by the Council on energy improvement measures. Many of these projects are spend-to-save initiatives, saving the Council future revenue costs and reducing exposure to pricing fluctuations in respect of electricity, gas and oil.

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 2.9% in 2016/17, compared to 2015/16, and is 10.7% higher than the baseline year (2011/12). This situation will continue to be monitored, and a programme of engagement developed to reverse this trend.

Staff Travel

Staff travel mileage has decreased by 25% (2,349,860 miles) from 10,473,109 miles (2011/12) to 7,813,349 miles (2016/17). However, this figure represents a 2% increase in mileage over 2015/16. Business travel by staff in their own cars ('grey fleet' mileage) was 27% lower (2,349,860 miles) in 2016/17 than the baseline year, saving £549,258. However, there was a 2% increase in grey fleet use from the previous year which also resulted in a 14% increase in cost. This situation should continue to be monitored, and managers should ensure that all staff follow the Council's travel hierarchy.

Various reporting changes within Integra have been identified, and certain codes are no longer in use. For example, essential car users are now reporting all mileage as business travel, regardless of whether their travel is for training. This can account for some of the increase in business travel and the associated reduction in training miles compared to the data for 2015/16.

Staff travel by public transport and by hire car has decreased by 18% since 2011/12, with costs having reduced by £141,066 (21%). 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 1% in 2016/17 compared to 2015/16, but with an associated decrease in costs of 5% (£29,692). Car hire mileage has reduced 22% (266,037 miles) saving £158,766, a 28% reduction in costs compared to 2011/12. However, there was an increase in car hire mileage of 12,273 miles (1%) compared to 2015/16, but with a decrease in costs of £44,488 (10%). 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 decreases in fuel consumption by the Council's fleet in 2016/17, resulting in a 12% reduction in carbon emissions compared to 2011/12. As mentioned at para 2.7, it should be noted that the fleet figures reported in 2014/15 and 2015/16 did not include diesel use from the VECTEC diesel card system used by a number of fleet staff. However, these figures form part of the Council's overall consumption, and the associated emissions and costs have been updated at Appendices 1 and 2 to provide accurate like-for-like comparisons. Fleet fuel spend has reduced by £1,142,829 compared to 2011/12. Falling fuel prices will likely have contributed to the decrease in costs. Diesel use, which contributes the majority of fleet carbon emissions, has fallen 12% compared to 2011/12.

Gas oil consumption was 52% lower in 2016/17 compared to 2015/16 (8% decrease compared to 2011/12). The reduction in gas oil consumption is due to the use of multi-use vehicles, which are generally LGV's and run on white diesel. In addition, the milder winter conditions in 2016/17 resulted in fewer dedicated gritters being required. Gas oil is used to fuel the gritting fleet, with winter conditions largely dictating gas oil use each year.

The reintroduction of the grass cutting service back into Council services in November 2016 is anticipated to significantly increase fleet use and associated carbon emissions in the current financial year (17/18).

Community Services are seeking to manage hire requests from a central location (similar to the travel desk arrangement) to reduce any unnecessary hires and to identify where purchases of vehicles and equipment would be cost effective.

Waste

Both waste going to landfill and recycling volume from Council sites have decreased by 1% compared to the baseline year of 2011/12. Landfill waste arisings from non-school properties has seen the largest increase of 3% compared to 2015/16, but a 10% increase compared to the baseline year, with costs increasing by £85,721 compared to 2011/12. In comparison, recycling rates have increased from non-school properties with an increase of 10% compared to 2015/16, but a 33% increase compared to the baseline year, with costs increasing by £40,148 compared to 2011/12.

There has been a slight increase in the total CO_2e from waste management, largely due to some premises being missed from previous year's reporting (mostly HLH sites). Some sites had been wrongly coded as non-schools, but this has now been corrected.

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 2016/17 have decreased 8% (774 tCO_2e) compared to 2015/16, 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.

The street lighting LED program is due to be delivered by 2019 with approximately 80 to 90% of lighting stock being converted, delivering an energy saving of 50%. Currently, around 28% of the street lighting estate has been converted and increased installation rates in 2017/18 will be achieved through temporary fixed term operatives to aid delivery.

LED street lights typically save 40-60% of the energy used by conventional sodium lights. It is estimated that by the end of the LED street lighting project, approximately £1 million will be saved per year in reduced energy costs, based on 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 2017/18 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
The Council's water supplier Anglian Water is having an ongoing software issue with their online reporting, affecting all local authorities supplied by the company. The Highland Council therefore has no verifiable consumption data for any sites, nor for the overall usage for the 2016/17 financial year. Figures from 2015/16 have been replicated for 2016/17 reporting and an update will be provided for Members once the issue has been resolved.

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 13,954 Council houses, 55 more than 2015/16. Total carbon emissions related to energy use was estimated to be 52,297 tCO_2e in2015/16. Housing now manage the Energy Performance Certificates contract but did not undertake any analysis on these during 2016/17 – therefore, the emissions estimate remains the same as in 2015/16.

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

The 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 67% compliant with EESSH. The Council is investing £8.5m in 2017/18 towards improving the energy efficiency of its housing stock and is planning to spend an additional £14.8m in 2018-21.

Municipal and Household Waste

In 2016/17, 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 2016/17. Municipal waste going to landfill has decreased by 7,347 tonnes (8%) compared to the 2011/12 baseline year. Despite accounting for only 55% of waste by volume, landfilled waste accounts for nearly 95% of carbon emissions arising from waste. The recent expansion of the types of waste included in kerb-side recycling in 2015/16 will, however, help to further reduce the amount of landfilled waste in the future.

The waste sent for Energy from Waste (EfW) is still a very small proportion of total waste arisings. More waste was sent to Shetland and Middlesbrough EfW plants in 2016/17 than the previous year. There are no contracts for these end destinations and the Council's waste teams can only ship material when they have capacity and when the transport arrangements work out to the Council's advantage.

The recent changes to green waste (brown bin) collections is expected to have an impact on the recycled/composted figure in 2017/18 and potentially the landfill figure, as some residents may include their green waste in the landfill (green bin) collections.

Table 4. Municipal and household waste emissions, 2016/17.

Household waste				
Waste and treatment	**Weight**		**Carbon emissions**	
	(tonnes)	**(%)**	**(tonnes)**	**(%)**
Recycled/Composted	59,368	45.16	1,247	5.64
Landfilled	71,960	54.74	20,868	94.35
Energy from Waste	134	0.10	3	0.01
Total	**131,462**		**22,118**	
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	60,973	42.36	1,280	5.07
Landfilled	82,709	57.46	23,986	94.91
Energy from Waste	252	0.18	5	0.02
Total	**143,934**		**25,271**	