

Transport and Environment Committee

10.00am, Thursday, 27 February 2020

Carbon Impact of Waste

Executive/routine	
Wards	All
Council Commitments	18,25

1. Recommendations

- 1.1 Committee is asked to note the contents of this report and in particular note that the Council's waste and cleansing services are designed in line with best practice and that the carbon impact of Edinburgh's household waste is lower than the Scottish average.

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Carbon Impact of Waste

2. Executive Summary

- 2.1 The report explains the links between the Council's waste management strategy and carbon management in line with the Motion to Transport and Environment Committee outlined in Section 3, in view of the declaration of a climate emergency.

3. Background

- 3.1 The report responds to the following motion by Councillor Burgess to Transport and Environment Committee on 16 May 2019.
- 3.2 "Committee: Notes the decision of Corporate, Policy and Strategy committee on 14 May in response to the climate emergency to agree "the target of working towards a net-zero carbon target by 2030;
- 3.3 Recognises that the generation and disposal of waste is a significant source of climate-changing pollution;
- 3.4 Therefore in response to the new 2030 net-zero carbon target, call for a report on minimising climate-changing pollution from waste."
- 3.5 This report deals only with waste managed by or for the Council. It does not include waste generated and managed in Edinburgh's wider economy. Separate work is being led by the Council's Strategy and Insight team to deliver on the Council's wider commitment for Edinburgh to be carbon neutral by 2030.

4. Main report

- 4.1 The Council signed Scotland's Climate Change Declaration on 16 January 2007, but more recently has set itself a target of working towards zero carbon by 2030. The Council's waste strategy covers the period from 2010-2025 but was comprehensively reviewed and approved by this committee on 9 August 2018, and both documents are published on our website (Section 8).
- 4.2 The Council's strategy is based on those principles widely accepted as the most appropriate to manage waste, the waste hierarchy. This puts prevention of waste as

the most preferred option followed by reuse. Recycling and energy recovery follow, while landfill and disposal are the least preferred options.

- 4.3 The actions outlined in the waste strategy encompass all of these, as well as other Council waste related activities such as education, enforcement, cleanliness and litter.
- 4.4 The Council's primary focus is on managing the waste which is produced and for which it is responsible. That is its statutory obligation. It does this through the provision of comprehensive recycling facilities, as well as diverting residual waste from landfill to energy recovery.
- 4.5 The Council has limited direct powers to prevent waste arising in the first place, which would be the most effective way to limit carbon impact. It has no control, for example, over what products are placed on the market. This requires action across society, and from all stakeholders.
- 4.6 Prevention and reuse are, nevertheless, still delivered at the Council level through education initiatives and financial support for third sector organisations such as Changeworks (who deliver a range of activities including the Council's waste education programme) and The Remakery, who provide public training workshops, as well as direct diversion of waste through upcycling. These activities sit alongside responsibilities which must be delivered by other stakeholders, including government, manufacturers and retailers as well as individual consumers.
- 4.7 Significant changes are being developed at both the Scottish and UK governmental levels which will influence and support these activities and objectives.
- 4.8 The launch of the Scottish Deposit Return Scheme for most drinks bottles and containers is forecast to remove 4 million tonnes of carbon dioxide equivalent out of the environment over 25 years, through increased levels of recycling Scotland wide, although it should be noted that as these materials will not be recycled by Councils themselves, these will no longer count towards our own recycling performance.
- 4.9 The UK wide review of Producer Responsibility legislation in relation to packaging is taking place in parallel and is expected to see the waste producers contribute significantly more towards the cost of managing the waste they create, while at the same time it is hoped to drive use of more easily recyclable materials.
- 4.10 The Council has constructively engaged with both consultations, although the outcome of the latter will be delayed by the wider UK political situation.
- 4.11 Finally in November 2019, the Scottish Government launched its consultation on the Circular Economy Bill, and the Council has responded in support of measures to prevent waste.

Achievements to date

- 4.12 Between 2010 and 2018 when the waste strategy was reviewed, the city's household numbers grew by more than 11%, but the amount of waste managed by the Council fell by more than 10%. Recycling tonnage increased by 25% and landfill tonnage fell by nearly 30%.

- 4.13 This was prior to the opening of the reprocessing facility at Millerhill which is reducing landfill use further. Around 90% of Edinburgh's household residual waste is now sent for a source of reprocessing rather than straight to landfill.

Carbon metric versus tonnage

- 4.14 Waste is measured by tonnages, and recycling performance and targets are set according to percentages of the tonnages recycled. This is a better measurement than volume as it provides a guide to the amount of "resource" within a product. This is important as some bulky products such as plastic containers are mainly air (by volume) and but may contain relatively few resources.
- 4.15 What this method does not do is account for the differing impacts of different materials or products. Metal packaging is often light, but extremely energy intensive to produce and so has a greater overall environmental impact than its weight would suggest. Manufactured goods will (per tonne) have a greater environmental impact than garden waste, which grows naturally with little external input.
- 4.16 In Scotland the Scottish Government previously developed a "carbon metric" (Appendix 1) as an alternative way to capture these issues. This does not cover all materials but for the most common it seeks to estimate a "carbon metric weighting" to account for the carbon impact of the product. This can then be combined with the weight of the product to calculate a carbon impact. This shows for example that the relative impact of clothing and textiles is high compared to other materials due to the wide range in inputs which result in its manufacture.
- 4.17 The carbon metric estimates the displacement of carbon emissions resulting from using a recycled material instead of a virgin one. It is based on lifecycle estimates and assumptions and is used at a national level but is not comprehensive and is described as not suitable for changing the materials used by businesses or householders.
- 4.18 Neither system (tonnage or carbon metric) can be used to fully reflect all environmental impacts associated with a material, but in Autumn 2019 the Scottish Environment Protection Agency published its analysis of Scottish household waste carbon impacts for the first time, using data for the year 2018.
- 4.19 This revealed that Edinburgh's household waste arisings per person and carbon impact per person both fall below the Scottish average. (Appendix 2), although because of Edinburgh's larger population size the total contribution is of course greater. At 0.95 kg of carbon dioxide equivalent per person, the latter is more than 10% lower than the Scottish average (1.06 kgCO₂e/ person).

Shape of recycling, and collection services and use of energy recovery to minimise landfill

- 4.20 The Council's collection services are designed to incorporate the principles associated with carbon efficiency.

- 4.21 Food waste is collected separately from garden waste and reprocessed using an anaerobic digestion (AD) process which is the most efficient method in carbon terms (a factor of 4.35 versus 2.10).
- 4.22 Glass is collected as a single stream, but separate from other materials, and reprocessed at Viridor's dedicated plant in Lanarkshire where it can be colour sorted to maximise the amount which can be recycled into new bottles and jars. This provides a greater carbon benefit (closer to a factor of 2.78) than reprocessing mixed glass as aggregate (1.58).
- 4.23 Edinburgh's collection services are also configured to drive the desired behaviour. In kerbside collection areas, the service is designed as an integrated whole. Food is collected weekly, and most materials are collected on alternate weeks to encourage participation in recycling, while the size of the standard household waste bin has gradually been reduced from 240 litres per week to 140 litres per fortnight, as recycling services have developed.
- 4.24 The communal bin review will significantly expand the recycling service availability in those areas and will better integrate the capacity provided to recycle into the overall communal bin service.
- 4.25 Collection rounds are rerouted on a regular basis as the city changes. This minimises the environmental impact of collections in terms of fuel consumption, while the use of alternate fuelled vehicles is being developed by the Council on a corporate basis. The use of telematics is also expected to help us better understand and manage carbon emissions from vehicles in the Cleansing service.
- 4.26 The development of the energy recovery facility at Millerhill means that waste which was previously treated as landfill is now used as a resource, so that energy is generated. This replaces emissions elsewhere in the energy supply industry and provides for the reuse of waste heat from the combustion process as the surrounding area develops. The facility also removes and recycles metals from the residual waste stream which provides a further environmental benefit.

5. Next Steps

- 5.1 The Council's waste and cleansing strategy has been in place since 2010; the planned activities set out in it, and in the review, are a combination of projects with a defined end date as well as activities which must be carried out on an ongoing basis to deliver the strategy's objectives. Progress against these will be reviewed annually by the Waste and Cleansing management team.

6. Financial impact

- 6.1 There are no direct financial implications resulting from this report.

7. Stakeholder/Community Impact

- 7.1 The Council has engaged as a consultee in the development of both the Scottish Deposit Return Scheme for drinks containers, and the UK wide review of packaging producer responsibility legislation. It is also engaging in the Scottish Government's consultation on the Circular Economy Bill.
- 7.2 The waste strategy has been comprehensively reviewed within the last year, and progress against the objectives set out therein will be reviewed annually by the Waste and Cleansing management team.
- 7.3 The primary focus of the waste strategy is to set out how the Council will fulfil its obligation to manage the waste it has to deal with, now primarily by recycling and energy recovery, but it also sets out a range of activities which support the sustainability and carbon reduction agendas through prevention of waste at source, reuse, cleansing, education and enforcement.

8. Background reading/external references

- 8.1 The Council's waste strategy, and the review of that strategy are published on the Council website.
www.edinburgh.gov.uk/info/20204/council_planning_framework/413/waste_strategies
- 8.2 Background on the carbon metric is available at:
www.zerowastescotland.org.uk/research-evidence/carbon-metric-summary-report
and www.gov.scot/publications/scotlands-zero-waste-plan-carbon-metric-guidance/
- 8.3 SEPA's analysis of household waste arisings is available at:
www.sepa.org.uk/media/469650/2018-household-waste-commentary.pdf

9. Appendices

- 9.1 Appendix 1: Carbon Metric Weightings for Different Materials
- 9.2 Appendix 2: Scottish Household Waste Generated and Managed per person in 2018 - Summary Data

Carbon Metric Weightings for Different Materials

Waste Stream	Carbon Metric Weighting	Waste Stream	Carbon Metric Weighting
Textiles	100.00	Board	5.83
Textiles and Footwear	84.70	Mixed paper and board	5.68
Aluminium cans and foil	65.87	Paper	5.23
Footwear	31.17	Books	5.23
Mixed Cans	27.80	Mineral Oil	5.15
Scrap Metal	16.07	WEEE - Fridges and Freezers	4.66
Steel Cans	12.25	Food and Drink Waste (wet AD)	4.35
PET (incl forming)	12.12	Food and Drink Waste (Composting)	3.48
WEEE - Small	10.54	Batteries (Post Consumer Non Automotive)	3.46
WEEE - Mixed	9.77	Glass (colour separated)	2.78
WEEE - Large	9.00	Mixed Food and Garden Waste (dry AD)	2.70
PS (incl forming)	8.81	Garden Waste (dry AD)	2.35
Wood	8.70	Mixed Food and Garden Waste (Composting)	2.10
Average Plastics	8.57	Garden Waste Composting	1.81
Average plastic rigid (incl bottles)	8.56	Glass (mixed colours)	1.58
HDPE (incl forming)	8.25	Plasterboard	0.99
LDPE and LLDPE (incl forming)	7.80	Aggregates (Rubble)	0.03
Average plastic film (incl bags)	7.65	Furniture	0.00*
PP (incl forming)	6.74	Paint	0.00*
PVC (incl forming)	6.31	WEEE - Fluorescent Tubes	0.00*

*Weightings for these materials and others are to be confirmed through further technical analysis so are currently set at 0.00

Source: www.gov.scot/publications/scotlands-zero-waste-plan-carbon-metric-guidance/

Scottish Household Waste Generated and Managed Per Person in 2018-Summary Data

Local Authority	Generated (tonnes per person)	Recycled (tonnes per person)	Other diversion from landfill (tonnes per person)	Landfilled (tonnes per person)	Carbon Impact (TCO _{2e} per person)
Aberdeen City	0.38	0.18	0.12	0.08	0.87
Aberdeenshire	0.46	0.20	0.01	0.25	1.18
Angus	0.47	0.26	0.19	0.02	0.97
Argyll and Bute	0.56	0.21	0.09	0.26	1.38
City of Edinburgh	0.37	0.14	0.03	0.19	0.95
Clackmannanshire	0.51	0.29	0.01	0.21	1.04
Dumfries and Galloway	0.53	0.15	0.15	0.24	1.53
Dundee City	0.41	0.15	0.23	0.03	1.00
East Ayrshire	0.44	0.23	0.04	0.17	0.97
East Dunbartonshire	0.48	0.26	0.09	0.12	1.03
East Lothian	0.47	0.25	0.02	0.20	1.05
East Renfrewshire	0.46	0.31	0.01	0.14	0.94
Falkirk	0.43	0.22	0.02	0.19	0.97
Fife	0.45	0.23	0.03	0.19	0.91
Glasgow City	0.39	0.10	0.03	0.27	1.17
Highland	0.54	0.23	0.03	0.28	1.35
Inverclyde	0.36	0.20	0.02	0.14	0.74
Midlothian	0.46	0.27	0.06	0.13	1.01
Moray	0.50	0.29	0.00	0.21	0.96
Na h-Eileanan Siar	0.53	0.12	0.07	0.35	1.41
North Ayrshire	0.45	0.25	0.05	0.16	1.04
North Lanarkshire	0.43	0.19	0.06	0.18	1.04
Orkney Islands	0.46	0.10	0.22	0.12	1.22
Perth and Kinross	0.47	0.25	0.03	0.20	0.93
Renfrewshire	0.46	0.22	0.14	0.10	1.07
Scottish Borders	0.46	0.18	0.01	0.27	1.16
Shetland Islands	0.42	0.04	0.28	0.09	1.35
South Ayrshire	0.50	0.26	0.06	0.18	1.11
South Lanarkshire	0.47	0.21	0.04	0.23	1.13
Stirling	0.44	0.24	0.00	0.20	0.93
West Dunbartonshire	0.47	0.20	0.05	0.22	1.15
West Lothian	0.41	0.27	0.04	0.10	0.83
Total Scotland	0.44	0.20	0.05	0.19	1.06

Source: www.sepa.org.uk/media/469650/2018-household-waste-commentary.pdf

Note: The carbon impact of mixed residual household waste is based on a national waste composition study and therefore does not reflect any difference in waste composition which may exist between local authorities.