



The Carbon Footprint of Scotland's Household Waste

2019 Household Carbon Metric Brief



European Union



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Investing in a Smart, Sustainable and Inclusive Future

Zero Waste Scotland exists to lead Scotland to use products and resources responsibly, focusing on where we can have the greatest impact on climate change.

Using evidence and insight, our goal is to inform policy, and motivate individuals and businesses to embrace the environmental, economic, and social benefits of a circular economy.

We are a not-for-profit environmental organisation, funded by the Scottish Government and European Regional Development Fund.

Find out more at <https://www.zerowastescotland.org.uk/>

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Written by: Ramy Saleemdeen (Zero Waste Scotland)

Reviewed by: Michael Lenaghan (Zero Waste Scotland)

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Key Findings

The Scottish Carbon Metric measures the whole-life carbon impacts¹ of Scotland's waste, from resource extraction and manufacturing emissions, right through to waste management emissions, regardless of where in the world these impacts occur. This report summarises the carbon impacts of Scotland's 2019 household waste using the latest Scottish Environment Protection Agency (SEPA) published waste data². For more information about the Carbon Metric and its methodology, see the latest Carbon Metric Technical Report on the Zero Waste Scotland website³.

Scotland's Household Waste and its Carbon Impacts in 2019

In 2019, Scottish household waste increased by 0.7% to 2.4 million tonnes however, the household waste recycling rate was 44.9%⁴, up from 44.7% in 2018. What's more, the carbon impacts of Scotland's household waste fell by 1.6% (~94,400 tonnes CO₂ eq.) from 2018, resulting in the lowest recorded carbon impacts for household waste since Carbon Metric reporting began in 2011, at 5.7 million tonnes of carbon dioxide (Mt CO₂ eq.).

2019 household waste was 7% (approximately 185,000 tonnes) below the 2011 baseline (Figure 1). The reduction in waste arisings between 2011 and 2019 has led to carbon savings of approximately 1.1 million tonnes (-16%) as shown in Figure 2.

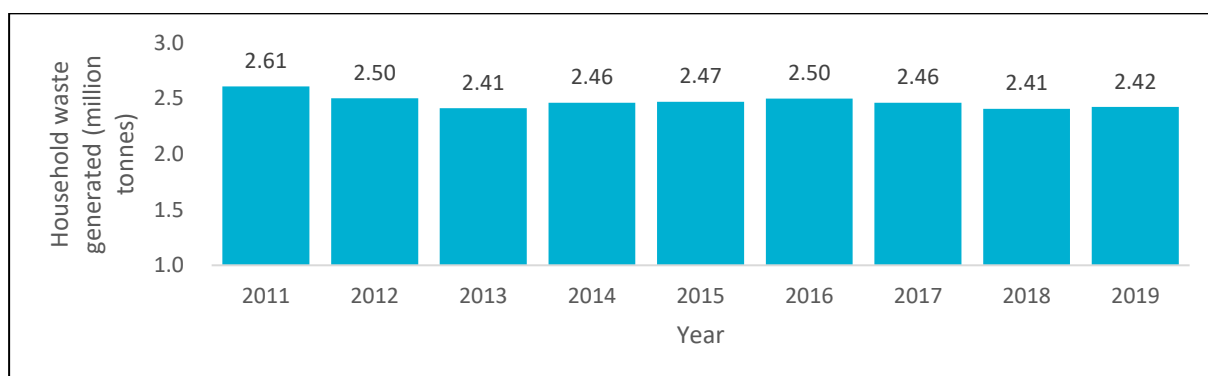


Figure 1 Scottish Household waste generated, 2011 to 2019. Note: the vertical axis does not start at 0.

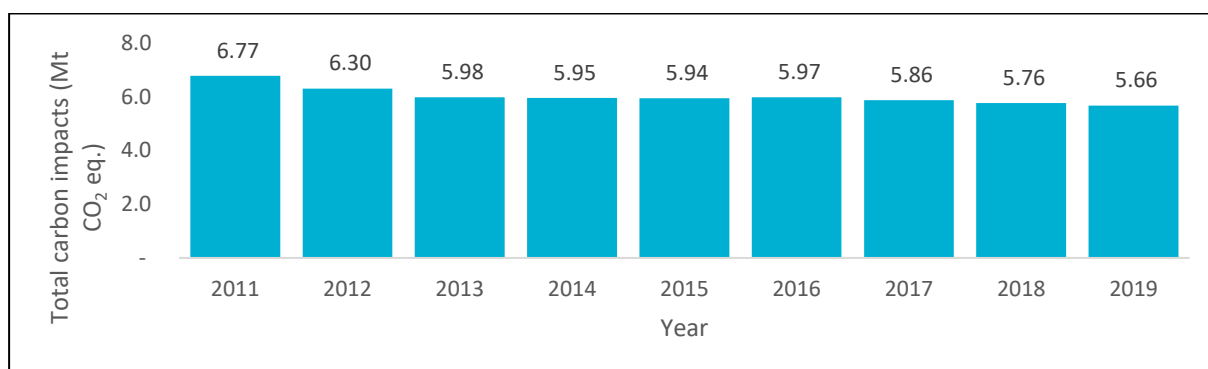


Figure 2 Carbon impact of Scottish Household waste generated and managed 2011-2019.

¹ Shorthand term for the emissions of any of the greenhouse gases that affect climate change. Carbon emissions are usually expressed as tonnes of CO₂ eq. (equivalent), which is a unit of measurement based on the relative impact of a given gas on global warming.

² SEPA (2020) [SEPA Household Waste Data Portal](https://www.sepa.org.uk) [Online]. Available at: <https://www.sepa.org.uk>

³ Zero Waste Scotland (2020) Carbon Metric – Publications [Online]. Available at: [zerowastescotland.org.uk](https://www.zerowastescotland.org.uk)

⁴ SEPA (2020) [Scottish Household waste – summary data 2019](https://www.sepa.org.uk/) [Online]. Available at: <https://www.sepa.org.uk/>

The total carbon impacts per tonne of household waste have been steadily declining since 2011, primarily thanks to greater recycling and reduced waste to landfill. Our analysis shows that the net carbon intensity (tCO₂e/tonne) of Scottish Household waste decreased by 2% in 2019 which can be attributed largely to increased recycling rates - particularly for high impact waste materials - as well as reduced landfilling of household waste. For example, the amount of non-ferrous metal, ferrous metal and food wastes recycled in 2019 has increased by 22%, 9%, and 7% respectively when compared to 2018 figures. What's more, SEPA's latest waste data reveals that the amount of 2019 Scottish household waste landfilled was 758,100 tonnes, a reduction of 26% from 2018⁵.

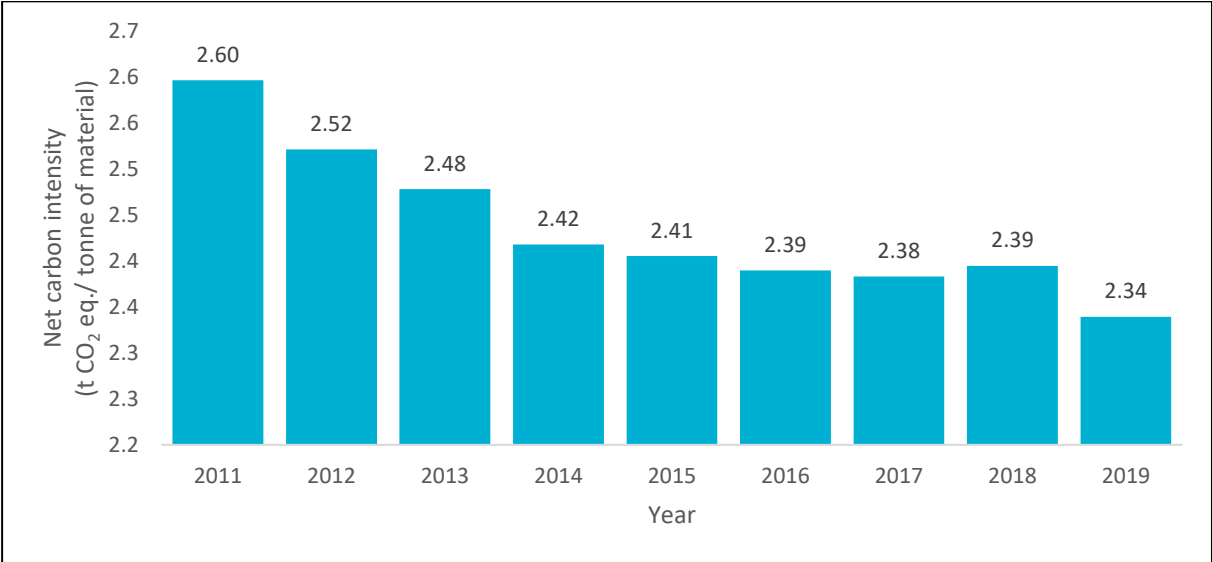


Figure 3 Net carbon intensity of Scottish Household waste 2011-2019. Note: the vertical axis does not start at 0.

Embodied carbon impacts from material production (i.e. impacts of producing the material in the first place before they become waste) are the greatest contributor to Scotland's whole-life waste carbon impacts, 5.78 Mt CO₂ eq. in 2019 as shown in Figure 4. In 2019, carbon impacts from landfilling household wastes remained the second largest carbon contributor at 307,600 tonnes CO₂ eq., followed by incineration which reached 129,700 tonnes CO₂ eq., an increase of nearly 78,800 tonnes of CO₂ eq. in comparison to 2018, and the highest yet recorded. Recycling reduced Scotland's household waste carbon impacts by 545,100 tonnes CO₂ eq.

The Big Five Waste Materials: Weight vs. Carbon Impacts

Scotland's Carbon Metric shows that some materials in the household waste stream have a particularly high carbon impact relative to their tonnages. To maximise the climate change benefits of waste and resource management, focus should be placed on these carbon intensive waste materials.

The top five most carbon intensive materials accounted for under half (45%) of all household waste in 2019, but 82% of household waste carbon impacts (Figure 5). Textile waste made up just 4% of waste arisings, but 31% of the carbon impacts. Food waste accounted for 18% of household waste by weight, but 32% of household waste carbon impacts.

⁵ SEPA (2020) [Scottish Household waste – summary data 2019](https://www.sepa.org.uk/) [Online]. Available at: <https://www.sepa.org.uk/>

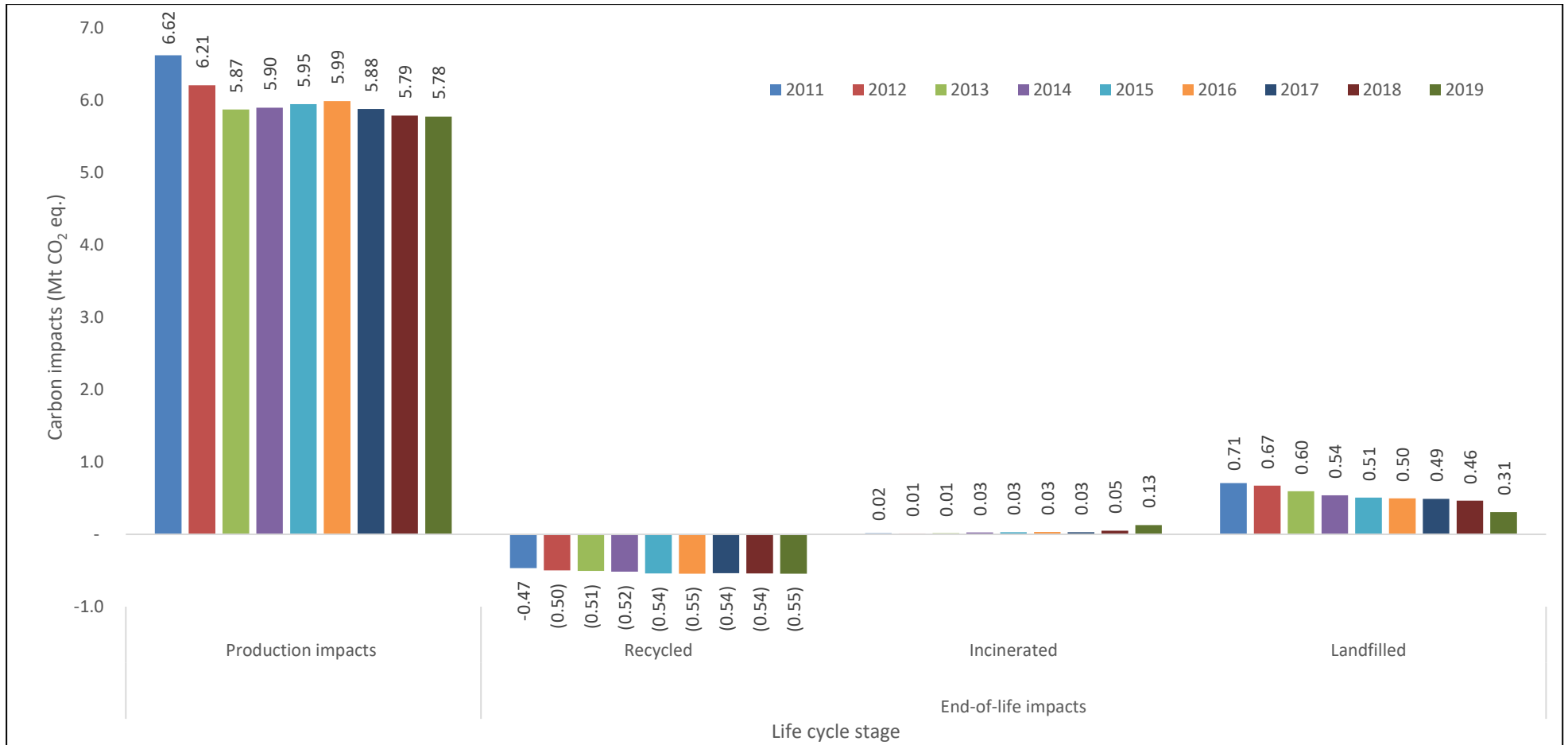


Figure 4 Carbon whole-life cycle impacts over time, 2011 - 2019.

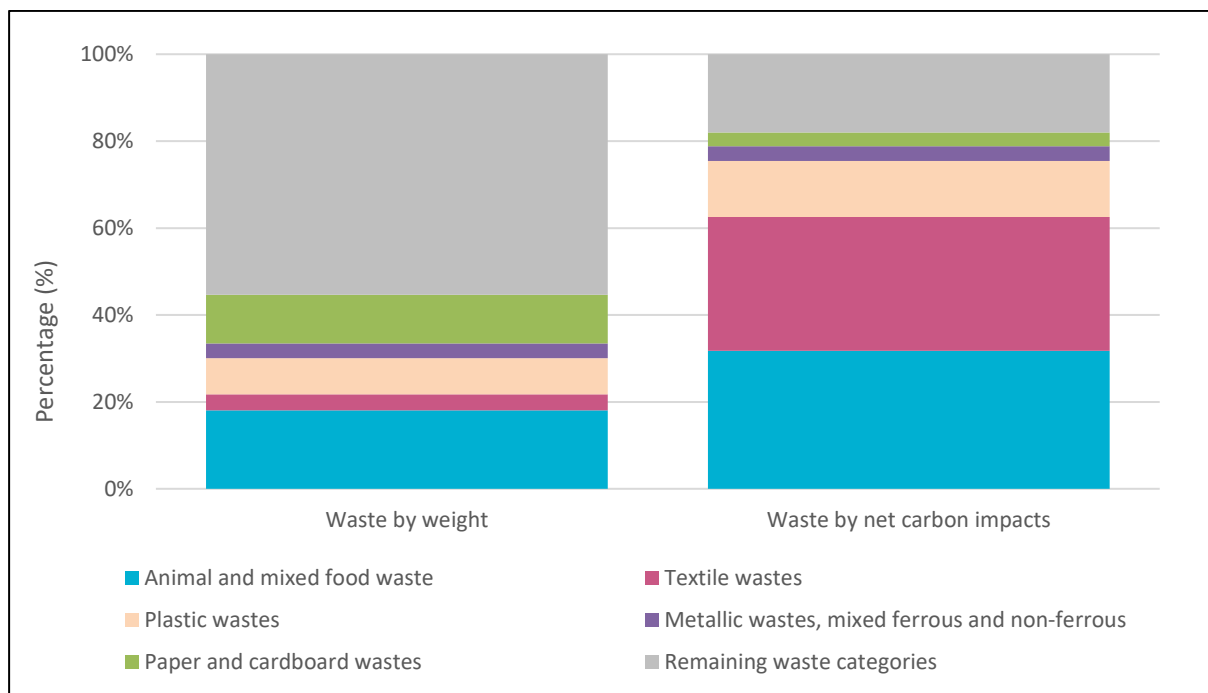


Figure 5 Relative weight vs. carbon impact of key waste materials 2019 (following disaggregation of the mixed Household and Similar Wastes category⁶).

Conclusion

This report describes the key findings from the 2019 household waste Carbon Metric update:

- **Household waste carbon impacts fell to 5.7 million tonnes CO₂ eq., approximately 1.1 Mt CO₂ eq. (16%) below 2011 levels and the lowest recorded since the Carbon Metric began in 2011.**
- Despite a 0.7% increase in the total amount of household waste generated, household waste carbon impacts achieved a record low due to increased recycling and a reduction in the amount of household waste landfilled.
- The top five most carbon intensive materials accounted for 45% of all household waste tonnage in 2019, but 82% of the carbon impacts.
 - Textile waste made up just 4% of waste arisings, but 31% of the carbon impacts.
 - Food waste accounted for 18% of household waste by weight, but 32% of household waste carbon impacts.

Further information on the Carbon Metric and archived documents relating to its development can be found on the [Zero Waste Scotland website](#).

⁶ The methodology of the disaggregation of mixed Household and Similar Wastes is explained in the Carbon Metric Technical report, published annually on [Zero Waste Scotland website](#).

 01786 433930

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