

Assess options for decarbonising the kerbside collection of residual household waste

1. EXECUTIVE SUMMARY

- 1.1. This workstream considers the carbon impact of residual waste collection by Local Authorities (LA). This could be considered alongside public sector transportation as a climate change topic. However as it relates to the provision of a specific statutory function, undertaken over 17 separate areas, without any standard for vehicles, collections or optimisation of collection rounds, it is considered to merits individual review.
- 1.2. There are no standards on the Island for kerbside residual waste collection. Each Local Authorities Waste Collection Area (LAWCA) service is specific to its area, delivered either in house or via a contractor. There is no optimisation of household refuse collection between LAWCA, each operating only within its political boundary. Households on the same road/estate can have different standards of service provision, and refuse collection vehicles rounds cannot therefore be optimised on the basis of geography and settlement profiles.
- 1.3. There is very limited contemporary data on LA waste collection schemes. There is currently 21 primary refuse collection vehicles (RCVs) registered for refuse collection. Only seven are Euro VI (European vehicle emission standard 6) and five vehicles were registered more than 14 years ago. Older vehicles are less fuel efficient, and lower the emission standards for their operation and annual vehicle check. This means they emit more greenhouse gases (GHGs).
- 1.4. The data currently available on RCV distance travelled/fuel used for refuse collection only is considerably out of date, and there is no data on the distance travelled to and from the Energy from Waste facility to unload. This data needs to be collected and analysed. The impetus for increased segregation of waste to allow for increased recycling will impact on the distance travelled for waste collection, particularly if this is via kerbside household waste collections. There are no proposals at present to centralise or regionalise refuse collection i.e. optimise refuse collection to reduce mileage. Calculating the carbon impact of refuse collections, and reviewing the vehicles used for current and future collections, is key.
- 1.5. One option, available through powers within the Local Government Act 1985, is for the Department of Infrastructure to set LAs minimum standards for delivering their respective waste collection functions. This could include a minimum standard (e.g. Euro VI/electric/hydrogen) that all RCVs used to deliver the LA refuse collection function by a target date (e.g. 2025). This would effect a reduction in public sector carbon and associated GHG emissions. It will also reduce air quality pollutants (PM2 and PM103). Vehicles used for household waste collection are generally also used for commercial waste collections.

1.6. Recommended actions:

Liaise with Local Authorities to obtain contemporary data on refuse and other residual waste collection services and vehicle types. This will enable the carbon and CO₂e GHG emission for delivering this statutory function to be calculated and advise further discussion with LAs regarding:

- Opportunities to optimise collection
- transition to low carbon or electric Refuse Collection and other collection vehicles
- the introduction of standards for refuse collection.

Review the current fleet of vehicles (LA and contractor) used for refuse collection (residual, bring bank and kerbside) with a view to ensuring a minimum standard of Euro VI for all RCVs providing the statutory waste collection function by 2025. Based on current data on vehicle types and RCV costs, this would cost in the region of £ 3 million across all LAs based on purchase price of new vehicles.

2. THE CHALLENGE

- 2.1. To reduce the impact of the refuse collection system, including kerbside recycling, on greenhouse gases (GHG) emitted on the Isle of Man (IoM) as a contribution to achieving net zero GHG emissions by 2050.
- 2.2. This work-stream considers the carbon impact of residual waste collection by Local Authorities (LA). This subject could be considered alongside public sector transportation as a climate change topic. However as it relates to the provision of a specific statutory function, undertaken over 17 separate areas, without any standard for vehicles, collections or optimisation of collection rounds, it is considered to merit individual review. This is particularly relevant if, as part of the 2018 Waste Strategy policy imperative to increase the recovery of recyclable materials from the household waste stream, there is a drive for LAs to provide kerbside schemes for the collection of source segregated waste for recycling (Isle of Man Government, 2018).
- 2.3. There are no standards on the Island for kerbside residual waste collection. Each LA Waste Collection Area (LAWCA) service is specific to its area, delivered either in house or via a contractor. There is no optimisation of household refuse collection between LAWCA, each operating only within its political boundary. Households on the same road/estate can have different standards of service provision, and refuse collection vehicles rounds cannot therefore be optimised on the basis of geography and settlement profiles.
- 2.4. There is very limited contemporary data on LA waste collection schemes. There are currently 21 primary refuse collection vehicles (RCVs) vehicles registered for refuse collection. Only six are Euro VI (European vehicle emission standard 6 (ICCT, 2016)) and five vehicles were registered more than 14 years ago. Older vehicles are less fuel efficient, with lower the emission standards for their operation and annual

vehicle check. This means they emit more GHGs.

- 2.5. The data currently available on RCV distance travelled/fuel used for refuse collection only is very out of date, and there is no data on the distance travelled to and from the Energy from Waste facility(EfW) to unload. This data needs collecting and analysing. The impetus for increased segregation of waste to allow for increased recycling will impact on the distance travelled for waste collection, particularly if this is via kerbside household waste collections. There are no proposals at present to centralise or regionalise refuse collection i.e. optimise refuse collection to reduce mileage. Calculating the carbon impact of refuse collections, and reviewing the vehicles used for current and future collections, is considered key.

3. THE CONTEXT

- 3.1. All sectors on IOM produce waste as a by- product of their activity. The type and quantity of this waste has changed over time in response to: changes in technology; identification and use of new synthetic materials and chemicals; economic activity; amount of disposable income; cost of items; availability of goods imported to the IOM.
- 3.2. Household waste audits undertaken in 2006 (Annex A) identified that 54 % waste stream is biodegradable. This means that if waste is not removed from point of production to a point of treatment or disposal it will soon start to decompose, may attract vermin and give rise to an increasingly serious public health nuisance.
- 3.3. Under the terms of the Public Health Act 1990, Section 65 (1) the Island's Local Authorities have a duty to collect waste from households (Legislation.gov.im, 1990). As currently interpreted under the Collection and Disposal of Waste regulations 2000 this includes households, schools, custody premises, hospital premises, residential and nursing premises (Isle of Man Government, 2012).
- 3.4. There are currently no regulations or standards for kerbside residual waste collection¹. The IOM is divided into 17 areas for the purpose of kerbside residual household waste collection. Each LAWCA service is specific to its area, delivered either in house or via a contractor.
- 3.5. The data currently available on RCV distance travelled/fuel used is not contemporary and needs to be updated. This data will need to include:
 - Distance travelled/fuel used per collection round
 - the return distance travelled by RCVs to EfW to offload waste
 - emissions associated with commercial waste collections
 - emissions from the operation of, and movement of waste from, the Islands four civic amenity sites

¹ The DOI is consulting Local Authorities on draft standards for kerbside collection of residual waste made under the provision of the Local Government Act 1985.

- kerbside and other LA recycling schemes
 - the DOI bring bank recycling scheme.
- 3.6. Public Sector Vehicle emissions are addressed in WPs 10, 27 28. However, much of the waste sector is serviced by commercial vehicles. In addition, and most significantly, as the imperative under the wider climate change agenda (calculated as “Embedded emissions”,²) is to increase the segregation of waste materials from the residual waste stream for reuse and or recycling, the distance waste materials are transported, and the associated vehicle emissions, will increase (Department of Energy & Climate Change, 2015).

4. THE OPPORTUNITY

- 4.1. There are no proposals at present to centralise or regionalise household waste collection on the Isle of Man. If introduced this would allow refuse collection to be optimised on the basis of housing densities, geography and road networks rather than political boundaries. Optimisation would to reduce the mileage needed to collect residual wastes and also ensure RCVs were operated at maximum load capacity.
- 4.2. One option, available through powers within the Local Government Act 1985, is for the Department of Infrastructure to set LAs minimum standards for delivering their respective waste collection functions. This could include a minimum standard (e.g. Euro VI/electric/hydrogen) that all RCVs used to deliver the LA refuse collection function by a target date (e.g. 2025). This would effect a reduction in public sector carbon and associated GHG emissions. It will also reduce air quality pollutants (PM2 and PM10³). Vehicles used for household waste collection are generally also used for commercial waste collections.
- 4.3. The standards could be extended to include all vehicles used for the collection of household residual waste whether for disposal under Section 65 (1) PHA 1990 or for or reclamation (recycling) under Section 73 (2).

5. THE ACTIONS

- 5.1. Liaise with Local Authorities to:
- a) Obtain contemporary data on refuse and other residual waste collection services and vehicle types. This will enable the carbon and CO₂e GHG emission for delivering this statutory function to be calculated and advise further discussion with LAs regarding:

²Embedded emissions’ which measure emissions on a “consumption” basis taking account of the emissions embedded within the manufactured goods and services which the UK imports and exports https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/450542/Alternative_approaches_to_reporting_greenhouse_gas_emissions_report.pdf

- Opportunities to optimise collection
 - transition to low carbon or electric Refuse Collection and other collection vehicles
 - the introduction of standards for refuse collection.
- b) Review the current fleet of vehicles (LA and contractor) used for refuse collection (residual, bring bank and kerbside) with a view to ensuring a minimum standard of Euro VI for all RCVs providing the statutory waste collection function by 2025. Based on current data on vehicle types and RCV costs, this would cost in the region of £ 3 million across all LAs based on purchase price of new vehicles.

³ PM2 refers to the atmospheric particulate matter that has a diameter of less than 2.5 micrometres, PM10 are the particles with a diameter of 10 micrometres and they are also called fine particles.

6. REFERENCES

Department of Energy & Climate Change, 2015. *Alternative approaches to reporting UK Greenhouse Gas Emissions*, s.l.: Department of Energy & Climate Change.

Isle of Man Government , 2018. *Isle of Man Government: Waste Strategy*. [Online] Available at: <https://www.gov.im/media/1362121/2018-approved-waste-strategy.pdf> [Accessed 2019].

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ICCT (2016). A technical summary of Euro 6/VI vehicle emission standards. [online] Theicct.org. Available at: https://theicct.org/sites/default/files/publications/ICCT_Euro6-VI_briefing_jun2016.pdf [Accessed 17 Dec. 2019].

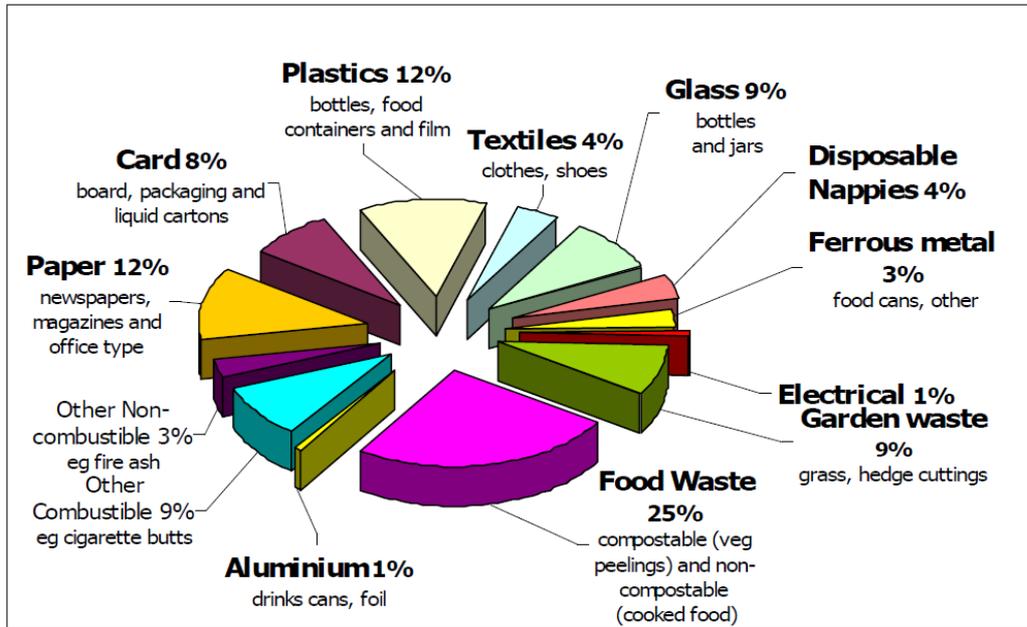
Legislation.gov.im , 1990. *Public Health Act 1990*. [Online] Available at: http://www.legislation.gov.im/cms/images/LEGISLATION/PRINCIPAL/1990/1990-0010/PublicHealthAct1990_2.pdf [Accessed 2019].

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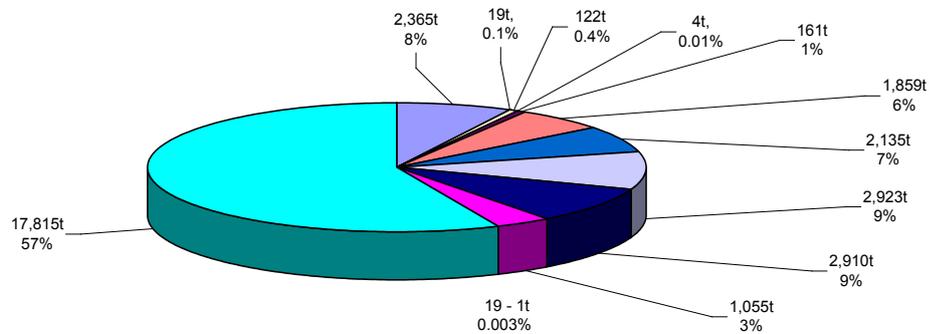
Department of Infrastructure	2018	Waste Strategy	Available on line at:	https://www.gov.im/media/1362121/2018-approved-waste-strategy.pdf
DEFRA	2012	Guidance on measuring and reporting Greenhouse Gas (GHG) emissions from freight transport operations		https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/218574/ghg-freight-guide.pdf
Department of Energy and Climate Change	2015	Alternative approaches to reporting UK Greenhouse Gas Emissions	Available on line at:	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/450542/Alternative_approaches_to_reporting_greenhouse_gas_emissions_report.pdf
Isle of Man Government	1990	Public Health Act 1990	Available on line at:	https://legislation.gov.im/cms/images/LEGISLATION/PRINCIPAL/1990/1990-0010/PublicHealthAct1990_5.pdf
Isle of Man Government	2000	The Public Health Act 1990, the Collection and Disposal of Waste Regulations 2000 SD 696/100		

ANNEX A

2006 Household Waste Composition



2008 Commercial and industrial Waste Composition



- 02 Wastes From Agriculture, Horticulture, Aquaculture, Forestry, Hunting And Fishing, Food Preparation And Processing
- 03 Wastes From Wood Processing And The Production Of Panels And Furniture, Pulp, Paper And Cardboard
- 08 Wastes From The Manufacture, Formulation, Supply And Use (Mfsu) Of Coatings (Paints, Varnishes And Vitreous Enamels), Adhesives, Sealants And Printing Inks
- 09 Wastes From The Photographic Industry
- 12 Wastes From Shaping And Physical And Mechanical Surface Treatment Of Metals And Plastics
- 13 Oil Wastes And Wastes Of Liquid Fuels (Except Edible Oils, And Those In Chapters 05, 12 And 19)
- 15 Waste Packaging; Absorbents, Wiping Cloths, Filter Materials And Protective Clothing Not Otherwise Specified
- 16 Wastes Not Otherwise Specified In The List
- 17 Construction And Demolition Wastes (Including Excavated Soil From Contaminated Sites)
- 18 Wastes From Human Or Animal Health Care And/Or Related Research (Except Kitchen And Restaurant Wastes Not Arising From Immediate Health Care)
- 19 Wastes From Waste Management Facilities, Off-Site Waste Water Treatment Plants And The Preparation Of Water Intended For Human Consumption And Water For Industrial Use
- 20 Municipal Wastes (Household Waste And Similar Commercial, Industrial And Institutional Wastes) Including Separately Collected Fractions

		Rigid 7.5-17 tonnes HGV			
TOWNS		Total miles pa LA refuse collection service NB not inc trip to EFW			
		Average laden			
		kg CO ₂ e	kg CO ₂	kg CH ₄	kg N ₂ O
DOUGLAS	16380	15843.7188	15606.3726	4.095	233.2512
		0.96726	0.95277	0.00025	0.01424
		Average laden			
CASTLETOWN	2080	2011.9008	1981.7616	0.52	29.6192
		0.96726	0.95277	0.00025	0.01424
		Average laden			
PEEL	3640	3520.8264	3468.0828	0.91	51.8336
		0.96726	0.95277	0.00025	0.01424
		Average laden			
RAMSEY	7280	7041.6528	6936.1656	1.82	103.6672
DISTRICTS		0.96726	0.95277	0.00025	0.01424
		Average laden			
ONCHAN	29536	28568.99	28141.01	7.38	420.59
VILLAGES		0.96726	0.95277	0.00025	0.01424
		Average laden			
PORT ERIN	6760	6538.6776			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
PORT ST MARY	5824	5633.32224			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
LAXEY	1248	1207.14048			
PARISHES		0.96726	0.95277	0.00025	0.01424
		Average laden			
ARBORY	962	930.50412			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
BRADDAN	1768	1710.11568			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
GERMAN	3380	3269.3388			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
PATRICK	1690	1634.6694			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
LONAN kinrade	2028	1961.60328			
		0.96726	0.95277	0.00025	0.01424
		Average Laden			
MALEW	5200	5029.752			
		0.96726	0.95277	0.00025	0.01424
		Average Laden			
MAROWN	1716	1659.81816			
		0.96726	0.95277	0.00025	0.01424
		Average Laden			
MAUGHOLD	2340	2263.3884			
		0.96726	0.95277	0.00025	0.01424
		Average Laden			
RUSHEN	208	201.19008			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
SANTON	1092	1056.24792			
		0.96726	0.95277	0.00025	0.01424
		Average laden			
Northern Parishes Refuse Collection Board					
	7800	7544.628	7431.606		
		0.96726	0.95277	0.00025	0.01424
		Average laden			
		97627.48632			

Indicative calculation only of annual Refuse Collection Vehicle mileage (7.5-17 rigid tonne) round collections only, estimated 2006 data, emission calculated from DEFRA

‘ Guidance on measuring and reporting Greenhouse Gas (GHG) emissions from freight transport operations’ Please note most IOM RCVs are 20 tonne or above