Waste Characterisation and Best Practice in Ireland: Lessons from Higher Education Institutions and Communities

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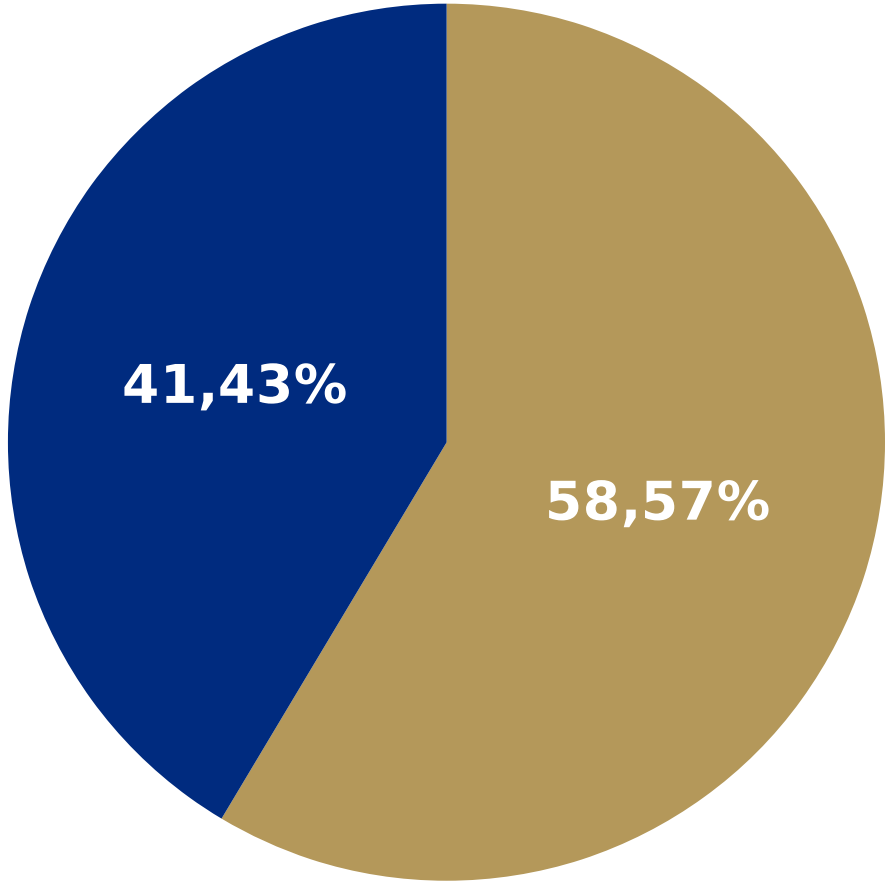
Funding Acknowledgement

The Sustainability Pillar of the EPA's Research Programme 2014-2020 is designed to identify pressures, inform policy and develop solutions to environmental challenges within thematic areas through the provision of strong evidence-based scientific knowledge.

National Municipal Waste Context

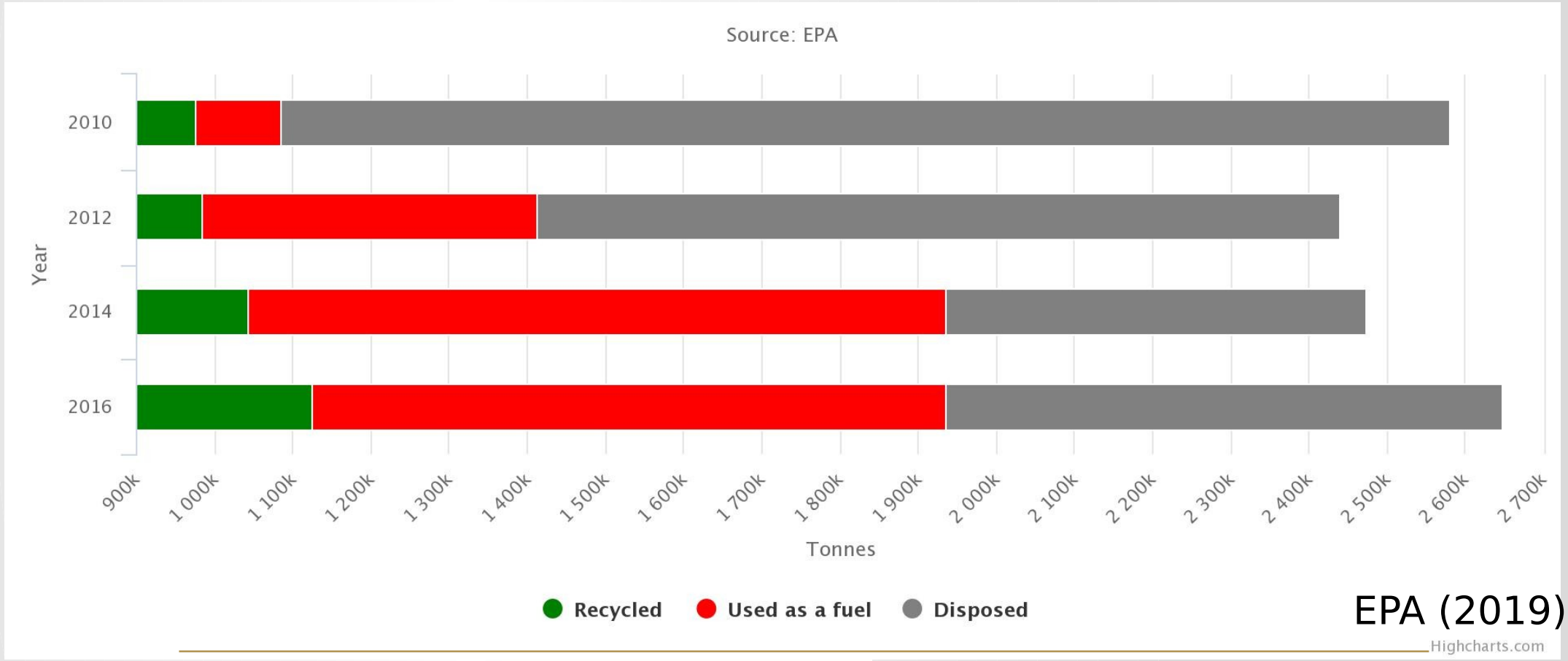
Municipal Waste In Ireland 2014



Household

EPA (2019)

Municipal waste recycled, used as a fuel and disposed to landfill



EPA (2019)

epa Research Climate - Water - Sustainability

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Circular Economy

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Concerns Surrounding Waste Recycling Internationally

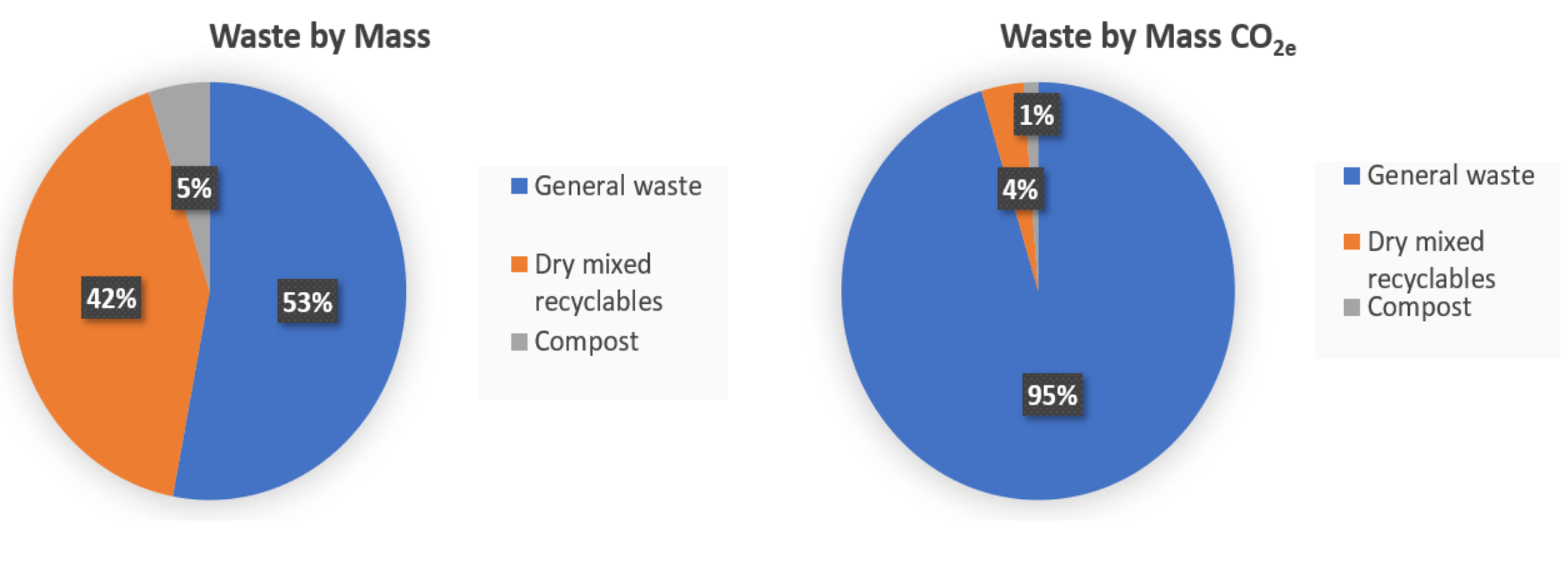
- China bans importation of mixed/contaminated wastes
- Southeast Asian countries serving as dumping ground for eg EU/USA waste (but likely to stop very soon)
- 2019 Philippines sends contaminated "recycling was[illegible]" back to Canada

HEI Municipal Solid Waste: Non-household

Limited Data Collection at Irish HEIs

HEI	Tonnes (Year)	Source	kg/m²
University College Cork	850 (2016)	UCC (2018)	3.1
National University of Ireland, Galway	423 (2015/16)	NUIG (2016)	2.1
University of Limerick	813 (2015)	UL (2016)	3.5
Trinity College Dublin	1,700 (2016)	TCD (2018)	4.4
Dublin City University	716 (2015)	Walpole and Fahy (2016)	3.0
Average intensity			3.2
Sector Total	8,589		3.2

Irish HEI Waste CO_{2e} Emissions



Comprehensive Data Collection at UK HEIs tied to Funding

Category	Tonnes
Total waste mass (tonnes)	519052
Total waste mass recycled (tonnes)	398814
Total waste mass incineration (tonnes)	9227
Total waste mass composting (tonnes)	5360
Total waste mass anaerobic digestion (tonnes)	6392
Total waste mass landfill (tonnes)	27992
Total waste mass other (tonnes)	18437
Total waste mass used to create energy (tonnes)	53826
Non-residential waste mass total (tonnes)	133038
Non-residential waste mass recycled (tonnes)	67673
Non-residential waste mass incineration (tonnes)	7056
Non-residential waste mass composting (tonnes)	4365
Non-residential waste mass anaerobic digestion (tonnes)	4019
Non-residential waste mass landfill (tonnes)	12984
Non-residential waste mass other (tonnes)	5172
Non-residential waste mass used to create energy (tonnes)	33278
Residential waste mass total (tonnes)	52970
Residential waste mass recycled (tonnes)	22832
Residential waste mass incineration (tonnes)	1766
Residential waste mass composting (tonnes)	727
Residential waste mass anaerobic digestion (tonnes)	2186
Residential waste mass landfill (tonnes)	7251
Residential waste mass other (tonnes)	2123
Residential waste mass used to create energy (tonnes)	16440

HESA (2017)

Packaging of RTU Infant Formula Milk

Product component	Material	Polymer identification	Feasibility of recycling In Ireland
Shrink wrap	Plastic	None	Unknown
Bottle	Plastic	polypropylene	Possible
Bottle lid	Plastic	High-density polypropylene	Possible
Fitting to attach teat to bottle	Plastic	None	Unknown
Cone to enclose teat	Plastic	None	Unknown
Bottle seal	Aluminium	Not applicable	Possible
Seal on teat packaging	Waxed paper	Not applicable	Not possible
Teat	Silicone rubber	Not applicable	Unknown

Exemplifies the big problems with plastic recycling

- Packaging uses a range of materials, not easily separated
- Difficult to identify polymers in many of the components
- Very small amounts of some materials makes collection unfeasible
- Danger of contamination by residual milk

Lessons for Non-Household Waste Reduction

- Provision of segregated waste bins becoming norm- Trials at UL, UCC, LIT
- Currently no standardised waste bin segregation signage adopted by entire HEI sector
- Awareness campaigns surrounding benefits of re-usable coffee cups- DCU, UCC
- Compostable coffee cups- Benefits lost without dedicated compostable bin
- Aspirations for plastic free universities- Debate on what plastics should be included

Community Municipal Solid Waste: Household

EPA Household Waste Characterisation Survey 2018

EPA (2018)

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EPA Household Waste Characterisation Survey 2018

Main Findings from Irish Household Waste Characterisation Surveys 2018

- There has been a significant reduction in organic waste in the household residual bin, thanks to the introduction of the brown bin.
- Approximately 50% of household organic waste is still being disposed of in the “wrong bins”, i.e. recycling or residual bin.
- Plastics have replaced organic waste as the most prominent waste category in mixed residual household waste.
- 11% of the household waste shouldn’t be in the kerbside bins at all. This mainly made up of Textiles, Glass and

Actions for Waste Reduction

- Upcycling of Waste Clothing- Ballymun Rediscovery Centre
- Zero Waste Cashel- plastic free areas (Schools), plastic straw awareness campaigns, water refill stations in community
- Community Composting- Greener Clare Programme collaboration with EPA Stop Food Waste

EPA Projects

- O'Regan, B., Moles, R., Shawe, R. and Horan, W. (2019) 'Developing the Potential of Third Level Campuses as Change Agents in Transition to Sustainable Communities', *Prepared for the Environmental Protection Agency*, Ireland.
- Byrne, S and O'Regan, B. (2019) 'Developing the Potential of Community Energy Action Groups Towards Transition to a Low Carbon Society', *Prepared for the Environmental Protection Agency*, Ireland.
- O'Regan, B., Moles, R., Byrne, R and Bennett, A. (2019) 'Sustainable Voluntary Communities: Supports for Sustainable Environmental, Social and Economic Development', *Prepared for the Environmental Protection Agency*, Ireland.
- O'Regan, B., Moles, R., Shawe, R. and Ryan-Fogarty, Y. (2019) 'Developing Frameworks for Evaluation and Mitigation of Environmental Impact of Infant Feeding Decisions on Healthcare and Society', Prepared for the Environmental Protecti

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