

Waste not, warm not

Exploring opportunities for decarbonisation in waste management

Regnan thematic investment insights

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In-brief

Waste management is a cornerstone of sustainable development with a multiplier effect on public health, safety and environmental outcomes. But it's also perceived as being a dirty business; and is often thought of as having a high carbon footprint.

In this report, Regnan's experts in water and waste and climate change provide answers to the questions:

1. Where do greenhouse gas emissions arise along the waste management life cycle?
2. How are these emissions being managed?
3. What are the best ideas emerging in the sector to decarbonise waste management?
4. What can investors do to encourage low carbon transition?

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Report highlights:

- Increasing focus on greenhouse gas emissions (GHG) in the waste management value chain presents many options for decarbonisation in the sector.
- Waste collection is an important enabler of reuse, recycling, and composting – key ways waste emissions can be reduced. Fuel efficiency, use of alternative fuels and electric vehicles present options for decarbonisation.
- There are interdependencies between waste management life cycle stages such that activities with low direct emissions rely on high emissions activities elsewhere in the value chain.
- Divestment can only shift high emissions activities out of portfolios, it does nothing to reduce the real-world impact of waste management.
- We see engagement with waste management companies as the best way for investors to contribute to waste decarbonisation

Carbon emissions footprint across the waste life cycle

While the broader sustainability credentials of effective waste management are readily acknowledged, there have been some lingering questions about the carbon footprint of waste management, which contributes about 3.3% of total global emissions, with ~2% from landfills.

Emissions arise throughout the waste management value chain and over different time scales.

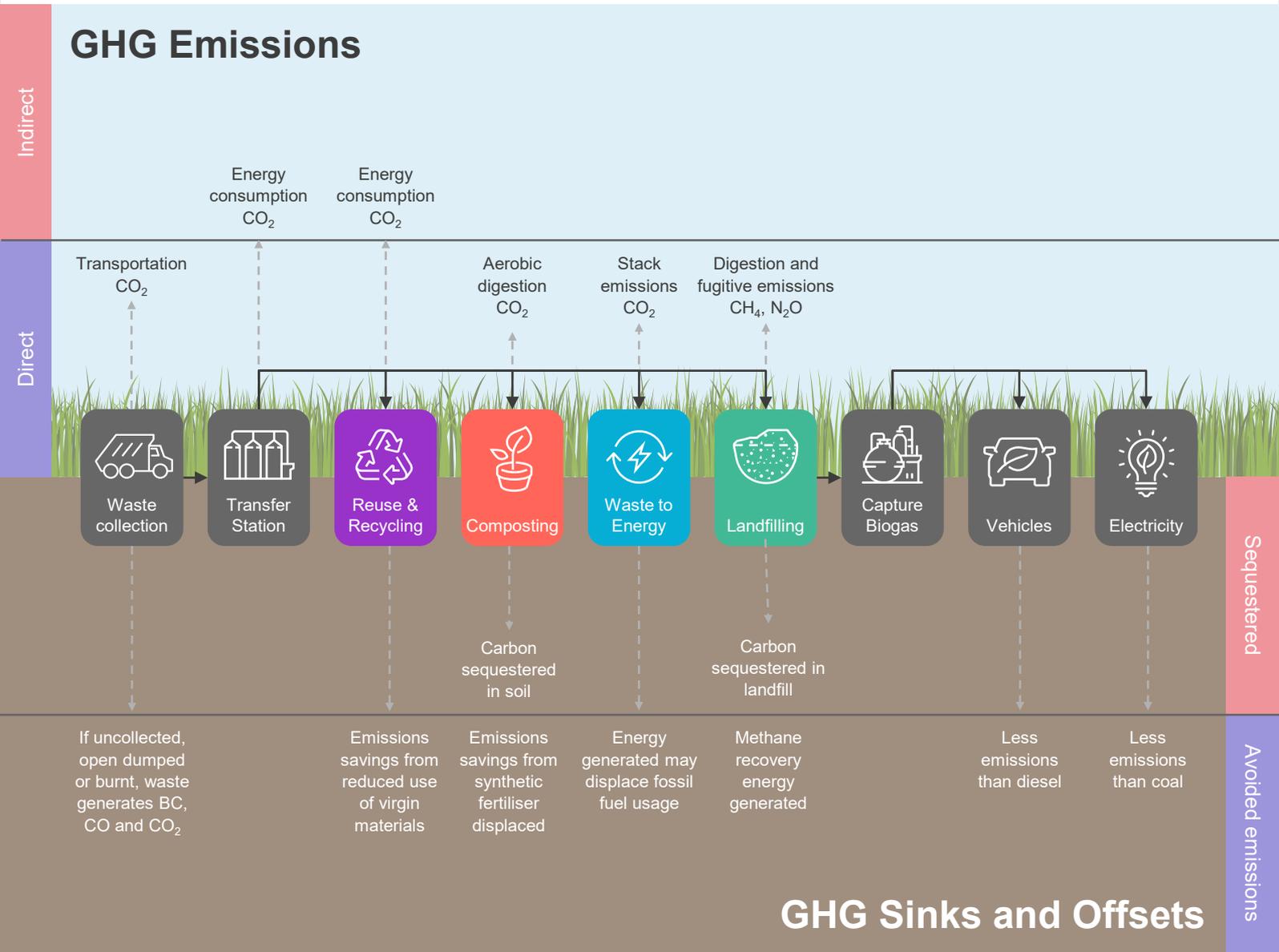
Waste collection contributes around 6-8% of emissions for an integrated waste management company involved across all life cycle stages. These emissions all occur in the year the collection occurs.

Landfills are the greatest share of the total emissions footprint: ~90% of total emissions for integrated waste management companies.

Landfill emissions are primarily from organic waste breaking down and releasing methane – a greenhouse gas that is ~28 times more potent than carbon dioxide. This is a slow process, with current year emissions arising from waste deposited over many years.

There are interdependencies between waste management life cycle stages such that activities with low direct emissions rely upon high emissions activities elsewhere in the value chain. For example, collection is an important enabler of reuse, recycling, and composting – key ways waste management emissions can be reduced.

GHG Emissions



GHG Sinks and Offsets

Emissions management



Waste collection and sorting

Waste collection and sorting is a critical component in the efficient reduction of GHG emissions in waste management, enabling reuse, recycling, composting, energy recovery and landfilling of waste. It is also essential to meet waste regulatory requirements in many jurisdictions.

Emissions can be reduced by:

- Using lower emissions fuels;
- Using software to optimise collection routes; and
- Upgrading trucks to more fuel-efficient models.

Substantial improvements in emissions intensity can be gained with these measures, for example:

- **Waste Management Inc.** reduced emissions per 1,000 miles driven by 31% from 2010 to 2019.
- **Republic Services** reduced fleet emissions by 7.5% in 2020 by using renewable natural gas.



Energy recovery

With room to landfill waste running out in some countries, energy recovery from waste incineration is expected to play an increasing role. Incineration of waste under controlled circumstances for the generation of energy has substantial GHG benefits compared to landfills according to the IPCC.

- **Biffa** diverts 500,000 tonnes of waste which cannot be recycled away from landfills to energy recovery facilities. The facilities will produce 90MW of energy, sufficient to power 170,000 homes in the United Kingdom.
- **Clean Harbors'** Safety-Kleen business addresses the priority to maximise reuse before energy recovery, diverting waste lubricant oils that would otherwise be burned for fuel. The company estimates on a life cycle basis that 8 kilograms of GHGs are saved through re-refining one gallon of used motor oil, compared with one gallon of motor oil refined from crude oil.



Reuse and Recycling

Reuse and recycling reduce GHG emissions by saving virgin materials and lowering the energy demand for production. Significant GHG emissions savings arise from composting where synthetic fertiliser is displaced and from recycling for materials that are energy intensive to produce, such as steel, aluminium, and glass.

Companies involved include recycling specialists, such as **Copart**, **LKQ** and **Schnitzer**, and integrated waste management companies, such as **Waste Connections**, **Waste Management Inc.**, **Republic Services**, **Cleanaway Waste** and **Biffa**.

- **Waste Management Inc.** is the largest post-consumer recycler in North America avoiding ~27 million MtCO₂-e per year.
- **Veolia's PROCYCLE** provides a solution for difficult to recycle items such as crisp packets, sweet wrappers and plastic toys utilising in-house expertise and network recyclers.



Landfilling

Improving landfilling processes and technologies offers the most opportunities to reduce GHG emissions, with state-of-the-art operations able to reduce emissions by up to 90%.

The volume of GHG emissions depend on how the site is operated; factors like whether it is an open dump or a controlled landfill, and the existence and type of gas collection system make a big difference.

- **Waste Connections** has gas collection at 50 sites, from 28 of these sites landfill gas generates electricity, fuels local industrial facilities or fuels vehicles, annually processing 28.5 billion standard cubic feet of gas (equivalent to power 289,000 homes).
- **Republic Services Group** has 69 landfill gas to energy projects. With beneficial use of biogas at 72.3 billion standard cubic feet, and a target of 110 billion standard cubic feet by 2030.

How can investors accelerate decarbonisation of the waste management sector?

Given the interdependencies between waste management life cycle stages – with low emission activities dependent on high emissions activities elsewhere in the value chain – divestment can only shift high emissions activities out of portfolios; it does nothing to reduce the real world impact of waste management.

That’s why we see engagement with waste management companies as the best way investors can contribute to the decarbonisation of the waste sector.

Engagement is a central plank of our active stewardship approach. Our engagements involve investment and subject matter experts from across Regnan. We set objectives for engagement in advance for individual companies, track progress, and transparently report to clients at least annually on the changes observed.

The table below sets out the key priorities we see for engagement with waste management companies on decarbonisation. Applicability will depend on individual company circumstances and performance.

Engagement Objective				
	Waste collection and sorting	Reuse and recycling	Energy recovery	Landfilling
Appropriate expertise, remuneration structures, capital allocation and governance in place to support effective decarbonisation activities	✓	✓	✓	✓
Decarbonisation goals are well supported by disclosed plans and interim targets	✓	✓	✓	✓
Piloting of EVs to set up initiatives for success/maximise decarbonisation	✓			
Calculation and disclosure of avoided and sequestered emissions uses appropriate and recognised methodologies with sufficient granularity to allow investors to monitor progress	✓	✓	✓	✓
Ambitious recycling/reuse targets		✓		
Evidence of lifecycle or equivalent analysis for reuse and recycling initiatives for better decision making on most efficient use of resources/energy		✓		
Prioritisation of non-recyclable fossil-based waste for energy recovery		✓	✓	
Consideration of carbon capture for energy recovery plants			✓	
Landfill covers and vertical/horizontal well systems are in place to capture landfill gas efficiently				✓
Implementation of interim measures ahead of EV rollouts where appropriate (such increasing fuel efficiency, alternative fuel use, enhance route planning etc.)	✓			
Customer/stakeholder feedback (on emissions) is actively sought to support effective stakeholder response and management	✓	✓		
Advanced technology is being used, for example in sorting (optical/smart) and refuse collection (smart trucks), to improve recycling capabilities	✓	✓		
Transparent participation in public policy	✓	✓	✓	✓

About Regnan

At Regnan we've been thinking forward and shaping the responsible investment movement since 1996 – long before it became mainstream.

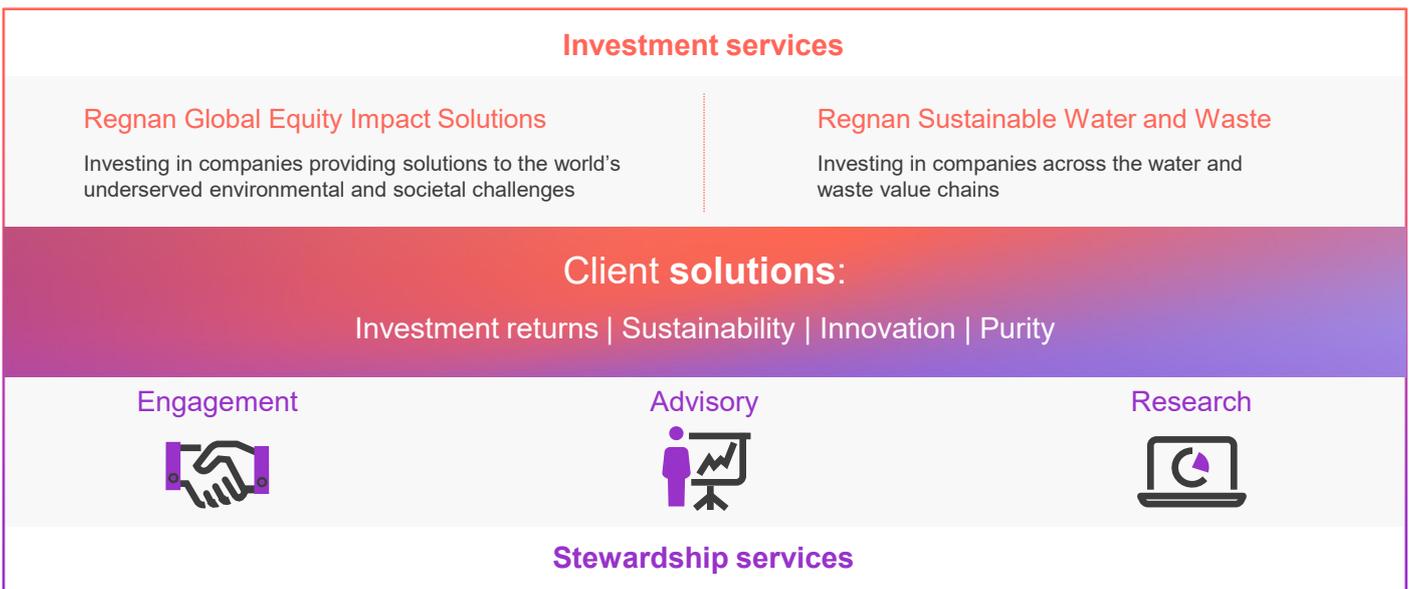
2020 marked our expansion into funds management supported by the investment platform of J O Hambro and the Pental Group. We've brought together proven sustainability and impact teams with track records tested through cycle, with the depth of insights provided by our engagement, advisory and research team.

Our collective purpose is to contribute to a more sustainable future by developing and promoting principled, rigorous and outcome-oriented approaches in responsible investment.

Client solutions sit at the heart of all that we do and are based on four key pillars:

- Delivering our clients attractive investment returns; we aim to grow their real wealth over the long term.
- Understand the materiality of sustainability issues to deliver improve decision-making and real world outcomes.
- Creating differentiated, innovative strategies that serve a purpose in client portfolios.
- Our strategies are authentic and provide significant exposure to underlying sustainability opportunities.

An ecosystem of leading investment and stewardship services



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