Regulations and guidance on the use of digestate as a biofertiliser in Australia

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Company Snapshot

Australia's most successful Waste to Energy company

LMS in 2020 – Australia's largest emissions reducer

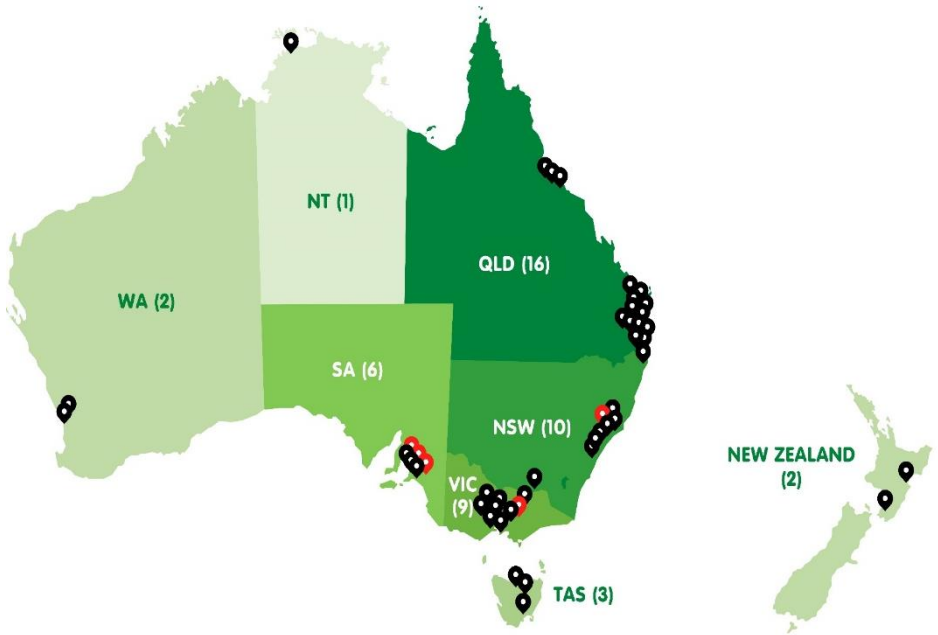
28 landfill biogas power stations across Australia and New Zealand

- **65 MW** installed capacity
- Project capacities from **0.5 MW to 8.8 MW**
- Baseload **availability > 95%**
- **100%** grid connected
- Anticipating c. **500 GWh** in FY21
- Additional **3 MW of solar PV** on landfill

18 biogas flaring projects

- 3 currently scheduled to be developed as power stations by end of 2021
- 4 new flare projects in development

Operate on 50 landfills throughout Australia and NZ



Gross abatement > 3.7 Million T CO2e per year

1. Context

Photo source: https://www.biocycle.net/anaerobic-digestion-in-the-northwest/

Pursuing a circular economy

The need for, and opportunities presented by, a circular economy are gaining momentum in Australia

For example:

2017 – Benefits of a Circular Economy in SA

2018 – Senate Committee recommendation*

National Waste Policy

2019 – NWP Action Plan

QLD Waste Management and Resource Recovery Strategy

2020 – WA Closing the loop: Waste reforms for a circular economy

Recycling Victoria: A new economy

NSW Circular Strategic Plan 2020-23

* Australian Senate Environment and Communications References Committee (2018) Never waste a crisis: the waste and recycling industry in Australia – recommendation 1

The Circular Economy

An economic model that contemplates the production of goods and services by:

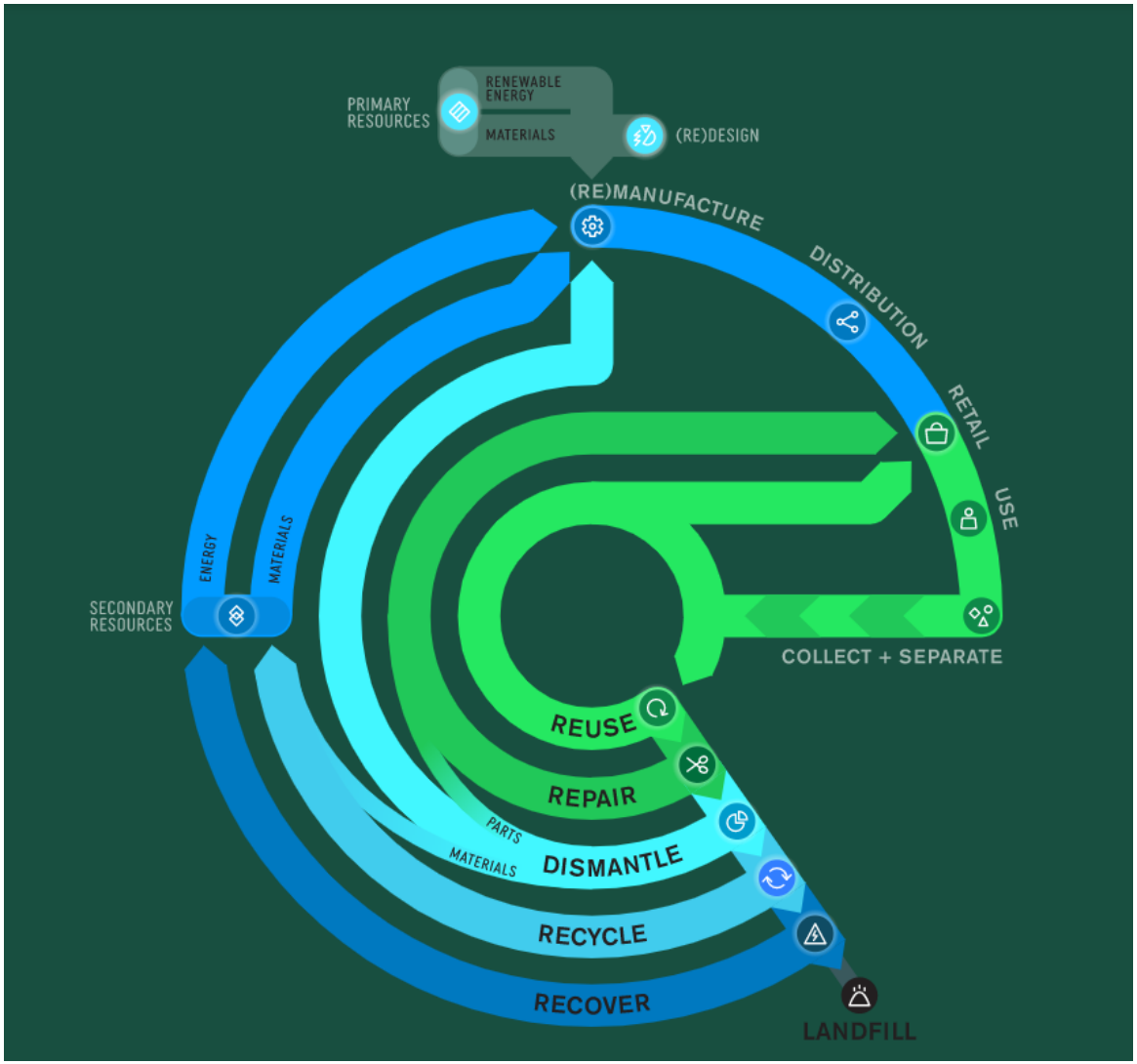
(i) a reduced reliance on virgin materials; and

(ii) on the basis of continuously functioning utility and an extended lifecycle; and

(iii) in a manner that eliminates, as far as is reasonably practicable, waste or pollution, or harm to the environment

Green Industries SA Act 2004

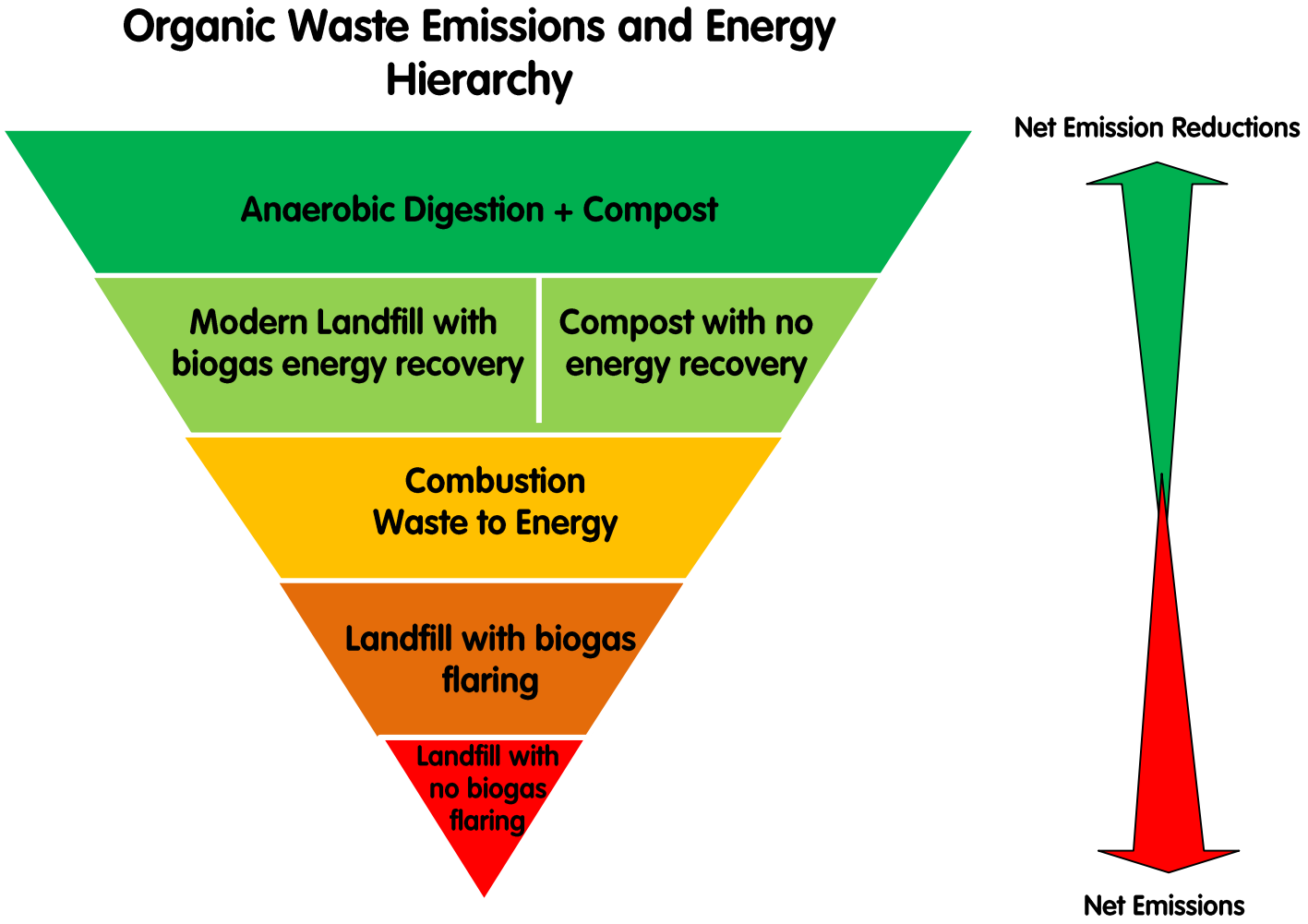
A circular economy runs on renewable energy



Source: https://acehub.org.au/

Organic Waste Hierarchy?

A potential, preferred use hierarchy based on reuse, renewable energy and emissions reductions from waste



Risk-based regulation

Regulators around Australia are tasked with seeking to achieve the highest and best order use of recovered materials and avoiding environmental harm

More toxic compost uncovered

Compost contaminated with toxic firefighting chemicals at more than 30 times suggested safe levels and destined for sale to the public has been found at another Queensland recycling facility.Environmental regulators discovered the high concentrations of per- and polyfluoroalkyl (PFAS) chemicals in compost during testing last year and in February at Wood Mulching Industries (WMI) at Swanbank, west of Brisbane. The compost, some of which was about to be trucked out for sale, was blocked by Queensland's Department of Environment amid concerns it could end up in farms, backyard gardens and even "kindergarten play areas".

The Australian
20 June 2018

Key regulatory tools

- **The anaerobic digester**
  - the digester receives 'waste' (unless an on-site recovery)
  - in many cases the digester will need a licence or permit to operate
  - the digestate produced may or may not be 'waste' – End of Waste regulatory provisions are key
- **Sites receiving digestate**
  - May also be considered a 'waste depot' and attract waste levy if the digestate is still 'waste'
  - May otherwise be subject to:
    - Illegal dumping offences (if still 'waste') – and levy
    - General environmental duties
    - Environmental harm offences

End of Waste

To cease being a 'waste', a material must typically:

1) be ready for use without further treatment

2) intended for imminent use – ie, there must be a market

3) not give rise to environmental harm from its use

These requirements may be met:

- meeting general or bespoke standards or specifications, or
- in some cases, where there is not a standard/specification applicable, satisfying a general requirement

2. Considering risk

Photo source: https://www.progressivedairy.com/

Anaerobic digestion feedstocks

Anaerobic digestors receive 4 key different types of waste matter, each with separate risk profiles:

1. Animal manure and agricultural waste
2. Source-segregated organic waste
3. Mixed organic waste (ie organic waste that has been collected with other materials, 'red bin' waste)
4. Sewage sludges from wastewater treatment

Classification of digestate from these can also vary under differing circumstances

Feedstocks in, digestates out

Scale of feedstock sources and digestate uses can also influence risk:

On-site source	risk	On-site use
Single source		Single site use
Multiple sources (single type)		Multiple sites (limited land-use)
Multiple sources (multiple type)		Multiple sites (open-use)

Risk profiling needs

			CONSEQUENCE			
			Digestate use			
	AD feedstock		On-site	Single off-site use	Multiple sites (limited use)	Multiple sites (open use)
RISK	Animal manure and agricultural waste	On-site source				
		Single off-site source				
		Multiple sources (single type)				
		Multiple sources (multiple types)				
	Source-segregated organic waste	On-site source				
		Single off-site source				
		Multiple sources (single type)				
		Multiple sources (multiple types)				
	Mixed organic waste	On-site source				
		Single off-site source				
		Multiple sources (single type)				
		Multiple sources (multiple types)				
	Sewage sludges	From WWTPs	Separately regulated as 'biosolids'			

Is this risk profiling clearly captured in Australia to help best promote a circular economy?

No

- Anaerobic digestion is a developing field in Australia
- The activities it comprises are:
  1. sometimes captured with compost guidance
  2. sometimes not clearly catered for
  3. sometimes not sufficiently delineated, based on their feedstocks, feedstock sources and digestate uses
- There are regulatory gaps

3. Current status

Disclaimer

The following gives a general introduction only to the regulatory regimes in various Australian jurisdictions. It is not a comprehensive statement of the law and does not serve as a substitute for legal advice. You must undertake your own due diligence and seek your own advice for any intended proposals and products. The presenter and LMS Energy undertake no duty and do not accept any responsibility to any third party who may rely upon this information.

New South Wales

Licensing:

Anaerobic digestors – need licensing as comprise 'composting', 'energy recovery' and 'resource recovery' (various thresholds apply – lowest are composting >200tpa of putrescible waste and energy recovery from >200kg liquid waste per year)

- per cl12, 18, 34 Part 1 Schedule 1, Protection of the Environment Operations Act 1997

Land application – if still waste, need licensing for 'Waste disposal (application to land)'- per cl39 Schedule 1, POEO Act

Levy:

Waste disposal facilities (and in various circumstances other waste facilities) must pay levy on all waste received at the facility – with deductions and rebates applicable

– per s88 POEO Act, POEO (Waste) Regulations 2014

New South Wales

End of waste guidance:

No end of waste status - Resource recovery orders (for processor) and resource recovery exemptions (for user) act to allow some wastes to be re-used independent of the usual NSW laws that control applying waste to land or using waste as a fuel.

- per Part 9 POEO (Waste) Regulation 2014

A person may comply with existing order and exemption requirements or apply for a new order and exemption.

Orders may include:

- material specifications
- reporting and record-keeping requirements

Exemptions include contain:

- reporting and record keeping requirements
- exemption from regulatory requirements (eg licence, levy)

New South Wales

'Compost':

- Compost Order
- Compost Exemption

composting means a process of managed biological transformation:

(a) to achieve pasteurisation; and

(b) for a period of not less than a total of 6 weeks of composting and curing at an adequate moisture level (>40 % by weight), and/or until an equivalent level of biological stability can be demonstrated.

Composting does not include drying or dehydration processes.

- relates to any combination of mulch, garden organics, food waste, manure and paunch that has undergone 'composting'
- processor requires a sampling plan, sets contaminant limits, gives test methods to be used for contaminants and provides record-keeping requirements
- user must ensure they do not cause or permit the migration of leachate from the land application site and applies the compost within a reasonable period after receipt

Also, see the fact sheet: Applying compost and biosolids to land

New South Wales

A mix of further broad and specific orders and exemptions are available

- consider the current list at any time at:

  https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/current-orders-and-exemption

- the current list includes:
  - Biosolids
  - Food waste (liquid)
  - Food waste (solid)
  - Manure
  - Mulch
  - Pasteurised garden organics
  - Processed animal waste
  - Rapidly decomposed food waste (Closed Loop)
  - Treated grease trap waste

South Australia

Licensing:

Anaerobic digestors – need licensing as a 'waste reprocessing facility' (ie separate from 'composting')

– per cl3(2)(e) Schedule 1, Environment Protection Act 1993

Land application – if still waste, need licensing for 'waste disposal'

- per cl3(3) Schedule 1, Environment Protection Act

Levy:

Waste disposal depots must pay levy on waste received for disposal

– per s113 Environment Protection Act, Part 6 Environment Protection Regulations 2009

End of waste guidance:

Explicitly provide for materials to cease to be 'waste' – by a standard/specification or, if no standard/specification applies, its general character

- Per clause 4(b) of the *Environment Protection (Waste to Resources) Policy 2010*

NB Act also allows for Approved Recovered Resource Declarations – these are not being used

Key documents

Standard for the production and use of Waste Derived Soil Enhancer (2010)

- Two-tier risk based approach for various inputs
- Delineates between materials subject to existing guidelines and other materials

Compost guideline – relates to anaerobic composting but contains useful quality assurance requirements regarding process and outputs

Guidelines for the safe handling and reuse of biosolids in South Australia

Victoria

Licensing:

Anaerobic digestors – need licensing as 'organic waste processing' and 'energy from waste' (thresholds apply – eg >100t per month or >70t per month and produce >50t per month of pasteurised material, compost or digestate) - per A07, A08 Schedule 1, Environment Protection (Scheduled Premises) Regulations 2017 + A01 can apply (classifications and thresholds are to change under new regulations)

Land application – if still waste, need licensing for 'Landfill' or 'PIW management' - per A01, A05 Schedule 1, Environment Protection (Scheduled Premises) Regulations 2017 (categorisations are changing under new regulations)

Levy: Landfill licensees must pay a levy for each tonne of waste deposited – with exemptions and recycling rebates available

Victoria

End of Waste: the waste hierarchy and beneficial reuses are currently promoted by current Environment Protection (Industrial Waste) Resource Regulations 2009. Anaerobic digestion is a form of 'treatment' vs a secondary beneficial reuse.

In a time of transition:

- Under the proposed new (draft) regulations:
  - In place of PIW regulation, many wastes will be pre-classified as:
    - Priority waste
    - Reportable priority waste for s142
    - Reportable priority waste for s143
  - 'Digestate' is currently to be classed as all 3 (without any underlying risk delineation from feedstocks used – despite strong delineation of organic wastes). Hence, all digestate movement needs to be tracked (as well as facilities being licensed).
- Also under the new laws, all 'industrial waste' must go to a 'lawful place'.

Victoria

Other key documents

- Guidelines: Energy from Waste (2017)
- Designing, constructing and operating composting facilities
- Guidelines for environmental management: Biosolids land application
- Sampling and analysis of waters, wastewaters, soils and wastes

Technology	Mixed Wastes				Organics				Separated streams for reprocessing					Comments
	Mixed municipal residual waste	Mixed C&I residual waste	Mixed C&D residual waste	Mixed dry recyclables	Source separated garden waste	Source separated food waste	Source separated C&I organics	Source separated timber (clean)	E-waste	Tyres & rubber	Plastics	Glass fines	Concrete & brick	
BIOLOGICAL PROCESSES														
Open windrow composting	🔴	🔴	🔴	🔴	🟢	🟡	🟡	🟢	🔴	🔴	🔴	🔴	🔴	Generally suited to garden organics
Aerated static pile composting	🔴	🔴	🔴	🔴	🟢	🟡	🟡	🟢	🔴	🔴	🔴	🔴	🔴	Suited to garden and food organics
In-vessel composting	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🔴	🔴	Suited to a wide range of organics
Anaerobic digestion	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🔴	🔴	Suited to garden and food organics
Vermi-composting	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟡	🔴	🔴	🔴	🔴	🔴	For putrescible organics only

Sourced from Table 25, Resource Recovery Technology Guide

- Sustainability Victoria, Resource Recovery Technology Guide (2018)

In brief

Qld: A waste can be approved as a resource if the department considers that it meets specified quality criteria for its specific use. This occurs through End of Waste codes. For current codes: https://environment.des.qld.gov.au/management/waste/business/end-of-waste-classification

- No composting / digestate code occurs in the current list.
- There is a biosolids code – relates to sewage sludges.

WA: Digestate use will be governed by the new draft Composting guideline. This approaches a high-risk testing regime as the default.

See: https://consult.dwer.wa.gov.au/regulatory-capability/draft-guideline-better-practice-composting/

4. Next steps

Promote a specific risk-based approach?

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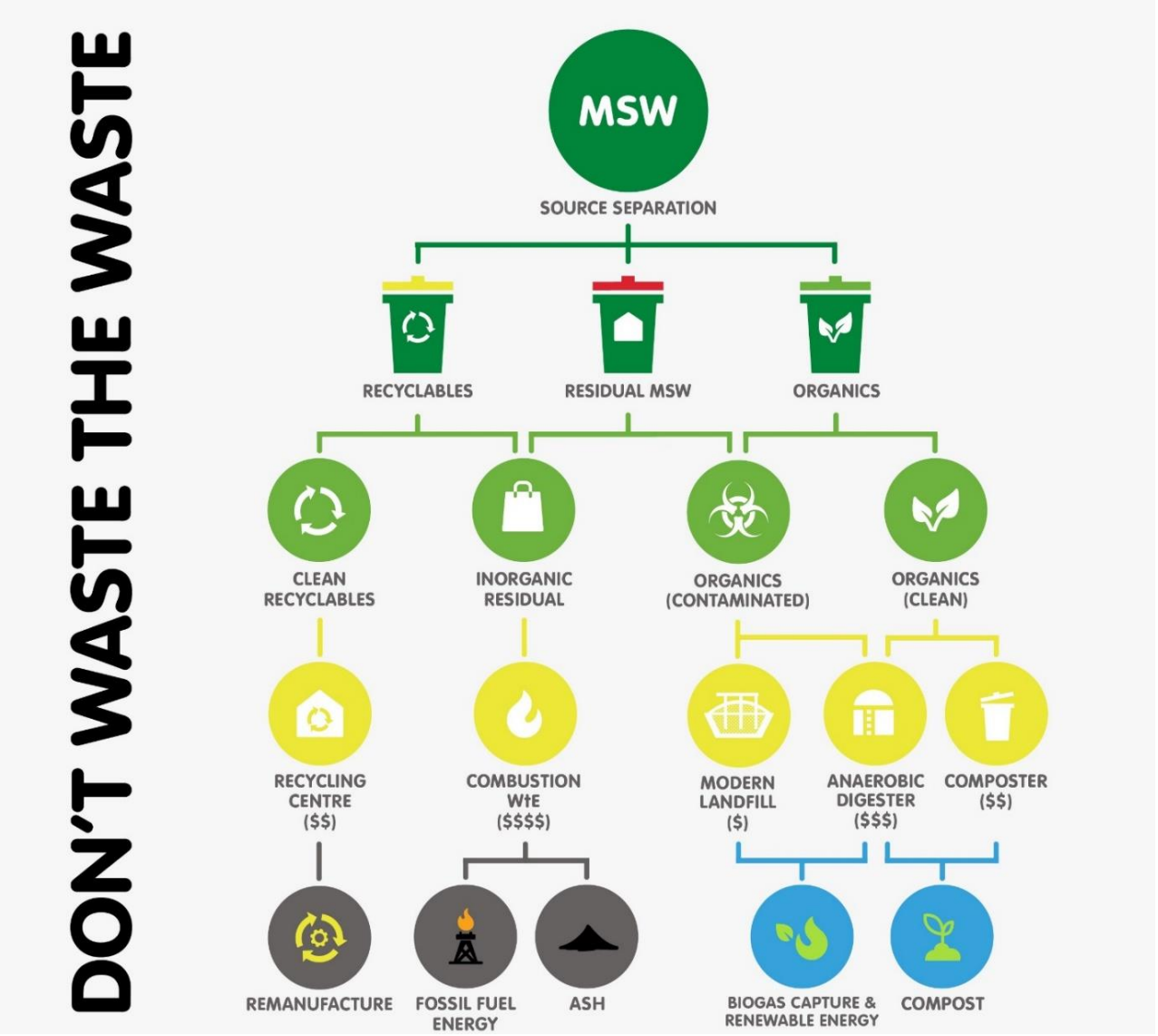
Could risk profiling result in different MSW waste flows?

Embrace the circular economy concept that is:

- Economically sensible
- Maximises emission reductions
- Maximises renewable energy

For organic waste this means:

- Recovering its renewable energy in a non- destructive manner, leaving it available for composting
- Organic waste that remains too contaminated to process for compost, still retains renewable energy value that can be efficiently extracted (either in landfill or in vessel)



Questions?

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