



Improving Organics and Packaging Resource Recovery through Innovation

- ▶ Presented by John Vyse and Jimmy Jaggs

Who are we and Why are we here?

- ▶ Our passion is driven by wanting to improve the recovery of resources especially **Organics** and **Carbon** in all their various forms.
- ▶ We know **resource recovery** is not easy and as a result - a lot of companies, technologies and processing facilities no longer exist.
- ▶ We wont mention MWOO.
- ▶ But the demand for **resource recovery** in the world exists not just because the regulator says you must - but more importantly because we only have **limited resources available**.

Looking for Solutions

- ▶ In early 2023, we became aware of 2 brothers combining their skills to process waste streams and produce marketable end-products with a world wide demand.
- ▶ The company they formed is **ARC Ento Tech Pty Ltd** and is based in Somersby NSW.
- ▶ Ramon Atayde is the Chairman and Managing Director. Ramon has a background in mining and engineering.
- ▶ Ricky Atayde is the Operations Manager and has a background in Aquaculture, Hatchery Management and Entomology

What is ARC offering?

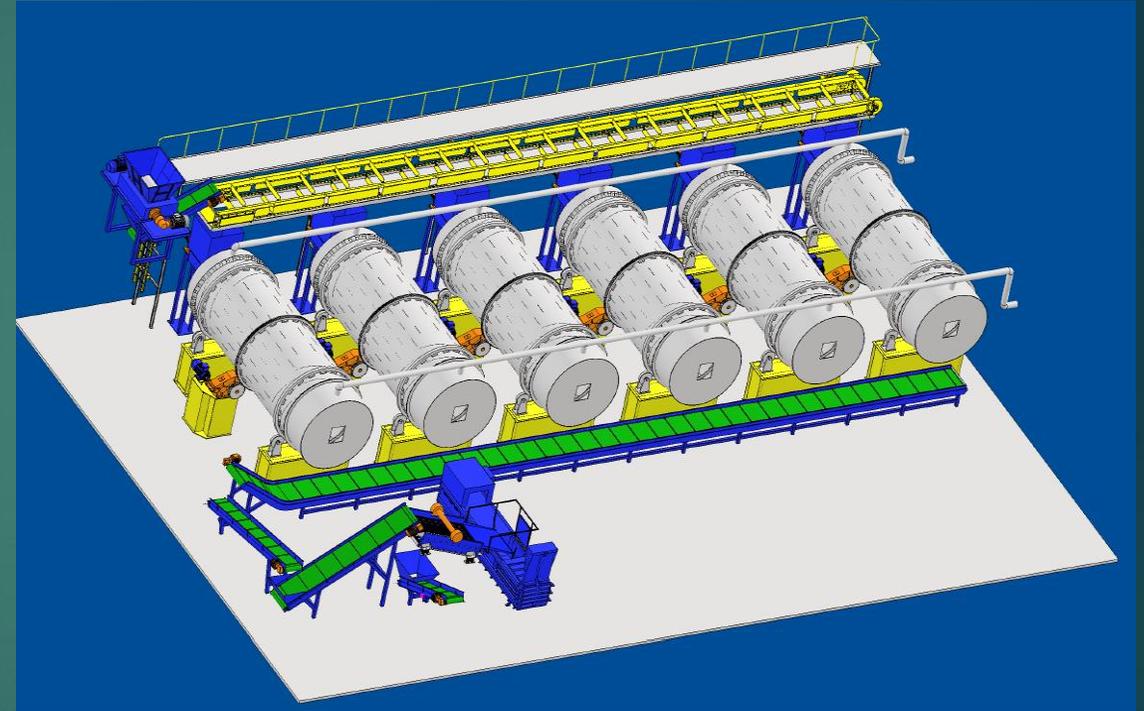
- ▶ Combining their knowledge they have used nature through the Black Soldier Fly and engineering to **develop an automated system to process wastes and recover end-products that have value.**
- ▶ We heard on Tuesday from Olympia, the founder of Goterra, about the use of Black Soldier flies to process food wastes. Producing valuable fertilisers and protein feeds suitable for use in livestock feed rations.
- ▶ Do a web search for BSF's and you will find a lot of information
- ▶ So, what is the **difference** that has made Jimmy and I be prepared to assist ARC in the promotion and development of their process?

Nature & Engineering

Black Soldier Fly – BSF



ARC – Drum Digester

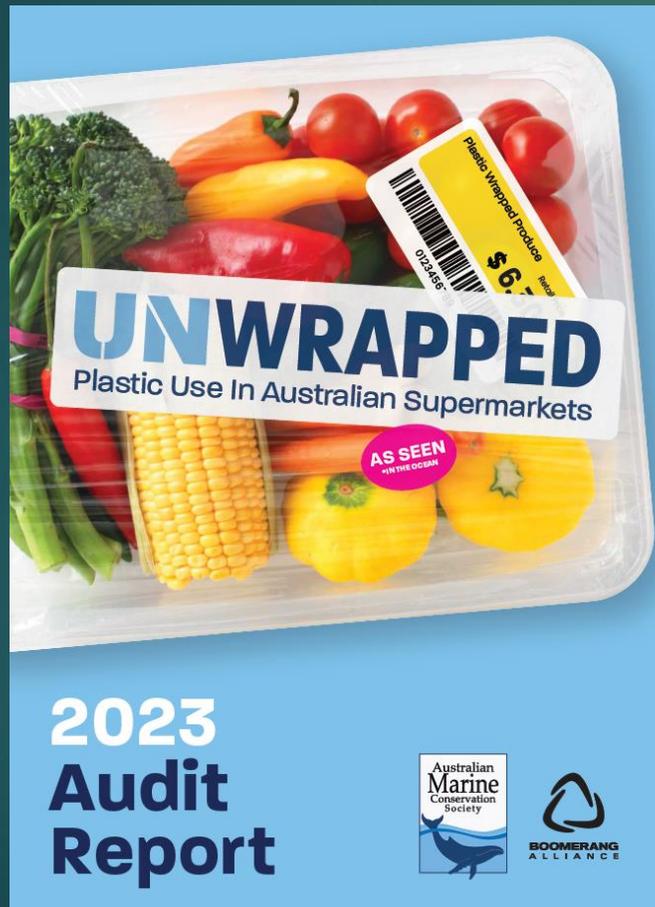


Using off-the-shelf rotating drum equipment with some additional sorting, screening and sizing steps - ARC has effectively automated and accelerated natural processes.

The Difference

- ▶ One of the major hurdles to the recovery of both food waste and food packaging is that some food, especially fats and sugars stick to the packaging. Unless the packaging can be cleaned, it has limited value in the market place.
- ▶ Cleaning separating and sorting packaging from food waste is difficult
- ▶ However given the right environment, the BSF will lick or suck the sugars, starches and fats from any packaging material.
- ▶ **The end result is the production of:**
 - ▶ **Soldier fly larvae suitable for use in animal feeds as a protein replacement**
 - ▶ **Frass being the clean excreta from the BSF as they consume the food waste**
 - ▶ **Clean dry packaging which is now suitable for extrusion to produce an additive to be used as a Carbon rich reductant in the manufacturing of steel.**

Packaged Food Waste – Part of the Problem



Supermarkets are the largest source of plastic packaging in our daily lives, representing an \$130.2 billion sector that sells the vast majority of Australia's groceries, cleaning and personal care products.



But where does most of this packaging end up currently?



What has been proven to date?

- ▶ The ARC Somersby R&D facility has successfully proven that through the use of the drums and BSF we can process:
 - ▶ Food Waste
 - ▶ Biosolids
 - ▶ 40mm minus FOGO
 - ▶ Animal waste
 - ▶ Contaminated packaging
- ▶ Having proven the process through the R&D plant, the next step is to establish a trial / demonstration plant - at some scale - to prove the commercialisation of the process.

The Next Steps

- ▶ The question now?

Can we use the ARC technology to process MSW?

- ▶ The answer:

We believe **YES!**

But this requires trials, testing and scaled demonstration.

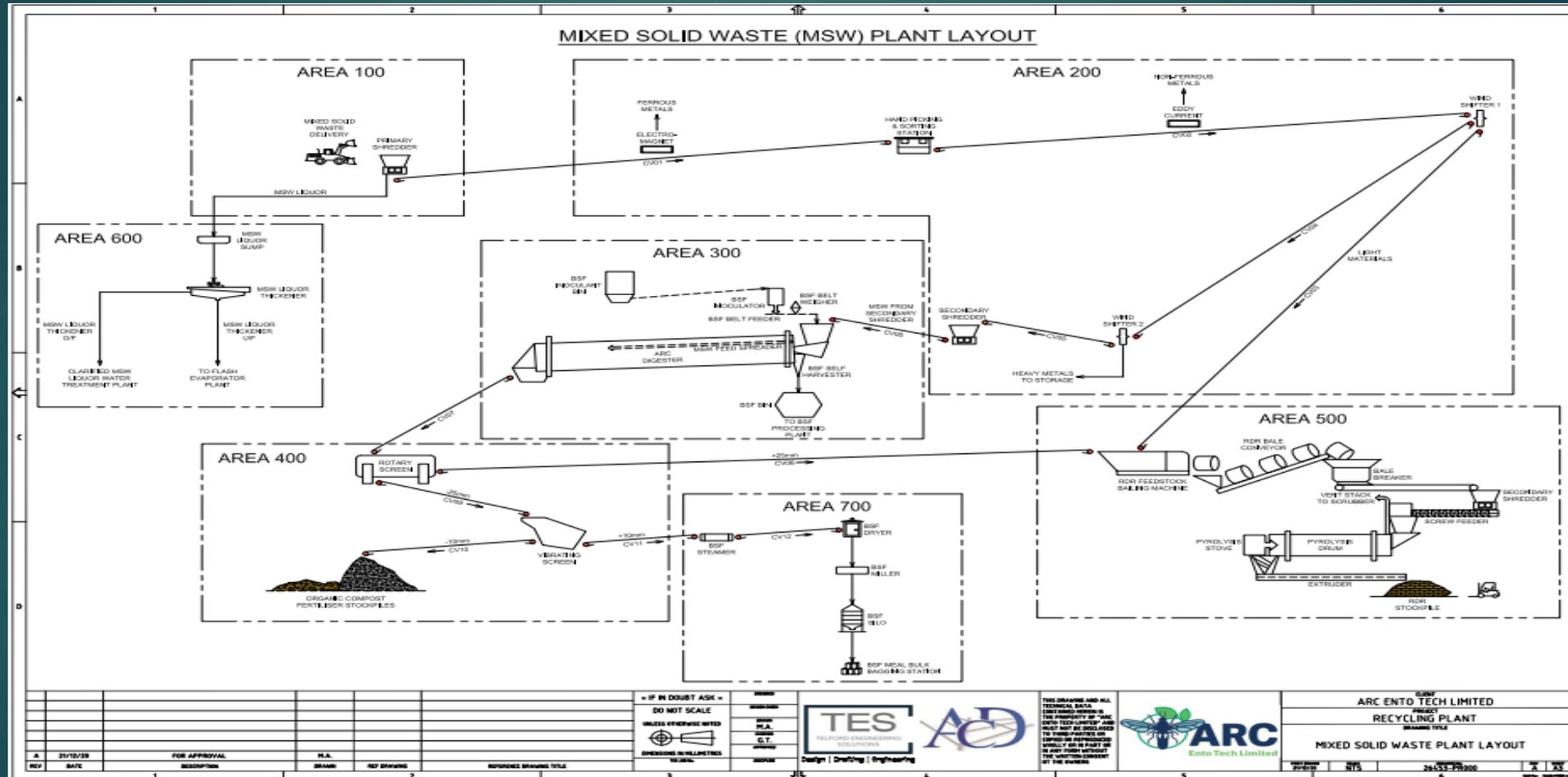
Demonstration Site Number One

- ▶ We have been exploring options for the establishment of the first trial facility with a number of NSW Councils
- ▶ Following discussions with Samuel Swain from **Hawkesbury City Council**, ARC Ento Tech and Council have now entered into an agreement to establish a trial / demonstration facility.
- ▶ The facility will be established on the Council's landfill site at The Driftway, South Windsor, NSW 2756

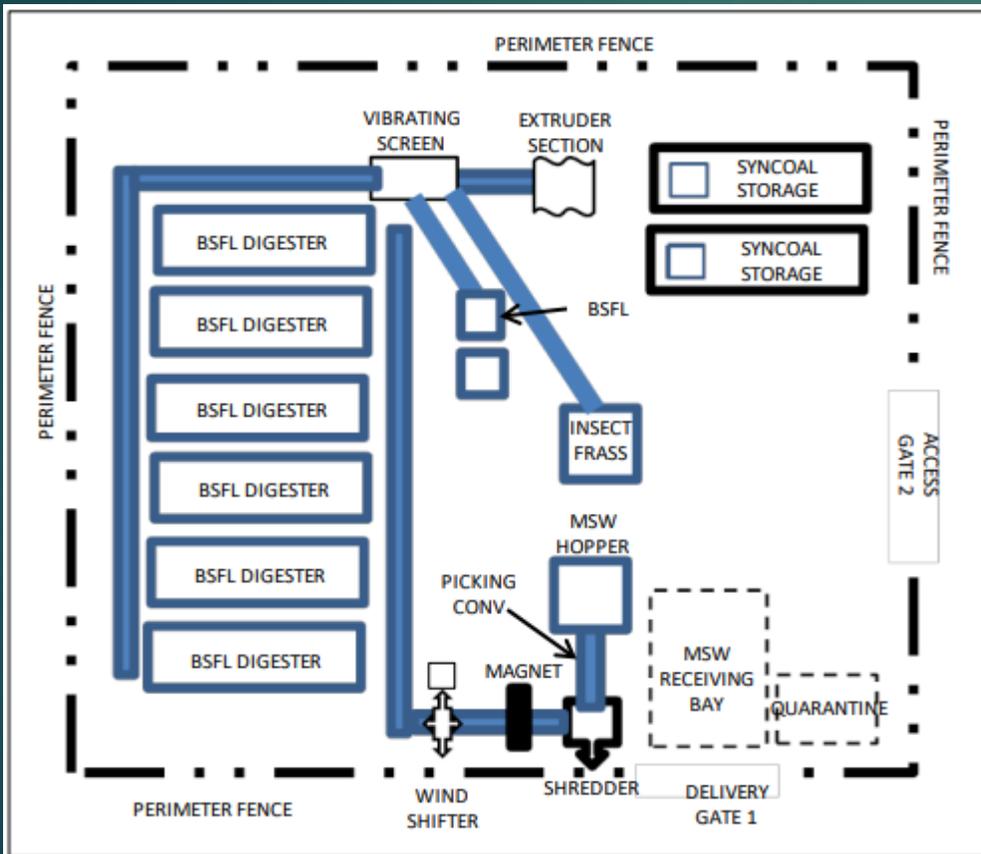
The Driftway – South Windsor



Example PFD of a proposed full scale commercial MSW plant



Proposed Layout and Design for the Hawkesbury Plant



Outline of the Hawkesbury /ARC Trial

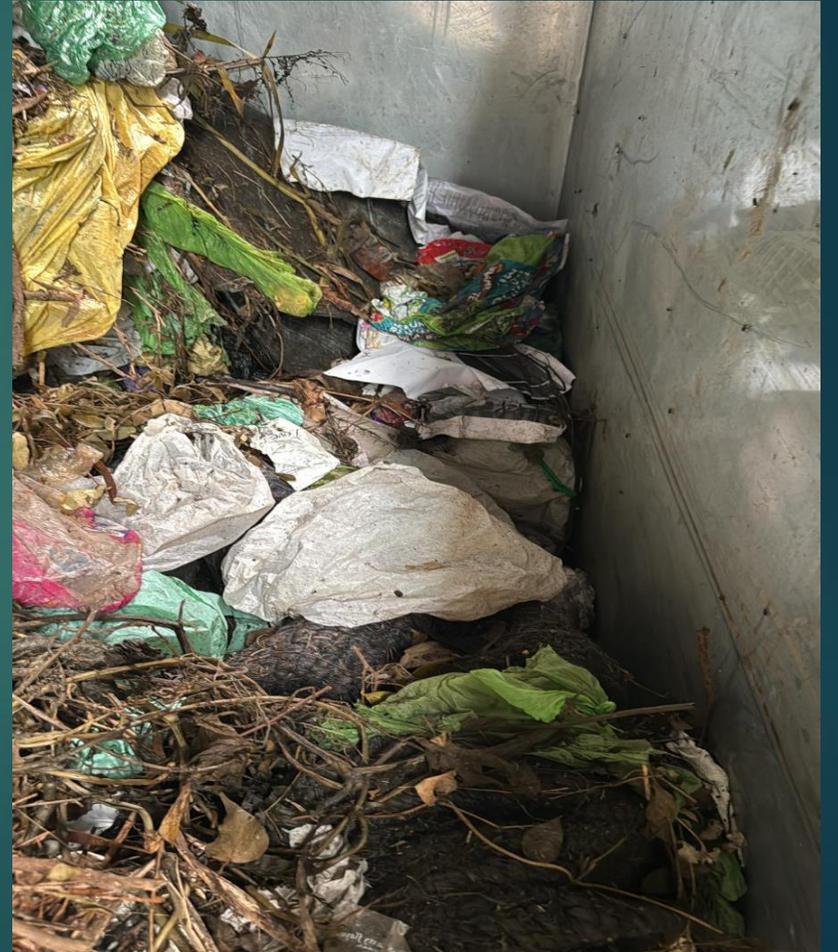
- ▶ Council has resolved to enter into an agreement with ARC to establish a “trial” MSW processing plant on the Landfill site at the Driftway
- ▶ Council has prepared a DA to seek formal approval for the construction of an “All Shelter” to house the ARC plant and process on site.
- ▶ Equipment and shedding has been ordered designed to process 25 tonnes per day or 9,000tpa of MSW
- ▶ Commencement date is expected to be some time in either late July or early August running for a 12 month period with an option for a further 6 months.

The Process

The operations can be broken down into **6 principle processing steps**:

1. Receival and inspection on arrival. Including identification and management of any hazardous items.
2. Primary sorting process – standard front end separation, bag opening, recyclable removal, size reduction.
3. Combining with BSF in digester drums.
4. Screening to separate the Frass and Larvae from the packaging material.
5. Further processing and screening to separate the Frass from the Larvae.
6. Extrusion of the packaging material to form **Syncoal™** for use as a reductant in the manufacturing of steel.

FOGO ????? Waste or Resource????



Testing and Recording

- ▶ It is worth noting that this is the first of what we hope will be 3 trial / demonstration facilities operating on Council owned licensed landfill sites in NSW during 2025.
- ▶ As trial facilities, detailed daily and weekly records of all material flows in and out will be recorded – effectively forming a long term waste audit.
- ▶ All finished products will be subject to extensive testing to both identify risks and more importantly confirm their suitability for their respective end markets.
- ▶ NSW EPA, Hawkesbury Council, Department of Primary Industries and DCCEEW of the Australian Government have and will continue to be consulted during the trial process..

Outcomes from Trial Plants

- ▶ Detailed waste analysis.
- ▶ Confirmation of process.
- ▶ Identification of opportunities for process improvement and streamlining.
- ▶ Confirmation of end product quality and suitability for market acceptance and uptake.
- ▶ Confirmation of financial viability.
- ▶ Acceptance from all regulatory authorities on the certification and use of the end products.

Anticipated Benefits

for both Councils and community

- ▶ Reduced waste to landfill
- ▶ Landfill life extension
- ▶ Reduced costs to Council and the community
- ▶ Reduced use of fossil fuels either for the production of fertilisers or the manufacturing of steel
- ▶ Significant social, environmental and economic benefits
- ▶ Establishment of long term viable end product markets

Thanks

Our thanks go to:

- Samuel from Hawkesbury City Council for believing in the vision and assisting in the establishment of the first plant
- To Tracey Chalk from Penrith City Council for her assistance and support for the establishment of the demonstration plant
- Ramon and Ricky for their passion and vision and allowing us to help them move towards commercializing the process
- You all for having the interest and passion late on the last day of the conference

ANY QUESTIONS.

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