



Rapid Composter Case Study: PASTEURISATION AND ACCELERATED PERFORMANCE OF THE GAIA FOGO COMPOSTING SERVICE IS DOCUMENTED IN REAL TIME FOR HEPBURN SHIRE COUNCIL

Introduction: Gaia EnviroTech

Gaia EnviroTech, based in Ballarat, Victoria, provides end-to-end waste management services that are modular, scalable and designed to fulfil local needs. The company's mission is to improve soil health, capture carbon in the soil, and reduce methane emissions from rotting food and vegetation.

Partnership with Hepburn Shire Council

Gaia has been working closely with Hepburn Shire Council since 2021, initially deploying a prototype of their innovative In-Vessel Rapid Composting System for trial purposes. Through these collaborative efforts, Gaia fine-tuned the system, enhancing its efficiency and ensuring good compost quality.

The trial unit proved its value by achieving pasteurisation, a crucial step in eliminating pathogens and preparing compost for soil rejuvenation, while Hepburn Shire Council minimised the contamination in the end-product. Building on this success Gaia has installed two new in-vessel composting cells at Hepburn Shire Council's Creswick Transfer Station site to address their FOGO (food organics and garden organics) challenges across the community.

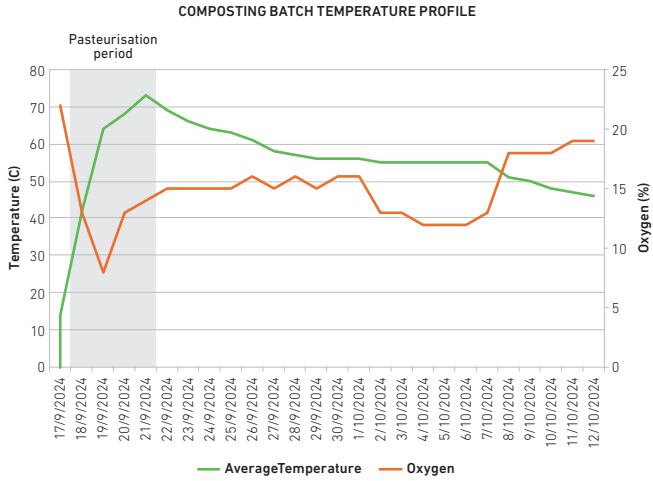
Results

The initial 8 batches, each weighing 45 tonnes, were successfully pasteurised within 5 days. The process operates on a 2-week in-vessel cycle, followed by a 6-8 week maturation period once the material is removed from the container.

The below chart is an example of the data produced in real-time by the Gaia Rapid Composter through the company's Neon Analytics data system. Air (oxygen) is controlled, as well as heating in the unit, and the chart below illustrates how quickly high temperatures are achieved (<24hrs). Effective pasteurisation is essential to kill off weeds and pathogens and is complete when the temperature is maintained at 55°C or higher, for more than three days (72hrs).

Batch Details		Pasteurisation	
Batch Stage	THERMOPHILIC	Status - From time	PASTURISED
Max Average Temperature	75.1 °C	Min Pasteurisation Temp SP	55.0 °C
Min Oxygen Conc	6.0 %	Total Time Above Min Temp SP	151 hours
Final Avg Temperature	32.2 °C	Min Pasteurisation Time SP	72 hours
		Act Pasteurisation Time	72 hours Ⓞ

Snapshot of the data produced in real-time by the Gaia Rapid Composter



The Gaia solution

Gaia is overseeing the operation and maintenance of the Rapid Composting Systems while utilising remote monitoring to ensure optimal process control for pasteurisation and end-product quality.

The in-vessel technology deployed by Gaia accelerates the composting process, yielding nutrient-rich compost from organics both faster and more consistently than traditional methods. A key feature of this technology is that the organic material is first processed "in-vessel" which minimises odours on site by being in a closed system rather than being windrowed in the open. Each Gaia Rapid Composter is equipped with its own pollution abatement control system to manage temperature and oxygen levels, to ensure GHG emissions are reduced.

Designed for ease of use, the system can manage different organic feedstocks and has been tailored for clients with FOGO and larger green waste streams, such as park, powerlines and roadside pruning. By reliably processing FOGO, Gaia's system not only mitigates environmental impact but also produces high-quality compost beneficial for community use.

It is a partnership that has yielded a local solution that delivers outcomes that everyone can benefit from in Hepburn Shire Council.



"Our partnership with Gaia EnviroTech has changed how we approach resource recovery in Hepburn Shire. By integrating innovative solutions like the Rapid Composting System, we are not only providing a solution for collection of organics but also enhancing soil health and fostering community engagement. This collaboration embodies the principles of a circular economy, turning organics into valuable resources and creating a sustainable model that benefits both our environment and our residents."

Bradley Thomas, CEO, Hepburn Shire Council

The FOGO processing story explained



Collect food and other organics at home



Place it in the FOGO bin



FOGO bin gets collected



Contamination including plastic gets removed at the council's waste facility



The Gaia team will prepare the FOGO



FOGO goes into the Gaia Rapid Composter for pasteurisation



Processed materials get tested to ensure they meet Australian standards



Compost can be used locally on parks, gardens, farms etc.

Conclusion

The partnership between Hepburn Shire Council and Gaia EnviroTech exemplifies a successful model for sustainable resource recovery management and the circular economy through innovation and collaboration. By implementing the In-Vessel Rapid Composting Systems, Hepburn Shire has improved their resource recovery and set a benchmark for local environmental stewardship, by processing locally. The system's ability to efficiently process organics while minimising odours and vermin has proven essential for community acceptance and engagement.

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