

## Project Title: Inorganic waste management at abattoirs

Project Report Reference: Project 3 in a portfolio of projects contained in 2016.1010

Date: June 2016

**Project Description:** This project investigated how inorganic waste streams can be avoided, reduced, reused or recycled via projects that provide a Return on Investment (RoI). The industry has made significant efforts to improve the environmental sustainability of red meat processing, however further improvements can be made through better informed procurement; investment in innovative technologies, processes, and practices; training of staff; and ensuring sustainable use of resources in a responsible and efficient manner.

**Project Content:** Meat processors are under pressure to reduce landfilling to reduce operating costs and are also experiencing a demand for increased environmental stewardship such as “zero waste to landfill”. The challenge is not to simply find new ways of disposing of the solid waste, but to find economically and environmentally acceptable means of recycling waste, thereby moving towards a circular economy. The following are general opportunities that were uncovered as part of this project:

- Ensure each facility has an effective waste management plan, measuring not only aggregate waste to landfill (kg/t HSCW), but separate measurement of plastic, cardboard & other wastes with recycling and recovery potential. Waste audit to define the current operation, opportunities and highlight low cost, easy wins especially around waste disposal contracts. For examples, if waste is paid per skip, then reducing volume may reduce landfilling costs. A waste audit forms the foundation of a waste management strategy.
- Further research should be conducted into the most sustainable use of plastics within the meat processing industry. This will need to consider cost, contamination, end user expectations and take a life cycle assessment approach to identify the environmental footprint and the best end of life treatment for both contaminated and uncontaminated material. A simple yet highly effective option is to be selective on the plastics that enter and are used in the facility via the use of a “plastic hierarchy”, such as:
 

Best options:	[1] Bio / biodegradable plastics e.g. polylactic acid (PLA)
	[2] High Density Polyethylene (HDPE)
	[3] Low Density Polyethylene (LDPE)
Acceptable:	[4] Polyethylene Terephthalate (PET)
	[5] Ethylene Vinyl Acetate (EVA)
	[6] Polypropylene (PP)
Least Preferred	[7] Polyurethanes (PU)
	[8] Polystyrene (PS)
	[9] Acrylonitrile Butadiene Styrene (ABS)
	[10] Polycarbonates (PC)
	[11] Acrylic
Prohibited	[12] PVC & halogenated polymers (containing chlorine or fluorine)

- AMPC’s continued industry support and collaboration with retailers and retail packing companies to develop methods and product designs to reduce the amount of plastic both in use and the resulting waste both on and off processing facilities. This can be achieved via: increased knowledge transfer to processors and organisations in the meat supply chain via collaboration; information on specific waste streams currently difficult to obtain (e.e. types of materials and companies able to accept or recycle different materials); engage with groups such as the Australian Packaging Covenant, manufacturers/suppliers and environmental agencies to improve the quality and quantity of data collected.
- Identify facilities that receive waste to conversion to energy to inform the industry of possible contaminated waste end of life options. Consideration of the following in seeking opportunities to utilise this waste stream as a source of energy: calorific value and material of construction; moisture content; chlorine content; particle size.

**Project Outcome and Benefit for Industry:** The following table summarizes the high level findings of this project. Whilst all opportunities are not pertinent to all red meat processors, the majority can be considered by all facilities.

Scenario	Findings
Waste co-firing in an existing solid fuel boiler	1 month to +1 year - depending upon material handling requirements and complexity for environmental approval
Packaged Plant Solid Fuel Boiler	3.4 years
Waste compaction	3 months
Small scale plastic pyrolysis	+10 years
Waste segregation for enhanced recycling	Immediate payback
Waste Recycling with local council	Immediate payback
Plastic procurement strategy	Immediate environmental improvement; use of the
Off-site waste to energy	Approximately break-even compared to landfilling assuming no capital / start-up costs. Further detailed analysis required.

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