

## NCWQ Environment Adviser's Report, September 2018

**Waste:** Australians are generating around 64 million tonnes of waste every year. This could cause health and environmental problems. To combat this problem the Federal and State Governments are updating the *2009 National Waste Policy: Less waste, more resources* to provide a national framework for improving Australian waste management. A circular economy is promoted in the discussion paper with five principles that underpin waste management, recycling and resource recovery: *Discussion paper Updating the 2009 National Waste Policy: Less waste, more resources September 2018*. In this report which forms the basis of feedback to the Government, these principles and strategies are discussed.



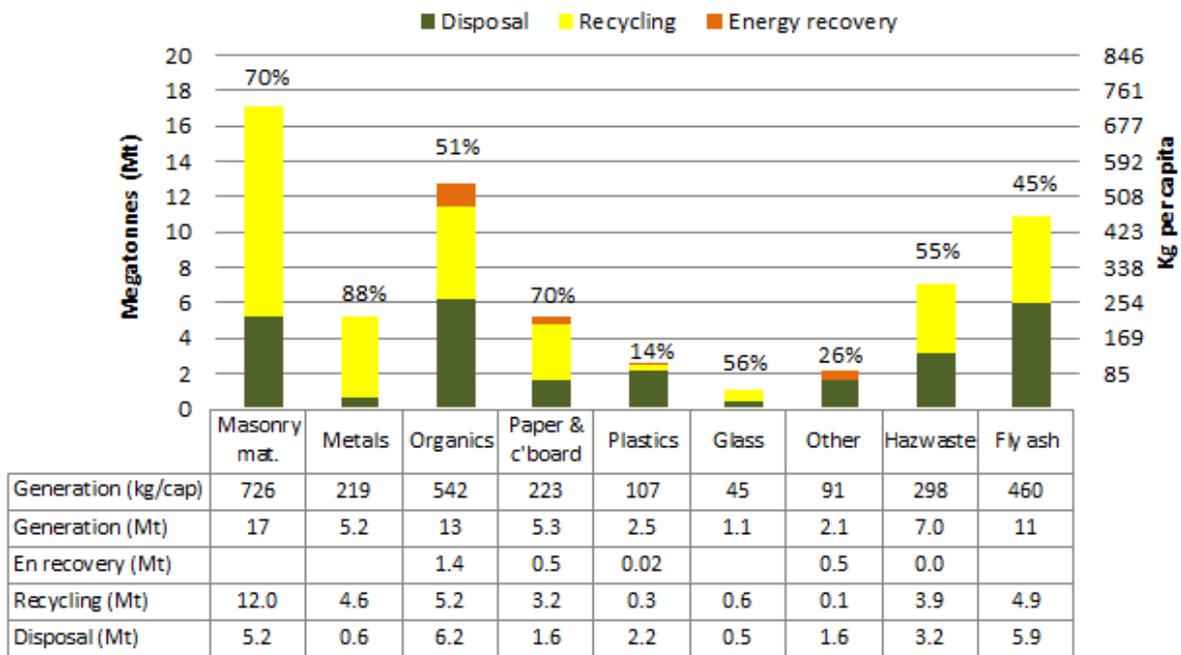
- *Updating the 2009 National Waste Policy: Less waste, more resources. Representation of a Circular Economy as it applies to resource use (reproduced by Department of the Environment and Energy with permission of the European Union)*

**Principle 1.** *Avoid waste (National target 10% by 2030; Food Waste target 50% by 2030, problematic plastics by 2030)-*

- *prioritise waste avoidance, encourage efficient use, reuse and repair*
- *design products so waste is minimised, they are made to last and materials are more easily recoverable*

Given the differences in % wastage of the various materials, it would appear advisable to encourage those industries which generate and use materials which can detrimentally affect health and the environment to have specific targets. e.g. as well as plastics, fly ash and hazardous waste

## Waste generation and fate by material category, Australia 2014-15



'Masonry mat.' means masonry material; 'c'board' means cardboard; 'Hazwaste' means hazardous waste; 'En recovery' means energy recovery. The stated percentages are the resource recovery rates = (energy recovery + recycling) / generation. [Australian National Waste Report 2016](#)

Designing systems and products that increase a product's lifecycle including disassembly and repair is very important. However the long term degradability of the material should be considered also. For example plastic can break down into microplastics which could act as an agent for the transfer of many fat-soluble pollutants, such as persistent, bioaccumulative and toxic compounds, from the environment and into organisms such as fish. [Lusher, A.L.; Hollman, P.C.H.; Mendoza-Hill, J.J. 2017. Microplastics in fisheries and aquaculture: status of knowledge on their occurrence and implications for aquatic organisms and food safety. FAO Fisheries and Aquaculture Technical Paper. No. 615. Rome, Italy.](#)

**Principle 2.** Improve resource recovery (80% from all resource recovery streams by 2030)

- improve material collection systems and processes for recycling
- improve the quality of recycled material we produce

While packaging is essential to protect the integrity and security of products, single use packaging can make a substantial contribution to waste. In their Australian Packaging Covenant Strategic Plan (2017-2022), the Australian Packaging Covenant Organisation (APCO) aims by 2022 to have

- developed proven viable approaches to remove 50% of current problem packaging types or materials including soft plastics, takeaway coffee cups and expanded polystyrene from the waste stream with 90% of its members actively participated in closed loop collaboration of circular economies.
- delivered a packaging *Recycling/Disposal Labelling Scheme* in market covering 85% of packaging; and the collective efforts of APCO members will have resulted in a decrease in labelled recyclable packaging going to landfill, and have reduced single-use Business to Business packaging, as a proportion of turnover, by 30%, based on 2017 reported levels. [Australian Packaging Covenant Strategic Plan 2017 – 2022](#)

Does APCO membership cover the majority of firms in the packaging supply chain? Perhaps membership could be extended to businesses in the packaging supply chain with less than an annual turnover of \$AUD5 million. Packaging on imported products must be a contributing factor to waste.

The current review of the Product Stewardship Act of 2011 should determine whether the Voluntary accreditation of product stewardship arrangements and the Co-regulatory product stewardship schemes delivered by industry and regulated by the Australian Government are effective. And it should be clear whether Mandatory product stewardship schemes are needed to label products, to make arrangements for recycling products at end of life, or require a deposit and refund to be applied to a product, or ban certain substances or materials from use in products. <http://www.environment.gov.au/system/files/consultations/79a39335-ee07-4f94-ab7f-cd8323641af0/files/ps-act-review-consultation-paper.pdf>

Having different bins for each type of waste would be advantageous. It should not be necessary for every householder to have every bin, provided depots are conveniently located. For example, in Kamikatsu, Japan, the population of about 1,500 take their rubbish to the recycling centre and sort it into 45 different categories. Volunteers collect the rubbish of the elderly once a month. Food scraps are mostly composted and more than 80% of the town's other waste is now recycled. The remaining 20% that can't currently be processed — things like nappies and certain types of plastics — get sent off to be incinerated. By 2020 the town aims to be waste free. The sheer inconvenience of having to take one's rubbish to the recycling centre also acts as a deterrent to excess consumption in the first place. <http://www.abc.net.au/news/2018-05-20/kamikatsu-the-japanese-town-with-45-different-recycling-bins/9776560>



[Photo: Kamikatsu's waste station manager, Kazuyuki Kiyohara.](#) [Photo: Kamikatsu residents bring their waste to the recycling plant. \(ABC News: Yumi Asada\)](#)

***Principle 3. Increase use of recycled material and build demand and markets for recycled products***

The importance of commonly accepted working definitions of what constitutes recyclable, compostable or reusable across the States and Territories is crucial for success. At present these differ by State and Territory. The milestone of having national standards and specifications for high priority recycled materials or applications in place by 2020 should start to address this.

Unless there is a strong domestic market for recyclable materials all the effort of collecting and sorting will be in vain. For example, the lack of market for recycled plastic appears to have been a disincentive. One recycling business which turns soft plastics such as milk

cartons and squeezable shampoo bottles into sturdy plastic play equipment, termite-proof boardwalk decking and bollards, processes about a third of what it has the capacity to. This firm with at least one other only accepts plastic waste from organisations willing to buy back the recycled products. <https://www.theguardian.com/sustainable-business/2017/may/22/recycling-in-australia-is-dead-in-the-water-three-companies-tackling-our-plastic-addiction>. Increased awareness of the waste problems and participation in recycling by organisations and the public is needed. The current ABC TV series may help.

Converting plastic waste to fuel has potential. Geyer *et al* note the vast majority of monomers used to make plastics, such as ethylene and propylene, are derived from fossil hydrocarbons. None of the commonly used plastics are biodegradable so they accumulate, rather than decompose, in landfills or the natural environment. The only way to permanently eliminate plastic waste is by destructive thermal treatment, such as combustion or pyrolysis. [Geyer, Jambeck, \*Law Sci. Adv.\* 2017;3: e1700782; \(DOI: 10.1126/sciadv.1700782\)](https://doi.org/10.1126/sciadv.1700782) Some types of plastics e.g. pure hydrocarbons, such as polyethylene and polypropylene are more suitable than others for using this technology. <https://instead.com/blog/plastic-to-fuel> A commercial scale facility capable of converting waste plastics to fuel at a rate of 50 feedstock tonnes per day was commissioned in NSW by Integrated Green Energy (IGE) with Foyson Resources using a catalytic restructuring process. <http://plasticpyrolysisplants.com/50-tpd-plastics-to-diesel-plant-produces-first-batch-in-australia/> A plant was also planned to be built at Hume in the ACT. The company claimed their technology removed ash, dealt with hydrocarbon contaminants, and used waste gas for heating to burn off gas at a high enough temperature to destroy noxious compounds. <https://www.canberratimes.com.au/national/act/foy-group-walks-away-from-plasticstofuel-plant-in-hume-20180114-h0i0qw.html> An independent panel reported the company's environmental impact statement failed to sufficiently address key risks, including the risk of explosions, the potential damage to surrounding land, and the effects on air quality. They also recommended ACT should have a "proof of performance" requirement. Hence the plan was shelved. <https://the-riotact.com/foys-planned-oil-refinery-has-hit-a-major-obstacle/202920> Could these problems have been addressed? Maybe, given the waste disposal problem exasperated by China's ban on imported solid waste, the need for sustainable continuous energy supply and that Australia only has 48 days aggregated fuel reserves, the limitation on resin type to be used in waste to energy plants should be reconsidered.

**Principle 4.** *Better manage material flows to benefit human health, the environment and the economy*

Although the megatonnes of organic waste is much greater than that of plastic and hazardous waste the latter two pose a greater threat or risk to public health, safety or to the environment.

Recycled plastics aren't able to continually serve the same purpose after recycling. The process of melting down and recycling plastic produces volatile organic compounds that can harm plant and animal life including humans near the industrial site if not carefully controlled. Plastic is manufactured from petroleum and this substance can leech into foods stored in recycled plastic containers. Plastic manufacturers only use a small portion of recycled plastic, if any, when producing food containers and packaging. Because of the potential health threats recycled plastic poses, much plastic recycling is actually down-cycling e.g. a plastic water bottle may be down-cycled to become artificial turf or plastic furniture. <https://sciencing.com/disadvantages-recycled-plastics-7254476.html> Hence, the aim of the National Waste Policy to phase out problematic and unnecessary plastics is strongly supported.

There are many reasons to support the target of the National Food Waste Strategy of halving the volume of organic waste sent to landfill by 2030, not least to help reduce greenhouse gas

emissions by diverting food waste from landfill, but also to make better use of resources such as land, water, energy and fuel to produce and distribute food. Innovative Australian Food waste solutions such as turning imperfect-looking vegetables and fruit into other products and identifying most cost-effective transport option from farm through to processor, storage facility or manufacturer, through to retailers and export ports should help.. [The National Food Waste Strategy](#).

**Principle 5.** *Improve information to support innovation, guide investment and enable informed consumer decisions.*

Baseline data being collected and referred to in National Waste Policy and the National Food Waste Strategy as well as data on hazardous materials in Hazardous Waste in Australia 2017 are essential information. Should not national strategies such as National Waste Policy and the National Food Waste Strategy be developed for other materials, in particular hazardous waste and plastics, under the auspices of the Department of the Environment?

Recently, Integrated Green Energy Solutions (IGES), announced a joint venture agreement with the Chinese Crown World Holdings to construct a waste plastic-to-fuel facility in Weifang in Shandong Province of China. The facility will have an initial production capacity of 200 tonnes per day, producing 70 million litres of road-ready fuels per annum. IGES's patented plastic-to-fuel process is claimed by the company to reduce the environmental impacts of waste plastic, that would otherwise be used in landfills or discarded into the environment. <http://www.manmonthly.com.au/news/australian-company-convert-chinas-waste-plastics-fuel/> This followed the shelving of the plastic to fuel facility in Hume. It is regrettable the expertise could not be kept and exploited in Australia. Strategies to support innovation and research and development in waste management and recycling, and support creating and maintaining markets for recycled materials are crucial.