

Environment and Planning Committee  
Inquiry into Recycling and Waste Management  
Parliament House, Spring St  
EAST MELBOURNE VIC 3002

10 May 2019

This paper outlines key information to guide the Victorian Government's Inquiry into Victoria's recycling and waste management systems. Thank you for your consideration.

### Port Phillip EcoCentre ('the EcoCentre')

The Port Phillip EcoCentre is a leading community-managed organisation with a dedicated team of scientists, educators and volunteers who design and implement innovative environmental programs. Our expertise includes Port Phillip Bay health and the urban ecology of Greater Melbourne, within the traditional lands and waters of the Kulin Nation. We connect communities to their ecosystems in over 160 Melbourne suburbs, and take an evidence-based approach to preventing pollution in our landscapes and waterways.

We bring together people of all ages and backgrounds to spark solutions and inspire environmental leadership. Each year the EcoCentre collaborates with over 25 Affiliate organisations, 120 schools and 250 partners from business, government, philanthropy, education and research institutions. Our collective impact since 1999 has transformed the way Melbourne understands wildlife, waterways and wellbeing in the age of climate change.

### EcoCentre Response to Inquiry Terms of Reference (*blue boxes*)

**The responsibility of the Victorian government to establish and maintain a coherent, efficient and environmentally responsible approach to solid waste management across the state, including assistance to local councils**

To consider its efficient and sustainable management, we must recognise that Australia's challenging volume of waste is driven by *wastefulness* at all stages of a product life cycle. The eco-footprint of the average Australian is 3.8x the planet's bioregenerative capacity<sup>1-2</sup>. Our wastefulness is growing faster than our population or economy.<sup>3</sup> This dangerous misalignment will eventually cost the Victorian Government in numerous ways, unless we use various mechanisms to advance an Australian circular economy inherently built around waste avoidance, regenerative/renewable reuse, onshore recycling and 'remanufacturing'.

In 2017, Australia's ability to offshore cross-contaminated solid scrap was dramatically constrained. Since then, discussion for solutions have generally discounted meeting contamination standards for materials export, and instead centred on two premises:

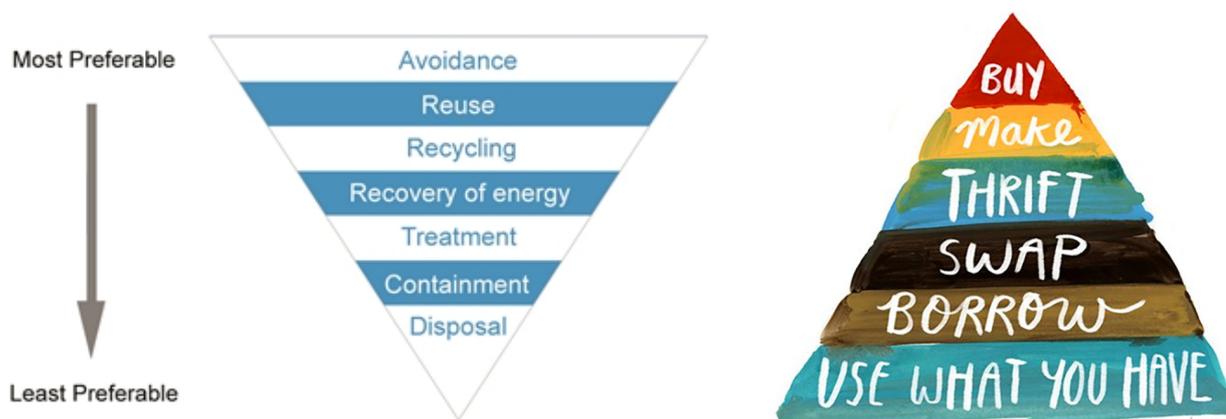
- a. **Develop domestic recycling, remanufacturing and a market for recycled content.** This has been driven by government and waste industry voices.
- b. **Reduce the volume of 'leftover' materials, thus defuse 'crisis' demands and other negative externalities of the 'take-make-dispose' model.** This position has been primarily led by community voices.

<sup>1</sup> WorldAtlas.com

<sup>2</sup> <http://www.abc.net.au/news/2017-08-03/earth-overshoot-day:-today-the-earth-goes-into-the-red/8770040>

<sup>3</sup> [https://www.environment.gov.au/system/files/resources/0a517ed7-74cb-418b-9319-7624491e4921/files/factsheet-australian-context\\_0.pdf](https://www.environment.gov.au/system/files/resources/0a517ed7-74cb-418b-9319-7624491e4921/files/factsheet-australian-context_0.pdf)

We ask Victoria to coordinate with all levels of government on both themes. Australian and Victorian waste management and resource recovery policies typically open with the *waste hierarchy* pyramid, a global standard which prioritises *prevention* measures over *recycling* and *recovery*. The hierarchy is codified as one of eleven principles in Victoria's Environmental Protection Act 1970. However, the lack of leadership, investment, incentive and messaging for waste avoidance has resulted in continuing overconsumption, skyrocketing waste generation and increasingly risky dependence on offshoring enormous volumes of Australian waste which positions anxious governments to respond to 'crisis' by making hazardous, rushed mis-investments such as Waste to Energy.



(L) The waste hierarchy appears in all government policies, however subordinate strategies then habitually skip over the top priority of waste prevention/avoidance. This design flaw places fundamental pressure on any plan's proposed waste management and recovery, given uncontrolled increase in material flows.

(R) Sarah Lazarovic's *Buyerarchy of Needs* plays on zero-waste management a share-and-repair economy

Recycling, even at its historical best rates, does not absolve governments from prioritising waste avoidance. Many materials can *technically* be recycled, given appropriate facilities. However, the technical feasibility may be outweighed by factors such as equipment and labor cost, energy emissions or water requirements, distance between materials and their potential processing sites, and lack of end market for resulting recycled stock. These are the domain for government authority and influence.

In addition to specifying 'avoidance' as the priority regarding wastes (Principle 1I), Victoria's Environmental Protection Act 1970 highlights a collective responsibility between public, private and community sectors for waste management, through the **Principle of product stewardship** (1H) and **Principle of shared responsibility** (1G.1):

*Protection of the environment is a responsibility shared by all levels of Government and industry, business, communities and the people of Victoria.*

We are alarmed at today's popular emphasis on individualised responsibility for recycling, given that contemporary model of recycling emerged in the 1960s with early campaigns targeting manufacturers to take responsibility for post-consumer waste. Citizens often assume they are 'doing the right thing, using the right bin' without having a transparent sense of whether government is providing suitable infrastructure, incentives and education for a win-win materials economy and healthy environment; or whether the processing of recycling is efficient, economical, ethical, and positively impactful. Although the 'recycling crisis' has brought systemic aspects of waste management into the

common vernacular, we observe the rise of Zero Waste principles still being driven from grassroots and individual champions. Australian not for profit 1 Million Women has 111,000 followers on social media, and Melbourne's Rogue Ginger has 23,000... Victoria's *Love Food Hate Waste* page, by comparison, has 18,000.

The skew toward community-driven initiatives, focused on individual (not systemic) changes contravenes the Environment Protection Act. It is appropriate, and legislated, for Victorian Government to take a shared role driving the circular economy and reducing waste and wastefulness – which would have greatly offset the current crisis point.

### Whether the China National Sword policy was anticipated and responded to properly

At the time of writing, we approach two years since China's National Sword policy.

For three decades, China was a large importer of recyclable materials, accepting over 30 million tonnes of material from across the world. In 2013, China adopted the policy 'Operation Green Fence' to prohibit the importation of unwashed recyclables and reduce contamination. In July 2017, China formally announced strict contamination thresholds for materials including paper and plastics, which effectively work as a ban, particularly in countries with 'single stream' bins of mixed recyclables, wide variation of content accepted between waste providers (and therefore between schools, homes, businesses within a single street), and without a rules-oriented culture to underpin attentive sorting.

**Whether or not China's specific policy was anticipated, for some time the EcoCentre and citizens have strongly advocated for waste prevention leadership by governments which might, if effective, have reduced the volume and intensity of the current challenges.**

One major scrap material pile-up due to tightened Chinese regulation is *plastic*. Plastics are, in many ways, emblematic of the overconsumption that compounds climate change but generally remains unchecked and unchallenged by government. 'Take-make-dispose' thinking and 'single use' products might clock up sales, but they drive numerous problems including economically. Currently, single-use plastic packaging comprises approximately 25% of world plastics by volume; but through litter and landfill around 95% of the value of plastic packaging material (worth US\$80-210 billion annually) is lost after a single use<sup>4</sup>. Much of this chokes our waterways; by 2050, there will be more plastics in the ocean than fish. The negative externalities of plastic products are estimated globally at US\$40 billion per year<sup>5</sup> and range from health impacts, to ecological, to tourism loss.

Aside from our government's legislated responsibility to prevent environmental harm, the matter of externalised health and economic impacts might have sufficiently justified Victoria to undertake expert, proactive systems redesign from 2013 onward; or responsive action given (a) ongoing community advocacy and (b) the July 2017 announcement. Solving this has interconnected consequences to our own future health and Australia's liveability; relates to Victorian policies and legislation across emissions, litter, water, health and biodiversity; and has deep moral implications for globally shared resources such as clean air and potable water.

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<sup>4</sup> Ellen Macarthur Foundation, 2014

<sup>5</sup> *The new plastics economy: Rethinking the future of plastics*, 2014, McKinsey, the Ellen MacArthur Foundation, and the World Economic Forum

## Identifying short and long-term solutions to the recycling and waste management system crisis

There are various useful suggestions circulating to address the current recycling and waste management crisis, to reduce, reuse and recycle onshore. These range from instituting an *Australian Recycled Content* label<sup>6</sup> to single-use product bans<sup>7</sup> and mandatory minimum recycled content for government procurement (such as using glass sand, rather than mined sand, for road construction<sup>8</sup>).

The EcoCentre strongly endorses investment in waste prevention measures at all stages of a product's life cycle, and extended product stewardship to incentivise circular economic principles – products and markets designed for direct reuse or component dismantling for efficient remanufacturing.

**Align practice with the waste hierarchy preference for waste avoidance.** Take care defining targets as 'diversion from landfill', a phrasing by which Waste to Energy (WTE) schemes, reduced wastefulness, or even litter might be considered theoretical success.

**Like many environmental groups worldwide, we harbour extreme concerns about WTE schemes that use thermal processes to convert various 'feedstocks' into heat or electricity.** Waste to Energy technology has an overall low potential calorific (energy production) value for Australia's needs, triggers problematic tradeoffs and diverts funding from more productive, zero-emission technologies and waste reduction investments. It has benefits primarily for niche distributed scenarios. These do not relate to thermal processing of municipal mixed solid waste, where government 'diversion from landfill' targets and reduced ability to offshore recyclables have currently raised risky temptation to invest in WTE.

In Australia, waste biomass is expected to continue to be utilised for heat and electricity production in niche, localised applications generally in single-site configurations such as biogas from landfills or sewage treatment plants. In 2018, the Clean Energy Finance Corporation (CEFC) announced WTE investment funds, including debt financing for the Australian-first \$668m Western Australia facility. One year earlier the CSIRO had concluded, "Large-scale new build/retrofit combustion and gasification plants that run on 100% biomass are unlikely to be required or cost competitive."<sup>9</sup> The Victorian Government acknowledges WTE that includes plastic waste, such as municipal waste, is "the same as using fossil fuel."<sup>10</sup>

**WTE proposals typically claim landfill and energy production benefits – but what is the cost-to-benefit ratio?** The Victorian Government's *Turning Waste into Energy* discussion paper (2017) states "The CEFC contends that energy from waste could meet up to 2 per cent of Australia's electricity demands" up from a current level of 0.9% (~800 MW).

<sup>6</sup> Waste Management and Resource Recovery Association of Australia, *Five Point Action Plan* (2019)

<sup>7</sup> Although banning items such as straws and ubiquitous packaging of fruit and vegetables in supermarkets is a start towards preventing these items from getting into the environment, we recommend future bans are implemented on a higher level materials-based approach, rather than by individual end product, to avoid perverse incentives (such as offering thicker plastic bags for a price). This means that rather than product-by-product bans, the Act needs to implement higher level regulations that require materials and designs to fulfil a set of sustainability criteria at all stages of their life cycle. Products that do not fulfil these criteria could then be amended or phased out by an agreed date. For single use products, in order to be manufactured or imported to Australia, the criteria should include demonstrated necessity or health benefits as a single use product - for example, medical or legal contexts.

<sup>8</sup> Inside Waste, *Paving the way to a more sustainable society* (April/May 2019)

<sup>9</sup> CSIRO, [Low Emissions Technology Roadmap](#) (2017) p90

<sup>10</sup> Victorian Government, *Turning waste into energy* (2017) p17

This is a small potential impact, given the following concerns:

- **Zero gain.** WTE for mixed waste is no better than landfill (European Union Circular Economy Plan, 2018)
- **Toxic emissions.** Thermal technologies have a greenhouse emissions profile equivalent to burning coal (US Environment Protection Agency, 2014). New York State compared emissions profiles and found that WTE produced 14x the amount of mercury as an equivalent coal plant, and more lead and cadmium.
- **WTE is a significant net energy loss compared to recycling.** Not only do many items have low calorific value, but once burned it is likely that replacement products will need to be made. For example, recycling a tonne of plastic saves 8,397 kWh compared to generating new plastics; burning that same plastic will only generate 2,403 kWh and making a new tonne (to replace what was burned) will use 9,619 kWh.
- **Cannibalising material.** Thermal processes rely on 'reliable waste volumes over long periods to justify investment, consequently locking up (and using only once) resources that could be repeatedly recycled in the circular economy' (Boomerang Alliance, 2017)
- **Perverse disincentive for more sustainable waste reduction.** WTE locks in ongoing dependence upon generating a certain level of waste material, therefore undercutting preferred *reduce*, *reuse* and *recycle* actions on the waste management hierarchy. Gayle Sloan from the Waste Management Association of Australia (WMAA) says that if the technology detracts from a focus on reusing and recycling resources, then it is doing us a disservice. "It's one of the lowest options on the hierarchy, as in it's the last resort before landfill. Once you've burnt it, it's gone. You don't get that resource back."
- **Mixed waste WTE loses money.** Europe is often heralded for its WTE, however a 2019 McKinsey study concluded that "Almost 60% of Denmark's plastic waste ends up at incineration plants. If the nation were to recycle the material instead, it would benefit the economy as much as 1.5 billion Danish Krone (or US\$ 152 million) each year.<sup>11</sup> Because a 15-to-20 year contract is typically needed to make WTE facilities bankable, investors (including governments providing waste material) become locked in to this net loss.

**Waste to Energy for municipal waste is risky and must not divert priority investment from zero emissions electrification, overall waste reduction and creating a circular economy.**

We note even WTE proposals for non-municipal waste ('bioenergy') are complex and problematic environmentally and economically. Most available bioenergy is from very disparate agricultural wastes. Collecting and transporting such wastes add significant costs. Energy crops are inefficient; and burning native forests is unsustainable and unjustifiable. In their 2018 *Electrifying Industry* report, Beyond Zero Emissions wrote, "Solar panels convert sunshine into energy far more efficiently than any plant, producing 3-5 times more energy per hectare than sugar cane. Electricity is also a far more useful and transportable form of energy than biomass."

Port Phillip EcoCentre supports 100% renewables by 2030 and net zero emissions by 2035, which has been demonstrated possible with current technology, within a growing economy. **Government investments must be in zero-emissions renewable technologies.**

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<sup>11</sup> <https://recyclinginternational.com/research/mckinsey-study-says-denmark-is-wasting-money-by-burning-plastics/>

## Strategies to reduce waste generation and better manage all waste

### **Victoria must invest in wastefulness prevention, not just waste management.**

The Victorian Government must be bold and transparent with our state, whose businesses and residents currently consume at the unsustainable pace of 4x the planet's regenerative rate for natural resources required for our basic and lifestyle needs. Melbourne's famous liveability cannot continue at the cost of other people or the planet.

### **Honor the Product Stewardship principle of the Environment Protection Act 1970.**

Product stewardship of plastics and particularly single-use plastics are of highest priority due to their impact in freshwater, soils and food chains. Convene an advisory panel to consider mandatory sustainability standards for product categories, including plastics, with particular consideration of criteria to distinguish necessary and/or permissible single-use products. Fund education and community initiatives that bring everyday Australians along in the thinking and behaviour shifts that accelerate and complement sustainability-driven shifts by industry.

Waste To Energy by incineration is not Product Stewardship.

Please see also our submission to the 2018 [Product Stewardship Act Review](#).

## Relevant reviews, inquiries and reports into the waste and recycling industry in other Australian jurisdictions and internationally

For your consideration, we list the following extracts from 'European Strategy for Plastics in a Circular Economy' (2018). We believe these measures would apply equally in the Australian context, for plastics and other materials. The strategic visions include:

- Moving decisively towards a more prosperous and sustainable plastics economy could deliver considerable benefits.
- Plastics and products containing plastics are designed to allow for greater durability, reuse and high-quality recycling. By 2030, all plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner.
- EU plastics recycling capacity is significantly extended and modernised. By 2030, sorting and recycling capacity has increased fourfold since 2015, leading to the creation of 200 000 new jobs, spread all across Europe.
- Thanks to improved separate collection and investment in innovation, skills and capacity upscaling, export of poorly sorted plastics waste has been phased out.
- Substances hampering recycling processes have been replaced or phased out.
- More plastic recycling helps reduce Europe's dependence on imported fossil fuel and cut CO2 emissions, in line with commitments under the Paris Agreement.
- Plastic waste generation is decoupled from growth. Citizens are aware of the need to avoid waste, and make choices accordingly. Consumers, as key players, are incentivised, made aware of key benefits and thus enabled to contribute actively to the transition.
- The leakage of plastics into the environment decreases drastically. Effective waste collection systems, combined with a drop in waste generation and with increased consumer awareness, avoid litter and ensure that waste is handled appropriately. Marine litter from sea-based sources such as ships, fishing and aquaculture are significantly reduced. Cleaner beaches and seas foster activities such as tourism and fisheries, and preserve fragile ecosystems.
- Higher levels of plastic recycling, comparable with those of other materials, will only be achieved by improving the way plastics and plastics articles are produced and designed. It

will require increased cooperation across the value chain: from industry, plastics manufacturers and converters to public and private waste management companies.

Specifically, key players should work together to:

- improve design and support innovation to make plastics and plastic products easier to recycle;
- expand and improve the separate collection of plastic waste, to ensure quality inputs to the recycling industry;
- expand and modernise the EU's sorting and recycling capacity;
- create viable markets for recycled and renewable plastics.

### Any other related matters

As the Committee reviews waste management and resource recovery, we urge you to consider and publish externalised costs (biodiversity, amenity, clean water access) impacted by Victoria's patterns of consumption and systems of materials management. This Inquiry provides opportunity to debut environmental-economic accounting recommended under *Protecting Victoria's Environment – Biodiversity 2037*.

The EcoCentre is particularly concerned by the evidence of the impacts of waste mismanagement upon waterways. 85% of marine pollution comes from sources on land, and rivers are the main ways plastic pollution makes it to Port Phillip Bay from land based sources. Our recent study found **more than 828 million pieces of litter make their way from the Yarra and Maribyrnong rivers into Port Phillip Bay, annually**. In both rivers, most of the litter caught consisted of hard plastic remnants, secondary microplastics from broken up plastic items. Of the other analysed litter items, polystyrene, nurdles, plastic bottle caps, straws and soft plastics were prevalent.

The potential for plastic pollution to harm aquatic life is recognised by scientists as a global problem. Microplastics are classified as pieces of plastic smaller than 5 mm in diameter, which are mostly parts of broken up larger plastic products. Plastics (at macro, micro and nano scales) have been proven to damage air<sup>12</sup>, soil<sup>13</sup>, water and cause brain damage in fish<sup>14</sup>. As a vector both for toxins into food chains and for invasive species between ecosystems, plastic in waterways is also a significant risk for human health, tourism, and fisheries.

- See also our research paper [Microplastics in the Yarra and Maribyrnong](#)
- See also our [Issues Paper on preventing waterway pollution and Waste to Energy](#)

Given the consequences of microplastics and other mismanaged waste on marine ecosystems, human health and economies, **we request that recommendations of this Inquiry emphasise not only the technical processes of waste management and resource recovery, but comment on the context of the ecological and economic implications of recommended actions, and their relation to other Victorian environmental legislation, policies and strategies.**

Prepared by April Seymore  
Executive Officer



<sup>12</sup> Gasperi et al, *Microplastics in air: Are we breathing it in?* (2018)

<sup>13</sup> Forschungsverbund Berlin, [An underestimated threat: Land-based pollution with microplastics](#) (2018)

<sup>14</sup> Mattsson et al, [Brain damage and behavioural disorders in fish induced by plastic nanoparticles delivered through the food chain](#) (2017)