

Submission to the House of Representatives

Standing Committee on Industry, Innovation, Science and
Resources

Inquiry into Australia's Waste Management and Recycling Industries

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INQUIRY INTO AUSTRALIA'S WASTE MANAGEMENT AND RECYCLING INDUSTRIES

The Australian Academy of Technology and Engineering (ATSE)¹ welcomes the opportunity to respond to the House of Representatives Standing Committee on Industry, Innovation, Science and Resources' inquiry into Australia's waste management and recycling industry.

ATSE is currently undertaking a major project investigating the readiness of the Australian waste management and resource recovery sector to adapt, adopt, or develop technologies that will enable it to meet the three key challenges it will face in the decade to 2030:

- Transition to waste as a resource
- Domestic capacity to process core waste, and
- Emerging waste streams

The project is focused on the opportunities presented by waste materials, and innovative solutions to these challenges.

ATSE's vision for the waste and resource recovery industry in 2030 includes the conversion of waste streams to income streams, with an expanding network of waste and recycling hubs, skilled jobs created in waste management and innovation, and more efficient supply chains and business opportunities in Australia's manufacturing sector. The Australian waste and resource recovery sector will be profitable, resilient and ready for the country's transition toward a more circular economy. We will maximize the use of resources and minimize waste. The waste sector will have reduced environmental impact through the diversion of waste from landfill, reduced resource depletion and reduced emissions, toxicity, and contamination.

The Challenge

The current model of waste management is linear, with the most common method of dealing with waste being disposal. We will examine how technology can assist in the transition towards a more circular model where the waste and resource recovery sector, and Australian society as a whole, can see **waste as a resource**.

Australia's **domestic capacity to process core waste** is becoming an urgent consideration in the context of a COAG Environment Council agreement to phase ban the export of waste glass, plastics, tyres, and paper & cardboard from July 2020. We have very little capacity to recycle this waste in Australia.

Emerging waste streams are growing exponentially. Waste generated in 2030 will look a lot different to today. The waste streams are also becoming increasingly complex, because new products contain rare metals and toxic materials in much higher quantities than current products. It is vital that we anticipate the volume and complexity of these emerging waste streams and plan for the future.

ATSE's project is looking at waste generated or managed in Australia. Its focus, guided by the findings from the National Waste Report 2018, is on high priority core waste – masonry materials, organics, paper and cardboard, plastics, and glass. The project will also consider emerging waste streams such as e-waste, Li-ion batteries (LIBs) and solar PV, all of which are growing rapidly and need urgent

¹ The Australian Academy of Technology and Engineering is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

solutions. We will also include end-of-life tyres (EOLTs), given the upcoming ban on their export from Australia and our limited ability to process them.

Each of these materials has its own specific challenges. For masonry materials, organics, paper and plastics, it is the sheer volume of material ending up in landfill. For plastics, organics, and tyres, it is the proportion of waste ending up in landfill rather than recycling. The low recycling rate for paper and cardboard, plastics, glass and EOLTs will be a major challenge once the COAG waste export ban is applicable in phases from July 2020. Particularly for wastepaper and cardboard, plastics and tyres, Australia currently relies largely on exports for processing. With only 10 per cent of EOLTs being recycled domestically, it will be a massive challenge to increase their management and recovery.

The Solution

The project is framed by the principles of the waste hierarchy, which are avoidance, reuse, recycle and recovery, treatment, containment and disposal.²



Source: EPA Victoria, State Government of Victoria

Based on advice from our Fellows and independent expert stakeholders, ATSE has identified four potential solutions to these challenges. Through consultations currently being undertaken with the industry, government and researchers, ATSE is assessing the industry’s readiness to adopt, adapt or develop these solutions by 2030:

- **Improved product stewardship** where the consumer, manufacturers and the waste sector work together to reduce waste. Through business models such as product as service, sharing platforms³ and product life extension, manufacturers take responsibility for the environmental impacts of their products by maximizing the utility of assets via renting, lending, swapping, bartering and giving—facilitated by technology⁴.
- **Design for disassembly:** Products designed with disassembly in mind from the outset will enable industry to repair, repurpose and remanufacture them and recover valuable materials from them as they reach end of life. This requires a rethinking of the product design processes, to focus on separation of components, possibility of upgradation and exploring ways of combining the components to fit a new use (repurpose).

² Treatment, containment and disposal are excluded from the scope of the project
³ Accenture (2019), *Using digital tech to spin the circular economy*. Available online at: <https://www.accenture.com/au-en/insight-outlook-using-digital-tech-spin>
⁴ World Economic Forum (2014) *Towards the Circular Economy: Accelerating the scale-up across global supply chains*. Available online at : http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf

- **Smart waste management systems (for collection, disassembly, material recovery and processing):** These include intelligent systems for waste collection and management, improved sorting and separation of waste, recovery of valuable materials from waste. Advanced technologies can assist in minimizing the effects of contamination of waste streams and maximize the values of recovered goods. For instance, using technology to incentivize waste separation by consumers through a reward system⁵, 'Pay as you throw' systems⁶ among others can bring a change in the way waste is created and disposed⁷.
- **Advanced resource recovery solutions** that use technologies to recover energy to produce electricity, heat, gas and fuels from waste.

Further information

ATSE will enter the consultation phase of this project in March 2020 and would be pleased to brief the Committee and learn more from the results of this inquiry. The report is expected to be launched in mid-2020.

For further information about this project, please feel welcome to contact Dr Matt Wenham, Executive Director Policy, Australian Academy of Technology and Engineering on (03) 9864 0926 or matt.wenham@atse.org.au.

⁵ For instance, smart bins using RFID (radio frequency identification) tags to identify and track people's recycling habits

⁶ Systems where the refuse collector scans and weighs the bins, records the information in a database, and then charges for the un-recycled waste

⁷ [Can technology help tackle the world's waste crisis](#)