



23 September 2019

The Hon. Matt Kean  
Minister for Energy and the Environment  
52 Martin Place  
SYDNEY NSW 2000

Dear Minister

**Re: NSW Waste and Resource Recovery Strategy**

Thank you for the opportunity to provide input into the development of the NSW Government's 20-year Waste and Resource Recovery Strategy. The Centre for Sustainable Materials Research and Technology (SMaRT) at the University of New South Wales (UNSW) has particular expertise in waste recovery and recycling, and we hope to contribute that expertise to achieve a strategy that best meets the need of NSW.

**What are the key issues facing the NSW waste system?**

The critical issue facing the NSW waste system is developing new advanced strategies that will facilitate our move away from the traditional model of waste collection by a contractor to local government, and then taken to landfill, shipped offshore or simply stockpiled.

The development of new supply chains will allow for the recovery of waste so that it can be recycled or reformed into value-added materials. At present, there is a focus on waste management at one end of the current chain, with an emerging recycling and manufacturing industry at the other. New supply chains need to link the two together to achieve the desired solution of recycling the elements of waste products so that they can be reformed in our manufacturing industries.

Indeed, a shift is needed in our thinking, to move away from classifying items as waste, towards instead conceiving of these items as containing the basic elements to be used as input materials for manufacturing. For example, discarded textiles, paper and glass can be reformed into floor tiles, ceiling tiles, or sound-absorbing wall tiles, while discarded e-waste such as laptops and smart phones can be converted into materials for use in industrial grade metals and ceramics; and plastic filaments for 3D printing.

With new supply chains that conceive of waste in this way, a new economic opportunity will be created, that offers the possibility of creating jobs in regional NSW communities, while also more efficiently using council resources presently devoted to waste disposal.

A small number of hurdles need to be overcome to allow for this shift. First and foremost, the procurement of waste management services by local councils needs to be done in a way that allows sufficient flexibility for councils to pursue new and innovative solutions when they

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are developed. At present, councils are locked into lengthy contracts with waste management businesses with no scope to consider new waste management solutions such as establishing microfactories<sup>TM</sup> to recycle waste.

Secondly, and related to the first challenge, private sector waste management providers need incentives (whether economic or regulatory) to recover, re-use and recycle waste. Without incentives, they can be expected to pursue the cheapest and easiest option for waste management, which will not necessarily align with the NSW Government's public policy goals or the broader public good.

It is important to note that the scientific basis for re-use and recycling of waste already exists in many cases, underpinned by more than a decade of research. The basis of good waste policy now rests on using that science in a practical way, and addressing the challenges highlighted in this submission.

We commend the NSW Government for developing this strategy, and for recognising the link between waste and recovery. Ultimately however, the challenge of waste management cannot be confined to NSW, and will require a national and global response. With the technology developed here at UNSW, and the NSW Government's foresight in recognising this opportunity, there is scope for NSW to become a global leader in waste management.

### **What are the main barriers to improving the NSW waste system?**

As highlighted in our response to Question 1, a key barrier lies with the procurement of waste management services, and the disconnect in supply chains between waste management and manufacturing. Councils are generally in charge of waste disposal activities, and are often locked into long-term contracts with waste management businesses, who are therefore not incentivised to seek innovative solutions.

Not only do long-term contracts allow large waste disposal companies to become comfortable without any requirement to offer their clients a better service, but they could prevent councils from trying new things that would better serve the communities they represent.

At present, there are small manufacturing businesses interested in using recovered waste as feedstock, so creating new supply-chains from councils to businesses need to be developed and councils need support to enable new pathways to market to be created.

Ideally, waste disposal would be run as a distributed solution across NSW, with microfactories close to the point of disposal working to recycle waste material into manufacturing feedstock. If processed locally through a series of microfactories, it offers the opportunity to generate local jobs through manufacturing new products, and would be economical to the body (usually council) charged with waste management.

### **How can we best reduce waste?**

The best options for reducing waste are those that don't conceive of an item as waste following the end of a product's life, but rather as a component in the manufacture of a future product. Therefore, the optimal solutions to waste management will be those that re-use or recycle products rather than burying them in landfill, or incinerating waste (including waste to energy proposals).

The solution identified by UNSW researchers at SMaRT is now recognised as world leading, as evidenced by the establishment of the Australian Research Council (ARC) funded Green Manufacturing Hub in 2015. As well as developing the science to underpin this solution, we

have also been at the cutting edge of developing industry links to promote that research being put into practice. Further industry involvement with our research and implementation of solutions will support the reduction of waste in NSW and beyond.

For example, already millions of tyres have been diverted from landfill, partially replacing coke in EAF steelmaking. As highlighted above, other materials, such as glass or e-waste are being transformed into tiles, industrial grade metals and ceramics and plastic filaments that are then used in 3D printing, through our engineered microfactories.

To allow for these outcomes, a number of policy settings are needed to promote the recycling of waste into new products, and to encourage waste management companies to move away from simply seeking the cheapest solutions (such as landfill) to seek innovative solutions.

Ideally, policy and regulatory settings should encourage councils to address the whole life cycle of waste, going beyond waste collection to also include the creation of recycled products by supporting partnerships with manufacturing companies.

As well as covering procurement of waste management, policy settings should encourage competition in the marketplace, supporting small business and distributed solutions to waste management and recovery.

The recent Council of Australian Governments (COAG) decision to ban the export of waste will hopefully promote waste management companies to seek sustainable solutions such as those set out in this submission, rather than stockpiling waste or exporting it. It should also be noted that stockpiling waste often presents a health and fire hazard. At present, flammable cladding that has recently been removed from buildings is being held in stockpiles, and this practice simply moves the fire risk from buildings to the stockpile site.

A key theme of this submission is that waste management companies will respond to their regulatory environment. Therefore, we urge the NSW Government to adopt regulations that promote recovery, re-use and recycling of products by industry and their end customers.

### **How can we recycle better?**

Critical to better recycling is a program of incentives for the private sector to participate in research and development, and to better recover materials after a product has reached the end of its useful life.

There is already the precedent of “return and earn” type schemes changing the dynamic of markets for waste materials, and a new program of grants and/ or levies could serve to incentivise recycling by waste management companies.

There are also organisations such as the Community Recycling Centres (CRCs) that sort waste, which in turn facilitates the re-use of waste materials. Drawing on the work of CRCs and other similar organisations would support the establishment of microfactories that manufacture recycled value-added materials, components, semi-finished and finished products for our economy.

### **What are the main opportunities for improving the NSW waste system?**

The SMaRT Centre at UNSW already plays a world leading role in developing microrecycling science & technology and establishing microfactories. Our centre has undertaken the research to enable innovative recycling possibilities that address multiple public policy goals relating to the sustainable future of waste management.

As well as better addressing waste and recovery issues, our solution also offers the benefit of creating manufacturing jobs in rural and regional NSW. By locating solutions close to where the waste originates, transport expenses are minimised and the solution is cost effective.

Already, NSW manufacturing businesses are benefiting from this technology, and those benefits could be enhanced through the right policy settings to encourage innovation and waste reduction, in turn driving business participation in using our microrecycling and microfactory<sup>TM</sup> technologies.

NSW Government policy should recognise these developments in waste management, and the economic opportunity to communities around the state flowing from turning waste into new products. By taking innovative microfactory<sup>TM</sup> technologies developed by SMaRT, and developing economic and regulatory incentives for waste management companies and customers to seek similar solutions, the Government could address the challenges facing the waste system, and promote positive economic outcomes.

We would be pleased to work with the NSW Government to contribute to the development of policy that could achieve these important objectives.

**Are there any additional views or information you would like to provide about waste in NSW?**

In addition to the information provided above, we'd like to draw the NSW Government's attention to the role played by UNSW in hosting the Circular Economy Innovation Network, working with various stakeholders to lead the way in sustainable waste management and industry development.

With the expertise generated at SMaRT, we stand ready to help the NSW Government address important issues relating to waste management, recovery and capitalising on the exciting opportunities arising from recycling that waste. We look forward to working with you on developing these solutions.

Yours sincerely,

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