Plastic Waste CRC

“It's our waste. It's our responsibility”

Rethinking the way we design, use, and reuse plastics to create a valuable circular economy for plastic, and a cleaner, safer environment.

In-principle Foundation Partners

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Introduction

Our relationship with plastic needs rethinking. Plastics are versatile materials, but the way we use them is not sustainable. We take oil and gas from the earth to make plastic products that are often designed to be used only once, and then we throw them away.

Australians consume around 130 kg of plastic per person per annum, most of which is sent to landfill. Recycling rates are low (12%), and leakage (9%) into the environment is difficult to manage and a growing threat to human, animal and environmental health.

While plastic has many benefits, we now know there are negative consequences if it becomes waste or pollution. With the demand for plastic packaging set to double over the coming two decades, it will be impossible to keep this ever-growing flow of plastics in the economy and out of the environment. To achieve a circular economy, we need to reduce the amount of material that needs to be circulated. Globally, replacing just 20% of single-use plastic packaging with reusable alternatives is conservatively estimated to be an opportunity worth at least USD $10 billion.

Stakeholders from across the entire plastic life cycle should have a strong interest in participating in the Plastic Waste CRC:

- Manufacturers - looking to develop, use and reuse new sustainable materials, and create new markets
- Brand owners - looking for novel sustainable packaging solutions
- Packaging companies - seeking alternative, effective and sustainable solutions
- Retailers - developing more sustainable supply chains for their customers
- Waste Management companies - exploring novel, efficient and effective plastic sorting technologies
- Recycling operators - seeking scalable, economic and efficient solutions, and commercial value from plastic
- Public and Private enterprises - wishing to advance their social license to operate, and address sector-specific challenges (e.g. medical, agricultural, packaging, textile, mixed and e-waste etc.)
- SMEs - servicing the needs of industry across the entire plastic lifecycle and wanting to capitalise on the development of a circular economy for plastic
- Business and industry advocacy groups - investigating sustainable and commercially viable solutions on behalf of their members
- Local Government Authorities - seeking plastic-specific solutions to key waste challenges
- State Government Agencies – seeking solutions and pathways to NWPAP targets
- Consumer and community groups - wanting to engage with world class research and help to promote local action.

The Plastic Waste CRC will rethink the way we design, use, and reuse plastics to create a viable and valuable circular economy for plastic, and a cleaner safer environment.

Why the Plastic Waste CRC?

The development of a circular economy for plastic is fundamental to solving Australia's plastic waste challenge. The Plastic Waste CRC will identify new technologies, products, services and industries that can emerge from taking on a circular economy approach. By rethinking the way we design, use and reuse plastic, the Plastic Waste CRC will fast-track the development of a viable and valuable circular economy for plastic that will create 1000s of jobs, drive business, economic and export growth, and result in a cleaner, safer environment.

Australia's plastic waste challenge is complex and multi-faceted, and encompasses the:

- Ubiquity of plastics in modern life;
- Complexity and diversity of plastic materials;
- Global nature of plastics supply chains and waste flows;
- Imperatives of improving design, changing behaviour, and developing new business models; and
- Demands of establishing waste collection, processing and reuse systems at scale in urban, regional and remote settings.

The Opportunity

The development of an Australian circular economy for plastic (including medical, packaging, agricultural, textile, cosmetic, mixed plastics and e-waste) represents an enormous opportunity for stakeholders across the plastic lifecycle, delivering new revenue streams across design, consumption, reuse, recovery, avoidance, collection, sorting, recycling and manufacturing.

The Plastic Waste CRC will help drive and enable:

- Novel and commercial pollution free material and packaging options
- New commercial remanufacturing and reuse enterprises
- Commercial-scale feedstock recycling connecting the waste and manufacturing sectors
- Novel technologies for SME commercialisation and delivery
- Artificially intelligent plastic waste sorting technologies
- Novel biotechnology for cleaning up plastic pollution
- Commercial plastic waste to energy solutions
- Collaborative engagement with community, business and consumer advocacy groups

The Plastic Waste CRC will fast track the growth of burgeoning technologies through collaborative research. Demonstration facilities and pilot projects coupled with digital twins will step change the incremental advancement in national short- and long-term goals for plastics.

Outputs of the Plastic Waste CRC

The Plastic Waste CRC will adopt a 4R (Reduce, Reuse, Recycle, Recover) approach to combine innovative technology in product design and material selection, link production with recycling technologies and develop novel technologies for timely detection, clean up and effective management of plastic pollution. A holistic approach to collection, transport, sorting and valorisation will enhance clean-up of plastic wastes and shift the 'take-make-dispose' consumption pattern to a circular economy. Outputs of the Plastic Waste CRC will include:

- Innovative products and materials for reuse, remanufacture and recycling
- Smart manufacturing and recycling technologies for plastics
- Demonstration of economically viable technologies through pilot projects/plants
- Smart infrastructure for waste collection, storage and processing
- Plastic material flow and recycling information apps
- Evidence-based decision support tools
- Innovative circular business models
- Education and behaviour change tools

Outcomes and Impact

The Plastic Waste CRC will deliver and enable:

- New high-tech driven manufacturing, recycling and reuse industries
- Competitive and viable circular economies for plastic
- Position Australia as a leading country for plastic waste recycling research and practice
- Thousands of new jobs, business and economic growth
- Expanded industry capabilities and skill-sets
- Significant growth in plastic recycling
- Dramatic reductions in plastic sent to landfill
- Major reductions in plastic leakage and environmental pollution
- Elimination of single use plastics

Proposed Research Programs

Through the Plastic Waste CRC, integrated multi-disciplinary research across the plastic industry supply chain will deliver technological innovation in plastic production, recycling and re-manufacturing, environmental clean-up and management technologies for plastic waste, innovative circular economy business models and a shift in cultural and social behaviour towards plastics. It will also provide a framework to integrate these elements that will help develop effective policy and regulation.

"Australia is missing an estimated $419 million of value per annum for PET and HDPE that is unrecovered."

2032 Plastic Waste OLYMPICS BRISBANE

Zero Plastic Waste at the 2032 Olympics

A key project within Research Program 4 will be to support the 2032 Brisbane Olympics to meet global, national and community expectations to deliver a zero plastic waste event.

Research Program 1:
Design for circularity

This program will design, develop and commercialise products and materials that enable greater recycling, reuse, decomposability, degradability, and avoidance - minimising waste production and creating profitable new circular businesses. Possible areas of research:

- Optimising the selection of key materials for mainstream plastic products through circular product design
- Designing innovative products and materials for reuse, remanufacture and recycling
- Designing and developing recyclable and compostable alternatives with low-emission, energy efficient and economically viable characteristics
- Developing innovative biotechnology for transforming organic waste into high value bioplastics
- Conducting market and supply chain analysis for the development of innovative circular business models.

Research Program 2:
Transforming plastic waste

This program will develop and commercialise new technologies that maximise plastic recycling and remanufacture outcomes and value, creating new opportunities in advanced manufacturing in the pursuit of dramatic reductions in plastic waste to landfill and the environment. Possible areas of research:

- Transforming plastic waste into new value-added materials
- Optimising plastic feedstock technologies across sectors, uses and plastic types
- Innovative recycling technology for energy and resource recovery
- Market, supply chain and material flow analysis for lifecycle costing and the development of efficient and effective circular plastic waste economies
- Artificially Intelligent plastic sorting technology for organic and mixed plastic wastes, and plastics mixed with other materials

Research Program 3:
Cleaning up and restoring the environment

This program will develop approaches and new technologies to clean up plastic pollutants present in the environment and to minimise plastic waste entering the environment, reducing the potential impacts of plastic pollution on human, animal and environmental health. Possible areas of research:

- Developing novel remote sensing, spectral and sensor technologies to detect and monitor plastic pollution
- Developing novel biotechnology solutions (e.g., microbial enzymes) and biological systems (e.g., worms) for rapid degradation of plastics
- Innovative filtration technology to prevent microfibers entering the environment
- Evaluation of plastic burning and microplastic impacts on air quality
- Evaluation of the impact and health risk of plastic pollution on humans and animals through the food chain

Research Program 4:
Collaborating for a circular plastic economy

In support of Programs 1 to 3, this cross-cutting program will develop effective engagement and collaboration across key stakeholder groups to rethink and reimagine how we develop and implement a viable and valuable circular plastic waste economy in urban, regional, remote and indigenous communities. Possible areas of research:

- Developing evidence-based decision support tools for effective and implementable policies, regulation, and standards for imports and recycled products
- Stakeholder mapping and engagement throughout the entire plastic supply chain to understand key barriers and drivers of change
- Partnership with end-users to develop both technologically and economically viable demonstration/ pilot plants in a variety urban and regional settings
- Developing effective short, medium and long-term intervention measures, such as tools for engagement and behaviour change across communities, industry and end-users
- Developing product stewardship for major plastic products to address socio-environmental concerns.

Education and Training Program

A dedicated education and training program will deliver applied programs, vocational skills development and community education and awareness, including:

- Higher Degree by Research (HDR) programs for PhDs and Masters by Research to support promising young researchers in the sector
- Industry training programs through TAFEs and VETs as well as Plastic Waste CRC industry partner network for building the skills of existing workforce, including a focus on SMEs
- Masters by Coursework programs for mid-career professional development and modules in undergraduate programs to address skills shortages at an early stage
- Micro-credential programs in business, leadership, commercialisation and driving innovation for generating highly valued and effective workplace candidates
- Community education and awareness of circular economy and bio-based plastic products through strategic, stakeholder-driven information campaigns

Plastic Waste CRC Governance

The Plastic Waste CRC will be established as a not-for-profit company limited by guarantee. It will be governed by an independent skills-based board. The CRC will establish Consultative Committees for each Research Program and for Partners.

The CRC will maintain a flexible approach in considering options for ownership and use of IP beyond a default position of the Plastic Waste CRC owning the legal title to the IP, with alternative arrangements stipulated in Project Agreements. The CRC will have two participant categories, one for research institutes and the other for non-research institutes such as industry and government.

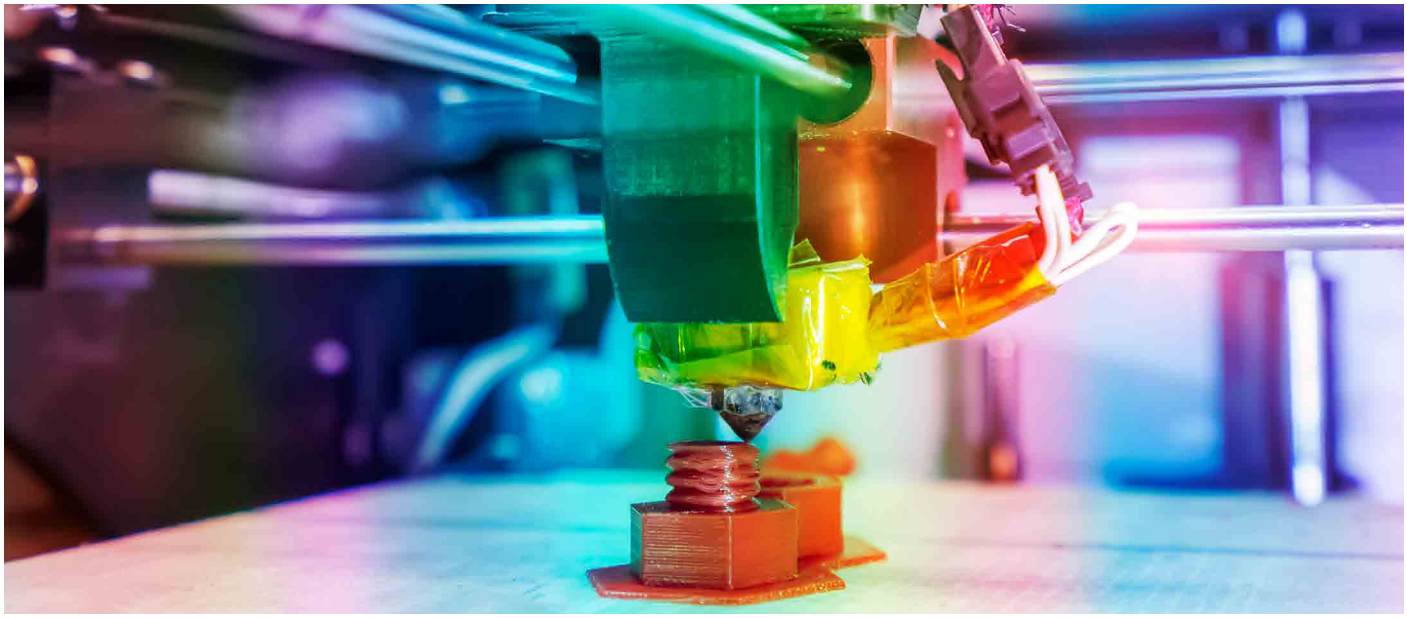
The Plastic Waste CRC has a draft term sheet, developed in consultation with participants, which articulates the governance and management of the CRC. The draft Term Sheet will form part of the package of information made available to CRC partners.

What is a CRC?

The Cooperative Research Centre (CRC) Program is a Commonwealth Government program providing grants for up to 10 years.

CRCs are independent entities, established and governed as incorporated companies limited by guarantee and comprise industry led collaborations between industry, researchers and the community. The focus is on research and development that will have commercial uses. The CRC program aims to improve the competitiveness, productivity and sustainability of Australian industries, especially in government priority areas, use high quality research to solve industry identified problems, and encourage SMEs to take part in collaborative research.

With more than 226 CRCs being funded since the program's commencement, the Australian Government has committed more than $4.5B in CRC funding.



Participating in the Plastic Waste CRC

The Plastic Waste CRC seeks to raise $3.5 million per annum from key stakeholders (including $2 million per annum from industry participants) for the 10-year life of the CRC which will see an additional $35 million matched Commonwealth funding being requested.

Partner Tier	Core	Key	Supporting	Affiliate
Membership contributions/annum	$200k or >	$100k or >	$10k or >	<$10k or in-kind only
Membership of CRC Company	✓	✓	×	×
Nominate Board Members	✓	✓	×	×
Nominate a representative to Research Program Consultative Committees	✓	✓	×	×
Access to industry embedded PhD and Masters students and opportunity for co-supervision	✓	✓	×	×
Nominate the theme and host an annual plastic waste innovation challenge	✓	✓	×	×
Hosting potential pilot / demonstration sites	✓ (up to 3)	✓ (up to 2)	×	×
Discounted professional training and development	✓ (tailored)	✓	✓	×
May be eligible for offsets under the R&D tax incentive	✓	✓	✓	×
Other benefits, including participation in CRC conferences, seminars and other networking events; regular news updates and reports	✓	✓	✓	✓

Timeline

June/July 2021:
Partner engagement and research program shaping

June - Aug 2021:
Stage 1 Application development, Participant declarations finalised

24 Aug 2021:
Stage 1 assessment, Shortlisting for Stage 2

Oct/Nov 2021 - Jan/Feb 2022:
Stage 2 Application development and impact model development

Feb 2022:
Stage 2 assessment and panel interviews

March/April 2022:
Successful CRCs announced

Oct 2022
CRC established and funding begins

To find out how to become a participant in the Plastic Waste CRC, or for more information, contact:

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