A Proposal for Water Research Australia to Invest in Plastic Waste CRC (2023-2032, 10 years).

Funding: cash requested from Water Research Australia: $100k per year for 10 years, to focus on developing various novel, practical and economically viable technologies to convert waste water, sewage sludge into affordable bioplastic and remove microplastic contaminants to commercialise biosolids into high value fertiliser product.

a) **Novel biotechnology to convert biosolids to biodegradable bioplastic:** Biotechnology can be developed using some specific, salt-tolerant bacterial strains (e.g., *Zobellella denitrificans*) to produce polyhydroxybutyrate under stressful environment (nutrient unbalance) that is an emerging class of bioplastics.
b) **Advanced decontamination (e.g., PFAS, PFOS, microplastic) biotechnology**: A suite of advanced technologies will be developed to engineer multiple-functional biopolymers produced from locally available, low cost organic wastes to adsorb and destroy PFAS and PFOS, and novel plastic-degrading enzymes and microorganisms from extremophile microbiomes will be explored and developed to remove microplastics in biosolids to convert biosolids into the high value fertiliser products.
c) **Circular design and material selection** for waste water sample bottle to be re-used
d) Advanced technologies for renewable energy generation and energy conversion
e) Any other projects from WRA.

Key benefits for Water Research Australia and its members invested include:

a) *WRA– become a key partner on behalf of investor members:* membership of CRC company, nominate board member and other benefits listed in the brochure.
b) *Use of licence and shared ownership of IP* of novel technologies to remove plastic and other contaminants (PFAS and PFOS etc.) in the biosolids – high value fertiliser for improving soil health.
c) *Invest less cash for more research done:* Invest $1 is expected to get $3 worth research done from funding from federal government and research partners.
d) *Influence of regulation and policy of all levels of governments* to minimise plastic wastes produced and entering the organic waste streams. Ability to make informed and timely business decisions in response to novel research outcomes and potential shifts in government regulation and policy.
e) *National and Global Recognition of the Significant Contribution* to the reduction in plastic waste and associated GHG Emission made by industry, showing the both Corporate's Responsibility and Environmental Sustainability (Green Environmental Image).

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