



COOPERATIVE RESEARCH CENTRES PROJECTS

## CRC Projects - Power Efficient Wastewater Treatment Using Graphene Oxide Technology

### Customer Story

*Wonder material to help global energy and water shortages*



*Ground water and municipal wastewater are excellent sources provided they can be economically treated.*

An amazing new wonder material called graphene is set to help global energy and water shortage issues and two Australian companies and Monash University are at the cutting edge of its use as a wastewater filtration solution.

Researchers from Monash and two innovative businesses – early-stage technology company Ionic Industries Pty Ltd, and environmental energy and water business Clean TeQ – have joined forces with support from the Australian Government’s Cooperative Research Centres (CRC) Programme.

Specifically, under the CRC Projects initiative, these great minds are working on using graphene oxide to dramatically improve filtration of water, while reducing energy to do so.

They believe the project will produce working products by mid-2018 and it will modernise Australia’s current waste water management from the traditional treatment approach to a low-energy consumption, resource recovery approach.

*“Graphene has special properties which could disrupt current commercial filtration techniques and significantly reduce the energy required to filter wastewater.”*

MAINAK MAJUMDER, LEAD RESEARCHER, MONASH UNIVERSITY

The commercial market for water and wastewater treatment is estimated to be worth \$US 54 billion by 2020.

Freshwater scarcity is a critical barrier to energy and food production and industry in general.

Contaminated freshwater sources, such as ground and surface water and municipal wastewater, are excellent sources provided they can be economically treated.

For the past six years, Ionic Industries and Monash University – supported by a range of Australian Government funding initiatives – have pursued graphene solutions.

Clean TeQ will help them commercialise the great research and development ideas.

*“We plan to be the first to take this breakthrough technology to market in Australia and in developing countries such as China, India, South America and South Africa, where access to clean freshwater is a significant issue.”*

PETER VOIGT, EXECUTIVE DIRECTOR, CLEAN TEQ

Ionic's first applications will target removal of organic matter for water and wastewater treatment.

Graphene's strength, surface area and chemical inertness make it ideal for use in water filtration applications. Ionic has developed two technologies for use in water treatment:

- Patented graphene oxide membranes, that are chemically resistant, much stronger and more tuneable than existing polymer or ceramic membranes meaning safer, lower maintenance, wider applications and increased flow rates.
- Graphene oxide coated SuperSand, a simple, activated carbon substitute, with higher-performance at lower cost than activated carbon products.

Graphene is 200 times stronger than steel.

It has the largest volume-to-surface area ratio of any material.

It is also chemically inert so does not react with other atoms.

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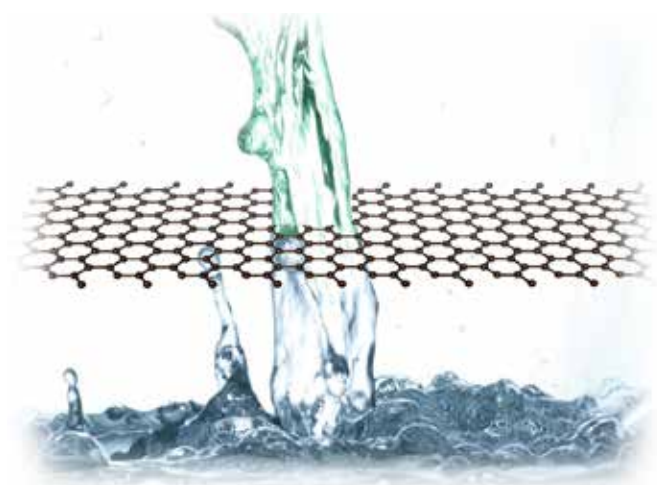
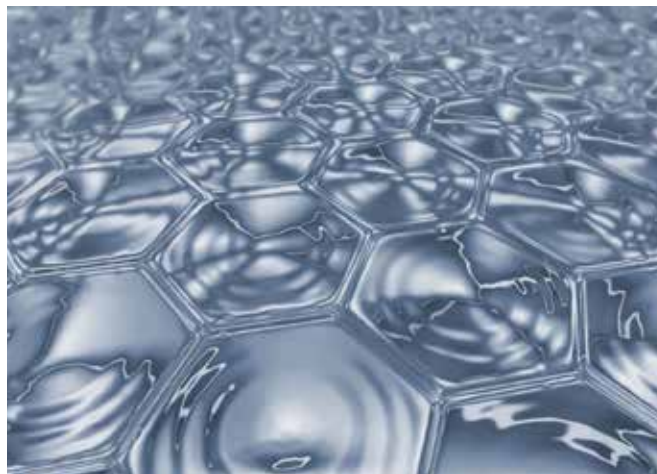
*“Our partnership with Associate Professor Majumder has been pivotal in assisting with the transition of graphene manufacturing expertise out of the laboratory and into commercial applications, and the involvement of Clean TeQ, a highly successful Australian Company, is a testament to the strength and commercial prospects of this technology.”*

SIMON SAVAGE, MANAGING DIRECTOR, IONIC INDUSTRIES

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Visit [Ionic Industries Pty Ltd](#) and [Clean TeQ](#)

The CRC Projects' Power Efficient Wastewater Treatment Using Graphene Oxide Technology project was awarded \$632,285 towards the \$1.6 million project.



*Graphene oxide membranes will deliver superior performance at lower cost than polymer technologies.*

### *The Cooperative Research Centres (CRC) Programme*

The CRC Programme is a competitive, merit-based grants programme that supports industry led collaborations between industry, researchers and the community. The CRC Programme aims to improve the competitiveness, productivity and sustainability of Australian industries through fostering high quality research that solves industry-identified problems. The programme encourages and facilitates small and medium enterprise participation in collaborative research.

Check your eligibility by visiting [business.gov.au](#) or call **13 28 46**.

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