

Background

The NSW Small Business Innovation & Research (SBIR) program is an initiative of the NSW Government that provides competitive grants to small and medium-sized enterprises (SMEs) to find and commercialise innovative solutions to well-defined problems for NSW Government agencies. Further information about the SBIR program is available on the Office of the NSW Chief Scientist & Engineer website. This document sets out the Water Purification Challenge for the 2021 SBIR program.

Challenge summary

The NSW Ministry of Health is seeking technology solutions to identify and quantify micro-plastics in linen services' wastewater and to remove them from wastewater which eventually ends up in rivers and oceans.

Technology solutions might include, but are not limited to:

- Sampling and analysis of the micro-plastic loads in linen services' wastewater pre- and post-treatment
- Water quality sensors to detect trace micro-plastics and other chemicals potentially harmful to the environment
- Suitable filtration and treatment technologies to remove microplastics from wastewater.

Overview of challenge

HealthShare NSW is seeking to improve water purification processes to reduce its trade wastewater and micro-plastics burden on the environment.

HealthShare NSW provides linen services for NSW public hospitals, using approximately 300ML of water per year to wash 40,000 tonnes of linen. The current service produces large volumes of trade wastewater, which is rich in surfactants, dirt, biological matter and micro-plastic particles. HealthShare NSW wants to identify and quantify the impact of micro-plastics in its linen services, improve its management of micro-plastics and remove them from waste. Removing micro-plastics from trade waste is also expected to reduce other contaminants.

Proposed solutions could also increase water recycling, thereby reducing potable water requirements and helping to manage droughts in regional communities in which HealthShare NSW's linen facilities operate. Ultimately, should a successful model be developed, it is HealthShare NSW's intention to upgrade all its seven facilities across the state – Tamworth, Wagga Wagga, Lismore, Illawarra, Orange, Cardiff and Parramatta. A successful wastewater treatment and water efficiency solution would also have wider industry application in reducing micro-plastic contamination of rivers and oceans.

Solution requirements

The solution should comprise both the technology and the method for applying that technology to reduce micro-plastic contamination.

Proposals must:

- describe the scientific basis of the technology to address the problem
- demonstrate that the technology and method can:
 - consistently and reliably quantify micro-plastic loads in linen services at scale
 - cost effectively reduce micro-plastic contamination in wastewater from linen services
 - deliver an infrastructure solution that is robust, practical, scalable and supports conventional linen service load and delivery requirements, including those of HealthShare NSW linen services.
- include a cost-benefit analysis for upgrading wastewater treatment at existing linen services incorporating economic, environmental and social considerations.

This challenge is agnostic to the type of technology used and is seeking the most effective and efficient technology and methodology. Applicants may propose a single technology or device, or a suite of integrated technologies and devices.

Proposed solutions that also increase water recycling and improve energy efficiency will be highly regarded.

Benefits of the solution

Should a viable solution be developed in response to this challenge, the NSW Government would potentially adopt this technology across the public healthcare sector. The solution could provide significant environmental benefits by reducing the impact of micro-plastics.

There are also substantial economic opportunities for water purification technologies. The global market for water and wastewater treatment services was worth over \$340 billion in 2018. This market is likely to continue to grow as the global population, living standards and industrialisation increases. A scalable and commercially viable solution could compete in this market and attract interest from private and public customers in sectors such as hospitality, tourism and government services.

How to apply

For more information please visit www.chiefscientist.nsw.gov.au/sbir