

Waste Recovery and Management Challenge

2022 NSW Small Business Innovation & Research program

Background

The NSW Small Business Innovation and Research (SBIR) program is a NSW Government initiative that provides competitive grants to small and medium-sized enterprises (SMEs) to find and commercialise innovative solutions to well-defined challenges identified by NSW Government agencies. This document sets out the Waste Recovery and Management Challenge for the 2022 SBIR program.

Challenge summary

NSW Health is seeking resource recovery technologies and waste management solutions that:

- offer an innovative design for new facilities
- redesign and reconfigure existing facilities
- uncover ways of modernising our waste collection and processing systems, separation and collection of waste that can be implemented across NSW Health.

This challenge is a collaborative endeavour between HealthShare NSW, Hunter New England Local Health District, Health Infrastructure, the Office of Energy and Climate Change, and NSW Treasury, with strong potential for scalability across the public and private sectors. It has a particular focus on plastic waste (clinical, general and food packaging) as a priority but is not limited to these waste streams.

NSW Health is seeking to significantly increase resource recovery and divert waste from landfill through innovative technology, machinery or equipment solutions in hospitals, with priority given to kitchens, clinical areas and loading docks.

Technology, equipment or machinery solutions might include, but are not limited to:

- Technology such as robotics, smart waste bins and digital audit tools that remove the need for point-of-care source separation on hospital wards while increasing resource recovery. This technology should be adaptable to support future waste management practices.
- Source separation technologies that segregate existing waste streams and enable additional waste streams to be collected without increasing the time required to complete these tasks.
- Innovative hospital collection area and/or loading dock solutions that minimise the space requirement for recycling, while maximising resource recovery. This could include technology such as multi-level waste systems, compactors and waste level sensors.
- Automated source separation solutions that are suitable to manage waste complexity, including contamination tolerance and clinical waste streams.
- Solutions that reduce contamination levels in existing waste streams and/or significantly improve levels of recovered waste. Opportunities for improving recovered waste and improving links with circular economy will be highly regarded.
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Challenge details

Healthcare is the NSW public sector's largest waste generator, with publicly-run health services generating an estimated 52,400 tonnes of waste each year, of which recycling accounts for 9,400 tonnes (17.9%). Traditional waste management systems are not equipped to deal with the growing amount and streams of waste in hospitals. While a full waste audit of NSW hospitals has not been conducted, international experience has demonstrated there is significant cross-contamination of waste streams. Often clinical waste is unnecessarily disposed of using more expensive and environmentally damaging channels, rather than being used elsewhere, retaining its value and reducing its impact.

Future proofing healthcare facilities to meet NSW Government circular economy objectives is also a challenge. A lack of space on hospital wards and limited space in existing waste dock areas does not provide the flexibility needed to innovate and meet future needs. This is a significant barrier to increased recovery for existing waste streams and for new waste streams with the capacity to increase recovery of products and packaging. Other challenges include managing waste stream contamination, and the cost of staff time required to source separate waste streams, including additional waste streams.

To address these issues, NSW Health needs to adopt smart waste management technologies that increase efficiency, reduce collection costs and divert more waste from landfill.

Solution requirements

Solutions must meet objectives and obligation under the Whole of Government Waste Services contracts, which the NSW Government entered in 2021. NSW Health will collaborate with NSW Treasury as the contract owners and the HealthShare NSW Waste Contract Manager to consider the waste contract objectives and obligations.

The solution must be:

- Simple to use and tolerant of human error
- Robust and able to recognise contamination
- Time-efficient and compact in design to be able to be used in limited space at hospital docks
- Compatible with multiple waste streams
- Efficiency-focused without increasing the time required for waste management practices
- At a minimum, scalable across NSW at multiple healthcare facilities.

There is zero tolerance for any unsafe practices in relation to healthcare service provision. All solutions must be fit for purpose and protect safe and efficient healthcare provision as a first priority, including meeting Work Health and Safety and infection, prevention and control considerations.

The solution must engender the support of medical professionals and healthcare service providers through good design that is accessible, easy to use and does not interfere with their primary functions. This would include customer experience tracking, human centered design, change management and communication protocols.

NSW Health has a highly variable asset base, from eight beds through to 1,400 beds. The solution must demonstrate capability to scale up or down in size, and be able to be applied in different geographical settings, based on the physical attributes of individual hospital settings is required. Please refer to attachment for more information.

Benefits of the solution

Challenges around lack of space, staff time required to source separate existing or additional waste streams while managing contamination are issues that apply to nearly every sector of the economy both in Australia and internationally. The solutions have the potential to scale across 100,000 healthcare beds state-wide and over 300,000 beds nationally, as well as private healthcare facilities. Challenges around lack of space, staff time required to source separate existing or additional waste streams while managing contamination are issues that apply to nearly every sector of the economy both in Australia and internationally. Creating solutions within healthcare facilities and loading docks provides the potential to scale solutions across other sectors and will support a transition to a more circular economy.

Solving waste stream management in a system as complex as healthcare would pave the way for other institutional settings to adopt more effective waste management technologies. Individual components of the technology solutions could be licensed or adopted elsewhere in the economy. For example, logistics management of loading docks for better waste recovery and traffic management to and from loading docks is an enduring roadblock in commercial property management. The education sector is another portfolio area where this technology could be applied as it is the second largest waste generators of public sector

New technologies to improve waste separation will increase the use of recycled materials in products and expand options for NSW Health to procure consumables and other products containing recycled material, further reducing its carbon and environmental footprint.

How to apply

Applications to the NSW 2022 SBIR Program will be made through the smartygrants platform, online applications forms can be found at <https://chiefscientist.smartygrants.com.au/SBIR2022Round>.

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