

Response details

Dear Productivity Commission,

Input from the Department of Health and Aged Care to the Opportunities in the Circular Economy Inquiry

In December 2023, the Australian Government launched Australia's first National Health and Climate Strategy (the Strategy). Laid out in the Strategy are 49 actions to help achieve healthy, climate-resilient communities, and a sustainable, resilient, high-quality, net zero health system. The Strategy development and its implementation is led by the National Health, Sustainability and Climate Unit at the interim Australian Centre for Disease Control in the Australian Government Department of Health and Aged Care.

One of the actions in the Strategy (Action 4.16) is the following:

Supporting the systematic implementation of waste reduction action

The Australian Government will commission and publish a review of the potential ways in which health and aged care waste can be reduced, reused, refurbished, recycled, replaced and segregated and how these changes can be implemented. The review will then feed into the green procurement and sustainable resource use guidelines and further resources for health and aged care facilities and staff.

The review is being finalised for publication and reports findings from a systematic literature review as well as Australian and UK case studies.

Consultation questions

Information request 1:

Circular economy success stories and measures of success

“Reduce” health system waste

In the systematic literature review, we identified many studies quantifying the waste and CO₂e emissions of removing rarely used items (such as drapes, gowns, gauze, instruments) from pre-prepared sterile surgical packs. For example, one study included the following interventions: reduce the generic handset to a carpal tunnel release specific set with only essential surgical instruments; switch to smaller drapes (90x90cm square drapes) without compromising sterility of surgical field; minimise the use of single-use non-recyclable items, for example not using single-use plastic dishes, suction tubing, plastic sheets. The estimated CO₂e emissions reduction was 22.2 kg CO₂e per carpal tunnel procedure.

We also identified one Australian reduce case study. The “Gloves Off” project was implemented at the John Hunter Hospital, located in the Hunter New England Local Health District. It focused on reducing the unnecessary use of non-sterile gloves. The initiative consisted of targeted education and communication efforts, including classes, informal education at points of care, and creative engagement methods such as glove-themed songs. Visual aids like posters and banners were utilised throughout the hospitals to reinforce the campaign's message. The initiative reduced glove use by 2.3 million pairs of gloves a year. This is associated with an estimated

78,540 kg reduction in CO₂e emissions. It resulted in a procurement cost saving of \$115,000 and an estimated savings of \$2,000 from reduced waste disposal services.

Table 1: "Reduce" case study

Case study	Intervention	Effect on waste and/or greenhouse gas emissions	Economic cost
The Gloves Off Project John Hunter Hospital NSW	The pilot project aimed to improve hand hygiene and reduce unnecessary non-sterile glove use through formal education, informal education, staff engagement, and communication interventions.	Projected annual reduction of: <ul style="list-style-type: none"> • 2.3 million fewer gloves used (a 21% reduction in glove use) • 8 tonnes of waste reduction • 78,540 kg of CO₂e avoided 	Projected cost saving of \$115,000 per annum and \$2,000 avoided in waste disposal services.

“Reuse” health system waste

There are a number of studies published that undertake life cycle assessments comparing the environmental impact of reusable versus single-use equipment, including reusable personal protective equipment, including masks, respirators and isolation gowns, reusable surgical textiles, including gowns, scrub caps and drapes, and reusable procedural instruments, such as specula, airway devices, surgical instruments, and endoscopes. Almost all studies report CO₂e reductions and cost savings associated with the reuse of devices.

We identified one Australian reuse case study. South Western Sydney Local Health District utilised the Waste Action Reuse Portal to repurpose unused item like furniture and equipment. Over two years, they diverted more than 65 tonnes of waste from landfills, repurposed \$53,000 worth of assets, and facilitated over \$217,000 in donations of medical equipment.

Table 2: "Reuse" waste case study

Case study	Intervention	Effect on waste and/or greenhouse gas emissions	Economic cost
Waste Action Reuse Portal South Western Sydney Local Health District NSW	Implementation of the Waste Action Reuse Portal which allows staff to list and claim items no longer in use, such as furniture and equipment.	65 tonnes of waste diverted from landfill over two years.	Repurposing of \$53,000 worth of assets within the district. More than \$217,000 of medical assets to charity group Rotary Medishare, for redistribution to developing countries.

“Recycle” health system waste

We identified five case studies in our Australian health services that report on the waste and CO₂e reductions from recycling initiatives.

Hunter New England Local Health District and the Belmont Mass Vaccination Hub in NSW undertook two pilot projects to recycle plastic needle caps during COVID-19 and influenza

vaccination campaigns. They diverted 70 kg of needle cap waste from landfill per month 2021 and 35 kg of waste from landfill in 2023.

Hunter New England Local Health District partnered with a local plastic recycler and diverted 415 kg of haemodialysis single-use plastic waste from landfill in 2023, saving 2,230 kg CO₂e. Baby bottles are now recycled at the neonatal intensive care unit at John Hunter Hospital in NSW, diverting 5 tonnes of plastic from landfill in 2021. John Hunter Hospital's recycling program also includes other hard and soft plastics and 18 tonnes of plastic was diverted from landfill in 2022-23. John Hunter Hospital has also donated a large number of incubators and infant warmers to wildlife hospitals and MediShare.

Two further recycling interventions have been introduced where waste and CO₂e avoided has not yet been reported. Western Health, Footscray Hospital, Sunshine Hospital, Williamstown Hospital and Sunbury Day Hospital in Victoria have all participated in an initiative to recycle single-use metal surgical instruments. From April 2024 staff at Hunter New England Local Health District can return old uniforms to be recycled into green ceramic tiles. By introducing recycling bins, Brisbane Day Surgery diverted 127.4 cubic metres of recyclable plastics from landfill in the first 12 months.

Table 4: "Recycle" waste case studies

Case study	Intervention	Effect on waste and/or greenhouse gas emissions
Needle Cap Recycling Program Hunter New England Local Health District (HNELHD), Belmont Mass Vaccination Hub NSW	Two pilot projects in 2021 and 2023 partnered with plastics manufacturers and diverted plastic needle caps during vaccinations campaigns to be recycled into a range of building, engineering parts and a range of products.	2021 pilot: diverted 70 kg of COVID-19 vaccine needle caps per month from landfill. 2023 pilot: diverted 35 kg of plastic needle caps from landfill during the annual influenza vaccination campaign.
Recycling Renal Dialysis Plastics Hunter New England Local Health District NSW	Partnered with a local plastic recycler to explore opportunities to divert the plastic waste generated by a haemodialysis treatment from landfill.	Throughout 2023, 415 kg of single-use plastic was diverted from landfill, resulting in an emissions reduction of 2230 kg CO ₂ e.
Greening the NICU John Hunter Hospital NSW	Recycling single use baby bottles.	5 tonnes of plastic diverted from landfill in 2021.
Circular Economy John Hunter Hospital NSW	Recycling of soft plastic, such as sterile wrap, plastic wrap and IV bags, and hard plastic, such as pourable fluid bottles, baby bottles, pathology plastics, breathing circuits, needle caps and plastic packaging.	In 2022-23 diverted 12 tonnes of soft plastic and 6 tonnes of hard plastic from landfill.
Eco WarriERs Fiona Stanley Hospital	Introduced co-mingled, syringe and PVC recycling bins across the emergency department	By August 2021 35 co-mingled recycling bins were collected from ED. Additionally, during the same

Case study	Intervention	Effect on waste and/or greenhouse gas emissions
WA	with education sessions to enhance staff awareness and engagement.	period, 6 bins with metal instruments, 6 bins with PVC material, and 3 bins with syringes were also collected.
Diverting recyclable waste from landfill Brisbane Day Surgery QLD	Introducing a colour-coded bin system for easier segregation of recyclables in anaesthetic bay and operating theatres, including separate sorting of PVC recycling. These measures were supported by onsite training and signage.	Over the first twelve months Brisbane Day Surgery diverted the following from landfill: 53 cubic metres of commingled recyclable material 68.64 cubic metres of healthcare plastics 5.76 cubic metres of PVC.

Health system waste segregation

In the literature review we identified studies of interventions which included a combination of education and engagement, such as staff training, signage and competitions to improve waste segregation, with two of these studies occurring in Australian hospitals. Princess Alexandra Hospital in Brisbane reduced clinical waste by 13,700 kg over 4 weeks and segregation of clinical, general and recyclable waste saved the hospital around \$93,600 per year. Interventions on the postnatal ward of a tertiary maternity service in Melbourne reduced regulated medical waste by 4,307 kg per year.

We identified one further Australian waste segregation case study. It involved separate bins, signage and staff education (note other case studies involved the segregation of recyclables under the recycling heading above). As a result of introducing separate bins and staff education, the Royal Melbourne Hospital operating theatres have reduced clinical waste by 187 tonnes since 2012-13, saving the hospital \$230,000.

Table 5: "Waste segregation" case study

Case study	Intervention	Effect on waste and/or greenhouse gas emissions	Economic cost
Reducing Waste from Operating Theatres Royal Melbourne Hospital VIC	Introduced cardboard and paper recycling bins, comingled glass and plastic bins, aluminium bins, battery bins and PVC bins and educated staff on the correct disposal of waste.	Reduction of 187 tonnes of clinical waste since 2012-13 (reporting year not specified, but case study submitted in 2017).	Savings of \$230,000 since 2012-13.

Information request 2

Our review identified fifty-eight studies from Australia and other high income countries that reported on economic costs resulting from waste interventions. Fifty-six of these studies found

cost savings associated with the waste and emissions reducing interventions. With cost pressures at the facility and the system level, these findings provide further justification for actions to reduce the greenhouse gas emissions from health system waste.

Information request 3

Barriers to circular economy approaches in healthcare exist on several levels. An analysis of such barriers in the health sector and their interdependence is provided by [MacNeill et al 2020](#). A 2021 submission to the Productivity Commission's 'right to repair' inquiry by a team of [biomedical engineering](#) professionals at Sir Charles Gairdner Hospital (WA) also details several examples of anti-competitive behaviour.

A number of the studies included in our systematic review reported on barriers to addressing health system waste including long or complicated approval processes. Logistical barriers include difficulty determining the workflow (e.g. involving infection prevention and control, identifying a vendor, linking with the supply and/or sterile processing department), working across departments, lack of adequate storage, and lack of adequate recycling facilities.

Staff related barriers include lack of knowledge and awareness, attitudes, concerns about increased workload, resistance to change, and staff turnovers. Patient and staff safety was another concern raised by staff involved in a waste segregation intervention.