Victorian Health Building Authority

Sustainability performance report

VHBA Environmental sustainability strategy 2018–19 to 2022–23

VICTORIA State Government

On 1 February 2021, the Department of Health and Human Services (DHHS) split into two departments – the Department of Health (DH) and the Department of Families, Fairness and Housing (DFFH).

At the same time, the Victorian Health and Human Services Building Authority (VHHSBA) was renamed to the Victorian Health Building Authority (VHBA).

All references to DHHS in this report should be taken to mean DH (unless otherwise specified) and all references to VHHSBA should be taken to mean VHBA.

Contents

Rachel Ulbrick, Wayne Cassell and Geoff de Campo from Peninsula Health at Rosebud Community Health with the first battery installed in a public hospital.

1. Introduction

The Environmental sustainability strategy 2018–19 to 2022–23 sets out the department's commitment to further improve the environmental performance of the health system and to adapt the health system so it is resilient to climate change.

The strategy contains three strategic directions, with each direction having a series of key objectives and high-level actions from 2018–19 to 2022–23. The strategic directions are:

- provide leadership and engage with the sector
- improve the environmental performance of the health system
- adapt to a changing climate.

At the mid-way point of the life of the strategy, 35 actions have been identified and progressed by VHBA. Of these, 86 per cent are either complete (54 per cent) or ongoing (32 per cent). Five actions, or 14 per cent, have been delayed primarily as a result of COVID-19.

Table 1: Progress in delivering environmental strategy actions

Strategic direction	Complete	Ongoing	Delayed	TOTAL
Provide leadership and engage with the sector	7	5	3	15
Improve the environmental performance of the health system	9	4	1	14
Adapt to a changing climate	3	2	1	6
TOTAL	19	11	5	35

2. Environmental sustainability performance

To continually improve the accuracy of reporting, the department reviews data on an ongoing basis. Changes to previously reported data can therefore occur and can be attributed to changes in the number of facilities reporting, from decommissioning, expansion or new build, and/or better-quality data received from health services and/or suppliers.

Tables 2 and 3 compare the health system's performance over 2018-19 and 2019-20 to the most up to date 2017–18 data, which is the baseline year for comparing the environmental performance of the health system.

Over this period, electricity use reduced by 52 terajoules – or 2.3 per cent – while there was an increase in natural gas and other energy sources of 47 terajoules, resulting in overall energy use remaining static. Overall carbon emissions as a result energy use are down by 6.2 per cent, or 49,007 tonnes. This is due to several factors including changes in the grid carbon emissions intensity factor, energy efficiency improvements delivered throughout the year, the rollout of solar in regional hospitals, and good facility management practices.

Due to a concerted effort by VHBA to increase reporting of carbon emissions from the health services vehicle fleet 36 health services reported on their vehicle fleet in 2019-20, compared to 19 health services in 2017-18. This resulted in an increase in reported carbon emissions by 9.5 per cent.

Over the same period water consumption increased by 133 megalitres, or 3 per cent. This could be as a result of a hotter dryer summer increasing cooling and irrigation requirements. Health services reported using 65 megalitres of recycled or reclaimed water – a 16 megalitre, or 26 per cent increase from 2017–18. Eleven per cent of 2019–20 water data is estimated resulting in a lower level of confidence in the results.

The amount of waste generated increased by 15.9 per cent, or 6,301 tonnes. Materials recycled decreased by 924 tonnes, while waste to landfill decreased by 4,719 tonnes. Clinical and related wastes increased by 115 tonnes.

From 2017-18 to 2019-20 paper use in public health services reduced by 23 per cent, or 135,324 reams of paper. This is most likely due to the implementation of electronic medical records across the system and some office-based functions transitioning to remote working as a result of COVID-19.

The kilograms of pollutants emitted from 2017-18 to 2018-19 increased by 22.4 per cent. This was primarily due to an increase in emissions of carbon monoxide (31,417 kilograms) and oxides of nitrogen (11,076 kilograms).

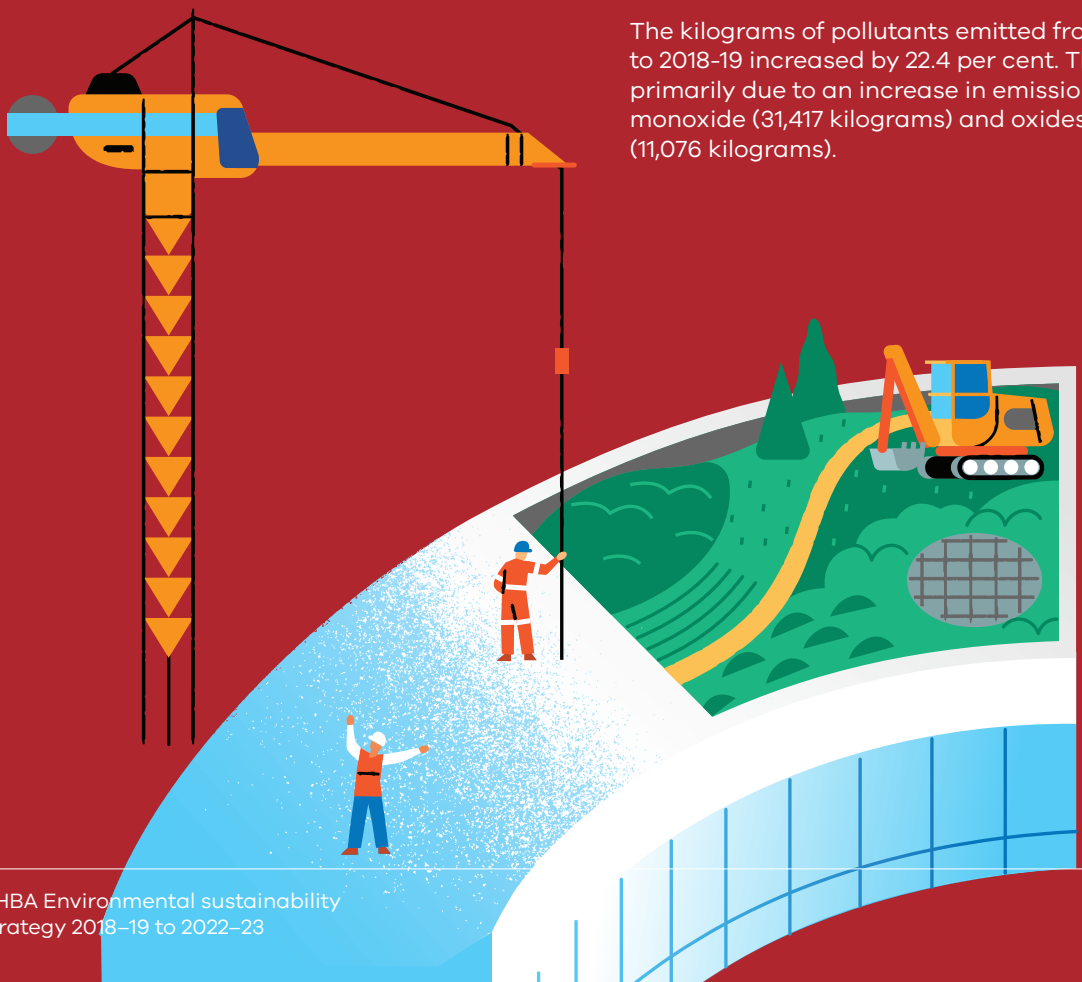


Table 2: Changes in absolute environmental performance

	Metric	2017–18	2018–19	2019-20	% change 2017-18 to 2019-20
	Tonnes carbon from energy use	786,889	779,433	737,882	–6.2%
	Tonnes carbon from nitrous oxide	16,321	15,523	15,708	–3.8%
	Tonnes carbon from emergency transport	21,684	23,885	21,160	–2.4%
	Tonnes carbon from vehicle fleet	5,916	6,015	6,479	9.5%
	Tonnes carbon from waste management	35,461	34,481	29,969	–15.5%
	**Total tonnes of carbon**	866,272	861,337	811,198	–6.4%
	Terajoules of electricity	2,245	2,239	2,193	–2.3%
	Terajoules of natural gas	2,020	2,007	2,052	1.6%
	Terajoules of other energy	593	602	608	2.5%
	**Total terajoules of energy**	4,857	4,847	4,853	–0.1%
	Megalitres of water	4,368	4,473	4,501	3.0%
	Tonnes of waste generation	39,607	38,687	33,306	–15.9%
	Reams of copy paper	685,878	664,194	528,870	–22.9%
	Kilograms of pollutants emitted	188,118	230,249	Not available	22.4%

To normalise performance across the health system, environmental metrics are measured against bed days, floor area and hospital employees. Bed days include in-patient occupied bed days (OBD) and public sector residential aged care bed days. Waste is measured against the number of patients treated, which is an aggregation of in-patient bed-days, aged care bed-days, separations and emergency department presentations.

Over the reporting period, carbon emission per bed-day reduced by 8.3 per cent, while carbon emissions per area of floor space was unchanged. Health services water use increased per bed-day (6.6 per cent) and square metre of floor space (3.3 per cent).

Kilograms of waste per patient treated decreased by 14.2 per cent, and the average recycling rate increased by 7.4 per cent. Reams of copy paper per full-time employee reduced by 17.7 per cent, which is less than the absolute reduction in paper use due to an increase in employees of 7 per cent over the same period.

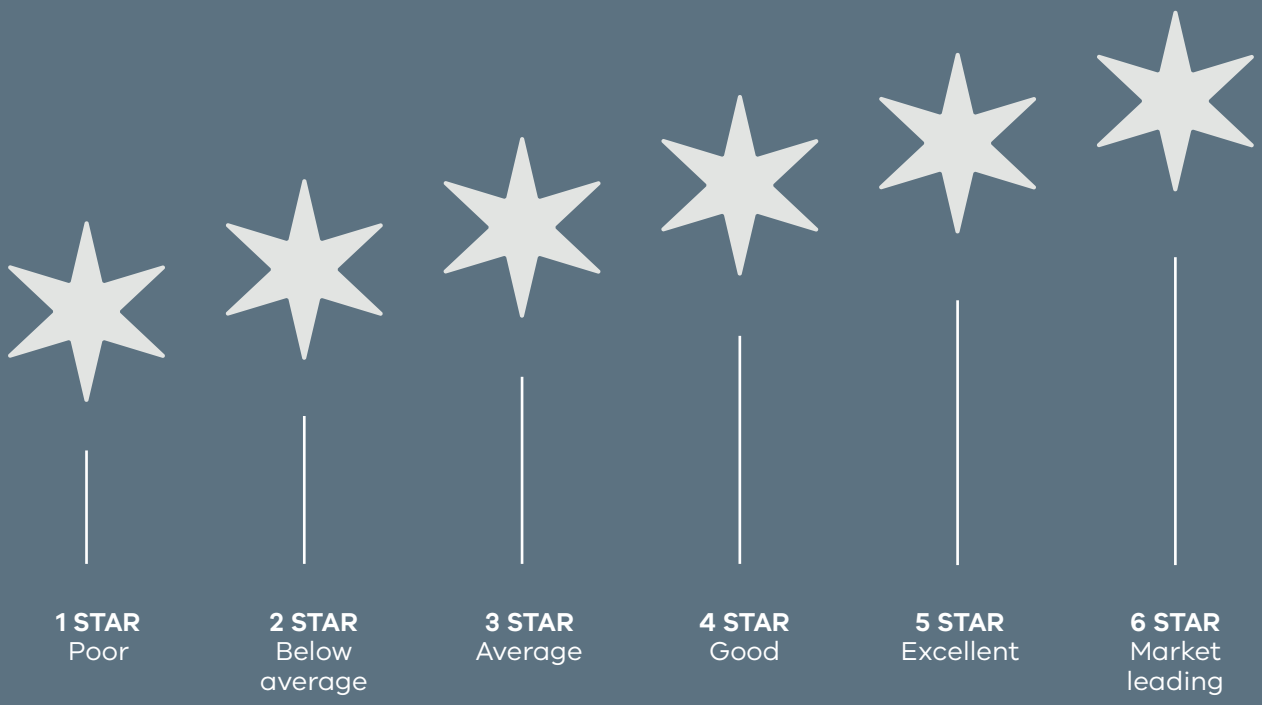
Table 3: Changes in environmental efficiency

Metric	2017–18	2018–19	2019-20	% change
Tonnes carbon per bed-day	0.12	0.11	0.11	-8.3%
Tonnes carbon per floor space (sqm)	0.22	0.23	0.22	0.0%
Gigajoules of energy per bed-day	0.68	0.68	0.70	2.9%
Gigajoules of energy per floor space (sqm)	1.36	1.35	1.36	0.0%
Kilolitres of water per bed-day	0.61	0.62	0.65	6.6%
Kilolitres of water per floor space (sqm)	1.22	1.25	1.26	3.3%
Kilograms of waste per patient treated	3.60	3.52	3.09	–14.2%
Percentage recycling rate	27%	29%	29%	7.4%
Reams of copy paper per FTE	7.72	7.25	6.35	–17.7%

2.1 NABERS for hospitals

The National Australian Built Environment Rating System (NABERS) is a rating system that measures the environmental performance of Australian buildings, tenancies and homes. NABERS is a Commonwealth initiative and is administered by the NSW Department of Planning, Industry and Environment. Through the Australasian Healthcare Infrastructure Alliance, VHBA and other state and territory health departments developed a NABERS for Hospitals rating tool to benchmark the environmental performance of public hospitals.

Figure 1: NABERS ratings



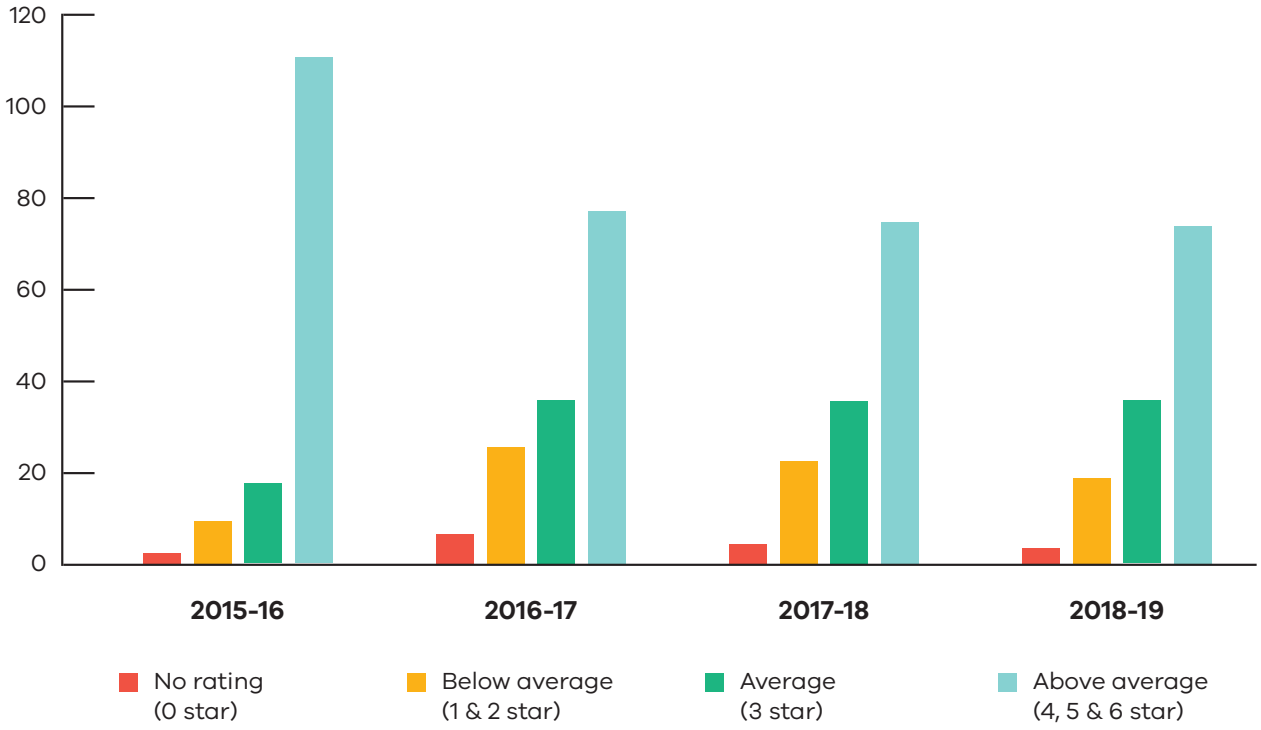
Victoria has rated around 140 public hospitals for each of the years from 2015-16 to 2018-19 inclusive and received a total of 560 certified energy ratings and 561 certified water ratings. In 2018-19, the latest year with certified ratings, 83 per cent of hospitals had an average or above average energy performance and 76 per cent had an average or above average water rating. The NABERS for Hospitals tool had a benchmark review during development, meaning the 2015-16 results may not be directly comparable to other years.

Table 4: Victorian public hospital NABERS ratings 2015-16 to 2018-19

	2015-16		2016-17		2017-18		2018-19	
	Energy	Water	Energy	Water	Energy	Water	Energy	Water
No rating (0 Star)	3	14	7	10	5	5	4	9
Below average (1 & 2 Star)	10	22	26	20	23	25	19	23
Average (3 Star)	18	26	36	29	36	28	36	30
Above average (4, 5 & 6 Star)	111	76	77	88	75	82	74	74
TOTAL HOSPITALS RATED	142	138	146	147	139	140	133	136

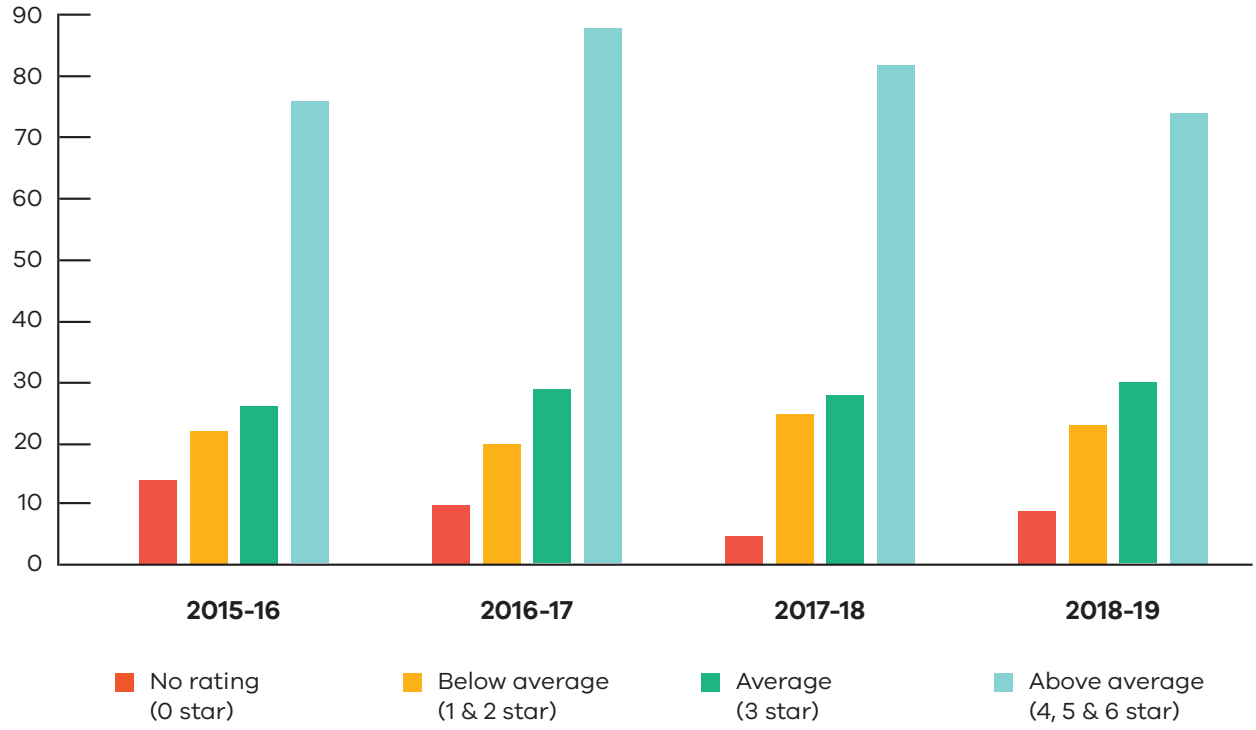
The changes in Victorian public hospital NABERS energy ratings from 2015-16 to 2018-19 are shown in Figure 2. From 2016-17 to 2018-19, which discounts the likely impact of the benchmarking review, the performance of the portfolio has remained relatively constant. The number of hospitals not qualifying for a rating reduced by 3 hospitals, and those rated below average reduced by 7 hospitals. There was also a reduction in the number of hospitals rated above average (3 hospitals).

Figure 2: Changes in NABERS energy ratings 2015-16 to 2018-19



Over the same period the number of hospitals that did not qualify for a water rating reduced by 1 hospital and those with a below average rating increased by 3 hospitals. The number of hospitals rated above average reduced by 14 hospitals. The changes in Victorian public hospital NABERS water ratings from 2015-16 to 2018-19 are shown in Figure 3.

Figure 3: Changes in NABERS water ratings 2015-16 to 2018-19



As a result of ongoing refinement of the NABERS for Hospitals tool, as well as varying quality of data across the portfolio, the number of hospitals with certified ratings varies year to year. As data quality across the portfolio improves and the NABERS for Hospitals tool matures, there should be a more consistent number of hospitals rated every year.

Victoria has signed a Memorandum of Understanding with the NSW Department of Planning, Industry and Environment to continue using the NABERS energy and water rating tools to measure and track the performance of its portfolios until at least 2021-22.

3. Delivering the strategy

3.1 Provide leadership and engage with the sector

Establish a research and innovation program to allow public hospitals and health services to implement local sustainability solutions (Complete)

The department's environmental sustainability innovation grant program funded 12 projects across 10 health services. The funding supported innovations in recycling, waste avoidance, life-cycle assessments, climate adaptation, energy use of imaging equipment and food services (see Table 5).

Table 3: Environmental sustainability innovation projects

Project title	Health service	Summary
Establishing recycling for challenging waste streams: disposable gloves and hairnets	Austin Health	It was estimated that 406kg of gloves and 207kg of hairnets and smocks are purchased for Austin Health's food services every year. It was found that whereas it was possible to recycle these items, the cost of doing so was significantly more than disposing of the waste to landfill. Austin Health is continuing to assess the viability of recycling these items.
Determining the carbon footprint of pathology testing	Austin Health	The project undertook a life-cycle assessment of five pathology tests: arterial blood gas, FBE (full blood examination), CUE (creatinine, urea and electrolytes), clotting profile and urinalysis. The carbon footprint of tests ranged from 0.074 (arterial blood gas) to 0.538 (urinalysis) kg CO2-e. The primary opportunities to reduce carbon footprint of pathology testing are: 1) Reduce unnecessary testing, 2) Use of renewable electricity, and 3) Increase utilisation of laboratories (lower impact per test)
Inside meets the outside –taking workspaces into the environment	Alfred Health	This project has been delayed. VHBA is working with Alfred Health on a revised program.
Recycling curtains / bed screens	Bendigo Health	Bed curtains need to be replaced every 12 months for quality purposes. Bendigo Health diverted approximately one tonne of curtains from landfill through a local recycling company. The project won the 2020 Premier's Sustainability Award health category.
Reducing unopened shelf stable waste in hospital foodservices	Eastern Health	The project found that of the 100 unopened shelf stable food samples tested there was no evidence of inappropriate levels of bacteria on the packaging indicating them safe to re-use. Due to no hazards being found, statistically the likelihood of introducing risk with an adverse outcome is unlikely. Eastern Health is looking to do further testing on an increased sample size and is considering how the items could be diverted from landfill.
Determining the carbon footprint of peritoneal dialysis	Melbourne Health	This project has been delayed by COVID-19. VHBA is working with Melbourne Health on a revised program.

Project title	Health service	Summary
Removing plastic in the pharmacy journey	Monash Health	Every year Monash Medical Centre, one of six sites of Monash Health, processes approximately 25,400 discharge prescriptions, 25,000 outpatient prescriptions and 20,100 non-imprest items involving the use of plastic bags. The project allowed Casey Hospital, Monash Health Translation Precinct and Monash Children's Hospital to trial paper bags for prescriptions. The trial was a success and other sites are working towards adopting paper bags. In July 2020 Monash Medical Centre eliminated almost 4,900 bags from going into landfill by switching to reusable satchels.
Procurement, waste generation and recycling study	Peninsula Health	The project developed weighted criteria for social procurement that will be used for all market engagements valued at over $30,000. A checklist is being incorporated into the Peninsula Health Procurement Assessment Tool and Peninsula Health has included social procurement criteria into the evaluation of new products and / or renewal of supply agreements.
Piloting a regionally relevant climate resilient greening initiative	Southwest Healthcare	The project collaborated with Warrnambool City Council to plant vegetation around Warrnambool Hospital to reduce the urban heat island effect and increase shading. This involved identifying areas for planting, developing a landscape plan and identifying suitable plants for the local conditions. The plants have been planted and the drip irrigation system repaired. The hospital is continuing conversations with council on planting suitable street trees.
e-learning package: Waste and recycling in healthcare	Western Health	This project has been delayed. VHBA is working with Western Health on a revised program.
Energy use of diagnostic imaging	Western Health	This project has been delayed. VHBA is working with Western Health on a revised program.
Rural waste management	West Wimmera Healthcare Group	This project established a specialist recycling service across nine campuses, including options for the community to drop-off items. Recycling depots have been created at each facility in a dedicated fenced and secure area. Each depot caters for recycling a number of different waste streams with an emphasis on eWaste generated by the health facilities. Communications with the local community to promote the eWaste recycling opportunity was delayed by COVID-19.

HealthShare Victoria (HSV) will develop a formal social procurement plan for collective procurement to implement Victoria's social procurement framework (Complete)

HSV developed a social procurement strategy to implement the social procurement framework in healthcare procurement. The strategy prioritises the following social and sustainability policy objectives for HSV collective procurement:

- women's equality and safety
- supporting safe and fair workplaces
- environmentally sustainable business practices
- environmentally sustainable outputs.

HSV engaged a social procurement project officer to deliver a health service education & training program for the roll-out of Victoria's social procurement framework and to support the social procurement objectives of the policy.

Join the Global Green and Healthy Hospitals network and encourage public hospitals and health services to join (Ongoing)

VHBA joined the Global Green and Healthy Hospitals network on behalf of the Department of Health. At the end of 2019–20 the following public health services were members, with respective goals identified in brackets:

- Ambulance Victoria (no goals identified)
- Austin Health (food, transportation)
- Bairnsdale Regional Health Service (leadership, waste)
- Bendigo Health (waste)
- Dental Health Services Victoria (leadership, water)
- Department of Health (leadership, energy, purchasing, waste, transportation, buildings)
- Goulburn Valley Health (no goals identified)
- Hepburn Health Service (leadership, chemicals, waste)
- Kilmore and District Hospital (leadership, energy)
- Kooweerup Regional Health Service (energy, water)
- Melbourne Health (leadership, energy, purchasing, waste, transportation, water)
- Mercy Public Hospitals (leadership, waste)
- Northeast Health Wangaratta (leadership, energy, waste, water)
- Northern Health (leadership, chemicals, energy, waste, water)
- Peninsula Health (waste, energy, water)
- South West Healthcare (leadership, energy, waste, water)
- St Vincent's Hospital Melbourne (energy, waste)
- Tallangatta Health Service (leadership and energy)
- Western Health (energy, waste, water)
- West Wimmera Health Service (energy, waste).

In addition, the Australian Nursing and Midwifery Federation (Victorian Branch) and the Institute of Healthcare Engineering Australia are members of the network. VHBA actively participates in network meetings and presented our Waste Education in Healthcare project to Australasian members.

Establish an annual professional development and webinar program for public hospitals and health services, and communicate sustainability messages to the sector through sustainability updates and our website (Ongoing)

VHBA held a sustainability in health forum in February 2019, with presentations on sustainable procurement, waste management, sustainability action plans, the Global Green and Health Hospitals network, climate adaptation and emissions reduction. There were more than 60 registrations from across the health system, and the sessions were recorded and made available to health service staff who were unable to attend.

Sustainability updates were provided to the health system in September 2018, December 2018, April 2019, October 2019 February 2020 and May 2020. The updates included information on resources prepared by the department, government policies, programs and legislative changes, climate change and sustainability events. These were distributed widely to health service staff and executives and made available on the department and VHBA website.

Environmental messaging was expanded on the VHBA website, with dedicated pages developed for the Regional Health Solar program and Peninsula Health energy performance contract. News articles were also written and made available providing information about the Environmental sustainability strategy 2018-19 to 2022-23 (28 October 2018), progress in delivering the strategy (15 April 2019), release of the guidelines for sustainability in

capital works (4 June 2020) and key sustainability resources were made available through the VHBA website on 25 June 2020.

During 2020 the revised Guidelines for sustainability in capital works were put on the VHBA website and promoted by a news article on the home page. The guidelines provide advice and information on how to build sustainable and resilient buildings for stakeholders involved in the design, construction and refurbishment of healthcare facilities. Over 250 page views were registered.

Across 2018-19, VHBA published 20 sustainability posts on social media – seven on Facebook, six on Twitter and seven on LinkedIn. In total, these posts had 104,498 individual impressions, with 6,535 engagements though reactions, link clicks and video views. LinkedIn had the highest engagement at 11 per cent, while Twitter had the highest number of impressions at 70,514.

Social media content in 2019-20 was limited due to COVID-19 and focused on the release of the guidelines for sustainability in capital works. There were over 260 views on Facebook, 954 views on LinkedIn and 1,905 views on twitter.

Report on the health system's emissions in the department's annual report, including for the first time on transport emissions (Complete)

The department's annual report includes carbon emissions of the health system relating to energy use nitrous oxide, waste generation, emergency transport and fleet transport. This level of reporting is above the minimum requirements for environmental reporting by government departments.

The most recent addition to environmental reporting is carbon emissions from the health service vehicle fleet. From 2017-18 to 2019-20 the number of health services reporting on the environmental performance of their vehicle fleet increased from 19 to 36 health services.

Work with Sustainability Victoria to educate public hospitals and health services on the requirements of the e-waste ban commencing on 1 July 2019 (Complete)

From 1 July 2019 e-waste – items that are powered by a cord or batteries – cannot be disposed of to landfill. Hospitals are large generators of e-waste including computers, medical devices, pagers, hospital beds and treatment chairs.

VHBA delivered a webinar on the e-waste ban with representatives from HealthShare Victoria, the Department of Environment, Land, Water and Planning, Sustainability Victoria and the Environment Protection Authority. The webinar is available to all Victorian public health services, and in 2018–19 there was 101 views of the webinar. In addition, VHBA provided ongoing advice and support to health services on meeting the requirements of the e-waste to landfill ban.

Data reported by health services indicated that from 2017-18 to 2019-20 the amount of e-waste recycled increased by 131 per cent from 44 tonnes to 103 tonnes.

Update the environmental management plan template to align with the strategy (Complete)

VHBA audited nine health services to assess compliance with environmental management requirements in the department's policy and funding guidelines. The audit found that health services were compliant with environmental management planning requirements, but improvement opportunities were identified in public environment reporting. The audits identified a lack of alignment between environmental reporting requirements in the policy and funding guidelines and the department's annual reporting guidance, which is in the process of being addressed.

The audits also identified ways in which VHBA could improve its guidance for environmental management planning. This was addressed in the update of environmental management planning resources. The environmental management plan was aligned with the department's *Environmental sustainability strategy 2018–19 to 2022–23* to ensure plans focused on leadership, environmental performance, climate change, governance and reporting on outcomes of action plans. The template and supporting resources were published on the department's website in February 2020 and comprise:

- an environmental management plan template,
- a factsheet on health service environmental management plan requirements,
- a checklist to assist with completing environmental management plans, and
- a sample list of environmental management plan actions.

Establish a waste mentoring program for public hospitals and health services staff (Complete)

Clinical staff throughout Victoria are working to introduce new or to improve the use of existing waste streams within their hospitals. However, as clinicians are often time poor and not aware of waste management best practice or effective education strategies, delivering waste management projects can be affected by competing priorities.

VHBA organised seven facilitated workshops to support health service staff to develop a waste management implementation plan for a single waste stream in a ward or department that includes stakeholder engagement and business case planning.

Regional workshops were held in Sale, Bendigo, Wangaratta, Ballarat and Warrnambool, and due to demand two workshops were held in Melbourne. Across all seven sessions there were 167 participants from 40 public health services, 15 private hospitals, Ambulance Victoria and justice. Based on a survey of participants:

- over 90 per cent found the workshop enjoyable and with a format that was easy to follow,
- over 86 per cent agreed or strongly agreed that the workshop met their expectations,
- over 87 per cent agreed or strongly agreed that they would be able to apply learnings from the workshop, and
- over 86 per cent agreed that the level of information and detail provided during the workshop was satisfactory.

Promote sustainability in healthcare across Australasia through chairing the Australasian Healthcare Infrastructure Alliance ESD sub-group (Ongoing)

The department chairs the Australasian Healthcare Infrastructure Alliance ESD sub-group of sustainability representatives from the health departments in Australian jurisdictions and New Zealand. The objectives of the group are to leverage existing state-based projects at the national level, share best practice between jurisdictions, pool resources to deliver projects of common interest and provide a common and unified understanding of sustainability in healthcare.

In 2019-20 the group focussed on the continued application of the NABERS energy and water hospital rating tools and development of a NABERS waste tool for hospitals.

Provide 2018-19 NABERS energy and water ratings to health services (Delayed)

The certification of 2018-19 NABERS ratings for public hospitals was delayed as a result of COVID-19. VHBA is aiming to release 2019-20 NABERS to health services in the first half of 2021. This report includes an analysis of NABERS ratings from 2015-16 to 2018-19.

Work with other jurisdictions to develop a NABERS waste tool for hospitals (Ongoing)

All jurisdictions have committed to developing a NABERS for hospitals waste rating tool over the period 2018-19 to 2020-21. Data upskilling and investigation commenced in 2018-19 and benchmarking waste data across representative hospitals is due to commence in 2020-21. The aim is to rate 200 hospitals in the first half of 2022, with close to a hundred of these in Victoria.

Monitor environmental sustainability actions in health service statement of priorities (Delayed)

There was a shift in priorities of health services to respond to the COVID-19pandemic and this action has not progressed.

Report on emissions from anaesthetic gases (Delayed)

There was a shift in priorities of health services to respond to the COVID-19pandemic and this action has not progressed.

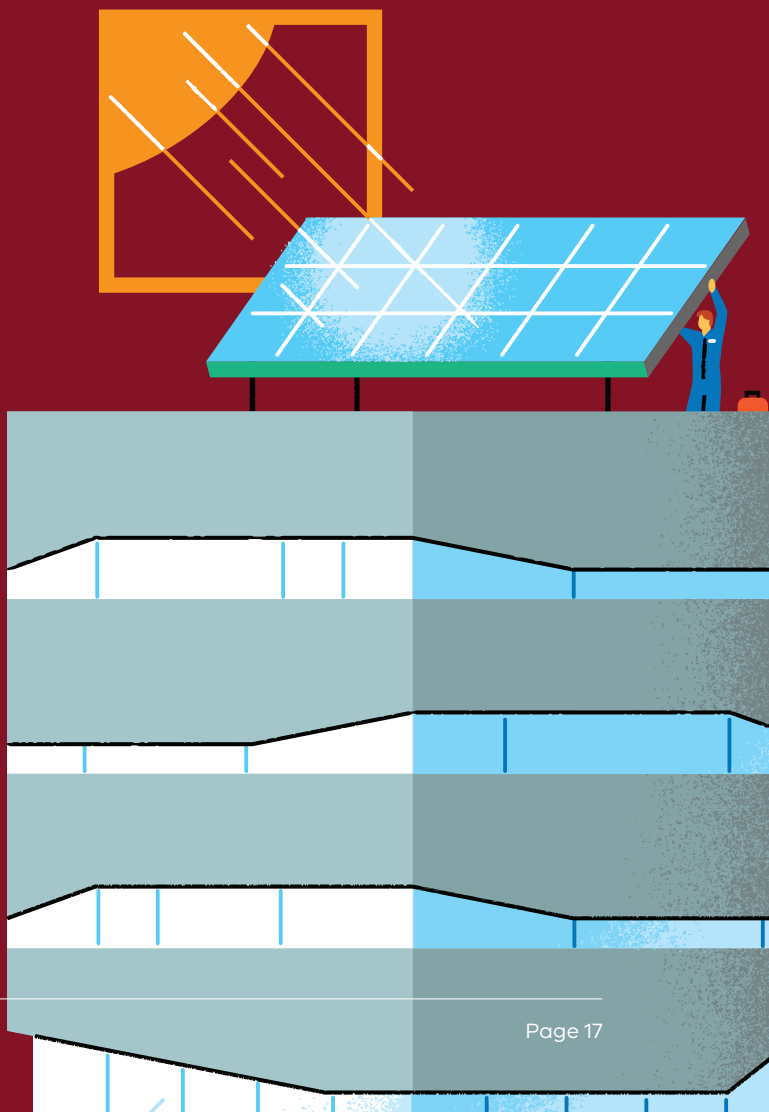
Target a WELL Gold rating for VHBA's new office fit-out and promote benefits to the sector (Ongoing)

The WELL Building Standard is a standard for buildings, interior spaces and communities seeking to implement, validate and measure features that support and advance human health and wellness. The standard requires implementation of initiatives across the principles of air, water, nourishment, light, movement, thermal comfort, sound, materials, mind and community.

The design and fit-out of VHBA's offices at 35 Collins Street adopted a range of these principle. One such key initiative is the installation of an eWater system for desk and surface cleaning. The certification of the fit-out was delayed by COVID-19 and working from home arrangements. The certification process recommenced in 2021.

Capture and promote learnings from the environmental sustainability research and innovation program to encourage broader uptake of initiatives (Complete)

The 2020 annual sustainability forum was held online on 19 November 2020 and attracted more than 120 attendees from across the health services, government departments and industry service providers. The diverse line up of speakers provided insights as to how to transition to a more environmentally sustainable healthcare system with a focus on climate change, solar and innovation.



Wayne Cassell (Peninsula Health), Julian Freeland (VHBA), Tiernan Humphrys (VHBA) and Geoff de Campo (Peninsula Health) with a solar array installed as part of the Peninsula Health $7 million energy performance contract.

3.2 Improve the environmental performance of the health system

Pilot methodologies to implement sustainable travel opportunities in two metropolitan hospitals (Ongoing)

In 2018–19 VHBA funded Peninsula Health to pilot approaches for improving sustainable transport options. The project is being delivered in partnership with Eastern Health and cover multiple sites across the two health services. The project outcomes will be used to establish an approach that can be applied more broadly across the health system.

A transport planning consultancy has been engaged and is sourcing travel behaviour data to support development of a tool kit and local travel plans. The pilot approach developed will be tested at a regional site before making the resources available to other health services. COVID-19 has impacted the delivery timelines and the project is due for completion in 2020-21.

HSV will source a food organics recycling service offer for metropolitan hospitals (Delayed)

In 2018–19 HealthShare Victoria began discussions with the existing waste contractor to establish a pilot across metropolitan hospitals. It would comprise a pickup service of food waste in 120 or 240 litre bins for transfer to a dedicated organics processing facility. The intended end product would be added to an AS4554-certified compost.

Action taken throughout 2019-20 by HSV saw the coordination between a waste service provider and the food service kitchens of three metropolitan hospitals for a pilot of a food waste recycling bin pick-up service. Following discussions with the service provider and health services it was determined that the available service model for commercial food waste collections was not suitable for the waste handling requirements of the hospitals.

Waste management services agreements are due to be re-tendered in 2021. Consideration is being given to including provision of a food waste recycling service meeting hospital requirements within the request for tender.

Prepare guidance for public hospitals and health services to improve the efficiency of their vehicle fleets (Complete)

VHBA facilitated a workshop with metropolitan health service fleet managers in 2018– 19. Based on the feedback, VHBA developed resources to help health services improve the efficiency of vehicle fleets. A template fleet efficiency plan identified four broad categories of opportunities:

- fleet-based improvements
- vehicle-based improvements
- alternative transport modes
- disruptive technologies.

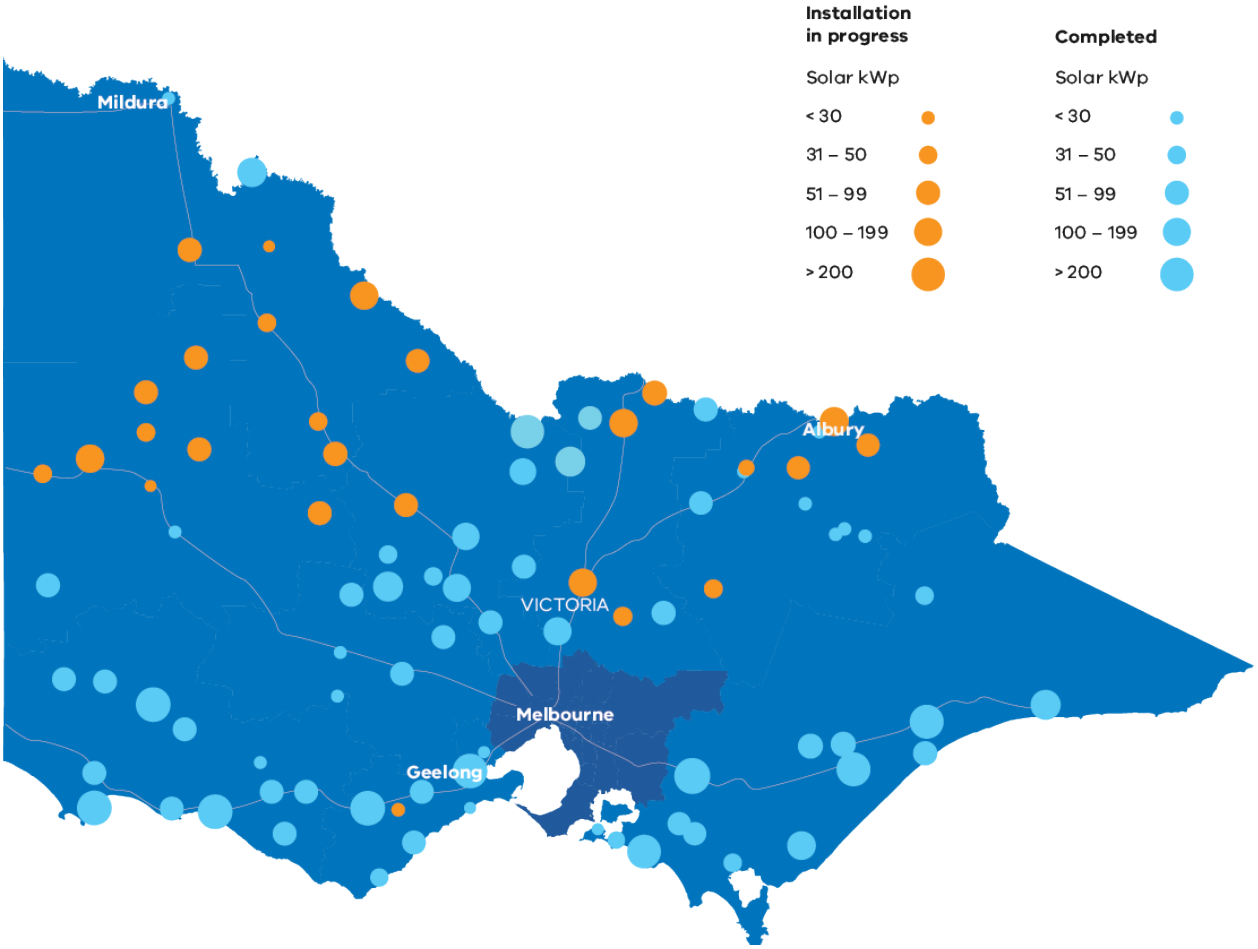
The plan provides a simple fleet efficiency baseline assessment and details improvement opportunities that could be implemented in each of the categories. A guidance note on the use hybrids and electric vehicles was also prepared to assist health services transition to a low carbon vehicle fleet.

Deliver the Regional Health Solar Program in the Barwon South Western, Grampians, Loddon Mallee and Hume regions, and progress energy performance contracts at Northern Health and Peninsula Health (Complete)

The Regional Health Solar Program is a $13.5 million Victorian Government initiative to install solar panels on hospital rooftops to help drive down energy costs and cut greenhouse gas emissions. The program will install around 8.8 megawatt-peak of solar photovoltaic arrays across 79 health facilities and generate more than 11 gigawatt-hours of renewable energy annually (see Figure 4).

The program is estimated to reduce annual carbon emissions by more than 13,000 tonnes by generating 2 per cent of our statewide hospital electricity consumption and up to 30 per cent of the electricity required by some regional hospitals.

Figure 4: Solar arrays on Victorian public hospitals supported by the regional health solar program



The program will expand the health system's generation of electricity from behind-the-meter solar to 2.5 per cent, resulting in the department being halfway to meeting its target of 5 per cent solar by 30 June 2023. More information on the program is available from the VHBA website <https://VHBA.vic.gov.au/health-infrastructure/regional-health-solar-program>.

Solar arrays with an aggregate of 2.2 megawatt peak across 15 health facilities in the Barwon South Western region were installed in 2018-19 through the Regional Health Solar Program. Tenders were also released and evaluated for a further 4.1 megawatt-peak of solar in the Hume, Loddon Mallee and Grampians regions. This included an 80 kWp array at Nathalia District Hospital to be built above the hospital carpark – a first for a Victorian public hospital.

In 2019-20 the department facilitated $4.94 million of loans through the program to support the installation of 3,364 kilowatt-peak of solar on 35 health facilities across the Grampians, Hume and Loddon-Mallee regions. Once fully installed it is estimated these arrays will generate some 5,000 mega-watt hours of electricity and reduce carbon emissions by some 5,150 tonnes per annum.

In addition, 13 further arrays with an aggregate of 0.4 megawatt-peak supported by VHBA were either commenced or completed. The list of 68 solar arrays supported through the regional health solar program and by VHBA over 2018-19 and 2019-20 is at Appendix 1.

Pilot single-use metal recycling and behavioural change programs to improve waste segregation in hospitals (Complete)

Hospital theatres generate the largest volume of waste per patient treated, and due to the high-pressure environment, waste streams can be highly contaminated compared with other hospital departments. VHBA commenced a project to research into behavioural barriers and potential interventions regarding waste management in theatre departments but it was impacted by COVID-19. Only one health service was able to follow through with implementation of the research findings but audits suggest that the interventions were successful with a reduction in contamination of the clinical waste stream and an increase in recycling. VHBA is reviewing what learnings are applicable to the broader health system and suitable for dissemination to other health services.

A major metropolitan hospital commenced a pilot to recycle single-use metal instruments from emergency, theatre and intensive care departments but was impacted by COVID-19. VHBA has captured the learnings and published them on the department's website. Analysis suggests that a large metropolitan hospital could recycle more than 40,000 single-use instruments per annum, which has the potential to prevent 24 tonnes of metal being sent to landfill and reducing waste disposal costs by $24,000.

Work with the Vinyl Council of Australia to increase PVC recycling in metropolitan public hospitals (Complete)

Plastics make up a significant share of hospital general waste, of which PVC medical products represent approximately 25 per cent. While an increasing number of health services have implemented PVC recycling collections, it was not available on all wards where PVC waste is generated, and a large number of Victorian public health services did not have a collection.

VHBA mandated PVC recycling in the theatre, renal and intensive care departments of all public hospitals in Melbourne. In 2018–19 collections were established in 62 of the 71 targeted departments, with associated staff education focusing on reducing contamination. In 2019–20, 33.4 tonnes of PVC was collected, a 143 per cent increase on 2017–18 and a 449 per cent increase from 2016–17. In 2017-18, 10 health services had PVC collections and by 2019-20 this had increased to 29.

HSV will review opportunities to reduce greenhouse gas emissions from anaesthetic gases (Ongoing)

Discussions began with HSV's pharmaceutical sourcing team in 2018–19 on the impacts, benefits and evidence of reducing greenhouse gas emissions from anaesthetic gases, as well as how to engage with hospital pharmacy customers.

HealthShare Victoria's review of the research literature identified that there are two fluorinated anaesthetic gases in use that have similar anaesthetic properties, but significantly different global warming potential. Purchasing comparisons show that the product with the higher global warming potential is more expensive than the product with lower global warming potential.

HSV is developing and distributing education materials to health services on the benefits of purchasing the anaesthetic gas with the lower global warming potential.

Develop waste audit guidelines for public hospitals and health services (Complete)

Previous waste audits have shown that up to 60 per cent of clinical waste consists of general waste or recyclable materials and that 45 per cent of general waste is recyclable. However, the audit methods and reporting have been inconsistent, making it difficult to benchmark performance.

VHBA developed guidelines to ensure that waste audits assess contamination, characterise and quantify waste streams, identify waste diversion opportunities, identify source reduction opportunities, assess the effectiveness of waste management systems and identify ways to improve efficiency. The guidelines are available on the department's website www.health.vic.gov.au/sustainability.

VHBA mandates use of the guidelines for all waste audits it funds. A survey of public health service views on the guidelines revealed that:

- 75 per cent of respondents confirmed that they had downloaded the guidelines,
- 35 of per cent of respondents confirmed that they had used the guidelines to guide the delivery of a waste audit for the public health service, and
- 89 per cent of respondents indicated that they were satisfied with the audit report generated using the waste audit guidelines.

Work with the Environment Protection Authority to update the Clinical and related waste operational guidance (EPA publication IWRG612.1) (Complete)

Given the changes in clinical practice since the EPA published its clinical waste guidelines in 2009, health service staff can experience confusion when determining whether an item is clinical or non-clinical waste. The minimal risk approach of disposing of items that are incorrectly classified as clinical waste in the clinical waste stream results in unnecessarily higher waste costs and higher environmental impacts given the level of treatment required for clinical waste.

Different interpretations of the guidelines across the system has resulted in health services adopting a range of clinical waste policies, resulting in varying waste management practices among a highly mobile workforce.

Following extensive review of the guidance by a specialist advisory group, proposed changes were submitted to the Environment Protection Authority for consideration.

VHBA subsequently prepared a supplementary guidance booklet and other resources for clinical staff that clearly and succinctly explains what does and does not constitute clinical waste was drafted to provide a consistent interpretation of the guidelines including:

- Clinical and related waste guidance – Supplement for healthcare staff
- Waste decision tree poster
- Clinical and related waste - training presentation
- Clinical and related waste – notes for training presentation.

The content was tested with selected focus groups, and suggestions incorporated into the guidance material. The guidance and training presentation were piloted with one health service in 2019 prior to distribution to all health services in February and March 2020. An evaluation survey of health services found that of the 29 responding health services 83 per cent had accessed the booklet and 41 per cent attended in service training on the separation of clinical and non-clinical waste items.

Collect data on electricity generation from behind-the-metre solar arrays (Ongoing)

VHBA mandated the automatic upload of solar data into the whole-of-system environmental data management system for all solar arrays installed though the regional health solar program and those supported directly by VHBA.

This policy change delivered real dividends with an increase from nine health facilities reporting 1.2 megawatt-hours of solar power generation in 2017-18 to 21 sites reporting 5.4 megawatt-hours of solar power generation in 2019-20.

VHBA also prepared a guidance note to support health services configuring previously installed solar arrays that do not automatically upload of data into the whole-of-system environmental data management system.

Deliver the $5 million *Emissions reduction pledges energy efficiency and solar program* in health services with >5,000 tonnes carbon emissions (Ongoing)

VHBA identified $4.69 million of energy efficiency and solar projects across 21 health services which were estimated to save over 7,000 tonnes of carbon emissions. As a result of COVID-19 the tendering of these projects were delayed and the program did not progress.

VHBA continued to support health services with minor energy efficiency projects through internal funding. Over 2018-19 and 2019-20 VHBA supported the following energy efficiency projects:

- LED retrofits at Albury Wodonga Health, Alfred Health, Ambulance Victoria, Beechworth Health Service, Colac Hospital, Dental Health Services Victoria, Northeast Health Wangaratta, NCN Health and Yarram and District Health Services, and
- hot water upgrades and installation of variable speed drives at Southwest Healthcare.

Peninsula Health's $7 million energy performance contract was completed in March 2020 and delivered upgrades of lighting, controls, air conditioning, pool heating and installation of a solar array and 13 kWh battery. The project will save 5,089 tonnes of carbon emissions per annum, equating to a 17 per cent reduction of Peninsula Health's 2018–19 reported direct (energy and transport) and indirect (energy and waste) emissions.

The Northern Health detailed facility study identified a range of efficiency measures across its facilities. After due consideration, Northern Health decided to progress with some of the proposed measures individually rather than through a single energy performance contract.

Release the Victorian Health Building Authority sustainability guidelines for capital works (Complete)

The *Guidelines for sustainability in capital works* released in June 2020 set key sustainability principles of healing environments, passive design, minimising resource use and resilience to climate change for the department's healthcare capital works program. The guidelines set minimum energy and water design targets, mandatory sustainability requirements, climate resilience actions and maintain the 2.5 per cent sustainability allowance for initiatives above business as usual.

The guidelines were made available through a number of communication channels in May 2020 including on the VHBA website, presentations to specific health services, and a webinar with registrations from over 200 consultants, project managers, architects, engineers and sustainability leads nationally.

Over the course of 2019-20 the Sustainability Unit provided advice and input was provided on capital projects, including those at the Royal Melbourne Hospital, The Alfred, Wantirna Aged Care, Melbourne Health and state-wide youth PARCs, regional alcohol and other drugs facilities, Wonthaggi Hospital, the new Melton Hospital, the new Footscray Hospital, the Heart Hospital and the Ambulance Victoria capital program.

Develop a template waste management plan for health services (Complete)

The development of a template waste management plan was delayed as a result of COVID-19 but was completed in the second half of 2020 and published on the department's website. The template provides guidance on development of a waste management committee, mapping waste management processes, waste audits and objectives to improve waste management.

VHBA ran seven waste in healthcare workshops in Ballarat, Bendigo, Melbourne, Sale, Wangaratta and Warrnambool to mentor and assist health services develop plans for introducing new or improving existing waste streams in their hospitals and provide strategies to gain buy-in from hospital stakeholders. The workshops were attended by 167 people from 40 public health services, 15 private hospitals, Ambulance Victoria and justice.

Complete the *Waste education in healthcare project* and evaluate outcomes (Complete)

The waste education in healthcare project was established to reduce the environmental impact of the healthcare sector through a reduction of waste generation and recoverable resources going to landfill and reduce the cost of waste management.

The completion and evaluation of the project was delayed as a result of COVID-19 but was completed in the second half of 2020. This evaluation found that the project contributed substantially to delivering against its objectives through:

- the development and promotion of waste management guidance tools,
- delivery of guidance on an ongoing basis – both specific to individual interventions and more generally on waste management,
- delivery of programs that achieved increased diversion and/or helped to mitigate waste management risks,
- delivery of pilot initiatives with the prospect of further testing and expanded roll out,
- delivery of workshops and site visits to build confidence and empower staff to become leaders in waste management, and
- preparation of guidance to provide clarity in response to emerging health service needs, and in doing so, showing an ability to adapt to shifting circumstances and demands.

The resources prepared as part of the project are available on the department's website.

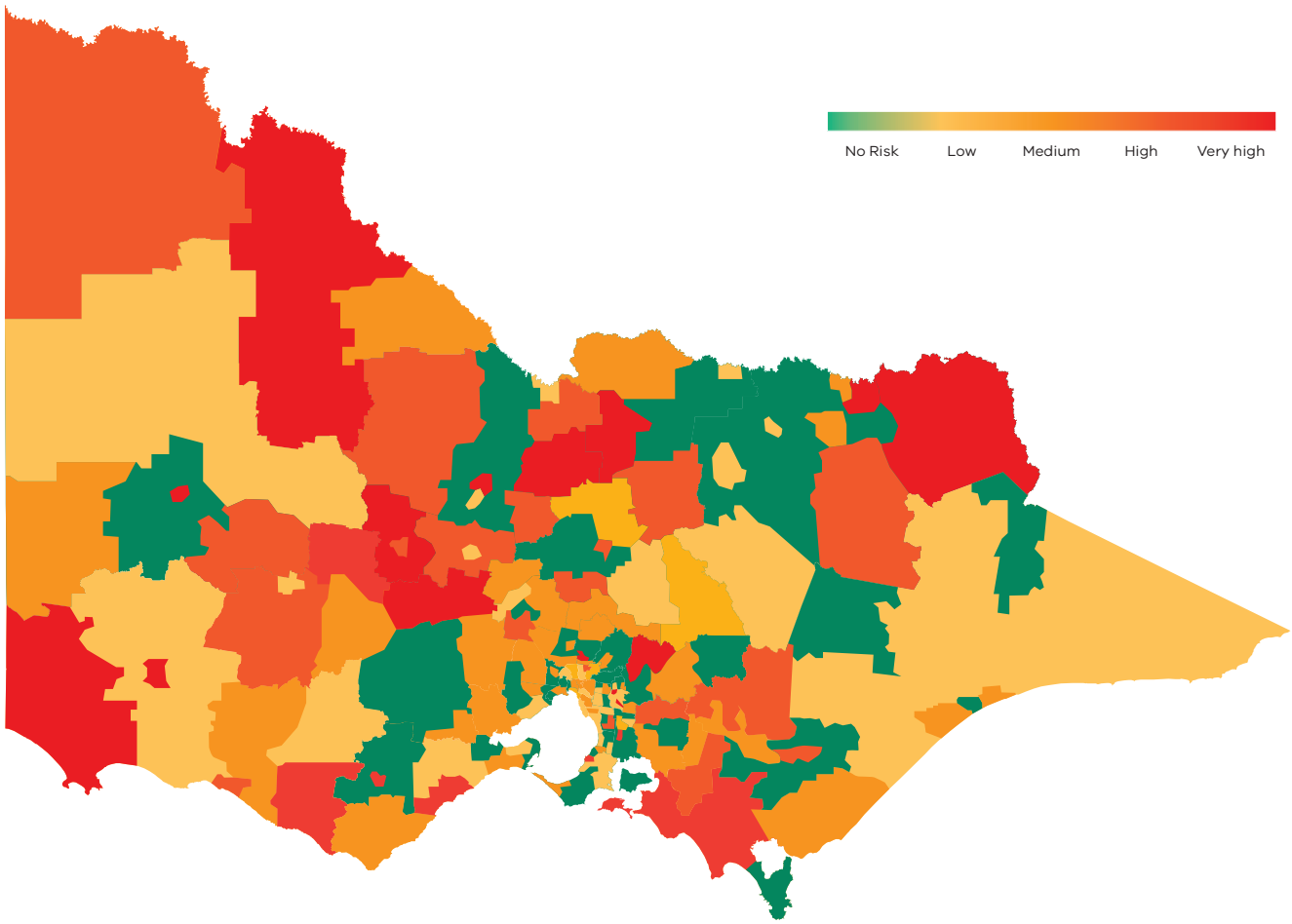
3.3 Adapt to a changing climate

Contribute to the Department of Health Climate change strategy (Ongoing)

VHBA contributed to the development's implementation and communication of the DH's pilot climate change adaption action plan. The plan was prepared ahead of the department's legislative obligations under the Climate Change Act to enable the health and human services sector to put in place the necessary systems to adapt to our changing climate.

The plan identifies the risks that climate change poses to health and human services clients, policies, programs, assets and outcomes and defines responses to those risks. Preparing the plan involved stakeholder engagement across the sector, including VHBA, representative hospitals, peak organisations and professional associations. The actions identified for VHBA align with the actions in the department's Environmental sustainability strategy 2018–19 to 2022–23.

Figure 5: Climate risk of health infrastructure in 2100 in a four-degree warming scenario



Map the climate risk to health infrastructure including health services, ambulance stations and public hospital helipads (Complete)

Climate change is a significant threat to public health, the health and human services system and the social determinants of health and wellbeing. Direct impacts to public health include death, injury and trauma due to more frequent and intense extreme weather events (heatwave, bushfire, flood). Indirect impacts include death, injury and illness due to increased rates of food, water, vector and zoonotic-borne disease.

The ability of infrastructure to deliver health services will be increasingly impacted by climate change through more frequent and extreme weather events.

VHBA completed a climate risk assessment of Victoria's public health infrastructure analysing 149 hospitals, 243 ambulance stations and 32 helipads. The analysis considered risk hazards for riverine flooding, coastal inundation, bushfire, extreme wind, soil movement and heatwave for a scenario of four degrees warming at 2100 (see Figure 5).

The results found that under this scenario extreme heat was a significant risk across all assets, flooding at 11 assets, inundation at six assets, bushfire at 109 assets, soil movement at 27 assets and wind at four hospitals and most ambulance stations.

Collect and analyse data on the energy security of public health facilities (Ongoing)

VHBA commissioned an independent assessment of emergency generators in the public healthcare system. The assessment found that public hospitals complied with AS/NZS 3009:1998 Electrical installations – Emergency power supplies in hospitals.

Prepare guidance on the design and operation of emergency generators in a wider range of climate conditions (Complete)

The hospital essential engineering guidelines incorporate fundamental design principles on the design and operation of emergency generators in a wider range of climate conditions. Facilities built in designated bushfire-prone areas must consider the provision of additional generating capacity to that normally required for that category of hospital. In remote or bushfire-prone areas, when designing on-site fuel storage, consideration must be given to delays that may arise in replenishing fuel supplies under emergency conditions.

Integrate climate resilience into guidelines on essential engineering services and sustainability in capital works (Complete)

Climate change risks to infrastructure include inundation due to sea level rise, riverine and inland flooding, soil contraction shifting foundations, extreme windstorms, bushfire and smoke damage, hot days and heatwaves, legionella growth and amplification of other pathogens and microbes. These can result in loss of assets to flooding, or reduced operability of air conditioning units, chillers and emergency generators in extreme heat. If these are not addressed when locating, designing, building and maintaining assets, climate change will reduce asset life, may result unexpected asset failure and increase operational costs over their lifecycle.

One of the four key principles of the sustainability guidelines is for hospitals to be resilient to climate change. The guidelines provide information on the implications of climate change for healthcare buildings and design responses. The guidelines require these implications to be assessed and appropriate responses integrated within the building during the design and delivery of healthcare buildings.

The essential engineering guidelines require designers to consider the potential effects of climate change and assess the potential risks posed to the project.

Communicate climate risks to health services and pilot climate adaptation planning in selected health services (Delayed)

This action is planned to be delivered as part of the department's climate change adaptation action plan.

4. Governance and reporting

4.1 Strategic advisory group

Implementation of the Environmental sustainability strategy is guided by a strategic advisory group comprising stakeholders from the public healthcare and environment sectors.

The group is chaired by the Executive General Manager of Asset Strategy, VHBA and comprises representatives from Western Health (metropolitan health service), South West Healthcare (sub-regional health service), Tallangatta Health Service (rural health service), Australian Medical Association, Institute of Healthcare Engineering Australia, HealthShare Victoria, Global Green and Healthy Hospitals, Department of Health, Royal Australasian College of Surgeons, Sustainability Victoria, Department of Environment, Land, Water and Planning and the Australian Nursing and Midwifery Federation (Vic Branch).

The group met once in 2018–19 to consider the strategic action plan and 2018–19 action plan. The group met once in 2019-20 to consider an updated term of reference, draft 2018-19 performance report, updates to the strategic implementation plan and 2018-19 action plan and establishment of a rural and regional hospitals project specific working group. The group also received a presentation from Dr Angie Bone, Deputy Chief Health Officer (Environment) on climate change and health.

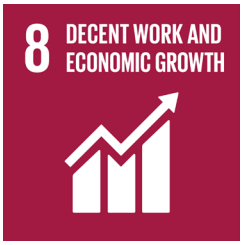
The group was scheduled to meet in April 2020, but was postponed by COVID-19. The release of the 2018-19 performance report was also delayed by COVID-19, but the updated strategic implementation plan and 2018-19 action plan were published in April 2020. The 2018-19 progress report noted that 20 actions (91 per cent) were at a performance that was as expected or better than expected. Two initiatives were identified of at risk of being below target as a result of changing priorities in the first half of 2019-20 and the potential that target timeframes may not be met.

4.2 Links to sustainable development goals

In 2015, countries adopted the 2030 Agenda for Sustainable Development and its 17 sustainable development goals. The contribution of actions in the Environmental sustainability strategy to delivering the sustainable development goals is outlined in Table 6.

Table 6: Contribution of environmental sustainability strategy to the sustainable development goals

Sustainable development goal	Action
	• Target a WELL Gold rating for VHBA's new office fit-out and promote benefits to the sector
	• HealthShare Victoria (HSV) will develop a formal social procurement plan for collective procurement to implement the Social procurement framework

Sustainable development goal	Action
	• Deliver the Regional Health Solar Program in the Barwon South Western, Grampians, Loddon Mallee and Hume regions, and progress energy performance contracts at Northern Health and Peninsula Health
	• HealthShare Victoria (HSV) will develop a formal social procurement plan for collective procurement to implement the Social procurement framework • Deliver the Regional Health Solar Program in the Barwon South Western, Grampians, Loddon Mallee and Hume regions, and progress energy performance contracts at Northern Health and Peninsula Health
	• Pilot methodologies to implement sustainable travel opportunities in two metropolitan hospitals • Prepare guidance for public hospitals and health services to improve the efficiency of their vehicle fleets • Prepare new sustainability guidelines for capital works delivered by the Victorian Health Building Authority • Provide 2018-19 NABERS energy and water ratings to health services
	• HealthShare Victoria (HSV) will develop a formal social procurement plan for collective procurement to implement the Social procurement framework • Report on the health system's 2018–19 emissions in the department's annual report, including for the first time on transport emissions • HSV will review opportunities to reduce greenhouse gas emissions from anaesthetic gases • Establish a waste mentoring program for public hospitals and health services staff • Work with the Vinyl Council of Australia to increase PVC recycling in metropolitan public hospitals • Work with Sustainability Victoria to educate public hospitals and health services on the requirements of the e-waste ban commencing on 1 July 2019 • HPV will source a food organics recycling service offer for metropolitan hospitals • Pilot single-use metal recycling and behavioural change programs to improve waste segregation in hospitals • Develop waste audit guidelines for public hospitals and health services • Work with the Environment Protection Authority to update the Clinical and related waste operational guidance (EPA publication IWRG612.1) • Report on emissions from anaesthetic gases • Develop a template waste management plan for health services • Complete the waste education in healthcare project and evaluate outcomes

Sustainable development goal	Action
	• Prepare new sustainability guidelines for capital works delivered by the Victorian Health Building Authority • Contribute to the Department of Health Climate change strategy • Map the climate risk to health infrastructure including health services, ambulance stations and public hospital helipads • Collect and analyse data on the energy security of public health facilities • Prepare guidance on the design and operation of emergency generators in a wider range of climate conditions • Collect data on electricity generation from behind-the-metre solar arrays • Deliver the $5 million Emissions reduction pledges energy efficiency and solar program in health services with >5,000 tonnes carbon emissions • Release the Victorian Health Building Authority sustainability guidelines for capital works • Integrate climate adaptation into the Victorian Health Building Authority sustainability guidelines for capital works and essential engineering guidelines • Communicate climate risks to health services and pilot climate adaptation planning in selected health services
	• HealthShare Victoria (HSV) will develop a formal social procurement plan for collective procurement to implement the Social procurement framework • Establish a research and innovation program to allow public hospitals and health services to implement local sustainability solutions • Join the Global Green and Healthy Hospitals network and encourage public hospitals and health services to join • Establish an annual professional development and webinar program for public hospitals and health services, and communicate sustainability messages to the sector through sustainability updates and our website • Update the environmental management plan template to align with the strategy • Establish a waste mentoring program for public hospitals and health services staff • Work with the Vinyl Council of Australia to increase PVC recycling in metropolitan public hospitals • Establish a group, including from the department, health services and other key stakeholders, to guide implementation of the strategy • Work with the Environment Protection Authority to update the Clinical and related waste operational guidance (EPA publication IWRG612.1) • Promote sustainability in healthcare across Australasia through chairing the Australasian Healthcare Infrastructure Alliance ESD sub-group • Work with other jurisdictions to develop a NABERS waste tool for hospitals • Monitor environmental sustainability actions in health service statement of priorities • Capture and promote learnings from the environmental sustainability research and innovation program to encourage broader uptake of initiatives • Align the 2018-19 strategy performance report with the sustainable development goals

Appendix 1

Solar arrays supported in 2018–19 to 2019-20 through the regional health solar program and VHBA

Hospital	Array size
Active Health Portland	35 kWp
Apollo Bay Hospital	30 kWp
Beaufort Hospital	30 kWP
Beechworth Hospital	80 kWp
Benalla Hospital	99 kWp
Birregurra Community Health Centre	20 kWP
Caladenia Nursing Home	20 kWp
Camperdown Hospital	90 kWp
Casterton Hospital	99 kWp
Cobram Hospital	99 kWp
Colac Hospital	250 kWp
Coleraine Hospital	99 kWp
Daylesford Hospital	99 kWP
Dimboola District Hospital	30 kWp
East Wimmera Health Service – St Arnaud Campus	99 kWp
East Wimmera Health Service – Wycheproof Campus	50 kWp
East Wimmera Health Service – Charlton Campus	80 kWp
Echuca Hospital	400 kWp
Edenhope Hospital	99 kWp
Frances Hewett Centre	21 kWp
Grange Residential Care	70 kWp
Hamilton Base Hospital	335 kWp
Heathcote Hospital	89 kWp
Heywood Hospital	90 kWp
Hopetoun BNH	60 kWp
Illoura Residential Aged Care	30 kWp
Inglewood Hospital	60 kWp
Jeparit Hospital	50 kWp
Kaniva Hospital	50 kWp
Kerang District Hospital	89 kWp
Kilmore Hospital – Student Accommodation	9 kWp
Kilmore Hospital	150 kWp

Hospital	Array size
Kyabram Hospital	200 kWp
Kyneton Hospital	99 kWp
Lismore Community Health Centre	18 kWp
Lorne Hospital	60 kWp
Macarthur Community Health Centre	18 kWp
Manangatang Hospital	20 kWp
Mansfield Hospital	50 kWp
McKellar Centre	370 kWp
Mortlake Hospital	20 kWp
Mount Alexander Hospital	200 kWp
Myrtleford Hospital	20 kWp
Nhill Hospital	180 kWp
Northeast Health Wangaratta Community Care (Buildings 13 & 14 Rohan & Dicker)	25 kWp
Numurkah Hospital	170 kWp
Ouyen Hospital	80 kWp
Penshurst Hospital	60 kWp
Port Fairy Hospital	99 kWp
Portland Community Mental Health	14 kWp
Portland Hospital	320 kWp
Prevention and Recovery Centre – Southwest Healthcare	20 kWp
Queen Elizabeth Centre – Ballarat	370 kWP
Rainbow Hospital	60 kWp
Sea Lake Hospital	50 kWp
Seymour Hospital	150 kWp
Skipton Hospital	30 kWP
Swan Hill Hospital	99 kWp
Tallangatta Hospital	99 kWp
Terang Community Health	10 kWp
Terang Hospital	80 kWp
Timboon Hospital	70 kWp
Wangaratta Base Hospital	85 kWp
Warracknabeal Hospital & Aged Care	79 kWp
Warrnambool Hospital	250 kWp
Yea Hospital	50 kWp
Total	**6,328 kWp**

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