



## **Net zero carbon emissions:** responsibilities, pathways and opportunities for Australia's healthcare sector

### **The Australian healthcare sector has a responsibility to urgently reduce its carbon footprint**

#### **Required emission reduction targets:**

- **An interim emission reduction target of 80% by 2030.**
- **Net zero emissions by 2040.**

### **Climate change is a public health emergency**

The changing climate is exposing our patients and communities to more frequent and intense extreme weather. Bushfires and associated smoke pollution, floods, heatwaves and drought have had devastating impacts, and they continue to pose unacceptably high risks to public health.

Health professionals are increasingly treating climate-related illnesses, and healthcare services are vulnerable to a range of risks, including an increase in patient demand and threats to infrastructure, workforce and supply chains.

Yet the healthcare sector itself is a significant contributor to climate change through its own carbon footprint, which is estimated to be 7% of Australia's total carbon emissions.

# Key points

- Climate change is a health emergency that is contributing to deaths and life-threatening illness.<sup>(1-3)</sup>
- To meet the 1.5°C Paris Agreement target, human caused greenhouse gas emissions must reduce by 7.6% every year from 2020 to 2030.<sup>(4, 5)</sup>
- With current carbon emissions pledges, the world is on track for a 3.2°C temperature rise, which is incompatible with current human civilisation.<sup>(4)</sup>
- National and international peak health organisations are urging their respective governments and healthcare sectors to deliver net zero emissions by 2030.<sup>(1, 6)</sup>
- Achieving an 80% reduction in healthcare's CO<sub>2</sub>e emissions by 2030 from 2014/15 levels is broadly consistent with the CO<sub>2</sub>e emission reduction necessary to protect health (limit global temperature rise to 1.5°C).<sup>(7)</sup>
- Net zero emissions by 2030 from the Australian healthcare sector, while desirable, are unlikely to be achievable due to the lack of a 'road map' and consistent measurement of carbon emissions to track changes.<sup>(7)</sup>
- Estimated at 7% of Australia's total carbon emissions,<sup>(8)</sup> the carbon footprint of Australian healthcare is substantial. This is largely attributable to public and private hospitals' reliance on emissions-intensive procurement, fossil fuel-based energy supply and pharmaceuticals.
- Achieving net zero emissions and thereby mitigating the climate crisis is fundamental to upholding the healthcare sector's core mission to maintain and improve health, and our responsibility to *first do no harm*.
- Significant emission reductions from the sector will yield economic benefits and wider health co-benefits (for example, lower heart and lung disease from switching to renewable energy and the concomitant reduction in air pollution).<sup>(9, 10)</sup>
- The establishment of an Australian Sustainable Healthcare Unit (SHU) is integral to advancing standardised and consistent measurement of emissions, mapping evidence-based approaches to emissions reductions and achieving sector-wide outcomes.

## Recommendations to enable healthcare sector targets:

1. Establishment of a national Sustainable Healthcare Unit (SHU) within two years to lead and coordinate metrics, innovation, improvement initiatives and collaboration nationwide.<sup>(11, 12)</sup>
2. 100% renewable electricity supply to all Australian hospitals by 2025.
3. No new gas installations or upgrades in Australian hospitals from 2021.
4. Reduction of healthcare demand through prioritising preventative and primary care and sustainable models of care.
5. Procurement of medical equipment, pharmaceuticals and goods with low carbon footprints, and reduction in travel emissions through telemedicine and electric vehicle fleets.
6. Establishment of a National Net Zero Expert Panel in 2021 to assist in guiding interim emission reduction targets and pathways for the healthcare sector.



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## Introduction

Climate change is a health, economic and socio-political emergency.<sup>(2,3)</sup> The World Health Organization has declared it the greatest threat to global health in the 21st Century.<sup>(13)</sup>

More intense storms, bushfires and floods, more frequent and severe heatwaves and the spread of infectious disease threaten the foundations of good health, with consequences for patients, the public, and the Australian healthcare system.<sup>(14-16)</sup>

With current carbon emissions pledges, the world is on track for a 3.2°C temperature rise, which is incompatible with current human civilisation.<sup>(4)</sup> To meet the 1.5°C Paris Agreement target, globally human caused greenhouse gas emissions must reduce by 7.6% every year from 2020 to 2030.<sup>(4,5)</sup>

The carbon footprint, measured as equivalent global warming potential of CO<sub>2</sub> (CO<sub>2</sub>e) over a 100-year period, of Australian healthcare is substantial, estimated at 7% of

Australia's total carbon emissions.<sup>(10)</sup> Globally healthcare contributes about 4-6% of greenhouse gas emissions – if the global healthcare sector were a nation it would be the 5th largest emitter.<sup>(17)</sup>

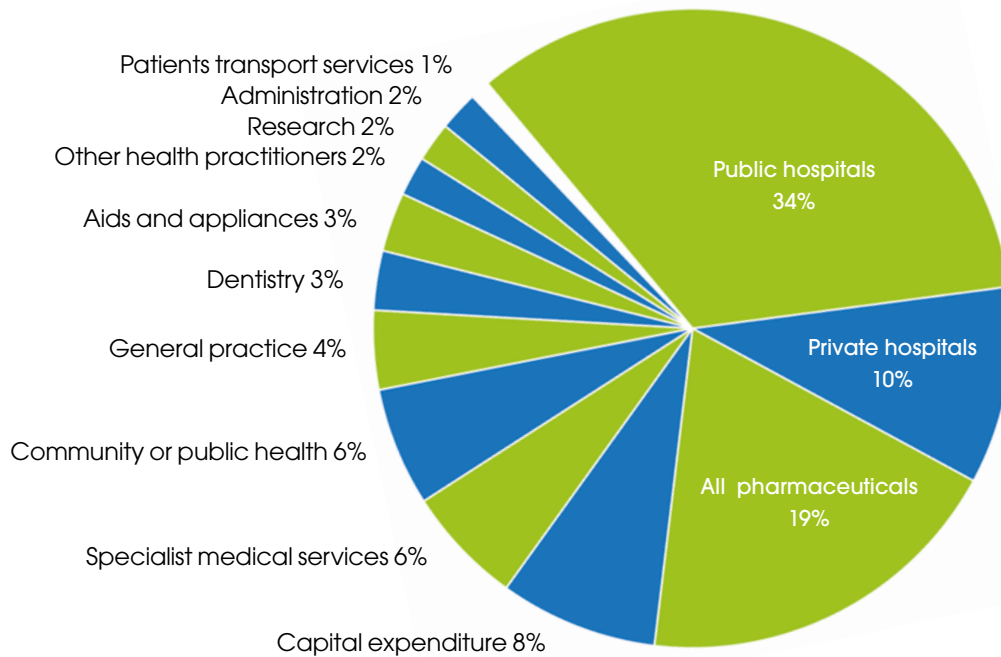
It is incumbent on the healthcare sector to take measures within its own domain to 'avoid the unmanageable' and to show leadership in emission reduction efforts. Australia's healthcare sector needs to reduce its total emissions to net zero urgently, and by at least 80% over the next decade, to play its part in meeting the 1.5°C Paris Agreement goal and averting the catastrophic health consequences otherwise predicted.

Achieving an 80% reduction in healthcare's CO<sub>2</sub>e emissions by 2030 from 2014/15 levels would be consistent with the emission reductions needed to protect health and sufficient to instigate widespread transformational changes within the sector.<sup>(7)</sup>

Despite this, responding to climate change has until recently been seen as distant from core business within

**Figure 1 The proportion of CO<sub>2</sub>e emissions from the various categories of Australian healthcare, 2014-15**

From Malik et al. Total and relative CO<sub>2</sub>e emissions for 13 health-care expenditure categories.<sup>(8)</sup>



Malik, Lenzen, McAlister, McGain. Lancet Planetary Health 2018; 2:e27-35

Australian healthcare, with a profound disconnect existing between healthcare, especially hospitals, and the environment. There is an absence of a 'road map' and consistent benchmarking of emissions to track changes. Important roles, such as electricity and gas purchasing, are often outsourced.

Malik *et al.* in their calculation of the carbon footprint of Australian healthcare estimated the contributions of certain sectors within healthcare.<sup>(8)</sup> The sectors responsible for the greatest proportion of total CO<sub>2</sub>e emission were hospitals, including their Scope 3 emissions (44%) and medications/ pharmaceuticals (18%).

The Malik *et al.* study is the only national estimate for Australian healthcare sector emissions. England's NHS data has repeatedly shown that the majority (over 60%) of healthcare's emissions are Scope 3 emissions (indirect emissions including goods and services such as equipment, medicines, food etc). Therefore, it is fundamental to include all emissions in reduction targets (Scope 1, 2 and 3 emissions). Figure 2 illustrates England's NHS most recent data.<sup>(18)</sup>

The direct greenhouse gas contributions from the release of anaesthetic gases and the propellant of metered dose inhalers (MDI) into the atmosphere were

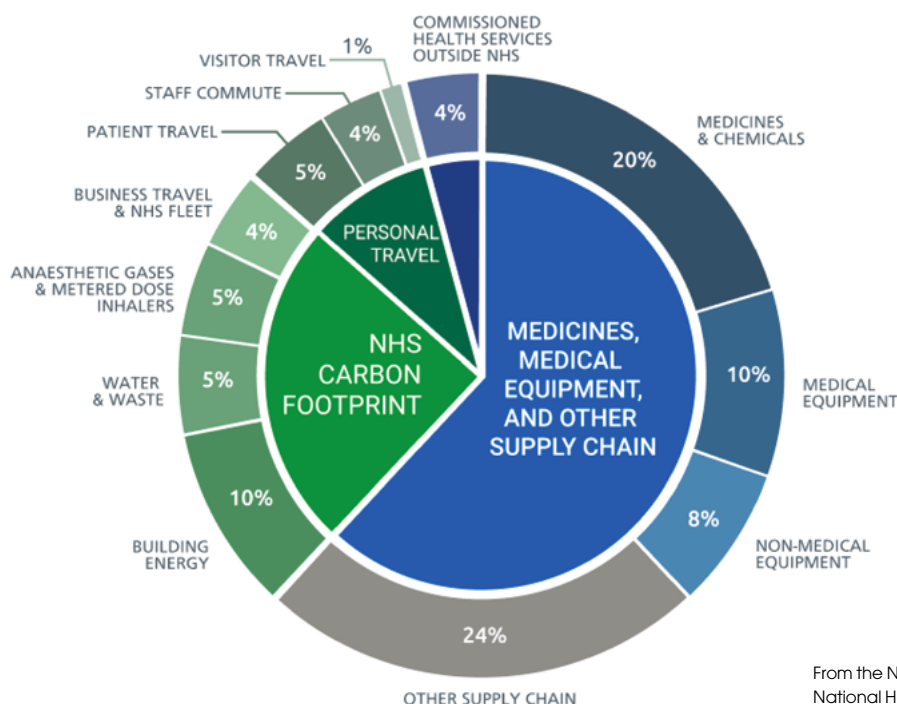
**Box 1. Broadly defined scope emissions <sup>(66)</sup>**

- Scope 1 emissions;** directly under the control of the healthcare facility, for example on-site natural gas or diesel combustion, vehicle emissions.
- Scope 2 emissions;** from electricity produced remote to the facility.
- Scope 3 emissions;** all indirect emissions from embedded CO<sub>2</sub>e emissions in goods and services, including the full supply chain.

not included in the Malik *et al.* estimate. These should also be incorporated in future evaluations, as NHS data estimated direct emissions from these sources to be responsible for approximately 5% of the NHS's total CO<sub>2</sub>e emissions.<sup>(18)</sup>

The current global COVID-19 pandemic highlights the importance of preparedness for health emergencies and reinforces the importance of healthcare leadership and a science-informed approach to public health and healthcare systems. The recovery from one health emergency – COVID-19 – cannot exacerbate the other global health emergency – climate change.

**Figure 2. Sources of carbon emissions by proportion of England's NHS Carbon Footprint Plus**



From the National Health Service. Delivering a 'net zero' National Health Service webpage NHS; 2020<sup>(18)</sup>

## Health rationale for net zero targets

Achieving net zero emissions offers a range of benefits for the healthcare sector by minimising both health impacts and impacts on healthcare services.<sup>(19)</sup>

Principally, achieving net zero CO<sub>2</sub>e emissions assists in the mitigation of climate change and its associated adverse health impacts. However, the health co-benefits of climate change mitigation are also substantial and will be experienced more immediately. For example, low carbon energy, transport and dietary choices can decrease morbidity and mortality through lower air pollution levels, increased physical activity and plant-based diets.<sup>(9, 13, 20-23)</sup>

In contrast, unabated climate change will continue to disrupt care and affect patients and the public at every stage of life.<sup>(16)</sup> Climatic changes affect human physical and psychological health directly through heat stress, bushfires, floods and storms and indirectly by disrupting ecological and social systems, which in turn cause changes in the ranges of disease vectors (such as mosquitoes), reduced water and air quality, food insecurity and socioeconomic impacts.<sup>(5, 13)</sup>

Extreme weather events and bushfires have the added implications of significantly increasing demand on healthcare services as well as potentially damaging infrastructure and interrupting supply chains.<sup>(24, 25)</sup> For example, during the Australian Summer of 2019/20, there were over 3000 cardiovascular and respiratory hospital admissions, 1305 asthma presentations to emergency departments and 417 deaths attributable to smoke in Queensland, NSW, the ACT and Victoria.<sup>(26)</sup>

The burning of fossil fuels adversely affects health at a regional/local level as well as through climate impacts. Fossil fuel combustion emits a range of air pollutants including particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NOx), mercury, lead, arsenic and volatile organic compounds.

Exposure to coal-derived air pollution is associated with increased incidence of respiratory, cardiac and pregnancy-related diseases and mental ill-health.<sup>(27-29)</sup> It is estimated that each year in Australia, air pollution from coal-burning power stations is responsible for over 373 premature deaths and approximately 850 cases of low birth weight in newborns and 14,000 asthma symptoms in children and young adults aged 5-19.<sup>(30)</sup>

Vehicle exhaust emissions are also a major source of air particulate matter and therefore a major contributor to ill-health.

Unconventional gas extraction (for example hydraulic fracturing) has also been linked to adverse health outcomes<sup>(31-33)</sup> while the extraction and burning of fossil gas also leads to considerable greenhouse gas emissions. Advocacy and awareness of the potential health and environmental impacts of fossil gas are important in the context of COVID-19 recovery planning.

## Ethical rationale for net zero targets

The Australian healthcare sector's significant carbon footprint and reliance on fossil fuel energy sources means that it is contributing toward some of the very diseases it seeks to manage and treat.

*First, do no harm* is central to the day-to-day practice of medicine. Healthcare energy choices and carbon footprint are no exception. The healthcare sector needs to be part of the solution rather than contributing to the problem.

### Health, the healthcare system and climate change are inter-related

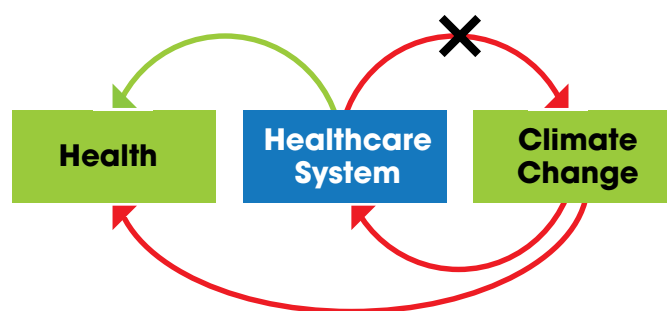


Diagram adapted from David Pencheon

*The Lancet* Commission on Climate and Health states that there is a special responsibility for the health sector to lead by example in achieving emissions targets, as reducing emissions provides leadership across the wider community.<sup>(15)</sup>

Healthcare's ethical imperative has been acknowledged internationally and nationally.

In the UK, sustainable healthcare has been defined and embedded into the NHS mission and values statements as "a system that provides high quality care and improved public health without exhausting natural resources or causing severe ecological damage".<sup>(34)</sup> The NHS recognises that "by transitioning to a high-quality sustainable healthcare system [it] can meet the needs of today, without compromising the needs of tomorrow."

The Australian Medical Association, Doctors for the Environment Australia and numerous Australian medical colleges have recognised the ethical responsibility to address greenhouse gas emissions and have made formal health emergency declarations (Box 2).<sup>(35)</sup>

**Box 2. List of Australian medical colleges that have declared a climate health emergency, along with DEA and the AMA.**

Doctors for the Environment Australia (DEA)
Australian Medical Association (AMA)
Royal Australian College of Physicians (RACP)
Royal Australian College of General Practitioners (RACGP)
Australian College of Emergency Medicine (ACEM)
Australian College of Rural and Remote Medicine (ACRRM)
College of Intensive Care Medicine (CICM)
Australian and New Zealand College of Anaesthesia (ANZCA)
Royal Australian and New Zealand College of Psychiatrists (RANZCP)

It is now time the healthcare sector as a whole acknowledges that it has an ethical responsibility to ensure it is not contributing to unmanageable global warming and the associated adverse health impacts.<sup>(14)</sup>

### **Economic rationale for net zero targets**

Many of the changes needed to achieve net zero emissions within healthcare are the same as those needed to deliver financial sustainability and quality improvements.<sup>(36)</sup> Processes that prevent escalation of care and unnecessary activity also promote resource and waste efficiency and associated cost benefits.

The high resource use and inefficiencies predominant in healthcare contribute significantly to healthcare expenditure. In contrast, sustainable models of care and approaches to care delivery that encourage greater efficiency of resources, whether these involve energy, water, staff, medications, products (clinical or non-clinical) or procedures may have short payback periods and potentially become highly profitable. Many national and international examples exist of cost savings incurred through resource conservation in healthcare.<sup>(17, 37, 38)</sup>

Renewable energy technologies like solar and wind are the cheapest source of *new* energy supply in Australia.<sup>(39)</sup> For existing facilities, large scale renewable electricity purchasing is now cost competitive for mains electricity

supply. Further, procuring renewable electricity supply can provide energy independence and stability.<sup>(40, 41)</sup>

Externalities including the environmental costs, the economic damage as a consequence of climate change, and the health costs of regional coal and gas pollution, are frequently neglected from cost analyses. For example, Australia's recent 2019/20 summer bushfires alone are believed to have cost somewhere between \$4.4 billion<sup>(42)</sup> (narrowly defined) to over \$100 billion (a more credible estimate).<sup>(43)</sup>

Over the next 30 years, increasing economic damages from climate change are predicted to cost the Australian economy at least \$1.89 trillion (approximately 4% of projected GDP each year), assuming current emissions policies are maintained.<sup>(10)</sup>

The cost of health impacts associated with air pollution from coal-burning has been estimated at \$2.4 billion a year in Australia.<sup>(30, 44)</sup> This equates to a cost of \$15.40 per megawatt hour generated from coal, or about a quarter of the value of the electricity.

These costs are borne by the community but go largely unrecognised.

### **Prioritising preventative and primary care and sustainable models of care**

Present day hospitals are high resource consuming, polluting entities. Therefore, a healthcare system that keeps patients well and out of hospitals, as well as one that minimises escalation of care – lead by evidence-based care pathways – is integral to reaching the necessary emission reduction targets.

As highlighted by Naylor and Appleby,<sup>(36)</sup>

***“Ultimately, the most sustainable system is one that minimizes unnecessary or ineffective use of resources (financial and natural) by delivering the right care, in the right place, at the right time – and by preventing care needs from arising at all where possible.”***

Non-communicable diseases (NCDs) now produce the largest disease burden in Australia and represent one of the most serious challenges to the financial sustainability of healthcare systems across Australia. NCDs such as cardiovascular disease and diabetes are largely preventable, yet public health prevention initiatives account for less than 2% of our health spending.<sup>(45)</sup>

Generally low cost and environmentally friendly prevention measures such as addressing diet, physical activity, smoking, stress and substance misuse have the potential to eliminate the need for more costly future treatments while improving physical wellbeing and mental health.

Primary health is the interface in our current health system where the whole range of chronic diseases including obesity, type 2 diabetes and cardiovascular disease are first addressed. International evidence suggests that a strong primary health care orientation within the health system is associated with reduced costs, increased efficiency, lower rates of potentially preventable hospitalisations and better population health outcomes.<sup>(46-49)</sup>

Australia's greenhouse gas emissions from our preventative/public health (6%) and primary health (4%) sectors are far lower than from our hospital sector (44%).<sup>(6)</sup>

## Healthcare leadership impacts the carbon footprint of supply chains

The influence of Australia's healthcare system goes beyond its provision of treatment and care.

The health sector has large and influential purchasing power and can drive positive economic, social and environmental outcomes through how it purchases energy, procures goods and services, uses land and other assets and travels.<sup>(50)</sup>

The opportunity to influence supply chains, including assisting the economy-wide transition to renewable electricity and zero emissions organisations, is crucial.

NHS data has repeatedly shown that the majority (over 60%) of healthcare's emissions are from supply chains (Scope 3 or indirect emissions, including those arising from goods and services such as equipment, medicines and food).

The NHS has undertaken to transform the carbon footprint of its supply chains through three main pathways. These include improving efficient use of supplies; promoting low-carbon substitutions and product innovation; and decarbonisation of its supply chains (80,000 suppliers).<sup>(18)</sup>

While the NHS is working with supply chains to reduce emissions, its long-term expectations are clear: **before the end of the decade, the NHS will no longer purchase from suppliers that do not meet or exceed their net zero commitment.**<sup>(18)</sup>

## The Australian healthcare sector can also lead and influence supply chains for the following reasons:

- It employs more than 1 million Australians.<sup>(51)</sup>
- It is a major producer and purchaser of goods and services – it spent an estimated \$185.4 billion in 2017/18, constituting 10% of Australia's overall economic activity for the year.<sup>(51)</sup>
- It is a very large capital estate holder and developer: hospitals have ownership of approximately 1,200 sites worth at least \$124 billion.<sup>(52)</sup>
- Public hospitals on average contribute more than 50% of public sector emissions in each state/territory.<sup>(53-55)</sup>

## Healthcare can make a substantial contribution to Paris Agreement commitments

Hospitals are amongst the largest consumers of direct energy and contributors to carbon emissions outside the intensive-manufacturing and industrial sectors.<sup>(56, 57)</sup>

Meaningful contribution by the healthcare sector will be required to achieve state/territory ambitions or legislated targets in accordance with the 2016 Paris Agreement.

Nearly all state/territory health sectors (excluding the ACT) have current targets that are incompatible with the central ethos of healthcare and the scientific realities of ongoing reliance on fossil fuels (Table 1).

## A national Sustainable Healthcare Unit (SHU)

A national Sustainable Healthcare Unit (SHU) would lead and coordinate metrics, innovation, improvement initiatives and collaboration nationwide. The details of a SHU have been outlined by Doctors for the Environment Australia previously.<sup>(12)</sup>

It would provide co-ordination and strategic direction for state-based SHUs' initiatives seeking to optimise benefits across the health sector, while also assisting in the developing of integrated sustainable models of care, strengthening primary care and public health, water, waste and plastic management and chemical usage.

Presently, individual sectors of healthcare in Australia are taking steps to address their environmental impact. Many are assisted by the Global Greening Health Hospital (GGHH) network,<sup>(58)</sup> coordinated by the Climate and Health Alliance in Australia.



**Table 1. Renewable electricity usage, renewable energy targets, net zero CO<sub>2</sub>e emission targets, and health sector ambitions across Australia**

Jurisdiction	% Grid renewable electricity (2019)	2030 renewable electricity targets	Net zero CO <sub>2</sub> e emission targets	Health sector targets
Australia	24	None	26-28% reduction on 2005 levels	None at the Federal level
Australian Capital Territory	97	100%	2045	Achieve zero emissions from the public health sector by 2040
Tasmania	96	100%	Achieved 2018	None
South Australia	52	Removed	2050*	None
Victoria	24	50%*	2050*	5% of hospital electricity from on-site renewables by 2023. Work with Health Purchasing Victoria to source state-wide power purchase agreements from renewable energy
Queensland	14	50%	Aspirational 2050	New health facilities shall <i>target</i> 20% of power sourced from alternative energy sources (2017)
New South Wales	15	None	Aspirational 2050	All non-Local Health District's (LHD) facilities purchase 6% GreenPower. LHDs to complete at least one renewable energy installation/year <i>if</i> internal rate of return >12% can be achieved over life of project
Western Australia	21	None	Aspirational 2050	None
Northern Territory	8	50%	Aspirational 2050	Assist government facilities (including health centres) to have more flexible financing options to enter into renewable energy projects

\* Legislated targets

## Proposals for Australian Sustainable Healthcare Units

Australian Medical Association (AMA)	Environmental Sustainability in Health Care – 2019: Position Statement
Royal Australian College of Physicians (RACP)	Environmentally Sustainable Healthcare: Position Statement
Doctors for the Environment Australia (DEA)	An Australian Healthcare Sustainability Unit: Proposal
Climate and Health Alliance (CAHA)	Framework for a National Strategy on Climate, Health and Well Being for Australia
Western Australia	Climate Health WA Inquiry Report

However, a national SHU would undertake systematic benchmarking, planning, setting of national targets and instigation of actions needed in order to realise emission reductions in line with what the science says is required.

National leadership and coordination from a SHU would enable the necessary changes across jurisdictions (states, regions, hospitals, clinics) and between stakeholders (healthcare professionals, facilities and suppliers etc). In turn, this would maximise emissions reductions and allow healthcare to capture the full benefits of sustainability initiatives.

### **Proposed priorities of an Australian Sustainable Healthcare Unit<sup>(12)</sup>**

- 1.** A national consultation with health sector bodies canvassing current and planned initiatives in relation to environmentally sustainable healthcare.
- 2.** Further targeted measurement of the carbon footprint and environmental impact of individual Australian healthcare services.
- 3.** Development of a sustainability strategy for the Australian healthcare sector including preventive healthcare, primary/community care and hospital care.
- 4.** Researching and developing innovations (technological, clinical, organizational etc.) that will improve the sustainability of healthcare.
- 5.** Social and psychological research to understand the behavioural attitudes and cultures that will be needed within healthcare to improve sustainability.
- 6.** Policy research to clarify how the overall design of health systems influences the uptake of sustainable behaviour and innovation.
- 7.** Implementation of strategies to improve the environmental sustainability of the health system.
- 8.** Development of strategies or policies that minimise the need for escalation of care and the associated increases in resources and costs within the healthcare system.
- 9.** Assessment of the anticipated effects from environmental impacts and climate change on health care services.
- 10.** Work closely with state-based sustainable healthcare units.

### **England's Sustainable Development Unit: leading by example**

The Sustainable Development Unit (SDU) in the UK's National Health Service (NHS) was established to coordinate and measure healthcare decarbonisation and set a practical, evidence-based and ambitious roadmap.

As a result, England's healthcare sector is a leading contributor towards achieving the country's 2050 target of net zero emissions. The NHS itself has established a net zero emissions target by 2040, and developed a detailed health sector roadmap to ensure this target is reached.<sup>(18)</sup>

Through SDU initiatives, the NHS reduced the health sector's CO<sub>2</sub>e emissions by 11% between 2007 and 2015 despite an 18% increase in inpatient admissions over the same period.<sup>(59)</sup> SDU initiatives continues to save the NHS over £90 million per annum.

As of 2020, more than 11% of the NHS's 3,500 buildings (hospitals, health centres, GP surgeries and offices) are set to be powered by 100% renewable electricity. By April 2021, it is expected that all NHS organisations will be purchasing 100% renewable electricity from their suppliers.<sup>(18)</sup>

### **Transitioning to 100% renewable electricity**

#### **There are a number of ways that health services can shift to clean energy sources and reduce their carbon footprint.**

- Most importantly, they can purchase large scale renewable electricity (i.e. GreenPower) to supply the direct energy needs of hospitals.<sup>(60)</sup>
- Rooftop solar installation can be part of the solution; however, hospital electricity usage is often so large that only a small proportion (roughly 10-15% at best), even for lower-level hospitals, could be powered by rooftop solar. Rooftop solar is ideal for smaller facilities such as dialysis units particularly in sunny regions.
- Healthcare facilities including hospitals should no longer rely on gas as a power source. They should adopt a policy of no new gas installation or refurbishment of gas infrastructure.

- To ensure hospital energy resilience (emergency supplies), the focus should be on increased battery backup and diesel generators when needed.

Since 2018, some 21 healthcare institutions in 12 countries have signed on to a 100% renewable electricity target for their healthcare facilities.<sup>(17)</sup> In Australia, the Canberra Hospital expansion, set to be completed in 2024, has made the first step and will be powered entirely on renewable electricity.

### Flow on advantages of renewable electricity

The energy sources for healthcare have wide reaching influence. Renewable electricity further supports CO<sub>2</sub>e emission reductions from other operations and practises within the sector — such as electrical transport fleets and the reusing rather than discarding of equipment.

For example, when washers and sterilizers are powered by renewable electricity, the lower carbon footprint can be shifted from single use to reusable equipment with flow on advantages for waste reduction.<sup>(61)</sup>

### Commitments to renewable electricity by other sectors

Other sectors, including tertiary education, large grocery and food retail, agriculture and mining have begun to develop commitments in response to consumer pressure and business risk associated with unabated climate change.<sup>(62-64)</sup>

Tertiary education, for instance, has set 100% renewable electricity targets and is acting to reduce emissions. Investment in renewable energy by individual tertiary institutions is occurring at a scale equal or larger than entire state/territory public hospital efforts.

For example, the renewable energy produced by all Victorian public hospitals was 11 gigawatt-hours in 2018/19, whereas Monash University is alone purchasing/producing five times this amount each year (55 gigawatt-hours of GreenPower and 6.3 gigawatt-hours of solar PV in 2018-19). Monash University is one of multiple universities entering into long-term Power Purchase Agreements to consume 100% renewable electricity.<sup>(65)</sup>

**Healthcare can do likewise.**

### Examples of healthcare carbon reduction initiatives in Australia and globally

- Ambulance Victoria (AV) will source 100% renewable energy by 2025.<sup>(67)</sup>
  - This will reduce the organisation’s overall emissions profile by 27%. The energy strategy has been developed subsequent to the Black Summer bushfires where the service was challenged by spikes in callouts of up to 51% for respiratory distress in single evenings.<sup>(67)</sup>
  - As of 2020, AV have already signed a power purchase agreement and switched to 100% GreenPower accredited renewable energy for all large AV sites that are high electricity users.
- Canberra Hospital Extension (to be completed in 2024) will be powered entirely by renewable electricity.<sup>(68)</sup> This is in keeping with ACT requirements that all new government buildings are emissions-free.
- Kaiser Permanente, the California-based integrated managed care consortium, obtains over 1,000 gigawatt-hours of GreenPower (purchased large-scale renewable electricity) and is already carbon net positive from its operations.<sup>(69)</sup>
- Gunderson Health System in La Crosse, Wisconsin, is the first health service to produce more energy than it uses. This follows full conversion from fossil fuels to locally produced energy in 2014. Combining all efficiency and new renewable energy projects completed between 2008 - 2014, Gunderson capital cost of \$2 million USD provided a 60% return on investment with annual energy expenses staying below 2008 costs. This is despite adding 26% more facility space and a 25 percent electricity price increase over that timeframe.<sup>(69)</sup>
- England’s NHS has committed to net zero carbon emissions by 2040 and an interim 80% reduction by 2028-2032.<sup>(18)</sup>

## Net zero emissions: Recommendations for action

1. Establishment of a national Sustainable Healthcare Unit (SHU) within two years to lead and coordinate metrics, innovation, improvement initiatives and collaboration nationwide.<sup>(11, 12)</sup>
2. 100% renewable electricity supply to all Australian hospitals by 2025.
3. No new gas installations or upgrades in Australian hospitals from 2021.
4. Reduction of healthcare demand through prioritising preventative and primary care and sustainable models of care.
5. Procurement of medical equipment, pharmaceuticals and goods with low carbon footprints, and reduction in travel emissions through telemedicine and electric vehicle fleets.
6. Establishment of a National Net Zero Expert Panel in 2021 to assist in guiding interim emission reduction targets and pathways for the healthcare sector.

### Examples of organisations working to assist the reduction of healthcare's carbon footprint

National Health Service (NHS) Sustainable Development Unit (SDU)	Recently released a report Delivery 'Net Zero' National Health Service	<a href="https://www.sduhealth.org.uk">https://www.sduhealth.org.uk</a> <a href="https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf">https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf</a>
Centre for Sustainable Healthcare		<a href="https://sustainablehealthcare.org.uk">https://sustainablehealthcare.org.uk</a>
Healthcare Without Harm (HCWH)		<a href="https://noharm.org">https://noharm.org</a>
Global Green and Healthy Hospitals (GGHH)	Co-ordinated by the Climate and Health Alliance in Australia	<a href="https://www.caha.org.au/globalgreen_healthyhospitals">https://www.caha.org.au/globalgreen_healthyhospitals</a>
Healthy Futures	Australian Repower Health campaign	<a href="https://www.repowerhealth.org.au">https://www.repowerhealth.org.au</a>
Doctors for the Environment Australia (DEA)	DEA has a sustainable healthcare Special Interest Group and resources	<a href="https://www.dea.org.au/health-systems/">https://www.dea.org.au/health-systems/</a>

## Conclusion

Health and the environment are inextricably linked. It is therefore integral for healthcare to lead in enabling a healthier future. This must include getting its own house in order.

In order to do so, Australia needs to have a coordinated approach to address and decrease carbon emissions from our health system. The establishment of science-based emission reduction targets, 100% renewable electricity and a national Sustainable Healthcare Unit (SHU) are all critical requirements.

A net zero emissions Australian healthcare sector would provide improved health and high-quality care for all patients without jeopardising the health of current and future generations.

***“Without decisive and urgent action, the climate crisis will increasingly undermine human health and disrupt healthcare delivery. There are both moral and practical reasons for health professionals to be at the forefront of climate action—to embrace the drive to decarbonise the economy and to reach net zero emissions. This is crucial in hospitals, clinics, and pharmacies. Healthcare must lead from the front, which entails urgently getting our own house in order by charting a pathway to net zero.”***

Renee N Salas and colleagues <sup>(19)</sup>

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## About DEA

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-governmental organisation of medical doctors and students in all Australian states and territories. We are supported by a distinguished Scientific Advisory Committee.

We work to address the public health impacts from damage to our natural environment such as climate change, which will increasingly undermine our health and our healthcare services if we fail to act.

A key focus of DEA's work is raising awareness of the healthcare sector's responsibility to reduce its sizeable carbon footprint and to ensuring adequate measures are instigated.

### **DEA's Scientific Advisory Committee:**

Prof Stephen Boyden AM, Prof Emeritus Chris Burrell AO, Prof Colin Butler, Prof Peter Doherty AC, Prof Michael Kidd AM, Prof David de Kretser AC, Prof Stephen Leeder AO, Prof Ian Lowe AO, Prof Robyn McDermott, Prof Lidia Morawska, Prof Peter Newman AO, Prof Emeritus Sir Gustav Nossal AC, Prof Hugh Possingham, Prof Lawrie Powell AC, Prof Fiona Stanley AC, Dr Rosemary Stanton OAM, Dr Norman Swan

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*We acknowledge the Traditional Custodians of the many Lands we call Australia, and pay respects to Elders Past and Present, as well as emerging Aboriginal and Torres Strait Islander leaders.*

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