

# **Sustainability and the health sector**

A guide to getting started

2019

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# Introduction

Our health is affected by the quality of the environment we live in. Pollution of air, soils and waterways, along with sedentary lifestyles, negatively impacts on our health and wellbeing, which is evident from, for example, increased rates of cardiovascular disease, asthma and other respiratory conditions (Pruss-Ustün et al 2016).<sup>1</sup> Thinking sustainably is one way in which individuals, organisations and communities can enhance the environment, or at least minimise the negative effects that their actions have on it. The negative impacts of human activity are likely to be magnified as the effects of climate change intensify. Climate change threatens to slow, halt or even reverse the health gains that society and health care systems have made over the last century (WHO and Healthcare Without Harm 2009). The expected temperature shifts alone have major health implications. The increase in floods, droughts and other extreme weather events will significantly impact human health, especially that of coastal communities and vulnerable populations (Bolton 2018; Royal Society of New Zealand 2017; WHO and Healthcare Without Harm 2009).

Somewhat ironically, the health sector contributes to the health issues within the populations it cares for because it uses lots of resources and contributes to greenhouse gas emissions. According to the New Zealand Energy Efficiency and Conservation Authority (EECA), the New Zealand health sector is the largest emitter in the public sector, excluding emissions from transport (EECA, personal communication, 4 December 2018). Without prompt and direct nation-wide action to reduce greenhouse gas emissions, the health sector will face increasing pressure from the burden of climate change related illnesses. Reducing greenhouse gas emissions is also an opportunity to improve the health, wellbeing and resilience of our communities. For these reasons it is critical that the New Zealand health sector takes a lead role in mitigating and adapting to the effects of climate change.

The aim of this guide is to support and encourage the New Zealand health sector to take an active role in implementing sustainability as an integral part of its practice. This document outlines ideas as to how health facilities in New Zealand can reduce their carbon footprints and contribute to the move to a sustainable, low-emissions world. Sustainability requires a multidisciplinary approach that cannot be addressed in isolation. In order to promote sustainability within the health sector, participation and support are required from the Ministry of Health, as well as from external parties such as the Treasury and the Pharmaceutical Management Agency Ltd (PHARMAC). The ongoing intention is for the Ministry of Health to work with district health boards (DHBs) to create a knowledge base of case studies, evidence and expertise to encourage sustainable thinking throughout the country.

<sup>1</sup> For more information, see [www.who.int/mediacentre/news/releases/2016/deaths-attributable-to-unhealthy-environments/en/](http://www.who.int/mediacentre/news/releases/2016/deaths-attributable-to-unhealthy-environments/en/)

# Sustainability context

The Bruntland Report defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Bruntland Commission 1987). To do so, sustainability must be addressed, monitored and evaluated in all three of its pillars: **economic, social and environmental** (United Nations General Assembly 2005).

The Paris Agreement aims to keep global average temperatures well below 2 degrees Celsius above pre-industrial levels, while pursuing efforts to limit the temperature increase to 1.5 degrees Celsius. New Zealand has ratified the Paris Agreement and has committed to reducing its greenhouse gas emissions to 30% below 2005 levels by 2030. Under the recently introduced Climate Change Response (Zero Carbon) Amendment Bill, this target would become legally binding. In order to meet this commitment and to mitigate the effects of climate change, all sectors must participate in this effort by examining their own contributions to carbon emissions and improving sustainability. As a larger emitter, the health sector has a lead role to play. The 2018/19 and 2019/20 letters of expectation both sent strong messages to the health sector to respond to climate change. In addition DHBs have been required to report on sustainability actions through the annual planning process.

## Sustainable development goals

As a member state of the United Nations, New Zealand has adopted the 2030 Agenda for Sustainable Development, including the Sustainable Development Goals (SDGs). The SDGs are a set of 17 goals and 169 targets that outline a universal plan to action to support people, the planet, prosperity, peace and partnership (United Nations 2015). The New Zealand health sector has the responsibility to contribute to achieving Goal 3: good health and wellbeing; however, because these goals are closely interconnected, the health sector has a stake in all 17 (see Figure 1).

**Figure 1: Sustainable development goals and environment-health risks**



Source: Prüss-Ustün et al 2016.

It is expected that working on sustainability within the health care sector will have wide-ranging effects beyond the health sector. As Figure 1 shows, health is related to all the other SDGs, in particular:

- Goal 6: Clean water and sanitation
- Goal 7: Affordable and clean energy
- Goal 8: Decent work and economic growth
- Goal 9: Industry, innovation and infrastructure
- Goal 10: Reducing inequalities
- Goal 11: Sustainable cities and communities
- Goal 12: Responsible consumption and production
- Goal 13: Climate action
- Goal 14: Life below water
- Goal 15: Life on land.

# Sustainability in Aotearoa

The concept of sustainability, and the recognition of a more holistic view of the relationships between humans, the environment and health, are views that share many similarities with te ao Māori (the Māori world). The environment is integral to Māori identity and culture and many Māori see the environment as an interconnected whole. Recognising the importance of Māori perspectives ensures that they are recognised as kaitiaki (guardians), contributes to the needs and aspirations of Māori and gives due effect to Te Tiriti o Waitangi, as well as reinforcing the messages of environmental sustainability (Auckland Council 2013).

Māori are vulnerable to the effects of climate change. The degradation of the environment diminishes the connection that Māori have to the land and from which a sense of identity and mana is derived. In addition, a significant portion of the Māori economy is in industries that are sensitive to the effects of climate change, such as forestry, fishery and agriculture (King et al 2010).

An example of how Māori perspectives are being incorporated into sustainability initiatives comes from Te Kōhau o Te Ngira, a mana whenua sustainability framework, which mana whenua iwi and hapū groups in the Auckland region have developed as part of the Auckland Sustainability Framework is given in Figure 2.

**Figure 2: Te Kōhau o Te Ngira – a mana whenua sustainability framework**



Source: Auckland Council 2013.



# Benefits of sustainability

Improving sustainability leads to a more efficient use of resources, which has wide-reaching benefits for individuals, organisations and communities. The health sector has the opportunity to influence the larger community by readjusting its supply chain and prioritising sustainability.

Sustainability achieves benefits in both the long and short term. The many co-benefits of sustainable action can lead to health outcomes such as (Bennett et al 2014; Royal Society of New Zealand 2017):

- improved food security, nutrition and mental health
- reduced rates of injury, illness, premature death, obesity, cardiorespiratory and allergic diseases, and vector-, water- and food-borne diseases.

Figure 3 lists some of the important economic, health, social, environmental and resilience co-benefits of sustainability action.

**Figure 3: Co-benefits of sustainability**

<p><b>Economic</b></p> <ul style="list-style-type: none"><li>• Cost savings through efficiencies and actions taken to reduce emissions</li><li>• Improved productivity (Nieuwenhuis et al 2014)</li><li>• An opportunity to demonstrate business leadership to the wider community</li></ul>	<p><b>Health</b></p> <ul style="list-style-type: none"><li>• Faster patient recovery time (World Green Building Council 2013)</li><li>• Reduced staff absenteeism (World Green Building Council 2013)</li><li>• Improved public health outcomes</li></ul>
<p><b>Environmental resilience</b></p> <ul style="list-style-type: none"><li>• Improved air, water and soil quality</li><li>• Reduced waste</li><li>• Reduced greenhouse gas emissions</li><li>• A legacy for future generations to reinforce the concept of stewardship of the environment</li><li>• Increased mitigation, resilience and adaption to climate change (Bolton 2018)</li><li>• Increased self-sufficiency</li></ul>	<p><b>Social</b></p> <ul style="list-style-type: none"><li>• An opportunity to influence public views on sustainability</li><li>• Improved staff satisfaction, retention and attraction of quality staff (Rechel et al 2009)</li><li>• Stronger, more resilient communities</li></ul>

# Ensuring success

A number of actions need to be taken to create a solid foundation on which a sustainability programme can progress and succeed. Figure 4 summarises these actions, while the discussion that follows provides further information and links to other relevant resources.

**Figure 4: Actions for ensuring successful sustainability programmes**



## Organisational commitment

Securing an organisation's commitment to sustainability is vital to ensuring the success of a sustainability programme. The entire hierarchy of the organisation, including those at the very top, should be aware and supportive of the concept. In this way a suitable sustainable infrastructure can be built, with dedicated staff members driving change supported by a diverse cross-section of other staff members (Health Care without Harm and Practice Greenhealth, no date; Keating 2017). Sustainability should be a strategic, tactical and operational consideration included in all policies and processes. Having a policy or position statement is one way of documenting an organisation's commitment.

## Measuring progress

The first step to measuring progress is to develop a baseline against which future metrics can be compared. Measuring against third-party standards provides a

framework for reporting and adds rigour to sustainability initiatives as well as quantifying savings.

When measuring your organisation’s greenhouse gas emissions, it is important to follow the accepted international standard for carbon accounting (ISO 14064 / GHG Protocol). In this way, your measurements will be robust and consistent with international standards. A number of companies offer greenhouse gas accounting as a service in New Zealand.

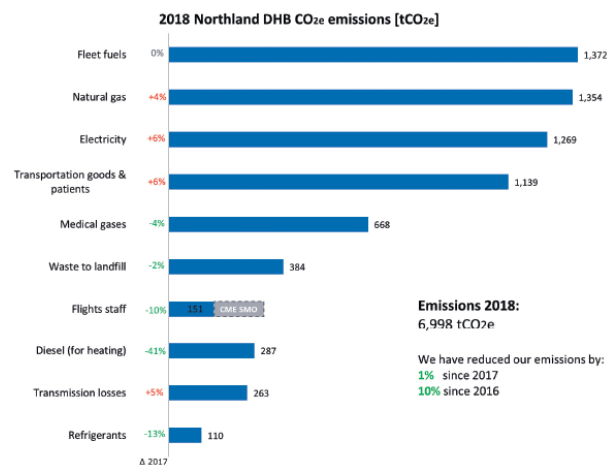
## Northland District Health Board carbon emissions measurement

Northland District Health Board has a goal to reduce absolute carbon emissions by 15 percent by 2025, compared with the 2016 baseline year. When growth is taken into account, this will likely require a total estimated 45 to 65 percent reduction in its current emissions profile. Northland DHB has recognised that achieving this goal is a significant challenge that requires a collective commitment across the organisation.

Each year Northland has measured its carbon emissions and had them audited by Enviro-Mark Solutions. Taking standardised measurements allows the district health board to track its progress against its goal; in two years it has reduced its carbon emissions by 10 percent. With this approach, Northland can also see what its major sources of emissions are and where it is making progress. Further, this approach helps it identify where it needs to do more work so that it can then build business cases around that to make improvements.

Northland has also found that its measurement activities have been an effective tool for raising awareness and educating staff about the impacts the hospital has. For example, most departments are keen to recycle but may not be aware that fleet car trips, staff commuting in a car and patients visiting hospital by car are a much bigger proportion of emissions.

**Figure 5: Northland DHB 2018 carbon emissions**



Source: Northland District Health Board (nd)

## Equity and pro-equity actions

Equity is the vital focus in the health sector and should be prioritised in all sustainability initiatives. In New Zealand, climate change will disproportionately affect disadvantaged populations already experiencing poorer health. Actions that help to

mitigate and adapt to climate change will help reduce overall impacts of climate change and improve resiliency among vulnerable populations to achieve equity, health and wellbeing (Bennett et al 2014).

There is also an opportunity to build in pro-equity actions to further enhance the effectiveness of climate change action. For example, DHBs could re-invest savings from energy efficiency initiatives into programmes that create healthy, warm, energy-efficient homes in communities with a high proportion of Māori and Pacific peoples. As another example, DHBs could collaborate with local marae to collect and compost food waste which would be used in the marae community food garden. DHBs could then commit to purchasing food from the marae garden. This would reduce greenhouse gas emissions from food-miles and food waste, as well as supporting local Māori economic development (Bennett and King, 2018).<sup>2</sup>

## Raising awareness

Education campaigns can introduce staff to the benefits of sustainability, explain how the health sector is a key contributor to the issue and stress the need to reduce our carbon footprint. Through education, we can develop a sustainability culture that encourages staff to engage in the programme and offers them the opportunity to be a part of the solution (Health Care without Harm and Practice Greenhealth, no date). Communication and social marketing tools can be used to create and promote a narrative of sustainable health care organisations. Ideally, staff will begin to act sustainably outside of the workplace and in their homes and communities as well.

## Building networks

Building networks with organisations that have similar goals or challenges is a way of sharing information and a source of support. Table 1 lists some relevant organisations and initiatives that you may find it helpful to network with.

**Table 1: Organisations and initiatives to consider for sustainability networking**

Organisation or initiative	Contact details
Sustainable Health Sector National Network	Contact OraTaiao for further information <a href="http://www.orataiao.org.nz/contact">www.orataiao.org.nz/contact</a>
Global Green and Healthy Hospitals Network	<a href="http://www.greenhospitals.net">www.greenhospitals.net</a>
2020 Health Care Climate Challenge	<a href="http://www.greenhospitals.net/about-challenge">www.greenhospitals.net/about-challenge</a>
OraTaiao: The New Zealand Climate and Health Council	<a href="http://www.orataiao.org.nz">www.orataiao.org.nz</a>

<sup>2</sup> Further details and other examples of pro-equity actions can be found in the following article <https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2018/vol-131-no-1481-31-august-2018/7681>

Global Climate and Health Alliance	<a href="http://www.climateandhealthalliance.org/about">www.climateandhealthalliance.org/about</a>
Health Care Without Harm	<a href="https://noharm.org">https://noharm.org</a>
Practice Greenhealth	<a href="https://practicegreenhealth.org">https://practicegreenhealth.org</a>
Climate Leaders Coalition	<a href="http://www.climateleaderscoalition.org.nz">www.climateleaderscoalition.org.nz</a>
Energy Efficiency and Conservation Authority	<a href="http://www.eeca.govt.nz">www.eeca.govt.nz</a>
Local Government New Zealand	<a href="http://www.lgnz.co.nz">www.lgnz.co.nz</a> Information on their position on climate change: <a href="https://www.lgnz.co.nz/our-work/publications/local-government-position-statement-on-climate-change/">https://www.lgnz.co.nz/our-work/publications/local-government-position-statement-on-climate-change/</a>
Government agencies: Ministry for the Environment, PHARMAC, Ministry of Business, Innovation and Employment, Health Research Council, Ministry of Transport, New Zealand Transport Agency	
Universities and other research institutions	

# Actions for sustainability

This section presents a broad range of ideas for improving sustainability. Note that it is easier to identify the most cost-effective and practicable actions when an organisation has data from baseline studies. See the further reading section for additional resources and the references section for details of the publications cited that provide evidence for these actions.

This section groups actions into one general action area and six specific action areas: waste, transportation, procurement, energy, food, and building design. Most organisations in the health sector should find they are able to make changes in all of the action areas; however, actions in the building design area are more relevant when planning to build new or to significantly renovate facilities.

## General actions

There are many broad actions that the health sector can take to deliver care in a way that maximises positive health outcomes and avoids both financial waste and harmful environmental impacts, while adding societal value at every opportunity. These actions include:

- Making systemic changes so that environmentally sustainable options become the default choice for staff, patients and their whānau
- supporting sustainable community initiatives through enhanced health promotion initiatives to strengthen the health, social cohesion and resilience of communities
- promoting sustainable transport options for staff and patients
- advocating for the benefits of sustainability to staff and patients and their families and whānau and educating them on how they can reduce their personal carbon footprint, such as by using strategies to improve energy efficiency, reduce production of waste and dispose of waste properly
- divesting from fossil fuel holdings (Bennett et al 2015)
- considering the environmental cost of all actions.

## Transport

Transport makes up a large proportion of New Zealand's greenhouse gas emissions profile; road transportation is 17 percent of all New Zealand's emissions<sup>3</sup> (Ministry for

<sup>3</sup> Road transportation is classified as a subset of energy emissions.

the Environment 2018). In a recent survey by the Ministry of Health, several DHBs reported transportation as one of the largest contributors to their carbon footprints. This includes staff travel, patient travel, ambulance movement and air travel.

The New Zealand Transport Agency is currently preparing a Safe and Environmentally Friendly Fleet Vehicle Procurement Policy, which will be available to the health sector in the near future. It is also working with the Sustainable Business Network to develop an e-bike purchasing scheme for large employers.

Sustainable transport actions include encouraging staff and patients and their families and whānau to use more sustainable modes of transport and limiting air travel, and should consider the needs of all members of the community, including those with disabilities. Table 2 makes some specific suggestions on how to achieve this.

**Table 2: Actions to promote sustainable transport**

Focus of action	Suggestions for action
Fleet	Using electric vehicles reduces emissions and reliance of fossil fuels. To encourage their use, replace fleet and pool cars with electric cars or other more sustainable vehicles (such as e-bikes). Install electric vehicle chargers for staff and visitors to use. An organisation can also reduce fuel costs and emissions through fleet optimisation – that is, optimising vehicle use and fleet sizes.
Active transport	Encouraging active transport has health benefits as well as reducing emissions. Encourage walking and cycling by identifying safe routes, and providing more bike racks, secure cycle parking, plugs for charging e-bikes, e-bikes for staff to use, and showers and drying rooms.
Parking	To encourage carpooling and use of other transport modes, change the parking systems that incentivise these behaviours.
Telemedicine	Using home-based care or telemedicine can decrease the amount of patient transportation to and from health facilities (Brown et al 2012).
Public transport	Work with local councils to establish safe, accessible and convenient public transport links to health care facilities.
Air travel	Consider limiting air travel and offsetting emissions. Video-conferencing can be a good alternative in some situations.
Inter-facilities shuttle	To reduce the number of inter-facility trips in metropolitan areas (especially for facilities in close proximity), use shuttles to transport staff, patients and their families and whānau.
Ambulances	To reduce emissions and reliance on fossil fuels, Sweden has trialled using ambulances running on biogas and using LEDs in the alarm light (Stockholm County Council 2010).
Transport logistics	Undertaking a transport logistics review can help identify where you can reduce the number of trips that staff, patients and their families and whānau need to take.
Travel information	Including information about active and public transport options on webpages and in appointment letters, staff inductions and health sites encourages people to use more sustainable modes of transport.

# Procurement

Procurement is responsible for an estimated 61 percent of all carbon emissions related to health care (Sustainable Development Unit 2013). This is the carbon emitted while extracting, manufacturing, packaging, storing and transporting pharmaceuticals and supplies. Including sustainability criteria (as well as human health equity and inclusivity) in procurement practices can benefit the organisation, society and the economy, while minimising environmental degradation (Department of Sustainability, Environment, Water, Population and Communities 2013). Making sustainable procurement part of decision-making processes across all health care sectors will help signal a shift in demand toward a more sustainable health care system.

New Zealand Government Procurement (within the Ministry of Business, Innovation and Employment) recently consulted on proposed changes to the Government Procurement Rules, which have included a shift in focus towards public value as opposed to value for money. Agencies are now expected to maximise return on spending to achieve the best possible results for New Zealanders. The new rules require agencies to support the transition to a net zero emissions economy through the procurement of lower waste and low emissions goods and services.

Where health sector organisations have control over procurement of goods and services, including sustainability criteria within the procurement process can help reduce carbon emissions. When making purchasing decisions, you should consider the 'whole-of-life cost' as well as the 'purchase price'. This means taking into account the cost of a product over its entire lifetime, including its purchase price and the costs of maintenance, operating and disposal (Department of Sustainability, Environment, Water, Population and Communities 2013). Life-cycle thinking is another recommended thought process as it requires organisations to carefully consider the environmental impacts of a product at all stages of its lifetime (Department of Sustainability, Environment, Water, Population and Communities 2013).

Greenwashing is the false claim that a particular product or service is more environmentally friendly or more sustainable than it really is. To avoid greenwashed products and services, look for third-party verifications such as Ecolabels, understand local recycling capabilities, see whether or not the product meets relevant standards, and be critical of marketing techniques such as the use of the word 'natural' to describe a product (Department of Sustainability, Environment, Water, Population and Communities 2013).

Table 3 identifies some actions the health sector can take as part of a sustainable approach to procurement.



**Table 3: Actions to promote sustainable procurement**

Focus of action	Suggestions for action
Pharmaceuticals	To reduce the environmental impact of pharmaceuticals (Karliner and Guenther 2011) the health sector can take care to: <ul style="list-style-type: none"> <li>• prescribe appropriately</li> <li>• promote manufacture take-back (for example through pharmacies)</li> <li>• dispose waste properly and safely.</li> </ul>
Reusable medical devices	Research shows reusable medical devices reduce costs, waste and carbon emissions (McGain et al 2017). Switching from disposable to reusable medical instruments where applicable may help improve efficiencies and minimise negative externalities.
Packaging	Many items come in unnecessary packaging. Where possible, choosing items with less packaging, negotiating for custom-made packages or arranging to return packaging to suppliers to dispose of (which encourages them to reduce their overall packaging) are some ways of reducing waste from packaging.
Sourcing	Sourcing materials from local and/or socially and environmentally responsible vendors can reduce your carbon footprint.
Chemicals	Choosing safer chemicals, without carcinogenic, mutagenic, toxic for reproduction, or bioaccumulative properties can improve safety and environmental wellbeing (Karliner and Guenther 2011). For example, the World Health Organization and Health Care Without Harm have a Global Mercury-Free Healthcare Initiative that encourages the health sector to replace all mercury thermometers and blood pressure devices with safe, accurate and affordable alternatives (Karliner and Guenther 2011).

## Waste

Emissions from waste make up nearly 5 percent of New Zealand’s overall greenhouse gas emissions profile (Ministry for the Environment 2018). According to the World Health Organization (2018), approximately 15 percent of health care waste is considered hazardous as it may be infectious, toxic or radioactive. However, 85 percent of all health care waste is general and can be composted, recycled or sent to landfill. Actions to improve sustainability with respect to waste centre around the six Rs.

- Refuse to purchase unnecessary items and single-use plastics where appropriate.
- Reduce the amount of waste generated by using less of that item.
- Reuse items if possible.
- Recycle items.
- Repair items.
- Replace broken items with more sustainable alternatives.

You can apply these actions at the organisation level and likewise individuals can take them at work and at home. Table 4 lists some actions specifically targeted at the health sector.

**Table 4: Actions to promote sustainability with waste**

Focus of action	Suggestions for action
Paper use	Reducing paper use minimises waste. Setting the default setting on printers to double-sided printing can reduce paper use by about 15 percent (Ekstrom and Egebark 2016). If possible, employers should provide electronic devices to enable paperless recording.
Waste separation	Composting and recycling reduces methane emissions by limiting waste that ends up in landfills (Health Care without Harm and Practice Greenhealth, no date). Educating staff about waste separation and providing multiple bins with effective signage in locations of consumption can encourage them to separate waste.  Community nurses and pharmacies can play a significant role in educating patients and their families and whānau in the community about treatment-related waste minimisation procedures (recycling, reusing, take-back schemes and community sharps disposal).
Increase the use of reusable items	To minimise waste, replace single-use items such as plastic water bottles, pill cups and drinking cups with reusable items. If you cannot source reusable products, consider using biodegradable or recyclable products.
Anaesthetic gases	Anaesthetic gases contribute greatly to the carbon footprint of the health care sector (Gadani and Vyas 2011). Using Blue-zone technology can help hospitals to make economic savings on anaesthetic gases while preventing emission of harmful greenhouse gases.

## Energy

Both the source of energy and the amount used impact on the carbon footprint and costs. For example, mains electricity generated using renewable hydropower is more sustainable than coal-generated electricity. Although over 80 percent of electricity in New Zealand is generated from renewable sources, overall New Zealand's energy use is less than 40 percent renewable as most heat and almost all transport fuel is fossil-fuel based (Ministry of Business, Innovation and Employment 2018). The energy sector contributes 40 percent of New Zealand's greenhouse gas emissions (Ministry for the Environment 2018). In the public sector, the health care sector is the largest emitter (EECA, personal communication, 4 December 2018).

To meet the objectives of the Climate Change Response (Zero Carbon) Amendment Bill, all buildings will need to operate at or near net zero carbon. This means measuring and reducing the energy use of all health facilities. For DHBs the most important opportunity to contribute to sustainable energy use is getting things right when new facilities are built. Health care facilities, especially hospitals, have high occupancy rates and strict temperature requirements, making heating and cooling them very energy intensive. Designing new buildings with sustainability and energy efficiency in mind can, for example, lead to heating systems designed to include low-emission heating technologies.

EECA provides information and funding support for organisations, including DHBs, to improve their energy efficiency and reduce energy-related carbon emissions. In many cases, relatively low-cost, non-capital improvements can be made that simultaneously improve efficiency, reduce emissions and reduce energy costs. Additional capital upgrades, such as replacing fossil-fuel heat sources with electric heat pumps, can

significantly reduce emissions and also tend to be cost-effective on a whole-of-life basis (even more so when implemented during the building design).

Table 5 identifies the kinds of actions that are typically most effective in saving energy in hospitals.

As well as funding activities such as energy audits and energy system optimisation, EECA provides capital funding through Crown loans and technology demonstration funding. It can also provide funding to organisations with large energy spends, and currently partners with several DHBs. Even if your organisation is not eligible for direct EECA funding support, see EECA’s website for more on the other kinds of information and support that are available: [www.eecabusiness.govt.nz/funding-and-support](http://www.eecabusiness.govt.nz/funding-and-support)

**Table 5: Actions to save energy in hospitals**

Energy-saving actions	Estimated payback period
<b>Maintenance</b>	
<ul style="list-style-type: none"> <li>Monitor energy use and manage it to optimise heating, air conditioning and hot water systems.</li> <li>Avoid waste: tune the boiler, fix steam and hot-water leaks, repair insulation etc.</li> </ul>	Under 1 year
<b>‘Low-hanging fruit’</b>	
<ul style="list-style-type: none"> <li>Conduct an energy audit and implement low-cost recommendations.</li> <li>Conduct benchmarking across sector.</li> <li>Upgrade space heating and hot-water controls.</li> <li>Use occupancy-controlled lighting, ie, install occupancy sensors.</li> <li>Replace older or inefficient lighting with LED lamps.</li> <li>Conduct staff engagement campaigns.</li> </ul>	1–3 years
<b>Minor capital upgrades</b>	
<ul style="list-style-type: none"> <li>Upgrade boiler and other heat plant controls.</li> <li>Use occupancy-controlled heating, ventilation and air conditioning, ie, install occupancy sensors.</li> </ul>	3–4 years 5+ years
<b>Major capital upgrades</b>	
<ul style="list-style-type: none"> <li>Replace diesel and LPG boilers with electric heat pumps.</li> <li>Replace natural gas boilers with electric heat pumps.*</li> <li>Replace coal boilers with electric heat pumps.**</li> <li>Replace coal boilers with wood boilers† (reduces greenhouse gas emissions).</li> </ul>	3–5 years 7–8 years 1–2 years Similar life-cycle costing
<b>New facilities</b>	
<ul style="list-style-type: none"> <li>Use high-efficiency building design (envelope, heating, ventilation and air conditioning, hot water, lighting).</li> <li>Use low-carbon heating systems – feasibility studies and technology demonstrations.</li> </ul>	

Notes

\* Where possible and existing natural gas boilers need to be replaced.

\*\* Where possible and if existing coal boilers need to be replaced.

† Where existing coal boilers need to be replaced.

# Food

Agriculture makes up 49 percent of New Zealand’s greenhouse gas emissions (Ministry for the Environment 2018). This substantial percentage is heavily influenced by current dietary preferences. At the same time, diet has important consequences for health and the health sector is already committed to providing healthy food. Sustainable actions around food relate to making healthy food choices available for patients, visitors and staff in canteens and cafes (see Table 6).

The recent EAT–Lancet Commission on healthy diets from sustainable food systems has more information about food and sustainability (Willett et al 2019).

**Table 6: Actions to promote sustainability with food**

Action	Suggestions
Reduce meat and dairy	Producing meat (particularly red meat) is resource intensive and has a larger carbon footprint than producing plant-based protein alternatives (Harvie 2008). The health sector can work with staff dieticians to develop alternative patient menus and encourage plant-based diets.
Buy local and sustainable food products	Consider including incentives for using locally grown produce in service contracts as buying local food reduces greenhouse gas emissions from transportation while also supporting the local economy.
Buy more environmentally friendly food options	By purchasing food items from suppliers who use less pesticides and fertilisers in their food production practices, health sector organisations can reduce the negative impacts on the environment (Health Care without Harm and Practice Greenhealth, no date).
Use self-grown vegetables and fruit	By growing vegetables and fruit on site, health care organisations can improve local resilience and foster a sense of community.
Prevent food waste	To minimise food waste, include incentives for reducing waste in service contracts and consider establishing programmes to donate leftover edible food to food rescue programmes, composting organic food waste or using it as animal fodder.
Reduce packaging	Consider including incentives for reducing waste – for example, not using single-use plastic items – in service contracts.

# Building design

Sustainability should be a consideration at every stage of the building process – from site design to tender to project evaluation. By considering sustainability in building design early, you can properly evaluate whole-of-life costs. Sustainable building features often involve higher capital costs but lead to substantial long-term savings. As well as reducing costs, evidence suggests that environmentally friendly buildings improve the health and productivity of the people using them, reduce staff illness and improve staff performance (Nieuwenhuis et al 2014). In hospitals, the improved indoor environment can additionally help patients recover more quickly from their illness (New Zealand Green Building Council and Green Building Council of Australia 2019; World Green Building Council 2013).

When designing a new health care facility, carefully consider the location in terms of its environmental resiliency, accessibility using public transport, and equity. All new builds, fit-outs and renovations should use a certified sustainability rating system such as Green Star, which 'designs in' efficiencies and healthy buildings. It is important to have buildings assessed periodically. EECA can help with feasibility studies and designs.

Table 7 sets out some specific actions that help in the design of more sustainable buildings.

**Table 7: Actions to promote sustainable building design**

Focus of action	Suggestions for action
Sustainable materials	Consider whole-of-life costing and life-cycle thinking when purchasing building and construction materials, including materials that can be easily renewed, are sustainably managed and/or have production and disposal processes that are low in carbon emissions.
Heating and cooling	To decrease the need for heating and cooling, consider using green insulation options such as sheep wool, shredded denim, hemp and soybean foam. Installing double- or triple-glazed windows and passive solar design can also reduce the need for heating.
Recycled materials	Consider including reused or recycled materials to reduce the need to buy new materials, as well as reducing the carbon footprint.
Water use	Reduce water consumption by improving technologies and policies, and encouraging staff, contractors, patients and visitors to get involved. Water reduction strategies include: using efficient faucets, toilets, washing machines and shower heads, and switching from water-intensive film-based radiological imaging equipment to digital imaging. Also consider collecting rainwater to use as greywater in toilets, washing machines and other water-intensive systems in your facility.
Green space	Research shows that providing biophilic environments <sup>4</sup> throughout hospital sites and medical facilities has physical and mental health benefits for staff, patients and their families and whānau (World Green Building Council 2013). Improving the outdoor facilities can also have community-wide impacts such as by promoting local biodiversity and mediating the effects of heat waves and other extreme weather events.

<sup>4</sup> Biophilic environments are those that incorporate contact with natural features such as fresh air, natural light and plants.

# Case studies

The following case studies provide examples of how the health sector in New Zealand could successfully reduce its carbon footprint and improve sustainability and patient and staff satisfaction.

## Hawke's Bay District Health Board – Go Well initiative

Hawke's Bay Hospital has more than 1,000 parking spaces but was frequently receiving complaints and feedback about the lack of parking for patients and visitors. In addition, many cars were parking illegally or using parking spaces in nearby residential areas. Staff – particularly shift and part-time workers – were also finding it difficult to park and some were using spaces reserved for visitors and patients.

In 2014/15 the facilities management team developed a Go Well Travel Plan for the hospital with the following high-level objectives.

- Improve access for low-income families and whānau.
- Promote exercise.
- Reduce the carbon footprint of the hospital.
- Increase the availability of car parks.

The Go Well Travel Plan introduced a number of other measures designed to encourage patients, visitors and staff to use public transport and carpools to get to the hospital. The measures have been funded by the introduction of a 'gold coin donation' parking fee. Table 8 lists some Go Well initiatives to date.

**Table 8: Go Well Travel Plan initiatives at Hawke’s Bay Hospital**

Area	Initiative
Promote use of public transport and carpooling	<ul style="list-style-type: none"> <li>• Provide free bus fares for patients attending appointments at the hospital.</li> <li>• Subsidise bus fares for staff.</li> <li>• Arrange for coordination of bus services with staff shifts.</li> <li>• Provide more facilities for active commuters (eg, bike racks, secure bike sheds and showers).</li> <li>• Run a free carpool scheme for staff.</li> <li>• Promote active commuter events (eg, Go by Bike Day, cycle safety courses).</li> </ul>
Improve safety	<ul style="list-style-type: none"> <li>• Recruit a dedicated parking warden.</li> <li>• Implement a guaranteed ride home scheme.</li> <li>• Run a security-operated shuttle to transport staff to their vehicles at night.</li> </ul>
Modify parking system	<ul style="list-style-type: none"> <li>• Reallocate staff, patient and visitor parking.</li> <li>• Introduce modest parking fees (\$1 for 3.5 hours for patients and visitors and \$1 per day for staff).</li> <li>• Provide parking fee exemptions for staff paid below the living wage, frequent users, long stay and volunteers.</li> </ul>

Since the introduction of the Go Well Travel Plan, complaints about parking have reduced considerably, and use of buses has increased by 100 percent among patients and by 4 percent among staff. In addition, the proportion of staff driving cars with no passengers has reduced by 10 percent and the proportion cycling to work has increased by 3 percent.

## Victoria University – LED lighting

Victoria University developed a programme to replace 4,500 incandescent and fluorescent light fittings with more energy-efficient and longer-lasting LED bulbs. The cost savings are estimated at \$100,000 per year and the scheme will also reduce the labour costs that had been involved in the past, when maintenance staff spent 831 work hours per year on physically replacing light bulbs. Having fewer light bulb replacements also reduces the risk to staff carrying out the replacements and reduces the amount of hazardous waste from the old fluorescent tubes.

The university used a Crown loan from EECA to help fund the work. EECA is a government agency working to improve the energy efficiency of New Zealand homes and businesses. Its Crown loans are a low-cost, interest-free way to fund energy efficiency projects for publicly funded organisations, which can use the loans to fund equipment that delivers carbon, energy and cost savings (EECA 2017).

# Further reading

These resources provide information about sustainability in the health sector beyond the publications that are referenced. This list is not exhaustive; it is simply a sample of the helpful resources available.

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