

Strengthening Resilience

Acting on Climate Change and Health



Global Compact
Network Australia



Australian Government
Department of Foreign Affairs and Trade



Strengthening Resilience

Acting on Climate Change and Health

Climate change has been described as the biggest global health threat of the 21st Century¹ and its potential damage to global health outcomes cannot be underestimated.

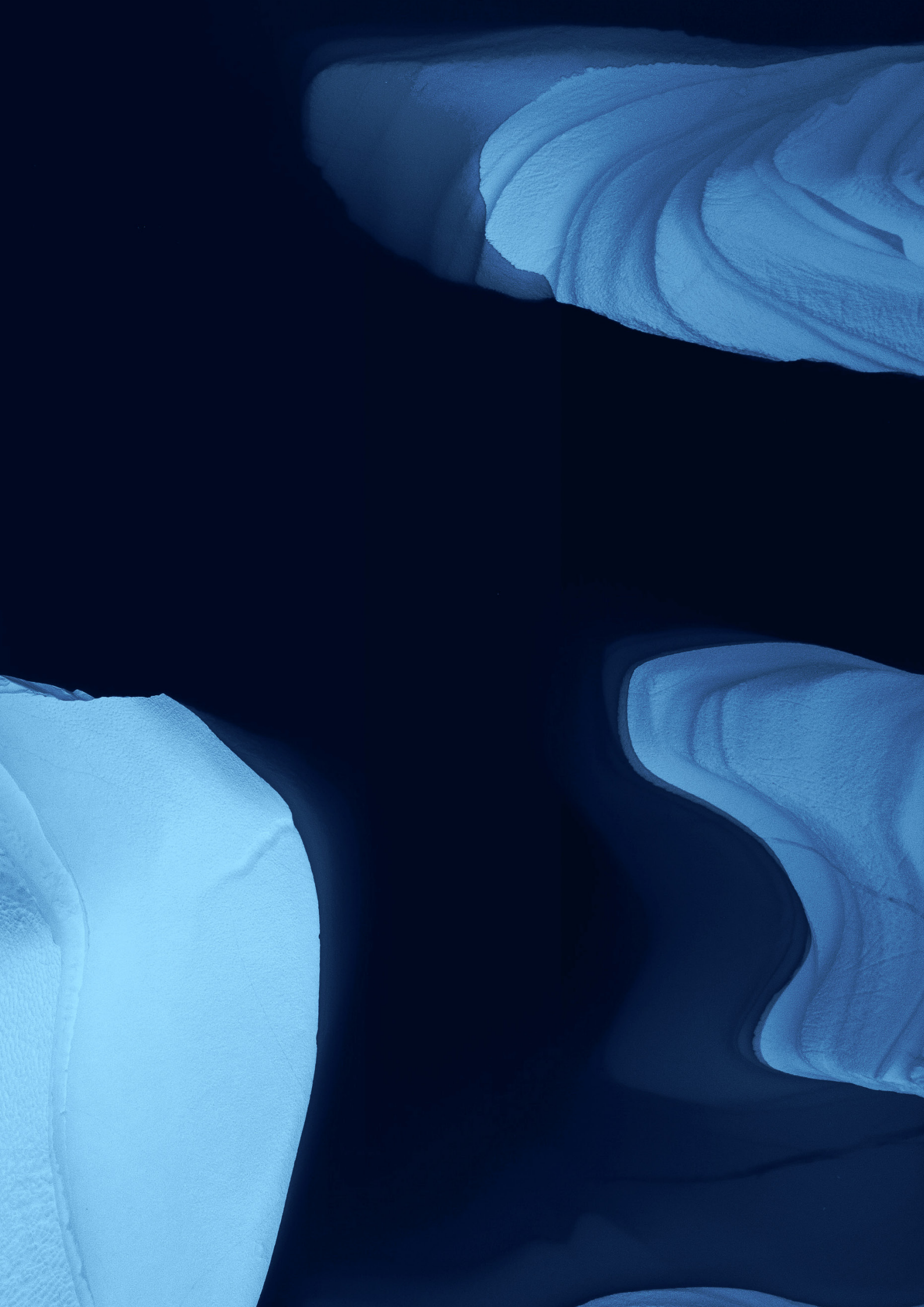
Whilst climate change is often marked by extreme weather events, rising sea levels and polar bears teetering on melting ice sheets, the impacts on human health if left unaddressed could be devastating.


The challenges ahead are immense.

As the impacts of climate change become more pronounced, so too does the opportunity for government and business to implement actions that align with the Paris Agreement.

The global COVID-19 pandemic is also an opportunity for business to press pause, take stock, and develop strategies and systems that build greater resilience to future crises in alignment with a net zero future.

¹ Nick Watts et al, 'Health and climate change: from 25 years of inaction to a global transformation for public health', (2017), *The Lancet Countdown*, 391 (10120), accessible [here](#).



A satellite image of Earth showing a massive dust storm or sandstorm originating from the Middle East, specifically the Arabian Peninsula and Iraq, and spreading across the Persian Gulf and surrounding regions. The dust appears as a large, dense, tan-colored cloud. The surrounding oceans are a deep blue, and other landmasses are visible in the background.

**“Moving towards a net zero
carbon economy is not
just sensible, it makes good
business sense.”**

Introduction

The climate crisis is also a public health crisis and the two should not be viewed in isolation. If left unaddressed, climate change has the potential to undo decades of progress made in improving public health. And with increasing temperatures and extreme weather events, we are likely to see increased disease risk² with many health facilities ill-equipped to deal with the consequences,³ resulting in implications for human health at the global, national and community levels.

Over the past few years, businesses have primarily been focused on combatting climate change by bolstering their energy efficiency and reducing their greenhouse gas (GHG) emissions from both their direct and indirect operations.⁴ They have achieved this by developing and implementing sustainability policies that map out their environmental responsibilities and responses to climate change. And whilst it is important for businesses to continue to address their operational impacts, the 2019/2020 'Black Summer' of bushfires that raged across Australia have sharpened the focus on how climate change affects human health. Almost half of the Australian population were exposed to hazardous levels of air pollution for several consecutive weeks.⁵ This human dimension provides the wake-up call for governments and businesses to understand the human cost that can result from climate change inaction.

Businesses can, however, enact plans to swiftly address climate change that will also help to create societal resilience to the impacts of climate change on health. These might include research and development (R&D), investment into technologies that assist with health promotion and disease prevention;⁶ the creation of climate-resilient infrastructure; and the provision of climate-sensitive services. There are many health-related business benefits associated with climate action that include bolstering more resilient and safer communities, decreasing the negative health impacts associated with climate change and avoiding a tenfold increase in climate change-related health expenditure.⁷ Moving towards a net zero carbon economy is not just sensible, it makes good business sense.

As climate change is likely to have pervasive effects on people and organisations it also becomes increasingly important for governments and businesses to understand and address both the short-term and long-term risks. In collectively addressing the human and physical dimensions of risks and the associated opportunities, business can play a decisive role by focussing on the root cause of climate change and supporting innovative pathways to net zero.

² IPCC, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], (2014), IPCC, Geneva, Switzerland, 151, p. 64, accessible [here](#).

³ World Health Organization, *Climate Change and Health*, (February 2018), accessible [here](#).

⁴ BSR, *Climate + Health: The Business Case for Action*, (September 2018), accessible [here](#).

⁵ Anthony Capon, '222 scientists say cascading crises are the biggest threat to well-being of future generations', (February 2020), *The Conversation*, accessible [here](#).

⁶ Climate Health Alliance, *Framework for a National Strategy on Climate, Health and Well-being for Australia*, (2017), accessible [here](#).

⁷ Ibid.

Climate Change and Health

State of Play in Australia

Australia currently sits behind other developed countries such as Germany and the United Kingdom (UK) in the steps it has taken to prepare for climate change associated health issues.⁸ The UK Government introduced the Climate Change Act in 2008 with the target of cutting carbon emissions by at least 80 per cent by 2050 with a minimum reduction of 26 per cent by 2020 across the UK. This set the scene for the National Health Service (NHS) to publish the world's first climate change related health policy in 2009 outlining how the healthcare system should drastically reduce its carbon footprint thus contributing to a more sustainable healthcare system.⁹ In Australia however, a Federal climate change policy does not exist despite all State and Territory governments having committed to achieving net zero emissions by 2050. In 2017, Queensland was the first state government to begin implementation of their climate change adaptation strategy which aimed to support human health and well-being services to become more resilient and manage the risks associated with a changing climate.¹⁰ Without comprehensive planning for potential impacts or risks to our health system and the individuals, businesses and broader stakeholders that rely on it, Australia could experience more sustained and negative health impacts.

Although health pandemics like COVID-19 may be distinctive to climate change, parallels can be drawn between them. Climate change and COVID-19 can intensify pre-existing disadvantages and can expose weaknesses in our health, economic and political systems. Both require a global-to-local response, long-term thinking and planning, major adjustments to the ways in which businesses operate and a fundamental shift in the way countries are governed. And whilst climate change may not be considered a priority now, the ongoing impacts of climate change do not simply fade into the background when we are responding to other matters of global significance, such as a global pandemic. If left unaddressed, climate change often adds more pressure and economic strain to governments and businesses.

The ways in which climate change coalesces with other existing risks is often referred to as a 'threat multiplier.' It is marked by an event, or series of events, that impact and compound on other social, environmental, and economic challenges. The nature of a 'threat multiplier' means that it is important for business and government to assess the actual and potential impact the 'threat' has on everything around it. With COVID-19, we have all unfortunately seen the devastation and toll it has taken on human life, human health and the economy.

Health-wise, as of June, there has been over 500,000 deaths globally from over 10 million confirmed cases.¹² From an economic standpoint, the Reserve Bank of Australia recently stated that the Australian economy is expected to record a global gross domestic product (GDP) contraction of around 10 per cent over the first half of 2020.¹³ These consequences are indicative of the impacts that might be caused by other large scale crises – and when these crises occur simultaneously and at greater levels of frequency, the effects on human life and sustainable economic growth could be crippling.

National Health Service Recommendations

Widespread support from NHS organisations and staff has given the NHS the mandate to implement its 'Saving Carbon, Improving Health' strategy.

It recommends:

- Reviewing its energy and carbon management at Board level, and increasing the use of renewable energy where possible;
- Working in partnership with suppliers to lower the carbon impact of all aspects of procurement and make decisions based on whole life cycle costs;
- Routinely reviewing the need for staff and visitors to travel, provide incentives for low carbon transport and promoting home working opportunities;
- Ensuring efficient use of water by measuring and monitoring usage;
- Monitoring, reporting and setting targets on management of waste;
- Designing sustainable and low carbon environments where possible;
- Encouraging staff to advocate for their well-being and low carbon initiatives by providing training programmes and including supportive material in job descriptions; and
- Consolidating partnerships and working to create regional sustainable development networks.¹¹

⁸ Ying Zhang et al, 'The MJA-Lancet Countdown on health and climate change: Australian policy inaction threaten lives', (2018) 209(11) *Medical Journal of Australia*, accessible [here](#).

⁹ National Health Service (England), *Carbon Reduction Strategy for England (CSR) 2009*, (2009), accessible [here](#).

¹⁰ Queensland Government, *Queensland Climate Adaptation Strategy: Human Health and Wellbeing Climate Change Adaptation Plan for Queensland*, 2018, accessible [here](#).

¹¹ National Health Service (England), *Carbon Reduction Strategy for England (CSR) 2009*, (2009), accessible [here](#).

¹² World Health Organization, *Coronavirus disease (COVID-2019) situation reports*, (2020), accessible [here](#).

¹³ Reserve Bank of Australia, *Statement on Monetary Policy: Economic Outlook*, (May 2020), accessible [here](#).

For example, what if the height of a health pandemic, such as COVID-19, had coincided with the 2019/20 summer bushfires? Research by The Climate Council¹⁴ and modelling undertaken by the Bureau of Meteorology¹⁵ suggests that it is only a matter of time before Australia starts seeing more intense and frequent bushfires. And these will be sustained for longer periods if substantial efforts to combat climate change are not acted upon.

In addition to the direct effects of climate change on human health, climate change creates ecological changes such as food and water insecurity and the spread of infectious diseases, which result in negative health outcomes for populations.¹⁶ Research from organisations like the World Health Organization,¹⁷ shows that epidemic risk can increase around five-fold after extreme weather events, such as floods. Evidence also shows a strong correlation between climate conditions and infectious diseases; excessive rainfall, damaged infrastructure and rapid temperature changes have been found to cause an increase in disease.¹⁸ For instance, the mega-flooding in Pakistan in 2010 resulted in nearly 2,000 deaths, led to the displacement of over 20 million people, destroyed crops and infrastructure and resulted in over US\$43 billion in property damage.¹⁹ The biggest impact, however, came in the aftermath of the floods with 37 million individuals reporting medical issues that year, ranging from respiratory infections, diarrhea, skin diseases and suspected malaria. This is somewhat analogous to the 2011 Queensland floods that followed an unprecedented wet season resulting in 33 deaths.²⁰ The Queensland Government's report found that after the flood, stagnant water provided a potential breeding ground for mosquitoes that could transmit other diseases, whilst damp conditions facilitated mould growth which aggravated asthma and other allergic diseases.²¹

Furthermore, individuals affected by the floods experienced reduced overall health and wellbeing in the following months and years while also being twice as likely to experience psychological symptoms.²²

Australian Medical Association Recognises Climate Change as a Health Emergency

In 2019, the Australian Medical Association (AMA) joined other health organisations around the world – including the American Medical Association, the British Medical Association, and Doctors for the Environment Australia – in recognising climate change as a health emergency.

The AMA President, Dr Tony Bartone said “the evidence on climate change is irrefutable [and] the AMA accepts scientific evidence on climate change and its impacts on human health and well-being.” The Federal Council Motion goes on to say that:

- The scientific reality is that climate change affects health and wellbeing by increasing the situations in which infectious diseases can be transmitted, and through more extreme weather events, particularly heatwaves.
- Climate change will cause higher mortality and morbidity from heat stress.
- Climate change will cause injury and mortality from increasingly severe weather events.
- Climate change will cause increases in the transmission of vector-borne diseases.
- Climate change will cause food insecurity resulting from declines in agricultural outputs.
- Climate change will cause a higher incidence of mental ill-health.
- These effects are already being observed internationally and in Australia. There is no doubt that climate change is a health emergency.

The Motion then goes on to ask for more ambitious mitigation targets, the development of a National Strategy for Health and Climate Change and the promotion of an active transition away from fossil fuels to renewable energy.²³

¹⁴ The Climate Council, *Bushfire Briefing Paper*, (November 2019), accessible [here](#).

¹⁵ Bureau of Meteorology, *State of the Climate 2018*, (2018), accessible [here](#).

¹⁶ World Health Organization, *COP24 special report: health and climate change*, (2018), accessible [here](#).

¹⁷ World Health Organization, *Climate change and health: Global environmental change*, (n.d.), accessible [here](#).

¹⁸ Ibid.

¹⁹ Anthony McMichael, 'Extreme weather events and infectious disease outbreaks', (2015) *Virulence*, 6(6), pp.543-545, accessible [here](#).

²⁰ Queensland Government, *Queensland Floods Commission of Inquiry Report*, (2012), accessible [here](#).

²¹ Ibid.

²² Ibid.

²³ Australian Medical Association, *Climate Change is a Health Emergency*, (September 2019), available [here](#).

“What if the height of a health pandemic, such as COVID-19, had coincided with the 2019/20 summer bushfires?”



Direct Impacts and Opportunities

Heatwaves

Direct human health impacts arise from increases in the quantity, intensity and duration of extreme heat and the rising temperatures.²⁴ The rise in natural hazards within Australia from climate change such as extreme weather events (droughts, heatwaves etc.) increased by 46 per cent from 2007 to 2016.²⁵

Heatwaves have resulted in more loss of life in Australia than any other natural hazard over the last 100 years.²⁶ For instance, in the summer of 2013/2014, there were over 100 fires burning across Victoria, South Australia and New South Wales, which at the time, was the most destructive bushfire season in terms of property loss since the 2008/2009 bushfire season. The fires coincided with extreme heatwaves which saw Victoria experiencing maximum temperatures of 12 degrees Celsius or more above the average, and parts of the state recording temperatures of more than 45 degrees Celsius on three consecutive days.²⁷ The heatwave resulted in 858 deaths across Victoria, a seven per cent increase in public hospital emergency department presentations and a 25 per cent increase in Ambulance Victoria's emergency case load in the metropolitan region.²⁸

Australia is particularly susceptible to climate change driven heatwaves.²⁹ Research from the World Health Organization has shown that heatwaves exacerbate existing health issues such as respiratory, heart, brain and diabetes-related conditions and may result in heat exhaustion or heatstroke;³⁰ droughts can destroy crop production and increase the incidence of mental health problems; and higher temperatures can increase allergies caused by pollen and amplify the risk of mosquito-borne diseases. This research is further supported by the 'Lancet Countdown 2017' report which makes the links between climate change and public health increasingly clear. The report also finds that extreme heat causes heat stress, heat stroke, and exacerbates pre-existing heart failure and kidney disease.³¹

These effects also come with a financial cost to the economy and businesses. The annual productivity costs of heatwaves across Australia were estimated to be approximately A\$720.50 per employed individual in 2013/14³² against the then average income of \$1,112 per week.³³ This means that businesses were losing approximately three days of productivity each year from lost employee time to heatwaves. This, in turn, has an impact on the economy resulting in approximately A\$6.7 billion or 50 basis points of Australia's GDP.³⁴ Furthermore, according to the Australian Bureau of Statistics, 70 per cent of Australian workers stated that they had worked less efficiently at some point in the year due to heat.³⁵ These correlations demonstrate how climate change can lead to poor health outcomes and the subsequent financial loss. Through effective adaptation planning, including policy implementation around climate resilience, government and business will be better positioned to support the Australian workforce in navigating the increasing challenges associated with our changing climate.

²⁴ World Health Organization, *Climate change and health*, (February 2018), accessible [here](#).

²⁵ Australian Government (Department of Agriculture, Water and the Environment), *Climate change impacts in Australia*, (2019), accessible [here](#).

²⁶ Ibid.

²⁷ Victorian Department of Health & Human Services, *The Health Impacts of the January 2014 Heatwave in Victoria*, (2014), accessible [here](#).

²⁸ Ibid.

²⁹ Ying Zhang et al, 'The MJA-Lancet Countdown on health and climate change: Australian policy inaction threaten lives', (2018), *Medical Journal of Australia*, 209(11), accessible [here](#).

³⁰ World Health Organization, *Information and public health advice: heat and health*, (n.d.), accessible [here](#).


³¹ Nick Watts et al, 'Health and climate change: from 25 years of inaction to a global transformation for public health', (2017), *The Lancet Countdown*, 391(10120), accessible [here](#).

³² Kerstin Zander et al, 'Heat stress causes substantial labour productivity loss in Australia', (2005) *National Climate Change*, (5), pp. 647-651, accessible [here](#).

³³ Australian Bureau of Statistics, *Average Weekly Earnings, Australia, May 2014*, (2014), accessible [here](#).

³⁴ Ibid. pp. 651

³⁵ Ibid. pp. 650

A close-up photograph of a tree trunk. The bark is light brown and textured, with some darker, charred areas at the top left. A small red ant is visible on the bark in the lower right quadrant.

“In recent hearings for the Royal Commission into Natural Disaster Arrangements, health experts explained that health problems from bushfire smoke were far greater than the health impacts of the fires themselves and that the smoke particles present in the air could trigger cardiac arrest or death in people with pre-existing conditions such as asthma or heart disease.”⁴³

Bushfires

According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia is extremely vulnerable to bushfires due to its dry and warm climate as well as the abundance of flammable vegetation.³⁶ Whilst the most recent example is the 2019/2020 bushfires, it is important to put them in context of other bushfires in Australia. The previous record for financial losses due to bushfires in Australia was set during the Black Saturday fires of 2008/2009. These fires resulted in a A\$4.4 billion direct loss to the economy.³⁷ In comparison, the Black Summer fires, which burnt over 20 times the geographic area of the Black Saturday fires (approximately 10 million hectares of land³⁸), are estimated to have directly cost the economy A\$18 billion, or around 1.5 per cent of Australia's GDP.³⁹ Furthermore, the conjoined crises – the Black Summer and the COVID-19 pandemic – have been key players in the biggest contraction of Australia's economy since the Great Depression, with GDP expected to decline by between 6.7 per cent and 10 percent⁴⁰ in the 2019/20 financial year compared to the 2018/19 financial year. The decline in GDP could reach 20 per cent for local government areas that were heavily impacted by the bushfires.⁴¹

Much of the economic loss from Australia's summer bushfires has occurred from insurance claims that, to date, total A\$4.6 billion and represent 242,000 claims.⁴² The bushfire smoke that blanketed Sydney is estimated to have cost the city between A\$12 million to A\$50 million a day. In addition, smoke from the Australian summer bushfires resulted in the deaths of 445 people and put more than 4000 people in hospital. The total health costs for the fire season are now estimated at A\$2 billion, four times higher than the 2002/2003 bushfire season. In recent hearings for the Royal Commission into Natural Disaster Arrangements, health experts explained that health problems from bushfire smoke were far greater than the health impacts of the fires themselves and that the smoke particles present in the air could trigger cardiac arrest or death in people with pre-existing conditions such as asthma or heart disease.⁴³

Other sectors were also directly affected by the fires – the farming, manufacturing and transport sectors in the fire-affected regions felt the immediate effects. For example, whilst the impacts on the wine industry in the Barossa and Adelaide Hills in South Australia will not be fully known for a few years, losses from smoke taint following the 2009 Victorian bushfires cost the wine industry over A\$100 million.⁴⁴ These figures do not, however, account for the ongoing and often intangible costs that are linked to bushfires. These costs include the devastating psychological costs of trauma and the other wide-ranging social issues that come with experiencing a large disaster event, such as long-term mental illness and the increased risk of suffering from chronic disease.⁴⁵

In 2014, the University of Melbourne in partnership with a diverse group of stakeholders, carried out research to examine and understand the impacts of Black Saturday and the related bushfires of February 2009 on community members' physical and mental health and well-being. The 'Beyond Bushfires: Community Resilience and Recovery' study involved the participation of 1000 participants across Victoria and found that 22 per cent of people in high impact communities reported symptoms of mental health disorders at approximately twice the rate evident in low impact communities and what would be expected in the general population.⁴⁶

Whilst a greater understanding of the economic and social impacts will undoubtedly be revealed when the Royal Commission into Natural Disaster Arrangements releases its final report in August 2020, there is little doubt that the proportions of the financial and social damage and disruption will be staggering.

³⁶ CSIRO, *The 2019-20 bushfires: a CSIRO explainer*, (2020), accessible [here](#).

³⁷ C&D Restructure and Taxation Advisory, *Ongoing Economic and Socio-Economic Impacts of the Australian Bushfires*, (February 2020), accessible [here](#).

³⁸ CSIRO, *The 2019-20 bushfires: a CSIRO explainer*, (2020), accessible [here](#).

³⁹ Ibid.

⁴⁰ Terry Rawnley, *COVID-19 and summer bushfires: The economic impact on your suburb and pathways to recovery*, (May 2020), SGS, accessible [here](#).

⁴¹ Ibid.

⁴² Adrian Rollins, 'Bushfire insurance claims net \$4.6 billion from disastrous summer', (April 2020), *The Canberra Times*, accessible [here](#).

⁴³ Royal Commission into Natural Disaster Arrangements, (n.d.), accessible [here](#).

⁴⁴ Max Allen, 'Smoke taint ruins vineyard crops', *The Australian Financial Review*, (January 2020), accessible [here](#).

⁴⁵ CDRTA, *Ongoing Economic and Socio-Economic Impacts of the Australian Bushfires*, (February 2020), accessible [here](#).

⁴⁶ Lisa Gibbs et al, *Beyond Bushfires: Community Resilience and Recovery Final Report*, (2016), University of Melbourne, accessible [here](#).

Food insecurity

Australia is one of only a few countries that produces more food than it consumes, but this could be at risk as a result of climate change.

Whilst Australia has benefited from unprecedented food security over the last few decades, rising population demands and erratic weather events will increasingly impact on food price, food quality, reliability and availability and add considerable strain to both the farming communities, the consumers and the broader economy,

The United Nations Food and Agriculture Organization (FAO) defines food security as "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life".⁴⁷

Climate change can impact food security through a variety of mechanisms. This can occur directly via damage to crops or indirectly through lowered crop nutritional values (e.g. iron) as a result of heightened carbon dioxide (CO₂) levels and the rise in food prices during a natural disaster. To demonstrate the former, total crop yield potential in Australia has decreased by 27 per cent between 1990 to 2015 as a direct result of lowered rainfall and increased temperatures.⁴⁸ However, this is not fully reflected in Australia's actual crop output due to technological advances in the area.

To better understand these impacts, Dairy Australia commissioned CSIRO to assess the potential impacts of climate change across all Australian regions in 2016.⁴⁹ The report found that warmer and drier climate poses significant challenges for the dairy industry in areas such as pasture growth, runoff dams, viability of shade of trees, managing feed, heat stress, pests, weeds, diseases, and reproduction. The report applied a high emissions scenario lens and looked at projections until the year 2040. The report also found that more extreme rainfall patterns increases risk of flooding, erosion, water logging, and supply chain and transport disruptions.

To further understand the links between climate change and Australia's food production, the Climate Council's 'Feeding a Hungry Nation: Climate Change Food and Farming in Australia'⁵⁰ report examined the nature of Australian food production, the way in which climate change has changed over the past century, the direct and indirect impacts that are expected on agricultural production, and the challenges and opportunities that might exist for effective adaptation. The report highlighted the following key findings:

- Climate change is making weather patterns more extreme and unpredictable, with serious consequences for Australia's agricultural production;
- More frequent and intense heatwaves and extreme weather events are already affecting food prices in Australia;
- Climate change is affecting the quality and seasonal availability of many foods in Australia;
- Australia is extremely vulnerable to disruptions in food supply through extreme weather events;
- Australia's international competitiveness in many agricultural markets will be challenged by the warming climate and changing weather patterns; and
- If the current rate of climate change is maintained, adaptation to food production challenges will be increasingly difficult and expensive.

A 2019 report from the Australian Farm Institute echoed many of the concerns raised by the Climate Council, but in particular highlighted that if Australia was unable to mitigate the negative impacts of climate change or adapt its practices it would be unlikely that the agricultural sector would be able to maintain food security across the region.⁵¹ The report goes on to explain the impacts that this will have on the ability of Australia to maintain its competitive advantage when it came to its exports. Currently, Australia exports around 65 per cent of its agricultural production which is valued at over A\$44 billion.⁵² Thus, as Australia's agricultural industry is export-dependent, the projected increases in the Australian population will inevitably increase demand for food production and combined with reduced production rates and increased supply chain disruptions, will likely expose the sector to serious risk.

⁴⁷ United Nations Food and Agricultural Organization (FAO), *Rome Declaration on World Food Security*, (1996), accessible [here](#).

⁴⁸ Z Hochman, D Gobbett and H Horan, 'Climate trends account for stalled wheat yields in Australia since 1990', (2017), *Global Change Biology*, 23(1), pp. 2071-2075, accessible [here](#).

⁴⁹ Dairy Australia, *Climate change impacts on Australia's dairy regions*, (November 2016), accessible [here](#).

⁵⁰ Climate Council, *Feeding a Hungry Nation: Climate change, Food and Farming in Australia*, (2015), accessible [here](#).

⁵¹ Australian Farm Institute, *Change in the air: defining the need for an Australian agricultural climate change strategy*, (2019), accessible [here](#).

⁵² Department of Foreign Affairs and Trade (DFAT), *Agricultural Trade*, (n.d.), accessible [here](#).

In 2019, Foodbank Australia's 'Hunger Report' stated that five million Australians were food insecure.⁵³ Whilst it is women who tend to bear the brunt of food insecurity, the majority of Australian households who report food insecurity are also welfare dependent and have experienced domestic violence.⁵⁴ As extreme events such as drought, flooding and major heatwaves become more permanent fixtures across Australia, the impact of these steep and sudden price increases are likely to put substantial burden on those who are most vulnerable which, in turn, is likely to place an even greater strain on our economy. The ability for these households to respond to these variances, particularly if they become more sustained, will place an inordinate amount of pressure on potentially millions of families. The World Economic Forum further stresses the links between food insecurity, global price increases and social unrest by highlighting the 2007 and 2008 riots that occurred across 48 countries including Bangladesh, Brazil, Mexico and Mozambique as a result of the sharp increases in food prices.⁵⁵ There is an opportunity for business and governments to work together through market-based public-private approaches and by putting in place mechanisms that improve food security and environmental/agricultural sustainability practices that could mitigate global outbreaks of social upheaval and political instability.

As such, without clear mitigation plans in place and the use of climate-sensitive approaches to agricultural production (e.g. regenerative farming, precision agriculture, integrated pest management, landscape management),⁵⁶ climate change is likely to seriously impact on our economy and the four dimensions of food security: food availability, food accessibility, food utilisation, and food system stability.⁵⁷

The Four Dimensions of Food Security

Food Availability:

The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

Food Access:

Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

Food Utilisation:

Utilisation of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

Food Stability:

To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity).

The concept of stability can therefore refer to both the availability and access dimensions of food security.⁵⁸

⁵³ Foodbank Australia, *Foodbank Hunger Report 2019*, (2019), accessible [here](#).

⁵⁴ Ibid.

⁵⁵ World Economic Forum, *Food Security and why it matters*, (2016), accessible [here](#).

⁵⁶ CSIRO, *Sustainable Farming Systems*, (n.d.), accessible [here](#).

⁵⁷ United Nations Food and Agricultural Organization (FAO), *Food Security Policy Brief*, (2006), accessible [here](#).

⁵⁸ Ibid.



“The foundations of a resilient society involve good health. Governments and businesses that strive to support thriving and resilient communities will need to explore the opportunities and benefits associated with addressing the climate change and health nexus.”

Indirect Impacts and Opportunities

Infectious and non-infectious diseases

Australia fortunately has one of the best healthcare systems in the world. This is supported by the release of the 'Sustainable Development Report (2019)', a report co-produced by the Bertelsmann Stiftung foundation and the Sustainable Development Solutions Network that provides a country by country analysis and review of countries' performance on the 17 Sustainable Development Goals⁵⁹. Whilst Australia continues to track well in the *Good Health and Well-Being* goal, with a score of 96.5 per cent, it is declining in its ability to meet the *Climate Action* goal, with a score of 33.9 per cent. By contrast, other major producers and exporters of oil and gas have higher *Climate Action* scores, such as Canada with a score of 68.5 and Norway with a score of 54.4. The scores relate to how countries are tracking against the targets below each goal. With regard to the *Climate Action* goal, the targets measure items such as energy-related CO₂ emissions per capita, imported CO₂ emissions per capita, CO₂ emissions embodied in fossil fuel exports, the effective carbon rate from all non-road energy and the number of people per 100,000 population affected by climate related disasters. Australia is stagnating in achieving this SDG which can pose a serious threat for Australia's healthcare system, particularly as the impacts from climate change challenge the overall resilience of Australia's healthcare system. Given the interrelationships that exist between climate change and health, this begs the question as to whether Australia will continue to benefit from one of the world's best healthcare systems.

For the healthcare system to remain resilient it will need to mitigate its own impacts on the environment but also adapt to existing and future climate change impacts. This will mean, for example, understanding how climatic conditions affect infectious diseases that include vector-borne diseases (e.g. dengue and malaria) and water-borne infectious diseases (e.g. cholera).

Some diseases are extremely sensitive or compounded by climate change and can cause loss of human life. For intestinal infections, studies in most Australian states showed that maximum temperatures and heatwaves significantly affect salmonella infections.⁶⁰ There has also been a risk in dengue fever in Queensland of 13.7 per cent from 1980 to 2016, with rising temperatures meaning that it is now more prevalent in winter and less sensitive to seasonal changes.⁶¹

Across the state average temperatures are now one degree Celsius higher than they were 100 years ago.⁶² This is comparable to the Philippines and Indonesia, that, over a similar time frame of 1980 to 2010, respectively saw an increase in dengue incidence of 24.4 per cent and 12.0 per cent.⁶³ Both countries are experiencing similar overall temperature increases across the regions.

The links between air pollution and poor human health outcomes have been studied and known for decades. Air pollution kills an estimated seven million people worldwide per year.⁶⁴ Of the seven million, 60 per cent of those deaths result from exposure to outdoor air pollution.⁶⁵ Air pollution from coal-fired electricity generation is responsible for hundreds of thousands of deaths globally each year, and the health impacts of coal-fired power generation is estimated to cost Australia A\$2.6 billion annually.⁶⁶ The health concerns associated with human exposure to toxic pollutants include medical conditions such as asthma attacks, stroke, type 2 diabetes, lung cancer, low birth rate and premature death.⁶⁷ These costs mainly arise from related insurance claims, costs to the public health system (i.e. hospital presentations) and medical services (i.e. medical specialists). This drains valuable resources away from where they are most needed and puts an unnecessary strain onto an already resource scarce area. Air pollution also plays a significant role in increasing concerns that the air condition has rapidly decreased across Australia due to the high volume of bushfires. To accentuate the already high outlay, there are growing concerns by the Australian Medical Association (AMA) that Australia is ill-prepared financially for the inevitable cost of mitigating climate-related health outcomes.⁶⁸ It is estimated that implementing procedures to reactively respond to upcoming health disasters could increase our health expenditure by ten times by 2050 if actions such as the promotion of a transition away from fossil fuels, the development of a National Strategy for Health and Climate Change or the establishment of a National Sustainable Development Unit are not adopted. (Refer to the pop out box titled: Australian Medical Association Recognises Climate Change as a Health Emergency p.3.⁶⁹)

The foundations of a resilient society involve good health. Governments and businesses that strive to support thriving and resilient communities will need to explore the opportunities and benefits associated with addressing the climate change and health nexus.

⁵⁹ Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN), *Sustainable Development Report 2019: Transformations to achieve the Sustainable Development Goals*, (June 2019), accessible [here](#).

⁶⁰ Ronnie D'Souza et al, 'Does ambient temperature affect foodborne disease?', (2004), *Epidemiology*, (15), pp. 86-87, available [here](#).

⁶¹ Ying Zhang et al, 'The MJA-Lancet Countdown on health and climate change: Australian policy inaction threaten lives', (2018) 209(11) *Medical Journal of Australia*, accessible [here](#).

⁶² Queensland Government, *Climate Change in Queensland*, (2019), accessible [here](#).

⁶³ Bernard Bett et al, 'Spatiotemporal analysis of historical records (2001-2012) on dengue fever in Vietnam and development of a statistical model for forecasting risk', (2019), *PLoS One*, 14(11), accessible [here](#).

⁶⁴ World Health Organization, *Air Pollution*, (n.d.), accessible [here](#).

⁶⁵ Ibid.

⁶⁶ Climate Health Alliance, *Framework for a National Strategy on Climate, Health and Well-being for Australia*, (2017), accessible [here](#).

⁶⁷ Ibid.

⁶⁸ Australian Medical Association, *AMA Recognises Climate Change as a Health Emergency*, (September 2019), accessible [here](#).

⁶⁹ Ibid.

Business Pathways to Net Zero

Setting a target

Business can assist with mitigating poor health outcomes as a result of climate change by directing their climate strategies towards net zero emissions by or before 2050.⁷⁰ ClimateWorks Australia's 'Decarbonisation Futures' report is a guide for businesses and government that outlines the types of technologies and deployment pathways that support the achievement of net zero emissions, and illustrates that the technologies are all essentially already available to invest in or deploy.⁷¹ As such, businesses and governments can achieve net zero emissions by investing in deep energy efficiencies, electrification, electric and fuel-cell vehicles, the circular economy, sustainable agriculture practices, wind or solar. Some of Australia's largest businesses have already committed to achieve net zero emissions by or before 2050. These include the software company Atlassian, real estate companies Dexu Property Group and Mirvac, telecommunications leader Telstra and Qantas airlines. Furthermore, all Australian state and territories are now aiming to achieve the same goal by or before 2050.

There are a wide range of communities and networks that exist to support businesses in achieving the net zero goal. One such example is the Science Based Targets initiative. The initiative was launched in 2015 and provides companies with a clearly defined pathway to future-proof growth by specifying how much and how quickly they need to reduce their GHG emissions. The United Nations Global Compact is a founding partner of the initiative alongside WWF, the World Resources Institute and CDP (formerly known as the Carbon Disclosure Project). Through the initiative, companies can access relevant technical materials, are assisted as they set their targets, and are subsequently able to showcase the innovations they may have required to reach their targets.⁷² Close to 900 companies including Origin Energy, Yarra Valley Water, Westpac, Intrepid Travel and Woolworths have already integrated science-based carbon goals to align with the Paris Agreement of keeping global warming to well below 2 degrees Celsius above pre-industrial levels.

The reason that this solution is so effective is because it targets the root cause of the negative health impacts. There are also numerous additional benefits which attach themselves to pursuing such an aim. The most important of these is the opportunity to adopt sustainability strategies early. Businesses that are early movers in this space will likely be able to reap some of the associated benefits as others follow suit. Opportunities around investment in climate risk complement the duties of directors to manage risks accordingly. By committing to setting a target, businesses can act proactively, rather than reactively. This will enable them to determine what strategies are beneficial to them, as they work through the real and tangible opportunities available to business as the globe transitions to a net zero carbon economy.

⁷⁰ ClimateWorks Australia, *Decarbonisation futures: Solutions, actions and benchmarks for a net zero emissions Australia*, (March 2020), accessible [here](#).

⁷¹ Ibid.

⁷² Science Based Targets, *About the Science Based Targets initiative*, (2019), accessible [here](#).

Business Pathways to Net Zero

Future Growth and Opportunities

As we transition across to a net zero carbon economy, some industries will either reduce or wane, while most will transition and new industries will emerge that create new jobs, with the potential for economic diversification and new investments. It is an opportunity for businesses to re-think their operating models and transform the way in which they work. For example, the Climate Council found in their 'Renewable Energy Jobs: Future Growth in Australia' report that jobs will be created in construction, operations and maintenance of renewable energy installations and could lead to an additional 28,000 new jobs under a 50 per cent renewable electricity scenario, which creates significant opportunities for this economy.⁷³ This was further supported by Beyond Zero Emissions' '2020 Million Jobs Plan' which paved a solution for Australia to become a "renewable energy superpower" by investing in jobs.

The transport sector is the second largest source of GHG pollution in Australia after electricity.⁷⁴ For this industry, it is critical for companies to invest in mitigation and robust adaptation planning to drive down its emissions and reduce its exposure to climate risks. As the sector is particularly vulnerable to the impacts of extreme weather events, such as heatwaves, flooding or storms that can disrupt and/or damage vital transport routes, it is important for transport operators and logistics companies to shape strategies and policies that critically respond to this new landscape and enable them to shift to net zero. For example, on 7 January 2018, the Sydney suburb of Penrith experienced severe delays and cancellations across the city's transport system as it became the hottest place on earth, reaching temperatures of 47.3 degrees Celsius.⁷⁵ Despite the growing challenges for this industry, there are clear opportunities for businesses to work together with governments and become more solutions focused and more resilient to climate change. For example, this can be achieved by rapidly transitioning across to cleaner modes of transportation, improving the quality and efficiency of public transport, or supporting the government to develop more coherent transport and climate change policies.

The recent release of the ClimateWorks Australia 'Net Zero Momentum Tracker' report for the transport sector, whilst acknowledging the long road ahead to meeting net zero and the continued dependency of the transport sector upon fossil fuels, highlighted the opportunities that have emerged as a result of the current pandemic.⁷⁶ For these companies, there is a unique opportunity to shape the discussion around the COVID-19 economic recovery phase. By setting science-based targets, pledging to the global EV100 initiative⁷⁷ or by shaping strategies that support these actions, companies can send clear signals to investors and customers that they can transition to net zero transport emissions. Zero emissions transport solutions are already available, with companies such as Australia Post, DHL, Qantas and Yarra Trams taking ambitious actions to support this global shift to net zero.⁷⁸

Similar opportunities exist for the agricultural sector. Whilst agricultural production accounts for 16 percent of emissions,⁷⁹ investment in climate-resilient research and changes to traditional farming will assist in reducing GHG emissions and making Australia's agricultural sector more resilient to climate change. For example, a report by Beyond Zero Emissions and the Melbourne Sustainable Society Institute demonstrated how Australia can significantly reduce the emissions from agriculture and forestry through solutions such as changes in land use and limited revegetation and carbon sequestration.⁸⁰ Meat and Livestock Australia (MLA) has set ambitious targets to be carbon neutral by 2030. To achieve these targets the MLA will need to leverage existing solutions and invest in technologies that avoid methane emissions⁸¹ from waste management and processing facilities; develop renewable energy technology to reduce CO₂ emissions from the use of fossil fuels; and develop technologies that reduce methane emissions from livestock. Through these technologies and investments in research, Australian beef, goat and lamb production, including feeding and meat processing will make no net release of GHG emissions into the atmosphere.⁸² Solutions exist for all Australian businesses regardless of sector and research suggests that the majority of the solutions to get us to net zero by 2050 already exist.

⁷³ Climate Council, *Renewable Energy Jobs: Future Growth in Australia*, (2016), accessible [here](#).

⁷⁴ Climate Council, *Waiting for the green light: transport solutions to climate change*, (2018), accessible [here](#).

⁷⁵ William McInnes, 'Sydney clocks the hottest place on earth as hotel weather continues', (2018), *Sydney Morning Herald*, accessible [here](#).

⁷⁶ ClimateWorks Australia, *Net Zero Momentum Tracker: Transport Sector*, (June 2020), accessible [here](#).

⁷⁷ The EV100 Initiative is a global initiative led by the Climate Group that brings together forward looking companies committed to accelerating the transition to electric vehicles (EV) and making electric transportation the new normal by 2030. More information accessible [here](#).

⁷⁸ ClimateWorks Australia, *Net Zero Momentum Tracker: Transport Sector*, (June 2020), accessible [here](#).

⁷⁹ Department of Primary Industries and Regional Development (Government of Western Australia), *How Australia accounts for agricultural greenhouse gas emissions*, (May 2020), accessible [here](#).

⁸⁰ Beyond Zero Emissions, *Land Use: Agriculture and Forestry*, (2014), accessible [here](#).

⁸¹ A potent greenhouse gas that is about 28 times more powerful than carbon dioxide at warming the Earth, on a 100 year timescale and more than 80 times more powerful over 20 years. More information accessible [here](#).

⁸² Meat and Livestock Australia, *Carbon Neutral by 2030 (CN30)*, (n.d.), accessible [here](#).

“With the COVID-19 pandemic entailing an end-to-end self-reflection for many companies and a slow-down in emissions, now is the chance for dialogue around the best way to tackle the climate change crisis. Rebuilding the economy will be no easy task but it represents a huge opportunity to weave in initiatives and structures that support net zero carbon pathways.”



Conclusion

Now is one of the best times to evaluate future business operations and how the environment will play a part in the incoming economy. With the COVID-19 pandemic entailing an end-to-end self-reflection for many companies and a slow-down in emissions, now is the chance for dialogue around the best way to tackle the climate change crisis. Rebuilding the economy will be no easy task but it represents a huge opportunity to weave in initiatives and structures that support net zero carbon pathways.⁸³

Furthermore, we have seen from the COVID-19 crisis that the contemporary world is not immune to global-scale pandemics which can result in near shutdowns of society as we have come to know it. We have also seen that governments and business alike can act swiftly and collaboratively in response to economic and societal challenges. In light of this, it is crucial that we begin planning for a future where climate change plays a bigger role in health issues and work to better understand the relationship between the two. It is also critical that we mitigate against the chance of a climate change and health event concurrently occurring so that we can adequately respond to both and not overwhelm our systems.

Planning for this process early will enable business, government and communities alike to become more resilient and protected against extreme weather events as a result of our climatic composition. With the regularity of events such as bushfires, floods and heatwaves and the rapid speed with which they strike, there are opportunities to harness technology, innovation and investment to ensure that we are equipped to deal with climate change consequences and the health outcomes that arise from them.

It is especially important that we deal with this issue appropriately in order to protect the most vulnerable members of society. As more people and assets are exposed to more frequent and intense weather events, it is often the most vulnerable that lack the financial resources to cope with the resulting rising food and associated household prices and lowered incomes.⁸⁴ This then translates into avoidable health detriment in the form of food insecurity and malnutrition.

There are many potential avenues that businesses can take to protect their employees, themselves and the communities in which they operate from the adverse effects of climate-associated health risks. These begin with the option of reinforcing their existing operations against issues like temperature rises and potential employee vulnerability. They also range to more future-looking actions such as committing to net zero and entering into partnerships to achieve this goal.

The Global Compact Network Australia (GCNA) is uniquely positioned to collaborate with a wide variety of businesses, investors, unions, the civil population and governments to encourage dialogue and develop best practice worldwide. The GCNA supports a forward-looking platform of action which can develop policies, initiatives and actions that fit and support business and community needs. The impact of climate change and health will eventuate over the next few decades and it is critical that the right people are brought together to plan and address it.

⁸³ Mike Foley and Nick O'Malley, 'Coronavirus presents us with terrible climate risk – and opportunity', (April 2020), *The Age*, accessible [here](#).

⁸⁴ Australian Institute for Disaster Resilience, *National Disaster Risk Reduction Framework*, (2018), accessible [here](#).

References

- Allen, Max, 'Smoke taint ruins vineyard crops', *The Australian Financial Review*, (January 2020), accessible [here](#).
- Australian Bureau of Statistics, *Average Weekly Earnings, Australia, May 2014*, (2014), accessible [here](#).
- Australian Bureau of Statistics, *Australian health survey: nutrition – State and Territory results, 2011-12*, (2015), accessible [here](#).
- Australian Bureau of Statistics, *National Health Survey: First Results, 2014-2015*, (2015), accessible [here](#).
- Australian Bureau of Statistics, *Australian health survey: nutrition – State and Territory results, 2017-18*, (2019), accessible [here](#).
- Australian Farm Institute, *Change in the air: defining the need for an Australian agricultural climate change strategy*, (2019), accessible [here](#).
- Australian Government: Australian Small Business and Family Enterprise Ombudsman, *Small Business Counts: Small business in the Australian economy*, (2019), accessible [here](#).
- Australian Government (Department of Agriculture, Water and the Environment), *Climate change impacts in Australia*, (2019), accessible [here](#).
- Australian Institute for Disaster Resilience, *National Disaster Risk Reduction Framework*, (2018), accessible [here](#).
- Australian Medical Association, *AMA Recognises Climate Change as a Health Emergency*, (September 2019), accessible [here](#).
- Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN), *Sustainable Development Report 2019: Transformations to achieve the Sustainable Development Goals*, (June 2019), accessible [here](#).
- Bett, Bernard et al, 'Spatiotemporal analysis of historical records (2001-2012) on dengue fever in Vietnam and development of a statistical model for forecasting risk', (2019), *PLoS One*, 14(11), accessible [here](#).
- Beyond Zero Emissions, *Land Use: Agriculture and Forestry*, (2014), accessible [here](#).
- BSR, *Climate + Health: The Business Case for Action*, September (2018), accessible [here](#).
- Bureau of Meteorology, *State of the Climate 2018*, (2018), accessible [here](#).
- Carrington, Damian, 'Climate change already a health emergency, say experts', *The Guardian* (29 November 2018), accessible [here](#).
- Capon, Anthony, '222 scientists say cascading crises are the biggest threat to well-being for future generations', (February 2020), *The Conversation*, accessible [here](#).
- C&D Restructure and Taxation Advisory, *Ongoing Economic and Socio-Economic Impacts of the Australian Bushfires*, (February 2020), accessible [here](#).
- Climate Change Authority, *Prospering in a low-emissions world: An updated climate policy toolkit for Australia*, Australian Government, (March 2020), accessible [here](#).
- ClimateWorks Australia, *Decarbonisation futures: Solutions, actions and benchmarks for a net zero emissions Australia*, (March 2020), accessible [here](#).
- ClimateWorks Australia, *Net Zero Momentum Tracker: Transport Sector*, (June 2020), accessible [here](#).
- Climate Council, *Feeding a hungry nation: climate change, food and farming in Australia*, (2015), accessible [here](#).
- Climate Council, *Renewable Energy Jobs: Future Growth in Australia*, (2016), accessible [here](#).
- Climate Council, *Waiting for the green light: transport solutions to climate change*, (2018), accessible [here](#).
- Climate Council, *Bushfire Briefing Paper*, (November 2019), accessible [here](#).
- Climate Health Alliance, *Framework for a National Strategy on Climate, Health and Well-being for Australia*, (2017), accessible [here](#).
- Coles Group, 2019 Sustainability Report, (2019), accessible [here](#).
- CSIRO, *Sustainable Farming Systems*, (n.d.), accessible [here](#).
- CSIRO, *The 2019-20 bushfires: a CSIRO explainer*, (2020), accessible [here](#).
- Dairy Australia, *Climate change impacts on Australia's dairy regions*, (November 2016), accessible [here](#).

Department of Foreign Affairs and Trade (DFAT), *Agricultural Trade*, (n.d.), accessible [here](#).

Department of Primary Industries and Regional Development (Government of Western Australia), *How Australia accounts for agricultural greenhouse gas emissions*, (May 2020), accessible [here](#).

D'Souza, Ronnie et al, 'Does ambient temperature affect foodborne disease?', (2004), *Epidemiology*, (15), pp. 86-87, accessible [here](#).

Eccles, Robert and Klimenko, Svetlana, 'The Investor Revolution', *Harvard Business Review*, (2019), accessible [here](#).

Encyclopedia Britannica, *Pakistan Floods of 2010*, (2012), accessible [here](#).

Ethical Corporation, *This is a wake-up call. We must live within our planetary boundaries to avoid future pandemics*, (March 2020), accessible [here](#).

Foley, Mike and O'Malley, Nick 'Coronavirus presents us with terrible climate risk – and opportunity', (April 2020), *The Age*, accessible [here](#).

Foodbank Australia, *Foodbank Hunger Report 2019*, (2019), accessible [here](#).

Gibbs et al, *Beyond Bushfires: Community Resilience and Recovery Final Report*, (2016), University of Melbourne, accessible [here](#).

Grimani et al, 'The effectiveness of workplace nutrition and physical activity interventions in improving productivity, work performance and workability: a systematic review', (2019), *BMC Public Health*, 19(1), p. 32, accessible [here](#).

Henderson, Rob, 'Counting the costs of our scorched summer', *The Australian Financial Review* (16 January 2020), accessible [here](#).

Hochman, Zvi et al, 'Climate trends account for stalled wheat yields in Australia since 1990', (2017), *Global Change Biology*, 23(1), pp. 2071-2075, accessible [here](#).

Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team Pachauri, R, and Meyer, L (eds.)], (2014), IPCC, Geneva, Switzerland, 151, p. 64, accessible [here](#).

Johnson & Johnson, *Johnson & Johnson Announces Commitment to Support Republic of Rwanda's Preparedness Against Ebola Outbreak*, (2019), accessible [here](#).

Lindberg, Rebecca et al, 'Food insecurity in Australia: Implications for general practitioners', *The Royal Australian College of General practitioners*, 11(44), p. 859, accessible [here](#).

McDonald, Tim, 'Australian fires: The huge economic cost of Australia's bushfires', *BBC News* (December 2019), accessible [here](#).

McInnes, William, 'Sydney clocks the hottest place on earth as hotel weather continues', (2018), *Sydney Morning Herald*, accessible [here](#).

McMichael, Anthony, 'Extreme weather events and infectious disease outbreaks', *Virulence*, 6(6), pp. 543-545, accessible [here](#).

Meat and Livestock Australia, *Carbon Neutral by 2030 (CN30)*, (n.d.), accessible [here](#).

Myers, SS et al, 'Increasing CO₂ threatens human nutrition', (2014), *Nature*, 510(1), p. 139, accessible [here](#).

National Geographic, 'Methane Explained', (January 2019), accessible [here](#).

National Health Service (England), *Carbon Reduction Strategy for England (CSR) 2009*, (2009), accessible [here](#).

Pickrell, John, 'Smoke from Australia's bushfires killed far more people than the fires did, study says', *The Guardian* (March 2020), accessible [here](#).

Price Waterhouse Coopers, *The possible economic consequences of a novel coronavirus (COVID-19) pandemic*, (March 2020), accessible [here](#).

Public Health England, *Climate change: health effects in the UK*, (2012), accessible [here](#).

Queensland Government, *Queensland Floods Commission of Inquiry Report*, (2012), accessible [here](#).

Queensland Government, *Queensland Climate Adaptation Strategy: Human Health and Wellbeing Climate Change Adaptation Plan for Queensland*, (2018), accessible [here](#).

Queensland Government, *Climate Change in Queensland*, (2019), accessible [here](#).

Quiggin, John, *Drought, climate change and food prices in Australia*, (2007), accessible [here](#).

Rawnsley, Terry, *COVID-19 and summer bushfires: The economic impact on your suburb and pathways to recovery*, (May 2020), SGS, accessible [here](#).

Reserve Bank of Australia, *Statement on Monetary Policy: Economic Outlook*, (May 2020), accessible [here](#).

Ride, K and A Lee, 'Review of nutrition among Aboriginal and Torres Strait Islander people', (2018), *Australian Indigenous HealthInfoNet*, 18(1), accessible [here](#).

Rollins, Adrian, 'Bushfire insurance claims net \$4.6 billion from disastrous summer', (April 2020), *The Canberra Times*, accessible [here](#).

Royal Commission into Natural Disaster Arrangements, (n.d.) accessible [here](#).

Science Based Targets, *About the Science Based Targets initiative*, (2019), accessible [here](#).

Steffen, Will et al, 'Heatwaves: hotter, longer, more often', (2014), *Climate Council*, accessible [here](#).

The Climate Group, *EV100*, (n.d.), accessible [here](#).

The Climate Institute, *Towards Climate-Friendly Farming*, (October 2009), accessible [here](#).

Thien, Francis et al, 'The Melbourne epidemic thunderstorm asthma event 2016: an investigation of environmental triggers, effect on health services and patient risk factors', (2018) *The Lancet*, 2(6), accessible [here](#).

United Nations, *COVID-19 likely to shrink GDP by almost one per cent in 2020*, (April 2020), accessible [here](#).

United Nations Environmental Programme (UNEP): Finance Initiative, *UN-convened Net-Zero Asset Owner Alliance*, (2019), accessible [here](#).

United Nations Food and Agricultural Organization (FAO), *Rome Declaration on World Food Security*, (1996), accessible [here](#).

United Nations Food and Agricultural Organization (FAO), *Food Security Policy Brief*, (2006), accessible [here](#).

United Nations Human Rights: Office of the High Commissioner, *The impacts of climate change on enjoyment of the right to health*, (2016), accessible [here](#).

Victorian Department of Health & Human Services, *The Health Impacts of the January 2014 Heatwave in Victoria*, (2014), accessible [here](#).

Victorian Minister for Health, *Press release: Victorians urged to be careful during extreme heat*, (January 2019), accessible [here](#).

Watts, Nick et al, 'Health and climate change: from 25 years of inaction to a global transformation for public health', (2017), *The Lancet Countdown*, 391(10120), accessible [here](#).

World Economic Forum, *Food Security and why it matters*, (2016), accessible [here](#).

World Health Organization, *Air Pollution*, (n.d.), accessible [here](#).

World Health Organization, *Climate change and health: Global environmental change*, (n.d.) accessible [here](#).

World Health Organization, *Information and public health advice: heat and health*, (n.d.), accessible [here](#).

World Health Organization, *Climate change and health*, (February 2018) accessible [here](#).

World Health Organization, *COP24 special report: health and climate change*, (2018), accessible [here](#).

World Health Organization, *Coronavirus disease (COVID-2019) situation reports*, (2020), accessible [here](#).

Xiang, J, et al, 'The impact of heatwaves on workers' health and safety in Adelaide, South Australia', (2014) *Environmental Research*, 133(1), p. 90, accessible [here](#).

Zander, Kerstin et al, 'Heat stress causes substantial labour productivity loss in Australia', (2005), *National Climate Change*, (5), pp. 647-651, accessible [here](#).

Zhang, Ying et al, 'The MJA-Lancet Countdown on health and climate change: Australian policy inaction threaten lives', (2018), *Medical Journal of Australia*, 209(11), accessible [here](#).

“In collectively addressing the human and physical dimensions of risks and the associated opportunities, business can play a decisive role by addressing the root cause of climate change and supporting innovative pathways to net zero.”



The Ten Principles of the United Nations Global Compact

The Ten Principles of the United Nations Global Compact are derived from: the Universal Declaration of Human Rights, the International Labour Organization's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption.

Written and edited by:
Corinne Schoch, Head of Programmes

Edits and contributions by:
Kylie Porter, Executive Director

With special thanks to Global Compact Network Australia Director, Sasha Courville



HUMAN RIGHTS

- 1 Businesses should support and respect the protection of internationally proclaimed human rights; and
- 2 make sure that they are not complicit in human rights abuses.



LABOUR

- 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- 4 the elimination of all forms of forced and compulsory labour;
- 5 the effective abolition of child labour; and
- 6 the elimination of discrimination in respect of employment and occupation.



ENVIRONMENT

- 7 Businesses should support a precautionary approach to environmental challenges;
- 8 undertake initiatives to promote greater environmental responsibility; and
- 9 encourage the development and diffusion of environmentally friendly technologies.



ANTI-CORRUPTION

- 10 Businesses should work against corruption in all its forms, including extortion and bribery.

Global Compact Network of Australia

E | secretariat@unglobalcompact.org.au

T | +61 (0) 491 234 061

A | 15 Lygon Street, Carlton 3053

unglobalcompact.org.au



Global Compact Network Australia



[globalcompactAU](https://twitter.com/globalcompactAU)



Global Compact Network Australia



[globalcompactnetworkaustralia](https://www.instagram.com/globalcompactnetworkaustralia)

This publication has been funded by the Australian Government through the Department of Foreign Affairs and Trade.
The views expressed in this publication are the author's alone and are not necessarily the views of the Australian Government.



Global Compact
Network Australia



Australian Government
Department of Foreign Affairs and Trade