



ENVIRONMENT & SUSTAINABILITY



Lord Mayor's Charitable Foundation is focused on reducing adverse urban impacts on the natural environment.

Victorians produce 4 x global average of greenhouse emissions.

16 of the last 21 growing seasons have had below-average rainfall.

Our hottest December & January on record were those in 2018 and 2019 respectively.

The changing climate, an increasing population, competing land uses and pollution are some of the environmental challenges confronting our community.

In response, we are developing and incubating solutions that ensure an equitable transition to a more sustainable future.

The Foundation is working towards achieving the following outcomes:

- OUTCOME 1**
Increased energy efficiency and climate resilience of vulnerable households.
- OUTCOME 2**
Increased public understanding of the climate challenge.
- OUTCOME 3**
Secure, healthy and sustainable food systems.
- OUTCOME 4**
Protected and rehabilitated aquatic eco-systems.

Does your organisation's work align with the outcomes of this Impact Area?

Learn about our grants at lmcf.org.au/grants

Speak to Daniel Pediaditis, Senior Program Manager Environment & Sustainability

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OUTCOME 1



Increased energy efficiency and climate resilience of vulnerable households.

Our community is vulnerable to the changing climate and also a significant source of greenhouse gas emissions. Victoria's per capita greenhouse gas emissions are among the highest in the world - approximately four times the global average.

While most temperature-related deaths in Australia can be attributed to cold weather, heat-related impacts on health are increasing; causing more deaths than all other natural disasters combined.

People most at risk of these temperature-related effects, such as low-income households, are also under pressure from rising energy costs. In all our Impact Areas, the Foundation has a particular commitment to supporting the most disadvantaged people in our community.

The Foundation aims to increase the energy efficiency and climate resilience of vulnerable households to reduce the cost of living, reduce emissions and provide protection from temperature related health impacts.

The Foundation's support is focused on:

- Initiatives that directly increase the energy efficiency and climate resilience of vulnerable households, such as subsidy or retrofit programs, including where they potentially intersect with our interest in increasing the supply of affordable housing.
- Activities that demonstrably influence relevant local, state and commonwealth policies, regulations and codes.
- Research to better understand energy poverty, temperature-related risks, residential greenhouse gas emissions and measures to reduce them.

Challenge

Temperature-related death and illness is increasing.

While most temperature-related deaths in Australia are attributed to cold weather, heat-related health impacts are rising. As the climate changes, the south east of the country is experiencing more frequent and intense heatwaves. The Black Saturday fires in 2009 tragically killed 173 people, however there were also 374 more heat-related deaths during that period, cases involving heat-related illness jumped 34-fold and cardiac arrests almost tripled in Victoria. Extreme heat kills more people in Australia than any natural disaster, causing more deaths since 1890 than bushfires, cyclones, earthquakes, floods and severe storms combined.

Large urban areas can be up to 12°C warmer than surrounding areas. In Greater Melbourne, this Urban Heat Island effect is strongly correlated with areas of disadvantage, particularly in the Western, Northern and South-Eastern suburbs. These effects are further amplified when housing is poorly constructed, not well-insulated and expensive to heat and cool. People with pre-existing health conditions, the elderly and the very young are also particularly vulnerable.

Victoria's per capita greenhouse gas emissions are some of the highest in the world.

Victoria's per capita greenhouse gas emissions are among the highest in the world - approximately four times the global average. This is primarily the consequence of emissions from energy; Victorians generate 1.07 kg of greenhouse gas emissions per kilowatt hour of electricity – well-above any other Australian state or territory and almost double the national average.

The poor energy efficiency of homes intensifies the issue. While all new homes in Victoria must comply with the compulsory 6-Star House Energy Rating, around 86 per cent were built before these stronger energy efficiency regulations were introduced in 2005. As a result, the average rating for houses constructed in Victoria before 2005 is 1.81 stars. More broadly, a range of market failures have slowed progress and improving energy performance in the built environment has been limited to a small segment of the housing market.

Energy costs are rising, impacting the most vulnerable households.

Low-income families, pensioners and other vulnerable people are under pressure from rising energy costs and face increasing difficulty paying electricity and gas bills. Retail electricity prices for households have increased by 80 to 90 per cent over the past decade and low-income households are hardest hit, spending up to five times more (as a proportion of disposable income) on electricity than higher-income earners. One in four – roughly 455,604 households – are now paying over 8.8 per cent of their income on energy.

Our Response

Energy efficiency and on-site renewables are cost-effective means of addressing all three of these challenges. These measures can reduce the cost of living for households, provide protection from both extreme heat and cold, while reducing Victoria's significant energy-related greenhouse gas emissions.

An investment in improving the energy efficiency of a house can often be recouped by the resulting reduction in energy costs, with a recent report showing higher energy efficiency standards for existing housing stock could deliver more than \$1,000 in electricity savings for the average household, annually. It has been estimated that strengthening the energy efficiency requirements of Australia's residential building code could reduce energy bills by up to \$27 billion, cut energy network costs by up to \$12.6 billion and deliver at least 78 million tonnes of cumulative emissions savings.

While, reducing greenhouse gas emissions in some sectors is more difficult, fortunately for the building sector, technologically proven and commercially available measures, such as energy efficiency and on-site renewables, could deliver 28 per cent of Australia's 2030 emissions reduction target.

Improving the energy efficiency and climate resilience of houses also provides protection from temperature-related risks through affordable, efficient cooling and heating as well as thermal performance improvements.

However, while the climate, financial and health benefits of energy efficiency and renewables are accepted, uptake of both remain limited among the consumers most likely to benefit due to lack of information, cost and other barriers, such as split incentives between landlords and tenants.

The Foundation is increasing the energy efficiency and climate resilience of vulnerable households to reduce the cost of living, reduce emissions and provide protection from both extreme heat and cold.

The Foundation's support is focused on:

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- **Activities that demonstrably influence relevant local, state and commonwealth policies, regulations and codes.**
- **Research to better understand energy poverty, temperature-related risks, residential greenhouse gas emissions and measures to reduce them.**



OUTCOME 2



Increased public understanding of the climate challenge.

Lord Mayor's Charitable Foundation is increasing the community's understanding of the climate challenge by providing regular, accessible, evidence-based information from trusted sources.

A well-informed understanding of climate change and potential impacts enables individuals, communities, policy makers and other sectors to take practical action to support our transition to a low-carbon economy.

The Foundation's support is focused on:

- Activities that effectively communicate the science and impacts of climate change .
- Activities that communicate the solutions and highlight the mitigation and adaptation opportunities, particularly those that demonstrate how the transition to net-zero emissions is technologically and economically viable.
- Projects that support the implementation of innovative local transition solutions that benefit the community.

Challenge

There is an overwhelming scientific consensus that humans are changing the climate. This consensus is not reflected in the general community, which is hindering an effective response.

The case for human-induced climate change is accepted in the peer-reviewed science (97 to 99 per cent).¹ The Intergovernmental Panel on Climate Change, which provides the objective, scientific view and reviews all available scientific data, is unequivocal on this.² As global economies have industrialised, carbon dioxide (CO₂) concentration has increased from 278 ppm in 1750 to 415 ppm today - the highest level in around two million years.³

These additional greenhouse gas emissions are trapping more heat and changing the climate. Unless emissions are substantially limited, there will be severe impacts across the globe.⁴

In Australia, nine of the ten hottest years on record occurred since 2005⁵ and, now in early in 2019, records are again being broken; the nation experienced its hottest January on record, which followed its hottest December, in 2018.⁶ Rising sea-levels, floods, drought, fire, extreme heat and damaging weather events are just some of the many impacts that will continue to increase in the years to come.⁷

Across the globe, 185 countries have ratified United Nations' Paris Agreement and are attempting to keep global temperature rise this century below 2°C above pre-industrial levels and ideally below 1.5°C.⁸

Despite the overwhelming scientific evidence for human-induced climate change and global efforts to address the problem, significant confusion persists within the community, political spheres, and other sectors. Only 56 to 65 per cent of the Australian public accept that climate change is driven by human activity.⁹ Reasons for the discrepancy likely involve several factors, including exposure to contrary information in the media, optimism bias, discounting the future, ideological positions that are dismissive of climate change and mistrust of institutions.¹⁰

The community, is struggling to introduce an efficient, effective and stable climate response to drive down greenhouse gas pollution, systematically adapt and meet emissions reduction targets.¹¹ While the reasons for inaction are numerous and complex, a significant barrier to effective action has been the widespread confusion about both the problem and an appropriate response.

The community needs help to understand the climate challenge and highlight the opportunities involved with the transition to net zero emissions, so that appropriate action can be taken at the individual level through to the policy level.

Our Response

Lord Mayor's Charitable Foundation is increasing understanding of the climate challenge by providing accessible, evidence-based information to the public, which will assist all levels of government and the community to respond to the challenge effectively.

The best practice for communicating the climate challenge involves the use of clear messages, that are repeated often by trusted sources. Climate scientists, farmers, firefighters, paramedics, doctors, weather presenters and nurses are the most trusted sources in Victoria. Information on the local impacts of climate change is also more effective at engaging audiences than national or global information. In addition, combining both emergency and hopeful components in the same message is an effective method of communicating the challenge.¹²

When communicating with different community sectors, specific messages and trusted sources within those communities should be utilised. Specific audiences can also be engaged by messages that speak to demographic differences in age, gender, religion, income, education, political views or geographic location.¹³

The technological and economic case for a cost-effective transition has also been made across many economic sectors and the costs of low-emission alternatives continue to fall dramatically – including the cost of wind power, photovoltaics, solar thermal and batteries, to name a few. The greatest potential comes from unexploited opportunities in the electricity and land sectors, with further potential across the industry, transport and buildings sectors.

The Foundation seeks to educate the community about the science and impacts of climate change, while highlighting mitigation and adaptation opportunities. Increasing understanding of the climate challenge by providing regular, accessible, evidence-based information from trusted sources will allow all sectors of the community to respond effectively.

The Foundation's support is focused on:

- **Activities that effectively communicate the science and impacts of climate change.**
- **Activities that communicate the solutions and highlight the mitigation and adaptation opportunities, particularly those that demonstrate how the transition to net-zero emissions is technologically and economically viable.**
- **Projects that support the implementation of innovative local transition solutions that benefit the community.**



OUTCOME 3



Secure, healthy and sustainable food systems.

Increasing demand for agricultural products, urban sprawl, climate change and a range of other threatening processes are undermining the security, health and sustainability of our food system.

Food production and consumption impacts biodiversity, aquatic and terrestrial resources, climate and a range of other critically important systems.

The food system can also produce less than ideal social outcomes, including limiting access to affordable, nutritious food.

The Foundation funds research that identifies the challenges and maps out solutions to help secure the food systems upon which we depend.

The Foundation's support is focused on:

- Research to better understand the issues threatening the security, health and sustainability of the food system.
- Evidence-based solutions and pathways to a secure, healthy and sustainable food system.
- Research and demonstration projects that influence or produce food system security, health and sustainability outcomes.
- Demonstration of more sustainable, low-carbon urban agricultural approaches.

Challenge

Demand is increasing, supply is constrained while social and environmental impacts grow.

The critical challenges of food system sustainability and security of supply are increasing across Victoria, Australia and internationally.

Food systems impact the environment in a variety of ways, including biodiversity loss, natural resource consumption, soil degradation, greenhouse gas emissions, water use, aquatic environment contamination and waste at all stages of the supply chain.¹

Food supply is extremely complex and vulnerable to dynamic environmental conditions, including climate change, the availability of arable land and water scarcity. At the same time, demand for food is increasing due to global population and income growth. Rising demand, coupled with supply constraints, will lead to greater food production vulnerabilities and higher prices.² An increasing global middle class, particularly in Asia, combined with the globalisation of food systems is changing Australia's agricultural profile – particularly, as demand for animal proteins increase.³

Melbourne is surrounded by a highly productive foodbowl that is a valuable source of fresh, healthy food for the city's population, and makes a significant contribution to the regional economy. Melbourne's foodbowl produces much of the community's food, with the potential to meet 41 per cent of the its food and 82 per cent of its vegetables, however, its capacity to meet the community's needs is decreasing due to urban sprawl and will be put under further pressure as the climate changes. As Melbourne grows to a predicted population of 7 to 8 million people by 2050, it will need at least 60 per cent more food, but it will have less land available to produce it.

Risks to Melbourne's foodbowl have been identified in relation to climate change, water scarcity, population growth, urban sprawl, food waste and farm viability. City foodbowls around Australia's other state capitals are unlikely to be able to meet deficits in Melbourne's fresh food supply, as they are facing similar pressures from population growth and urban sprawl.⁴

In addition to the food system security and sustainability challenges, disadvantaged groups are vulnerable to food price increases and are often less able to access affordable, nutritious food. Hunger is a growing problem in Australia, with over 4 million people experiencing food insecurity at some point and, within this cohort, 76 per cent are categorised as having very low food security.⁵

We need to find innovative land use and food system solutions to secure supply, reduce inequalities, while at the same time, managing the challenges of resource scarcity, biodiversity loss and climate change.

Our Response

Food systems, locally and across jurisdictions, need to increase their resilience to system shocks and reduce dependence on more distant food sources. There is a need to better understand the issues and opportunities, while advocating for relevant market and regulatory responses.

At the local level, farmers in Melbourne's foodbowl have the potential to play an increasingly important role. However, assistance is needed across a range of areas, including: farmland protection, farm viability, water access, nutrient recycling and sustainable farming.⁶

The Foundation is strengthening the resilience and sustainability of food systems, with a focus on Melbourne, as pressures from urban sprawl, climate change and volatility in the global and national food system increase.

Strategic research that highlights the vulnerabilities of Greater Melbourne's food system and maps out pathways to more socially and environmentally sustainable practices will help secure the food systems upon which we depend.

The Foundation's support is focused on:

- **Research to better understand the issues threatening the security, health and sustainability of the food system.**
- **Evidence-based solutions and pathways to a secure, healthy and sustainable food system.**
- **Research and demonstration projects that influence or produce food system security, health and sustainability outcomes.**
- **Demonstration of more sustainable, low-carbon urban agricultural approaches.**



OUTCOME 4



Protected and rehabilitated aquatic eco-systems.

Aquatic eco-systems are impacted by a very wide range of threatening processes, including the changing climate, competing land uses, invasive species and pollution from various sources, including litter - especially plastic and microplastics.

We are improving our understanding of aquatic eco-system health, reducing adverse human impacts and restoring damaged eco-systems.

Reducing adverse urban impacts on our waterways and bays will help us meet the needs of a growing population as well as the environment - on which we and many other species depend.

The Foundation's support is focused on:

- Communication, citizen science and education activities that demonstrably reduce aquatic eco-system impacts.
- Development of new technologies that reduce adverse urban impacts or support eco-system health.
- Research that improves our understanding of aquatic eco-system health, threatening processes and management strategies.

Challenge

Meeting the needs of a growing population while protecting aquatic eco-systems.

We need to meet the water consumption needs of our growing population, projected to reach 10.1 million people by 2051 as well as meeting the needs of the environment, which ultimately supports all life, including our own.

Our waterways and bays supply eco-system services, recreational opportunities and support a variety of residential, agricultural and industrial uses. They also provide habitat to more than 12,000 plant and animal species, many of which are not found anywhere else. However, these environments face significant challenges, due to urbanisation, various land uses, commercial and recreational fishing, invasive species the changing climate and population growth.

The Yarra River and Port Phillip Bay Report Card monitors the health of the bay and its catchments. Samples from 102 catchment sites and eight marine sites in 2016 were assessed. 40 per cent were under 'considerable stress' or 'severe stress'.

Aquatic eco-systems are impacted by pollution from various sources, including industry, treatment plants, runoff and waste streams - a significant pollutant is the increasing amount of litter, which affects coastal and marine eco-systems. Approximately three-quarters of the debris found along the Australian coast is plastic and coastal waterways are now threatened by microplastics and nanoparticles, which are largely unregulated and whose effects are poorly understood.

While rainfall is variable and normal cycles are driven by phenomena such as El Niño, La Niña, and the Indian Ocean Dipole, long-term trends show a shift towards drier conditions across south-eastern Australia. There has been a decline of around 11 per cent in April to October rainfall in the last 20 years and streamflow has decreased. These trends are expected to continue as a result of climate change, which is increasing pressure on many of Victoria's waterways.

There are many information gaps regarding eco-system health, threatening processes and management strategies. There is a need to address these gaps and influence relevant responses from policy makers, industry and the community.

Our Response

Lord Mayor's Charitable Foundation is improving its understanding of aquatic eco-system health, reducing human impacts and restoring damaged eco-systems. This will help meet the needs of a growing population as well as the environment - on which the community and many other species depend. The Foundation is focused on Victorian, particularly Melbourne's, waterways and bays.

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- **Development of new technologies that reduce adverse urban impacts or support eco-system health.**
- **Research that improves our understanding of aquatic eco-system health, threatening processes and management strategies.**

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Learn more about the issues affecting our community

Our [Greater Melbourne Vital Signs Report](#) provides a snapshot of the health, wellbeing and vitality of Greater Melbourne.