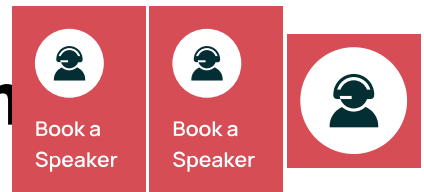


25 Jan 2022

Net Zero, Climate Change and Sustainability



Understanding the climate emergency



Understanding the climate emergency

The climate emergency is the defining challenge of our time. Mitigating its effects and preparing to meet its consequences as best we can are key to our continued survival on this planet.

Yet, many people are confused by some of the basics around climate change. At ICMI, we believe knowledge is power, so we've put together this article to help you understand the climate emergency better. We also have the leading [environment and climate change speakers](https://www.icmi.com.au/speaker/environment-climate-change/) (<https://www.icmi.com.au/speaker/environment-climate-change/>) to present at your next event or lead your next workshop, which we wrote a detailed article on [here](https://www.icmi.com.au/blog/australias-top-keynote-speakers-guest-speakers-and-experts-for-your-next-climate-centred-event/) (<https://www.icmi.com.au/blog/australias-top-keynote-speakers-guest-speakers-and-experts-for-your-next-climate-centred-event/>).

What does net zero emissions mean?

The media spotlight at the Cop26 conference in Glasgow recently has many asking themselves what exactly net-zero emissions is, and how can we get there?

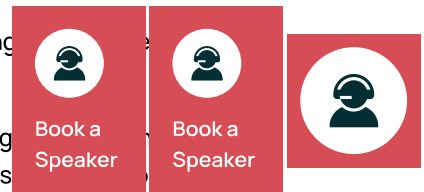
In essence, net zero emissions means that countries bring into balance their emissions outputs and the amount of carbon they can remove or store from the atmosphere.

This is often done through various carbon offsetting actions, which have long been popular with individuals and businesses.

For instance, when purchasing an aeroplane ticket, an option is usually presented to offset the carbon created by the flight. The money paid for this upgrade is then handed on to an organisation specialising in carbon offsets, which might use it to plant trees or fund renewable energy projects around the world.

Countries must now do this on a global scale. It's a difficult balancing act as many countries are struggling to get right.

Net zero as a concept is not the same as zero. Net zero carbon energy means that the carbon produced is offset in various ways. In contrast, zero energy production would emit no carbon in the first place.



There are many terms used in the conversation around climate change that might be hard to understand. Some of those used most frequently include:

Carbon neutral: this is, in essence, the same as net-zero emissions. Emissions (in this case, carbon dioxide) created are offset.

Carbon positive: this can refer to an organisation or building that not only emits no carbon but produces clean energy to feed back to the grid, for instance, from solar panels. It can also refer to companies or individuals that have achieved carbon neutrality by offsetting their all-time emissions, and going one step further to sequester more carbon than they have ever emitted.

Carbon negative: this is when more greenhouse gases are removed from the atmosphere than it would take to offset the relevant organisation or individuals carbon creating activities.

These terms can be confusing, but they can be broadly broken into three categories: Neutral, the exact amount of carbon created is offset; positive, additional energy is produced; and negative, more carbon is removed than created.

Achieving net zero

The most effective way of meeting net zero goals in Australia and around the world is by drastically reducing the amount of greenhouse gases released into the atmosphere. While effective, this approach poses some logistical challenges.

Modern life, especially in large cities, is emissions heavy. Energy production, transport and food are among the essential areas that create significant emissions.

The challenge is to lower these emissions without compromising dramatically on the quality of life that has been enjoyed over the last several decades.

Instead, many countries, including Australia, are looking to lower emissions where possible and use carbon capture and storage technology to support ambitious net zero goals. However, this technology is young, and there have been limited trials as to its capability in the real world.

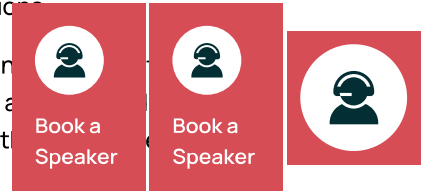
Natural carbon sinks, which capture and store carbon from the atmosphere, exist in the form of forests, peatlands and glaciers. Many of these naturally occurring carbon sinks are being destroyed, and even if technology could reproduce them on a global scale, they are often unstable sources of carbon storage.

Climate change

What is climate change?

Broadly, climate change is the term given to the heating of the Earth's atmosphere. While a natural phenomenon, anthropogenic activity since the industrial revolution has accelerated this natural process and pushed the Earth's limitations.

The result is severe changes to the Earth's climate, with some regions getting warmer while others get colder. This will have severe impacts in some areas and less severe impacts in others; overall, climate change is detrimental to the health of the planet and threatens the existence of humans as a species.



Ice and glaciers are melting earlier into the summer seasons or disappearing entirely. Critical heating and cooling currents in the ocean are being disrupted, which in turn is negatively impacting fish and mammal migration patterns.

Plants are blooming earlier, insects are dying, and more extreme weather events are becoming more frequent. The oceans are acidifying, and snow cover in mountain ranges around the world is receding.

Another effect of climate change is warming oceans. Warm oceans not only exacerbate the melting of ice sheets and glaciers, but warm water also expands. Both of these phenomena will lead to sea level rise, which will have catastrophic impacts on coastal communities around the globe.

This cycle will also continue to drive climate change. Glaciers and ice sheets, particularly in the far north and south of the planet, are critical carbon stores, meaning carbon is trapped within the ice. As this ice melts, the carbon is released, and the entire process of warming-melting-carbon release becomes a vicious cycle.

Humanitarian crises are also affected by climate change. Warming temperatures, sea level rise and more extreme weather, including fire, flood and storms, will make parts of the planet uninhabitable. Communities living in affected areas will be forced to flee their homes.

Causes of climate change

It is almost universally acknowledged that climate change is driven by human activity. Greenhouse gas emissions consisting of carbon dioxide, methane, nitrous oxide, ozone, as well as synthetic hydrofluorocarbons and chlorofluorocarbons are expelled into the atmosphere by many human activities.

Burning fossil fuels like coal and oil for energy is one of the biggest contributors to climate change.

The destruction of forests and rainforests and the increased consumption of red meat, particularly beef, also have significant impacts.

Climate change in Australia and its impacts

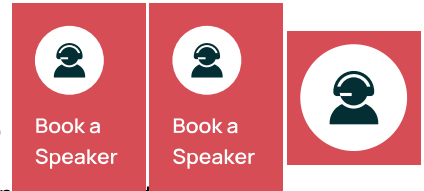
Per capita, Australia is among the world's top greenhouse gas emitting countries. The Australian Climate Change Authority notes that in December 2015, 415 parts per million of atmospheric carbon dioxide were measured. This figure is the highest ever recorded and is higher than at any point in the last 800,000 years.

The Bureau of Meteorology reports that the ten years between 2011 and 2020 have been the hottest on record.

The Australian climate emergency is well and truly underway. The Intergovernmental Panel on Climate Change (IPCC) projects that even warming of 1.5 degrees celsius worldwide will double the frequency of droughts. Particularly for rural and remote areas of Australia, this change will be catastrophic. Another half a degree more, and droughts will become 2.5 times more frequent.

Drought frequency at this level will make parts of rural Australia close to uninhabitable.

With significant amounts of Australia's food production happening in regions that will be affected, the Australian climate emergency will affect all Australians, not just those living on the frontlines of climate change.



What can we do to stop climate change?

Significant changes will need to be made in Australia and other countries to meet the net zero emissions targets agreed to at Cop26 in Glasgow. Critically, coal, oil and gas deposits need to remain in the ground. This would mean moving the energy grid away from these fossil fuels and using renewable energy sources such as solar, wind and hydro.

Net zero and sustainability go hand-in-hand. In light of the stark warnings from climate scientists about the impending effects of the climate crisis, there can be no true sustainability without a net zero emissions energy system.

There are plenty of things everyday Australian's can do to support our planet, but their impacts are minimal. Some examples include:

- Write to your local representative to express your support for climate-friendly policies
- Switch to a plant-based diet, or cut back significantly on beef and dairy
- Walk, cycle or opt for public transport wherever possible
- Buy second-hand, borrow and repair your goods wherever possible

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Climate change vs global warming – what's the difference?

These terms are often used interchangeably, but there is a difference in their meanings. Global warming refers to the warming of the planet since pre-industrial times (1850 – 1900), primarily due to the burning of fossil fuels for energy.

Climate change refers more broadly to all actions and events, both anthropogenic and natural, that have led to changes in the Earth's climate. This is one reason why contextually, climate change is often referred to as anthropogenic climate change.

Deforestation and climate change

Deforestation is a key driver of climate change. Trees are important carbon sinks, meaning they remove and store carbon from the atmosphere. When trees are destroyed, the carbon stored is released back into the atmosphere. A popular form of carbon offsetting is planting trees.

However, as far as a carbon offsetting strategy goes, this may not be the best option.

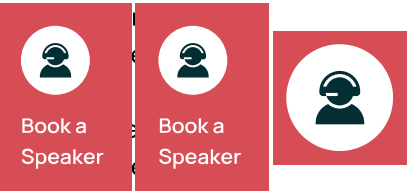
Trees are part of a short and stable carbon cycle, as they naturally go through the process of growing and storing carbon and then decaying and releasing carbon.

625

This is in contrast to fossil fuels, which are naturally stored deep below the Earth and store significant amounts of carbon in a stable manner. The Climate Council of Australia claims that it is unlikely that the carbon stored in fossil fuels would ever enter the atmosphere without human intervention.

Using tree planting to offset carbon dioxide emissions from fossil fuels creates an imbalance. A stable source of carbon storage is being disrupted and replaced with an unstable source of carbon storage. Not only is this unbalanced, but it also carries risks.

The effects of climate change stand in direct contrast to the conditions trees and forests thrive in. Increased drought, fires, floods, storms, and other extreme weather events are all likely to negatively affect trees. Trees destroyed by the impact of climate change will release more carbon dioxide into the atmosphere. Much of the carbon stored in trees is released when melting glaciers release carbon leading to more melting glaciers, hence perpetuating the cycle.



Deforestation is also linked to biodiversity loss, another threat to human wellbeing and prosperity, and one directly affected by climate change. Changes in biodiversity affect many elements of the climate. Loss of trees, for example, not only expels carbon into the air but leads to erosion, rising water tables and is also linked to more nitrogen run-off into waterways. This can lead to toxic algae blooms and dead zones.

Australia's climate actions in light of the climate emergency

Australia is a signatory to the Paris Agreement, which saw 192 parties pledge to reduce their emissions to limit global warming to below 2 degrees this century and ambitiously aim to limit global warming further to 1.5 degrees to mitigate the climate emergency.

Australia has also signed the final communique at Cop26 in Glasgow, the Glasgow Climate Pact, committing itself to achieving net zero carbon emissions by 2050. Notably, the final Glasgow Climate Pact includes a clause that countries will phase down coal production.

Despite these commitments and the Australian climate emergency's impacts already being felt around the country, Australia is not on track to achieve these aims.

Australia also refused to sign on to a pledge to reduce methane emissions by 30 percent by 2030. Methane is a potent greenhouse gas, which over a 100 year period warms up to 34 times more than carbon dioxide.

Many different human activities produce methane. Most infamously, it is burped out by cows. More impactfully, it is emitted by gas and coal mining.

Australia's emissions reduction strategy relies heavily on investing in and developing innovative technology that will lower emissions and partnering with other countries to reduce the cost of these technologies. Australia aims to deliver and deploy these technologies at scale and reach cost parity with higher emitting existing technologies.

Australia has come under fire for its climate actions. At Cop26, countries were expected to bring more ambitious targets for emissions reductions by 2030 to the table. Failing this, as Australia did, they were asked to revisit and re-address. Shortly after the Glasgow conference ended, the Morrison Government announced it had no plans to change its 2030 targets.

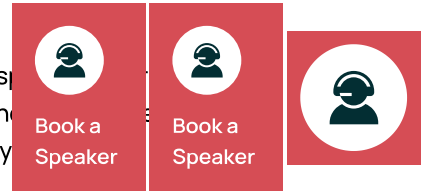
These actions were met with disappointment, especially as the bushfire season of 2019 and 2020 showed the world how severe the Australian climate emergency is becoming.

As shown by the government's own modelling, the targets set out by Australia will be insufficient to tackle the climate emergency and keep global warming to below 1.5 degrees Celsius. The government's modelling is in line with warming of 2 degrees.

Cop26 is not the first time Australia has come under international fire for its climate actions. In 2013 the Abbott government dissolved the Australian climate commission, an organisation tasked with providing up to date and trustworthy information about the Australian climate emergency to the public.

Many of the scientists who lost their jobs due to this went on to form the Climate Council, an independent organisation with the same aims.

In stark contrast to the Australian Government's underwhelming response, other countries have set significantly more ambitious targets. Uruguay and Costa Rica, for example, have both committed to reaching net zero emissions by 2050.



Sustainability

What exactly is sustainability?

The United Nations define sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". It refers broadly to a balance between environment, economy and human welfare.

A key to achieving global sustainability is finding sources of renewable energy. The benefits of renewable energy are that, unlike finite fossil fuels, renewable energy is an unlimited resource and can power societies across the globe with little to no negative climate impacts. Australia and other countries can only achieve climate change sustainability by transitioning to a mix of renewable energy types.

Types of renewable energy

There are many types of renewable energy being used around the world. Renewable energy in Australia is typically created using solar, hydro and wind technology. The benefits of all renewable energy sources are that they produce little to no carbon.

Is solar energy renewable?

Solar energy is a completely renewable form of energy. As long as the sun continues to exist, the right solar technology will be able to harness its heat and warmth using either solar photovoltaic technology, which converts sunlight directly into electricity or solar thermal technology. Solar thermal technology converts sunlight into heat.

Is nuclear energy renewable?

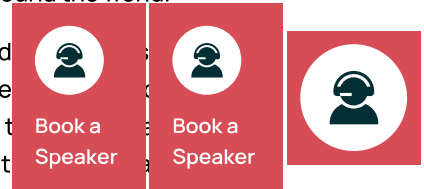
This is a question that has stirred up many debates. Some argue that nuclear energy should be considered a renewable form of energy because of the minimal emissions created. Others believe that because nuclear energy production relies on uranium, which is a finite resource, nuclear energy should not be considered renewable.

Its status as a renewable energy source is not the only source of controversy surrounding Nuclear Energy. Some futurists in Australia are heavily pro-nuclear. Others believe that transitioning towards nuclear energy is playing with fire and that the risks greatly outweigh the benefits. Nuclear energy production leads to nuclear waste, which is highly radioactive and must be disposed of with great care.

Sustainable development and its intersection with climate change

The goal of sustainable development is for all humans to live in prosperity within planetary boundaries. The United Nations has developed 17 sustainable development goals, which, if achieved, would lead to sustainable development around the world.

Climate change and sustainable development are intrinsically linked. Climate change makes sustainable development more difficult. As life becomes increasingly challenging in many parts of the world and people are forced to flee their countries, many vital elements of the UN's sustainable development goals are being put on the wayside.



Many of the sustainable development goals relating to quality of life will be harder to achieve for individuals forced into a transient existence.

The role of events

Climate change is an international emergency. While it can be a daunting process, everyday Australians and businesses must have the opportunity to learn about the individual and collective actions that they can take and how to work towards climate-friendly outcomes on a systems level.

Events are a great way to do this. ICMI has sustainability speakers well-versed in topics such as climate change and biodiversity loss. From global futurists, Australian business economists to activists and strategists, there are plenty of speakers out there who will inspire and empower audiences.

A top pick is [Laureate Professor Veena Sahajwalla](https://www.icmi.com.au/laureate-professor-veena-sahajwalla/). Veena was New South Wales' 2021 Australian of the Year, and with her focus on sustainable production and manufacturing, her work has relevance across all economic sectors. She has pioneered innovative recycling methods, including turning tyres into steel and textile and glass into hard ceramics for floors and walls.

Veena is just one of many impactful options.. view our full range of [Environment and Climate Change](https://www.icmi.com.au/speaker/environment-climate-change/) speakers below:

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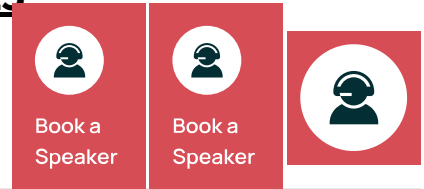
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