Emissions Reduction Fact Sheet – Climate Change

Global climate change is affecting all facets of life and can lead to an increase in the frequency and intensity of natural disasters such as bushfire, flooding and extreme heat. These events can detrimentally affect our built environment and the reliability of infrastructure, potentially leading to displacement and poverty, impacts to our health and wellbeing, and damages to our natural environment.

1. The Greenhouse Effect

Earth's atmosphere contains greenhouse gases (GHG's), such as carbon dioxide, methane and water vapour, that act like a blanket around the planet, trapping heat close to the Earth's surface. When the sun shines, our atmosphere captures the sun's energy to keep the planet warm. This process is known as the Greenhouse Effect.

Some of these GHG's are naturally occurring, in perfect balance to support our natural ecosystems and planet's biological cycles. However, since the 1800s and onset of the Industrial Revolution, the accumulation of greenhouses gasses in the atmosphere has rapidly increased.

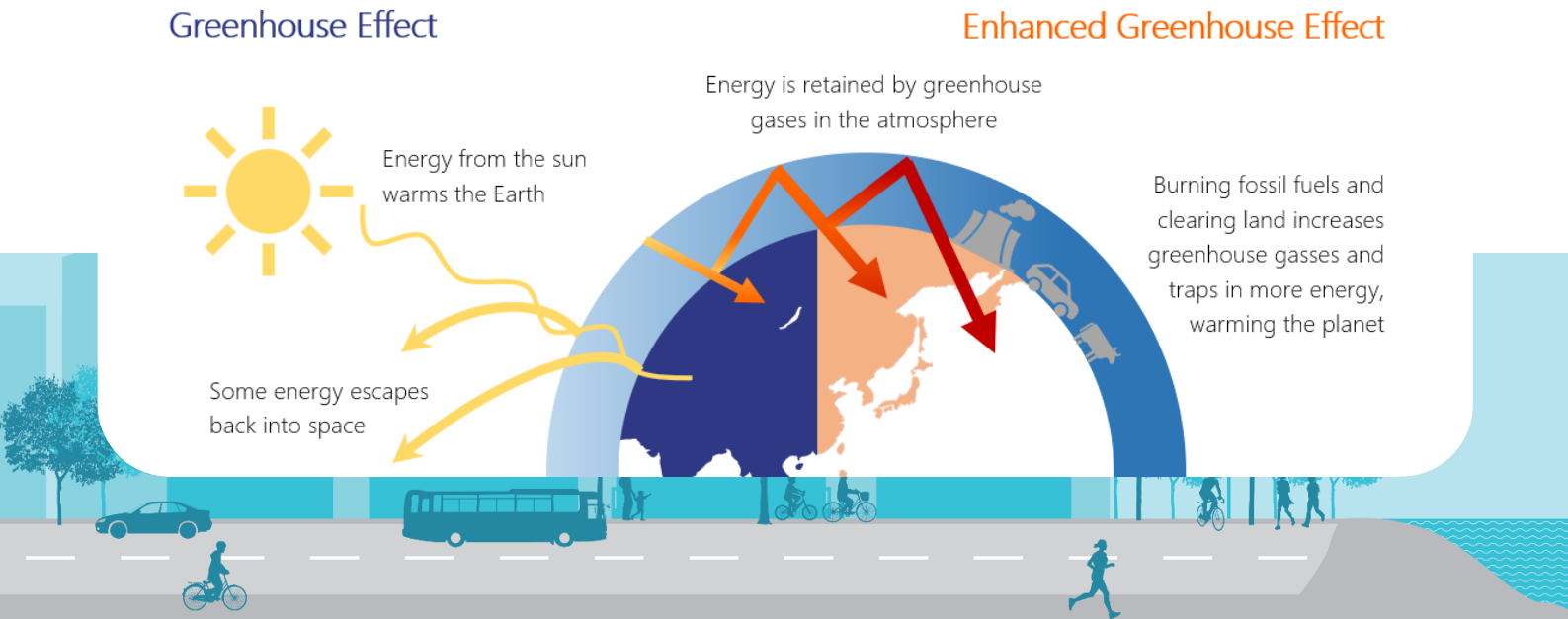
Additional GHGs continue to warm the planet, disrupting natural process and cycles, which cause natural disasters and extinction of animals and plants. This in turn impacts food production and universal access to clean water, leading to poverty and displacement and impacting health and wellbeing.

2. Activities and Emissions

Elements of our climate naturally vary over decades, but today we are experiencing unprecedented rapid warming caused by human activities. This is primarily caused by the burning of fossil fuels, such as coal, oil and gas that generate GHGs.

For example, using gas and oil for transport and heating buildings, or burning coal to generate electricity. Landfills and agriculture are also major sources of methane emissions, activities which have significantly expanded with industrialisation.

Trees and oceans naturally sequester carbon from the atmosphere. Clearing land for development and agriculture therefore contributes to an increased accumulation of GHG emissions. As oceans sequester carbon, sea temperature increases, resulting in loss of sea life and the melting of polar ice caps, which contribute to rising sea levels that flood and submerge low-lying land areas.



3. Global GHG Concentrations

Concentrations of all the major long-lived greenhouse gases in the atmosphere continue to increase, reaching 516 ppm (CO_2-e) in 2021, the highest levels on Earth in at least two million years.

4. Australia's Climate

Australia's climate has warmed on average by 1.47 degrees Celsius since national records began in 1910, leading to increased dangerous fire weather days and subsequent bushfires. Winter rainfall has been declining in the Southern parts of Australia by up to 19 percent since the 1970s, however the intensity of extreme rainfall events has increased by around 10 per cent or more in recent decades, particularly in the Northern parts of the country.

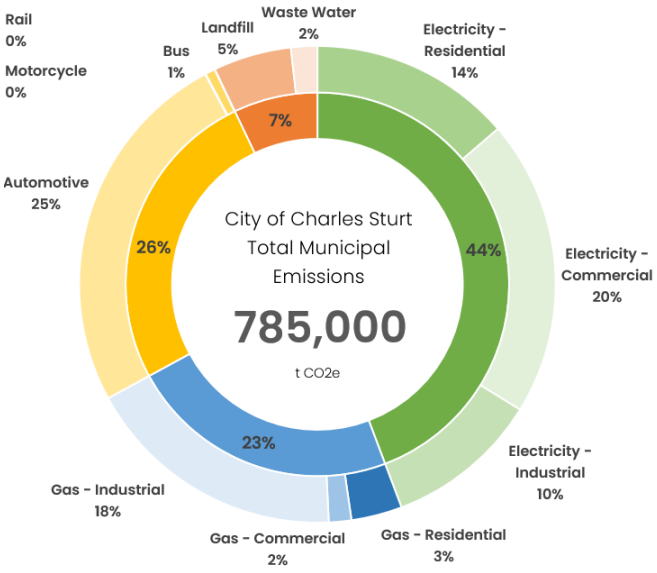
5. Australia's Achievements

Since 2009, Australia has decarbonised its economy by an average of 12 $MtCO_2$-e per year. In 2022 the Australian Government increased its commitment under the COP21 Paris Agreement to reduce emissions by 43% below 2005 levels, as well as committing to the goal of achieving net zero emissions by 2050, enshrined in the Climate Change Act 2022. More than 73 countries and over 175 of the world's largest private companies have committed to net zero emissions by 2050. Australia has also signed the Global Methane Pledge to collectively reduce global methane emissions by 30% by 2030.

6. City of Charles Sturt Emissions Profile

The majority of emissions within CCS are associated with electricity and gas consumption and passenger vehicles, estimated at 6.4tCO_2-e per person annually.

As a result of the decarbonising of the electricity grid already underway, through expansion of renewable energy and green hydrogen and transition away from gas, CCS emissions are predicted to decline. Further reduction in waste to landfill and switching to sustainable transport options (e.g., EVs, cycling) has the potential to reduce council wide emissions by 47% by 2030, from 785,000 to 415,000tCO_2-e annually, or 3.4tCO_2-e per person per year.



More Resources

CSIRO State of the Climate 2022
https://www.csiro.au/en/research/environmental-impacts/climate-change/state-of-the-climate

Climate Council
https://www.climatecouncil.org.au/

Refer to the series of Emissions Reduction Fact Sheets by CCS for actions the community can take to contribute to a positive climate impact.

Potential 2030 Targets

- Transition to 100% renewable electricity
- Reduce waste to landfill emissions by 15-30%
- Reduce transport emissions by 20%
- Reduce household gas connections to 25%