

# CLIMATE CHANGE

causes, consequences  
and solutions:  
an Australian  
perspective



# Causes, consequences and solutions to climate change: an Australian perspective

The natural balance of greenhouse gases (GHG) has been disturbed by industrialisation and land clearing, causing the Earth to warm at an unnaturally fast rate.

As the mean global temperature rises, more frequent and extreme storms, floods, droughts, heat-waves and wildfires occur. The oceans warm and ice packs melt, causing sea level rise.

People's physical and mental health will be at risk, as well as their incomes and livelihoods. The poor will be most vulnerable.

If global warming exceeds 1.5°C, methane emissions from melting permafrost, die-off of forests and reduced carbon absorption by oceans could lead to runaway climate change. (The warming potential of methane is 86 times higher than CO<sub>2</sub> when averaged over 20 years.)

To avoid this situation, **man-made emissions of greenhouse gases must cease as quickly as possible.**

If global GHG emissions are reduced to **net zero by 2033**, there is an 83% chance that global warming will not exceed 1.5°C. A **1-in-5 risk of exceeding 1.5°C** remains – a grossly unacceptable risk to humanity.

To date, climate risk has been ineffectively assessed and addressed by governments and organisations, impeding action to reduce emissions and build resilience.

Businesses and communities are exposed to 'long-tail' and cumulative risks that far exceed traditional standards of risk acceptance.

In the longer term, inaction will lead to the collapse of economies, communities and ecosystems. **Short-term inaction imposes its own 'carbon tax'** as investors and insurers shun fossil fuels and nations apply cross-border carbon tariffs.

Action to mitigate climate change will be costly but **new jobs and industries will be created.** The sooner action is taken, the less costly and disruptive it will be.

Positive and ambitious leadership is required to create the technologies and transition pathways that sustain hope, livelihoods and economies.

**Many solutions already exist.** With a solution-focused, 'can do' mindset, rapid progress can be made. We cannot rely on future technologies to save the day.

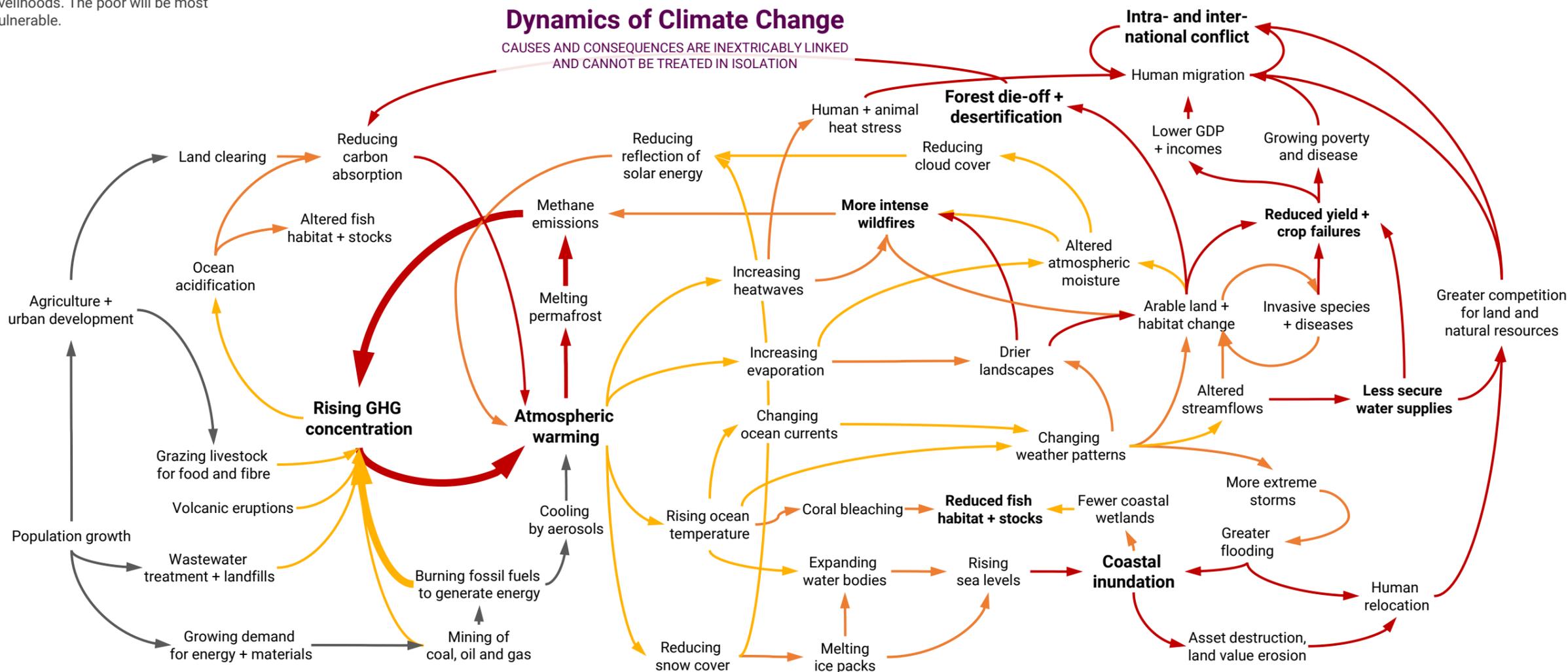
Governments, businesses and communities must collaborate to achieve a just and cost-efficient transition to a sustainable economy. Vulnerable communities and workforces must be supported through the clean energy transition.

**Governments must anticipate and lead changes** to policies, plans and regulations, ensuring the transition is well guided, unimpeded, and builds public trust and confidence.

Publicly-available data and reports must track progress, focus action, and maintain accountability against national and sub-national targets. Businesses should also be accountable for their climate action pledges.

## Dynamics of Climate Change

CAUSES AND CONSEQUENCES ARE INEXTRICABLY LINKED AND CANNOT BE TREATED IN ISOLATION



### AUSTRALIAN EMISSIONS PROFILE (2019)

51%	Power generation
18%	Transport
11%	Fugitive emissions
9%	Agriculture
6%	Industry (cement, chemicals, etc)
3%	Land use change
2%	Waste emissions

### SUGGESTED REFERENCES

- IPCC (2021) Climate Change 2021: The Physical Science Basis
- Alan Finkel (2021) Getting to Zero: Australia's energy transition
- Ross Garnaut (2019) Super-power: Australia's low carbon opportunity

### TECHNOLOGY MISSIONS

A shift in political will and the flow of finance to climate-smart solutions is necessary but insufficient. Finance needs practical solutions. **New and better technologies, deployed at scale, are essential.**

The public, private and R&D sectors must partner in climate-smart 'missions' to develop, build demand for and deploy climate-smart products and services.

### RENEWABLE ENERGY

Fossil fuels must become obsolete. **A rapid escalation in renewable energy is critical.** Plentiful, clean and affordable energy is the precursor for solutions to many other global challenges.

The cost of energy will reduce over time, making manufacturing and industry cheaper and greener. Green steel, aluminium and fertiliser will be valuable commodities.

### HYDROGEN FUEL

**Hydrogen must replace natural gas as a reliable, portable fuel.** It can fuel heavy vehicles for freight and industry, and become a valuable export commodity.

Export income must be diversified beyond current commodities to sustain income, tax revenues and government spending. Without it, public support for the transition may wane, which would be self-defeating.

### CIRCULAR ECONOMY

Exporting clean energy enables carbonless growth and helps other countries reduce their emissions.

Dirty industry must not be exported but cleaned up. We must create a circular economy, reducing wastage of food, resources and products and the energy required to produce, transport and dispose of them. **'Simplification' is key to all aspects of the shift to a sustainable society.**

### RELIABLE POWER

**The power grid must be integrated** to connect distributed sources of energy generation and battery storage, ensuring reliability of supply. Physical batteries and pumped hydro systems can provide the temporary energy storage.

GHG emissions must be actively removed from the atmosphere. We cannot rely on mechanical carbon capture and storage. It is unproven, expensive and difficult to deploy at the pace and scale required.

### RESILIENT LANDSCAPES

Deforestation must cease, with revegetation restoring the integrity, biodiversity and resilience of landscapes to a changed climate, while protecting and enhancing the valuable ecosystem services they deliver to society.

**Farmers must capture carbon in soils and by land revegetation,** improving agricultural productivity, biodiversity and income streams.

### GREEN CITIES

**Passenger and light freight vehicles should be electrified** (and provide temporary energy storage), fuelled by renewable energy via a national network of charging stations. Public transport should be made more safe, efficient and accessible.

Building standards should be updated to drive more energy efficiency and co/tri-generation solutions that reduce energy demand and build resilience.