

Kupu Arataki – Introduction to Climate Change

Human activity has impacted significantly on the Earth's atmosphere. There is evidence of climate change effects, including raised temperatures and sea levels and increased frequency of extreme weather events. The occurrence of these changes is projected to become more pronounced in the future and poses a serious threat to long-term community wellbeing.

How could climate change affect us in Rotorua?

Changes to our climate could mean:

- Higher temperatures
- More heavy rainfall events and more frequent flooding
- Water shortages, reduced water quality and increased risk of wildfires
- Longer crop growing season and fewer frosts
- Increased risk of invasive pests and weeds
- Increase in water-, food- and vector-borne diseases

What is being done about it?

NZ was one of 195 countries that signed the Paris Agreement in 2016, committing to “holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C”. To achieve this, the world must transition towards a low carbon economy by the second half of this century, i.e. a reduction in global greenhouse gas (GHG) emissions of 60-80% by 2050. If we don't act, global warming is expected to reach 4.1°C – 4.8°C above pre-industrial levels by 2100.

Taking action to cut emissions (mitigation) is the priority to reducing future global warming. However, we also need to take actions to adapt to the impacts of the climate change that is already happening.

The NZ Government has a range of initiatives they are seeking to introduce to help us transition to a low emissions economy and reduce the impacts of climate change:

- Zero Carbon Bill – will aim to reduce emissions to net zero by 2050
- Emissions Trading Scheme - key policy tool to reduce emissions and meet our emission reduction targets
- Investment in Research and Development to identify options to reduce agricultural emissions
- Offsetting emissions through forestry
- International Carbon Markets Project

Rotorua Lakes Council has responsibilities to prepare the community for and manage the risks of climate change related natural hazards. It is our role to assess these risks and how we can best respond to the challenges and opportunities presented by climate change. Adaptation for climate change is already a priority consideration in the planning and management of our infrastructure.

Mitigation through energy efficiency, emission reduction and other conservation initiatives can help slow the effect of climate change, as well as offer considerable potential cost savings.

Rotorua Lakes Council in its community leadership role, has committed to the UN Global Compact- Cities Programme in 2015 and developed the Sustainable Living Strategy in 2016. Climate change is a key objective of that strategy.

The goal is for Rotorua to:

- be well-positioned for upcoming changes in a low-carbon economy
- ensure a resilient community adapting to the changes in climate which may be unavoidable, presenting both challenges and opportunities

In 2018 Council committed to the Global Covenant of Mayors for Climate and Energy. Since then Council has undertaken a GHG inventory (carbon footprint) of its corporate GHG emissions and has worked with Bay of Plenty Regional Council to develop a footprint of the wider Rotorua district emissions. We have also undertaken a climate risk and vulnerability assessment.

Council is already active in addressing issues around climate change-

- Preparing for and responding to increasingly severe weather events through Civil Defence
- Designing storm water systems for to cope with increased rainfall
- Reducing energy use and operating costs through changes in heating of the Civic Building from natural gas to geothermal
- Developing facilities and promoting cycling and walking active transport
- Reducing waste to landfill through increased recycling, including kerbside collection
- Encouraging composting and worm farms for home green and food waste
- Replacing a petrol council vehicle with 4 e-bikes, purchasing an electric vehicle and installing an electric charge station in the fleet car park
- Providing households with independent home performance advice through Sustainability Options

Council is one part of the community but to be effective we need to work with a wide range of others towards the goal of our community being climate resilient.

To develop a Rotorua Climate Change Action Plan we will be talking with our community about:

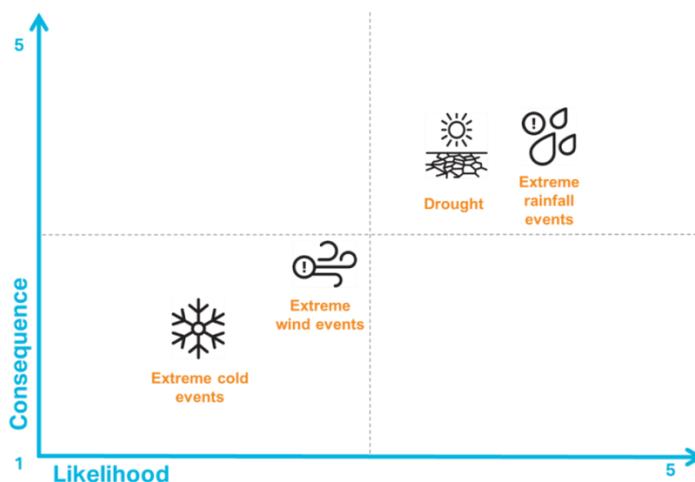
- The risks our district faces from climate change
- Planning how we can adapt to the changing climate
- Identifying opportunities for emission reductions and setting emissions targets.

Te Panonitanga o te Huarere - How Our Climate Is Changing

It is accepted internationally that the climate is changing as a result of greenhouse gases (GHG) already emitted into the atmosphere from human activity. The extent of this change depends on how the planet responds to increased GHG and to the amount of GHG that continues to be emitted.

To ensure that Rotorua's climate change action planning is in-line with other national, regional and district level plans across New Zealand, climate projection data has been drawn from the Ministry for the Environment (MfE) report 'Climate Change Projections for New Zealand'¹ and the National Institute of Water & Atmospheric Research (NIWA) report 'The climate and weather of Bay of Plenty'². In-turn, these reports draw from the global climate models developed by the Intergovernmental Panel on Climate Change (IPCC) in their Fifth Assessment Report (AR5).

Likelihood and consequence ratings of the risks associated with each hazard in 2040, derived from climate change risk assessment.



Over the next 70 years we expect climate change to result in:

- more frequent and intense extreme rainfall and extreme wind events
- a greater number of days with over 25mm of rainfall
- more frequent and longer-lasting droughts
- higher than average temperatures with more days reaching a temperature above 25°C
- a greater chance of extreme forest fire danger days and
- a reduced number of days where temperature drops below 0°C

Challenges and opportunities of a changing climate

A changing climate will present a range of challenges and opportunities, creating a need for diverse and innovative solutions. Identifying these solutions will be important for ensuring that in the long-term the district's wealth of natural assets and strong tourism reputation are protected and our community needs are adequately met.

¹ Ministry for the Environment (2018). Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment, 2nd Edition. Wellington: Ministry for the Environment.

² NIWA (2013). The climate and weather of Bay of Plenty. 3rd Edition.

No single action or organisation can comprehensively address our climate adaptation needs. We will develop a variety of complementary actions to be undertaken across short and medium timeframes with a focus on collaboration and partnership with other stakeholders and members of the Rotorua and wider Bay of Plenty communities.

Te Urutaunga o te Taiao -Climate Adaptation

Climate adaptation describes the processes and actions required to adjust to the impacts a changing climate will have on infrastructure, the natural environment, people and their economic wellbeing.

The following adaptation themes are commonly used to identify key areas of focus to reduce community vulnerability to the impacts of climate change.

- Infrastructure- Our infrastructure can withstand, absorb and adapt to a changing climate
- People and Communities- Communities are prepared to respond and adapt to extreme weather events
- Natural Environment- Ecosystems services and ecosystem health are enhanced and continue to provide services
- Economy- Businesses are supported to be ready for the physical and transitional risks associated with climate change
- Governance, Leadership and Advocacy- Climate risk and opportunity is integrated into Council decision making.

Council is already active in addressing issues around climate adaptation, for instance:

- Preparing for and responding to increasingly severe weather events through Civil Defence
- Designing storm water systems to cope with increased rainfall

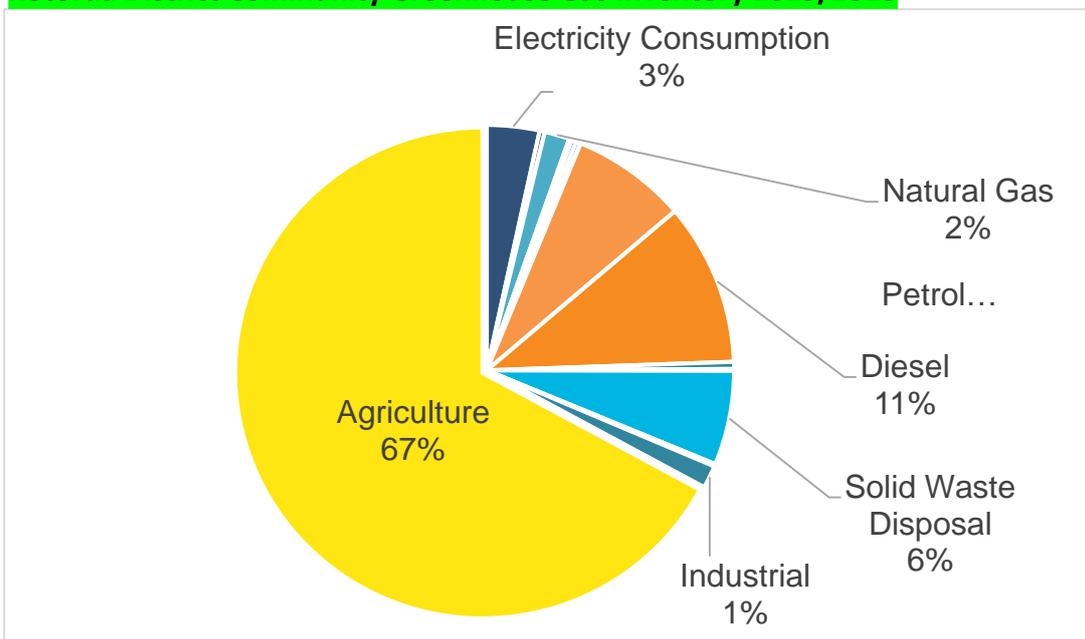
Ngā Whakaputanga Haurehu

Our Greenhouse Gas (GHG) Emissions

Rotorua completed its first district-wide community GHG inventory in 2017, providing a baseline of the emissions associated with various activities within our community – agriculture, forestry, transport, energy and industrial processes. This inventory calculated the GHG we emitted during the 2015/2016 financial year.

As a district we generated estimated net emissions (including forestry) of 1,541,673 tonnes of carbon dioxide equivalent (tCO₂e) for the year. Included in this net figure are carbon removals of 1,773,950 tCO₂e from exotic forestry and 46,185 tCO₂e from native forestry.

Rotorua District Community Greenhouse Gas Inventory 2015/2016



AECOM, 2018, Bay of Plenty Community Carbon Footprint 2015/16 – Final Results

https://www.rotorualakescouncil.nz/Rotorua2030/portfolios/sustainableliving/Documents/Sustainable_Living_020816/Bay%20of%20Plenty%20Community%20Carbon%20Footprint%202015%2016.pdf

As with many other regions in New Zealand, our top two main sources of emissions are our agricultural emissions (67%) and transportation (19%). Although we also have a large forest sink within the region, harvesting cycles mean that the effect on our overall emissions will be relatively neutral over a 50 to 100- year period.

The average per capita gross emissions for the Rotorua Lakes District are 21.0 tCO₂e/ person. The national average is 17.8 tCO₂e/ person and the regional average is 13.9 tCO₂e/ person. Emissions from agricultural and forestry activities within the district are responsible for most of the difference. However, Rotorua Lakes District has below national average per capita gross emissions for Stationary Energy and Industrial Products and Product Use emissions.

Te Whakataunga o te Huarere -Climate Mitigation

New Zealand's central government is proposing setting a net zero emissions target through the Climate Change Response (Zero Carbon) Amendment Bill to help NZ transition to a low emissions economy and reduce the impacts of climate change.

The Bill proposes setting NZ's greenhouse gas emissions reduction target to:

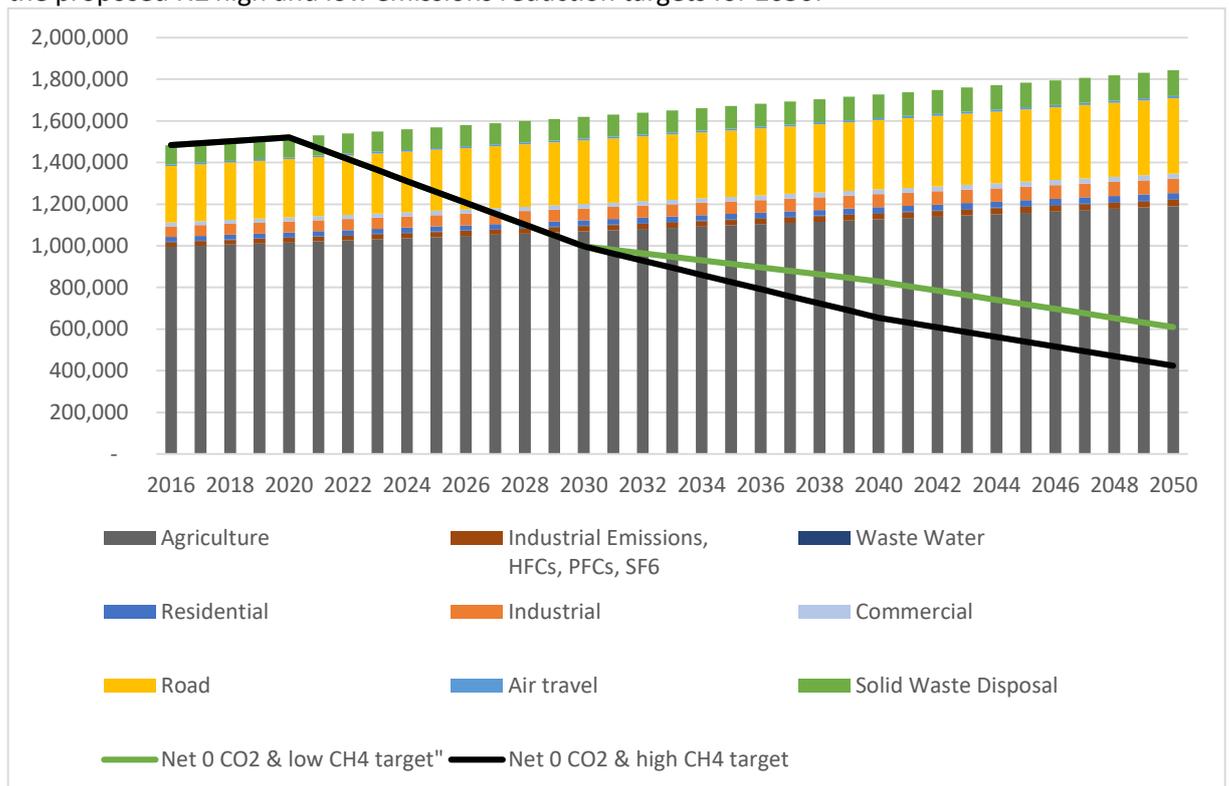
- Reduce all greenhouse gases (except biogenic methane) to net zero by 2050
- Reduce emissions of biogenic methane within the range of 24–47 per cent below 2017 levels by 2050 including to 10 per cent below 2017 levels by 2030

To put this target into perspective for Rotorua:

- In 2015/16 Rotorua's community net emissions were estimated at 1.5 million t CO₂e, of which approximately 700,000 t CO₂e resulted from biogenic methane (e.g. farm animals and waste treatment)
- Without any specific actions to reduce our emissions, these are expected to continuously increase reaching to up to 2 million t CO₂e by 2050.

Targets with current and targeted emissions

This table shows a breakdown of sector emissions expected without any specific actions, against the proposed NZ high and low emissions reduction targets for 2050.



Council is already active in addressing issues around climate change mitigation, for instance:

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- Reducing waste to landfill through increased recycling, including kerbside collection
- Encouraging composting and worm farms for home green and food waste

- Replacing a petrol council vehicle with 4 e-bikes, purchasing an electric vehicle and installing an electric charge station in the fleet car park