Guide for Climate Change Considerations in the Council reports

This guide is here to help staff members of Carterton District Council insert a Climate Change component in their Council reports.

Why consider Climate Change in the Council reports (council meetings, community boards, committees) and what are we trying to achieve?

One way to mitigate and adapt to Climate Change is to consider climate change in every single decision we make and in every single project we manage. It must become part of our 'Business as Usual'.

Climate change mitigation (greenhouse gas emissions reduction)

By adopting the Carbon Reduction Strategy called the Ruamāhanga Strategy (Council meeting 12th of February 2020), the Council committed in reducing its greenhouse gas emissions.

The Ruamāhanga Strategy set up carbon reduction targets:

- Reduce our emissions
- Increase our carbon sequestration (forest, wetlands)
- Reduce our biogenic methane emissions (methane emitted by solid waste and wastewater)

These targets have been adopted by the Council and it is now up to the CDC's staff members to achieve them.

The Council needs to make sure that it can effectively reduce its greenhouse gas emissions, therefore mitigate Climate Change. Because the Council oversees activities which emits a lot of carbon (such as solid waste and wastewater treatment), it can play an important role in the Climate Change mitigation.

Climate change adaptation (adapt to the impacts of climate change)

The council has legal requirements (RMA, LGA, Climate Change response (Zero Carbon) Amendment Act) to adapt to Climate Change and is the main actor of the local development.

Therefore, the Council must consider the Climate Change impacts to avoid mismanagement and increase resiliency. Here again CDC has a major role to play in the Climate Change adaptation.

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How to consider Climate Change in the Council reports?

A Climate Change component is present in the template for the Council report. This component must answer the following questions:

- **How does my project/decision/work impact the greenhouse gas emissions over its lifecycle (raw material, manufacturing, assembly, product use, disposal)?**
  *As much as possible you should try to provide **details** on greenhouse gas emissions (e.g. embodied carbon of the material used, emissions from a vehicle purchased, etc). There is more and more data available. Your suppliers are most likely able to provide the data you need. Our Climate Change Advisor can also help you with this.*
  Example of projects that can reduce the greenhouse gas emissions:
  - *Switching to LED lights*
  - *Improving the wastewater treatment plant*
  - *Fixing leaks on water supply pipes and on sewers*
  - *Improving our buildings (insolation, double glazing, etc)*
  - *Planning: e.g. high quality, higher-density living*
  - *Natural areas restauration (forest, wetlands, etc)*

  Example of projects that can increase the greenhouse gas emissions:
  - *Road maintenance*
  - *Planning: e.g. residential area away from centre town*
  - *Deforestation*
  - *Buying Internal Combustion Engine vehicles*
  - *Waste production*
  - *Water treatment plant*

- **Explain how you intend to reduce your project/decision/work's greenhouse gas emissions over its life cycle?**
  *Consider **alternatives** to understand where your choice sits compare to other possibilities (an alternative can be to not do the project).*
  If you do not choose the best alternative regarding the emissions, explain why (other alternative has better outcomes for the well-beings, is more fit for purpose…).
  *You can also **offset** your project/decision/work's emissions (e.g. plant trees, pay a company to offset the emissions)*
  Examples of alternatives:
  - *Water saving appliances rather than regular appliances*
  - *Recycled material rather than non-recycled material (e.g. paper, asphalt)*
  - *No alternatives known*

  Examples on why you choose this option:
  - *Project necessary due to health and safety reasons: e.g. trees that may fall and put human life at risk, road maintenance to keep our roads safe, treatment plant to provide safe drinking water*
  - *Project necessary to increase the community development: e.g. library, playground*

- **How is my project/decision/work impacted by Climate Change?**
  The Council must consider the climate-related risks to avoid mismanagement and increase resiliency.
  *Therefore, you must **identify the impacts of climate change** on your project/decision/work. To do so, use the climate change assumptions used across our organisation (attached to this guide).*
  Example of impacts on a project:
  - *A road may be flooded because of sea-level rise*
  - *A water supply catchment can be unusable after a wildfire*
  - *An asset may become hardly insurable due to increased climate-related risks*

- **Explain how your project/decision/work mitigate the impacts of Climate Change identified?**
  *Explain how you **mitigate the climate-related risks** and impacts identified on your project/decision/work.*
  Example of mitigation measures:
  - *Managed retreat of an infrastructure that will be at risk against sea-level rise*
  - *Firebreak*

The answers to these questions must be sufficient to allow the elected members to make an informed decision.

For more information

Feel free to contact our Climate Change Advisor, Mélanie Barthe, if needed. She will be happy to help you (melanie@cdc.govt.nz, present Monday to Wednesday in Carterton and every Thursdays in Martinborough).

Ruamāhanga Strategy (carbon reduction strategy)

https://docs.cdc.govt.nz:8443/download/116026

Greenhouse gas inventories

2018: https://docs.cdc.govt.nz:8443/download/116025
2019: https://docs.cdc.govt.nz:8443/download/116024

Assumptions (Climate Change Advisor)

IPCC SCENARIOS

	Mean temperature increase	
	Mid-century (2031-2050)	**Late-Century (2081-2100)**
RCP2.6: Low emissions scenario	0.5°C to 0.8°C	0.5°C to 0.8°C
RCP4.5: Intermediate/low emissions scenario	0.5°C to 1.0°C	1.0°C to 1.5°C
RCP6.0: Intermediate emissions scenario	0.5°C to 1.0°C	1.3°C to 2.0°C
RCP8.5: High emissions scenario	0.8°C to 1.0°C	2.3°C to 3.0°C

GWRC CLIMATE CHANGE ASSUMPTIONS

Greater Wellington regional Council provides climate change parameters for each Whaitua (super catchments) in the Wellington region. These parameters are based on the following reports:

- Climate Change and variability – Wellington Region, report prepared by NIWA for GWRC, June 2017
- Wellington Region climate change extremes and implications, report prepared by NIWA for GWRC, December 2019

These reports and parameters are based on the following IPCC scenarios:

- RCP4.5: Intermediate/low emissions scenario
- RCP8.5: High emissions scenario

		2040	**2090**	**Seasonal changes**	**Uncertainties**
Temperature and seasonality	Average annual T°C	Ruamāhanga Whaitua: +0.7 to +1°C above present Wairarapa Coast Whaitua: +0.5 to +1°C above present	Ruamāhanga Whaitua: +1.2 to +3°C above present Wairarapa Coast Whaitua: +1 to +3°C above present	Ruamāhanga Whaitua: Maximum warming in autumn and summer, least in winter Wairarapa Coast Whaitua: Maximum warming in autumn and summer, least in spring	Ruamāhanga Whaitua: lower range for significant emissions reduction (Paris Agreement targets met), and upper range for high emissions. Wairarapa Coast Whaitua: Lower range for RCP4.5 and upper range for RCP8.5
	Hot days (above 25°C)	Ruamāhanga Whaitua: Between 0 and 30 days increase Wairarapa Coast Whaitua: Between 5 and 30 days increase	Ruamāhanga Whaitua: Between 0 and 80 days increase Wairarapa Coast Whaitua: Between 15 and 60 days increase		
	Frost nights	Ruamāhanga Whaitua: Between 0 and 15 days reduction Wairarapa Coast Whaitua: Between 0 and 5 days reduction	Ruamāhanga Whaitua: Between 0 and 40 days reduction Wairarapa Coast Whaitua: Between 0 and 15 days reduction		
	Annual Growing Degree Days (GDD) base 10°C	Increase of 0 to 300 GDD units	Ruamāhanga Whaitua: Increase of 200 to 1000 GDD units		

	GDD = $(T°C_{max} + T°C_{min})/2) - T°C_{base}$ Measures potential for crop and pasture growth		Wairarapa Coast Whaitua: Increase of 200 to 900 GDD units		
	Annual potential evapotranspiration deficit (mm) Measures drought intensity	Ruamāhanga Whaitua: +20 to +120 mm Wairarapa Coast Whaitua: +40 to +120 mm	Ruamāhanga Whaitua: +0 to +180 mm Wairarapa Coast Whaitua: +40 to +160 mm		
Rainfall patterns and intensity	Average annual rainfall	5% decrease to 5% increase	Ruamāhanga Whaitua: 0% to 10% decrease Wairarapa Coast Whaitua: 10% decrease to 5% increase	Greater likelihood of positive changes in autumn, winter and spring.	There is a large uncertainty in the range of changes due to model differences, emissions scenarios. Changes against emission scenarios are not necessarily linear.
	Amount of rain falling during heavy rainfall days (>99th percentile of daily rainfall)	Ruamāhanga Whaitua: 0% to 10% increase Wairarapa Coast Whaitua: 0% to 15% increase	Ruamāhanga Whaitua: 0% to 20% increase Wairarapa Coast Whaitua: 0% to 30% increase		Although the uncertainty in average rainfall range is high, extreme rainfall increases are more certain due to the increased amount of water vapour that the atmosphere can hold as it gets warmer (about 8% increase in saturation vapour per degree of warming)
	River mean annual low flow discharge (MAL) Measure water shortage in the catchments	Up to 60% decrease	Up to 80% decrease		
	River mean annual flood discharge (MAF) Measures flood potential in the catchments	Ruamāhanga Whaitua: 20% decrease to 40% increase depending on catchment Wairarapa Coast Whaitua: 20% decrease to 20% increase depending on catchment	20% decrease to 60% increase depending on catchment		
	Days of very high and extreme forest fire danger	100% to 150% increase	100% to 150% increase		These figures are given by IPCC model averages. Individual models can show much higher increases of up to 700%.
Wind	Annual number of windy days	Ruamāhanga Whaitua: 0 to 4 days increase Wairarapa Coast Whaitua: 0 to 6 days increase	Ruamāhanga Whaitua: 0 to 12 days increase Wairarapa Coast Whaitua: 0 to 10 days increase		
	Intensity of wind during windy days (>99th percentile of daily mean)	0% to 3% increase	1% to 4% increase		
Sea level and coastal hazards	Permanent sea level rise	+0.12 m to +0.24 m above present	+0.68 m to +1.75 m above present	More regular storm events in the fragile coastal environment may also mean faster and more significant coastal retreat.	The projected sea level rise for 2090 is based on IPCC AR5 plus an estimated additional contribution from Antarctica, based on papers published in Nature in 2018. There is very high confidence in sea level rise projections, probably more so than any other variable.
Oceanic changes	Acidification of the ocean				
	General temperature rise of sea water				
	Marine heatwaves				