

Tasman Climate Response Strategy and Action Plan

Submission

Nature and Climate Group, Nelson Tasman Climate Forum
28 April 2024

Vote of Thanks

Firstly, we wish to send a vote of thanks to Tasman District Council, both Councillors and staff, for three key initiatives that have been rolled out in recent months:

- Investment in new and improved cycleways;
- Investment in a highly successful and popular e-bus service;
- Investment in several new electric vehicles for the Council fleet.

Each of these initiatives has the potential to significantly decrease greenhouse gas emissions across the region from transport – one of our biggest emission sectors.

The cycleways make active transport a more attractive option for both daily commuting and for recreation, reducing transport emissions and traffic congestion, and increasing public health. We appreciate that Council and staff have received considerable negative feedback on the cycleways, particularly around loss of parking. It is a difficult balance to get right and we acknowledge that some changes may yet be required to strike a more acceptable balance. But the overall initiative of prioritising non-polluting transport options over car use is to be applauded. We cannot continue our love affair with ice (internal combustion engine) vehicles in the face of a rapidly changing climate.

And so we are also deeply appreciative of the joint Councils' initiative to introduce the new e-bus service – it is a winner! Providing affordable, reliable and frequent public transport options to a wider sector of the community (including communities beyond Richmond's borders) using electric buses is a game-changer. That this is a hit with the community is reflected in increasing patronage, month on month. The use of electric vehicles and increasing patronage will result in decreasing emissions, as well as a range of other positive benefits in reduced congestion, increased public health and community engagement. What's not to love!

We also applaud Council for recently upgrading the Council fleet with a large number of electric vehicles (evs). This is an important initiative as it not only drives down emissions from transport, but it also sends a very positive message to the community that Council takes emission reduction seriously. By leading by example, Council has more credibility in encouraging other businesses to follow suit and invest in electric, including those businesses that supply to Council.

The strong leadership that Council has shown by its investment in evs needs to be widely publicised to demonstrate to the community that Council takes its climate commitments seriously, and that embracing technological solutions such as evs is feasible, affordable and desirable.

Feedback

Key Principles

- Climate change and associated climate instability are accelerating;
- Emission reductions must be accelerated in all sectors of society, including local government;
- The risks of climate instability require urgent and effective mitigation strategies;
- The interconnected crisis of biodiversity loss must be addressed urgently and effectively;
- The time for complacency and "Business as Usual" is over; we can prevaricate no longer.

Targets

Key Point

- Key Success Measure 1(c) must be increased to align with New Zealand's commitment to reduce net emissions of long-lived gases to 43% below 2020/21 levels by 2030 (a reduction of at least 7% each year until 2030), and 65% by 2035.

Details

The current target to reduce Council's emissions by 16% of 2020/1 baseline by 2030 is difficult to understand. Where is the ambition? Where is the leadership? Where is the commitment to make real emission cuts commensurate with the climate emergency we are facing? How will this bring down the district's emissions if Council is only contributing 2.2% of total emissions? 16% of 2.2% is a mere 0.35% emission reduction. Not enough!

A decade ago we would have called for bold action and applauded such action. We are beyond that point now. Now we demand action commensurate with the crisis we are facing.

We urge Council in the strongest possible terms to bring their emissions down to 43% of 2020/21 levels by 2030, and to 65% by 2035, or even lower.

And we urge Council to work proactively with all sectors of the community – commercial, business, industry, agriculture, horticulture, private sector, public sector, iwi, young, old, everyone – to bring district emissions down to 43% of 2020/21 levels by 2030.

We cannot afford to make incremental cuts, to tweak business as usual (BAU) around the edges, to make small compromises here and there, to forego a flight here or a small purchase there, all the while happily emitting tonnes of greenhouse gases (ghg) and contributing to our own demise.

The time for pussy-footing is over. We need urgent, radical change and deep, deep cuts in our emissions.

If we don't, the economic, environmental and societal costs will be beyond any doomsday scenario Hollywood can concoct. And we don't want that on our conscience.

Models and Data

Key Points

- It's imperative that Strategy and Plan (CRSAP) is based on the most up-to-date data possible;
- Climate instability is accelerating and decade-old projections are no longer fit for purpose;
- The need to reduce emissions deeply and adapt to a changing climate is urgent and critical.

Details

We are concerned that many climate change risks and impacts are being systematically underestimated by the Council, due to the use of outdated reports and data. The infographic on p20 of CRSAP is based, in part, on data from a 2015 NIWA report (Climate Change and Variability Tasman District, NIWA, August 2015). We acknowledge the sea level rise predictions in the infographic are based on the more recent MfE Interim Guidance (2022), but believe that the impact of land subsidence on relative sea level needs also to be indicated in the infographic to provide the full picture of the impact of sea level rise.

The 2015 NIWA report is based on findings of the IPCC 5th Assessment Report, specifically the Physical Science summary report from 2013 and the Impacts, Adaptation and Vulnerability and the Mitigation summary reports from 2014. These findings are now a decade or more old, and have been superseded by the IPCC 6th Assessment Report (AR6).

The use of older scientific data and reports has been duplicated across Council AMP documents and other supporting documents underpinning the LTP. This means that the TDC climate response across all areas of activity needs to be updated in line with the most recent climate trends and data.

The IPCC AR6, published in 2022, provides a much more recent and relevant update. Chapter 11 focuses on Australia and New Zealand (and can be downloaded at doi:10.1017/9781009325844.013). However, although more recent, this report is largely based on data published between 2018-20, already 4-6 years behind current climatic conditions.

While we appreciate that NIWA is yet to provide an update of national climate trends and expected impacts based on the IPCC AR6, we believe that CRSAP and other Council documents need to be much more explicit about the use of decade-old data and about the level of uncertainty associated with these data and subsequent models.

Unfortunately, the data used in the oft-repeated infographic (p20 of CRSAP) states that temperature increases of 0.7-1.0 °C (over 1991-2005 average) can be expected by 2040. This is likely to be a significant underestimate as temperature records continue to fall around the globe. Recently, the World Meteorological Organization officially confirmed that **2023** was the warmest year on record, with an annual average global temperature **1.45 °C ± 0.12 °C** above pre-industrial levels. Global temperatures in every month between June and December set new monthly records. (<https://wmo.int/media/news/wmo-confirms-2023-smashes-global-temperature-record>).

Similarly, global sea level rise in 2023 was almost double the recent average rate (7.6 mm vs 4.2 mm pa), and the average rate of annual sea level rise has accelerated from 1.8 mm pa 30 years ago (<https://www.jpl.nasa.gov/news/nasa-analysis-sees-spike-in-2023-global-sea-level-due-to-el-nino>).

When combined with land subsidence, which is severe in areas of Tasman Bay, the extent of sea level rise may effectively double. Especially vulnerable Council assets include Nelson Airport and the Richmond Aquatic Centre. Recent Satsense research by Cawthron has found a relative sea level rise rate (including subsidence) at Nelson Airport of 3.4 mm pa, compared with the NZ Sea Rise estimate of 1.98 mm pa just two years earlier (<https://searise.takiwa.co/map/6245144372b819001837b900/embed>).

These data lead to the conclusion that climate change is accelerating, with the concomitant risk of accelerating climate instability. With this acceleration *“comes increasing complexity of impacts and risks. Multiple climate hazards will occur simultaneously, and multiple climatic and non-climatic risks will interact, resulting in compounding overall risk, and risks cascading across sectors and regions. Some responses to climate change result in new impacts and risks”* (AR6, IPCC 2022).

The LTP and all associated documents need to reflect this acceleration and its potential impacts. It is likely that during the LTP period, average global temperature increases beyond 1.2 °C will become permanent, with all the risks and hazards that this engenders. This makes our task to reduce emissions and adapt to a changing climate even more urgent and critical. The CRSAP (and LTP) needs to incorporate this urgency and communicate it more effectively to the community.

Urgent, sustained and effective action is required **NOW**.

Return Periods

Key Point

- Effectively communicate updated risk likelihoods.

Details

Another area where a false sense of security is still being promoted is the use of the “1 in 100 year” terminology to assess the frequency of floods, droughts and other extreme weather events. However, the extreme event return frequency implied in this format is based on the past climate, NOT the future climate, and assumes that climate is relatively stable over decades. This is no longer the case.

Science and logic dictate that 1 in 100 year events will increase in frequency as the climate changes (i.e. with shorter return periods), so all planning must take account of these increased risks.

To avoid unintentionally providing a false sense of security when communicating risk return periods, it is preferable to couch likelihood in percentage terms. For example, a 1 in 100 year event has a 1% chance of occurring any year, whereas a 1 in 5 year event has a 20% chance of occurring any year. This overcomes the mistaken belief that 100 years will lapse between each 1 in 100 year event. Such events can co-occur in the same year or the same decade.

Biodiversity and Climate Change

Key Points

- Our indigenous biodiversity and ecosystems in Tasman are severely stressed;
- The threats associated with climate instability will exacerbate this stress, particularly as temperature and rainfall profiles change;
- Sea-level rise and increased storm surge threaten coastal and estuarine ecosystems;
- Healthy indigenous biodiversity and ecosystems can mitigate climate change impacts;
- Restoring ecosystem resilience will benefit our biodiversity and our community.

Details

Native biodiversity and ecosystems in Tasman have been severely impacted by a range of human activities over centuries, particularly land clearing and ongoing land use change, hydrological modifications, and the introduction of exotic weeds, pests and diseases. We have destroyed more than 90% of our wetlands, cleared more than 95% of our lowland forests, and significantly altered the flow regimes and water courses of many waterways. We have built on our riparian and coastal margins, ignoring the inherent dynamism of these systems until it is too late. We have introduced highly successful predators that prey on native fauna, and vigorous weeds that outcompete our native flora.

And now we are adding a rapidly changing climate to the mix of stressors. Increasing temperatures, changing rainfall patterns, sea-level rise – all of these will have negative impacts on the unique and priceless indigenous biodiversity for which we are responsible. These stressors will limit the ability of our native ecosystems to provide the very ecosystem services on which we depend.

The crises in our biodiversity and ecosystems are deeply intertwined with the climate crisis. But as the impacts of climate change threaten our biodiversity and ecosystems, the reverse is true – healthy native biodiversity and ecosystems can mitigate these impacts. Healthy native riparian vegetation can decrease flood impacts. Healthy, native-dominated wetland systems absorb high intensity rainfall and attenuate flows across the landscape. Healthy native coastal and estuarine vegetation attenuates storm surge. And of course, healthy native ecosystems sequester large amounts of carbon.

We urge Council not only to assess ecological vulnerability under climate change (Outcome 2(c)) but also to put in place measures that reduce this vulnerability. We urge Council to fund these activities, which are currently unfunded.

We urge Council to implement all aspects of the Biodiversity Strategy urgently, to restore and maintain indigenous biodiversity, reduce stressors, connect fragments, and implement effective programmes to enhance the health of our native biodiversity and ecosystems. This will require significant funding, and we urge Council to allocate sufficient to achieve the required outcomes, which is likely to be considerably more than the \$0.5 m currently allocated.

We applaud the enhancement of catchments and creation of green infrastructure in rural areas and urge Council to work with other partners to build this programme from its current base, into a larger programme that attracts significant funding in order to achieve real landscape change.

We urge Council to adopt an adaptive planning approach to managing our coastal margins and estuaries, to allow the inland migration of coastal ecosystems at a pace that matches that of sea level rise. Allowing this migration will allow for the migration of the flora and fauna that inhabit these key ecosystems – the intertidal zone, estuaries, salt marshes and coastal wetlands – and ensure these species can flourish as sea levels rise.

This inland migration will not only protect vulnerable and precious biodiversity, but will also protect assets further inland by limiting storm surge and salt intrusion. It is critical that Council identifies those areas most at risk along the coast urgently and prevents any developments that will hinder future inland migration of coastal ecosystems. It is also important that all developments are sufficiently far removed from coastal edges to prevent encroachment on the habitats of coastal and estuarine species, and provides them with the space they need to thrive.

One of the other key benefits of allowing the inland migration of these ecosystems is that they are critical carbon sinks, and can permanently sequester large amounts of carbon (termed ‘blue carbon’). This provides another avenue for removing carbon from our atmosphere and marine environment.

Plantation Forestry

Key Points

- Unless permanent, plantation forestry does not significantly reduce ghg emissions;
- While a valid Council activity, plantation forestry does not belong in the CRSAP;
- Council should invest in permanent native afforestation eligible for the ETS, to meet climate goals.

Details

We are concerned that while the growth of plantation forests does sequester carbon, unless forests remain unharvested, the majority of this carbon is re-released upon utilisation of the resource. The bulk of logs produced in New Zealand are exported to China, where most are turned into packaging, paper or other such short-lived products. While a value chain analysis has not been undertaken for the New Zealand industry, value chain analysis of the global plantation forestry shows that it generates more emissions than are sequestered (FAO Forestry Paper 159 (2010): Impact of the global forest industry on atmospheric greenhouse gases. <https://www.fao.org/3/i1580e/i1580e00.htm>).

Exotic forest plantations also exacerbate risks associated with climate instability, including increasing sedimentation and erosion from hillslopes during high intensity rainfall events, increasing risks of

wildfire, and posing a significant threat to native biodiversity through the spread of wilding conifers in the landscape. Indeed, we note that these are some of the reasons why Council has chosen to end plantation forestry on the Richmond Hills.

We acknowledge that the economic returns from well-managed forestry operations are important to Council's economic portfolio, which we do not discourage. However, we posit that such operations have no place in the CRSAP as the operations contribute nothing to reducing emissions or climate risks.

Instead of investing in plantation forestry as part of CRSAP, we urge Council to invest in permanent, native afforestation, preferably with a diverse range of species so forests maximise both carbon sequestration and biodiversity benefits. The New Zealand Climate Change Commission has proposed a shift to protecting and restoring permanent native forests to achieve long-term sequestration (2021) <https://www.climatecommission.govt.nz/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf>.

Such investments could be funded through the ETS and/or through the voluntary carbon market. Investing in native biodiversity through afforestation across the landscape has multiple benefits for biodiversity, for reducing emissions, for increasing landscape resilience, for soil health, ecosystem health, waterway health, and the mental and physical health of our communities.

We also recommend the planting of microforests within any new housing developments, especially in large-scale developments such as Berryfields in Richmond, and other appropriate sites, to provide all the concomitant benefits listed above.

Reducing Emissions from Electricity Usage

Key Points

- Eliminate Council's emissions from purchased electricity (currently 1,175 tonnes pa) by switching to a renewables-only provider such as Ecotricity;
- Save money by reducing use of electricity;
- Encourage and empower community to reduce electricity emissions through reduced use, efficiencies and renewables-only providers;
- Urgently facilitate investment in renewable generation, either by Council or others.

Details

Electricity providers who guarantee to supply electricity generated from renewables-only already exist in the market. Switching to one such provider would save 7% of Council's emissions. Encouraging the community to switch would reduce the district's emissions further.

Putting pressure on the electricity sector to renewably generate the increasing amounts of power required to sustain our evs and other energy demands as we phase out fossil fuels, will speed up investment and promote investment confidence.

We applaud Council in their first tentative steps to "investigate" entering the renewable generation arena through rooftop solar and solar farms, but note that no funding has been attached to these investigations or investment policy. Nor has funding been allocated for the required infrastructure.

We urge Council to accelerate progress in this critical area of investment by developing a policy in the next 12 months and funding infrastructure within the first three years of the LTP.

After all, it seems a bit pointless having a stable of Council evs which are partially powered by electricity generated by fossil fuels. We need them to be fully carbon neutral.

We also call on Council to provide leadership to the community in ways to reduce energy use. We are profligate energy users but transitioning away from energy dense fossil fuels requires us to re-examine our energy needs and wants. Continuing to increase energy demand is unsustainable and Council needs to work with the community to explore creative ways to reduce energy use.

Investing in energy efficiency is a great place to start, and needs to happen within Council and across the community. We urge Council to implement energy efficiency initiatives as soon as possible and not wait until 2027. We urge Council to empower the community to implement energy efficiency initiatives as soon as possible.

Reducing Methane Emissions and Emissions from Refrigerants

Key Points

- Accelerate waste reduction programmes (solid, construction and organic);
- Increase target from solid waste from 10% to 50% reduction by 2030;
- Accelerate (and fund) process of switching of refrigerants at Richmond Aquatic Centre and other Council owned facilities;
- Work with community (commercial and private) to increase use of low-emissions refrigerants and to safely dispose of current refrigerants in a way that does not increase emissions.

Details

We applaud Council for putting in place programmes to reduce emissions from methane and refrigerants, but urge Council to fund and speed up the process. Much of this work needs to happen in the 2024-27 period.

We also urge Council to proactively work across the community to reduce waste from all sectors, to facilitate the circular economy, to promote composting and the reduction of food waste, to reduce packaging, and to implement other programmes to reduce waste and increase sustainability.

Reducing Emissions from Transport

Key Points

- Increase public transport targets from 2% (2035) and 4% (2050) to 10% and 20% respectively;
- Increase reach and frequency of public transport services;
- Charge for parking in Richmond town centre;
- Increase bike parking options, with fit-for-purpose bike racks in multiple locations;
- Incentivise or develop ev-sharing schemes that operate at multiple sites across the district;
- Increase the number of charging stations for evs throughout the district.

Details

As noted at the outset, we applaud the new e-bus service. It is obviously meeting the needs of the community as shown by ever increasing patronage levels. We urge both NCC and TDC to roll out extra services during the 2024-27 period. These increases include weekend services to Wakefield and Motueka, increased frequency of the Wakefield and Motueka services, increased numbers of overflow buses for peak times, and increased early morning and evening buses.

We advocate for park and ride whereby people can park for free and catch the bus to their destination.

We advocate for fit-for-purpose bike parking at regular bus stops to facilitate bike and ride, particularly as the current design of buses only allows 2 bikes to be carried per bus.

We urge Council to set bold public transport targets with 10% of commuters using the bus regularly in 2035, and 20% in 2050. Added to the commuters riding and walking, this will reduce reliance on cars.

We advocate for effective ride- and ev-sharing schemes that meet the needs of communities across the district. Council should be prepared to develop these in areas where profitability will be low or non-existent. It is residents of outlying areas with few alternatives who contribute most to commuting kilometres and who need viable alternatives.

We also advocate for Council to increase the number and location of public charging stations for evs throughout the district to facilitate the uptake of evs by residents and by tourists with rental vehicles. We urge Council to encourage service stations and major supermarkets to install ev-charging stations in their forecourts and car-parks, as is happening elsewhere in the country.

We urge Council to ensure that there are fit-for-purpose bike racks throughout the district. These racks need to accommodate a range of transport options, including bikes and scooters of different sizes and types.

We urge Council to charge for parking in Richmond town centre to encourage the use of public and active transport. We applaud the active transport initiatives already underway and those planned.

We urge Council to empower the community to think twice before getting in their car, and to consider the range of climate-friendly options for getting to their destination.

We urge Council to work with industry and the commercial sector to reduce emissions from the transportation of goods and materials.

Water Conservation, Collection and Recycling

Key Point

- Investigate and encourage water conservation, collection and recycling, as rainfall patterns change and the risk of droughts increases.

Details

Although predictions indicate that the average annual rainfall across the district may not change significantly, it is highly likely that rainfall patterns will change. We need to expect more high intensity rainfall events, punctuated by longer, deeper, and more severe drought periods. Higher temperatures will also result in less snowfall during winter, which will affect river flows and aquifer levels.

We urge Council to investigate options for both Council and the wider community to embrace water conservation actions, collection of rainwater in areas where it would enter the storm water system, and the recycling of commercial/household grey water for use on gardens, crops and outdoor cleaning activities.

We urge Council to investigate and implement the most appropriate options from water-sensitive - urban design (WSUD) principles. There are a multitude of resources available from other cities and communities that can provide excellent examples for Tasman to follow.

Creative Accounting

Key Point

- Investigate alternative funding sources for climate-friendly initiatives.

Details

Get creative about funding these climate-friendly initiatives. Businesses locally, nationally and internationally are looking to offset their carbon emissions. Why not seek investment from an international air-conditioning manufacturer to fund the refrigerants switch? Or a food and beverage manufacturer to fund community composting initiatives and food waste collection services? Or an ev dealer to sponsor the ev-sharing scheme? They could count the emissions reductions as part of their offsetting profile.

After all, if a windscreen repairer can get street-cred for planting native plants, surely other businesses are willing to invest in emission reductions to boost their social licence to operate.

Explore options in the voluntary carbon market. Fund investment in carbon sequestration by natural systems (terrestrial, wetland, coastal and marine ecosystems) through carbon offsets in the voluntary carbon market. Use similar mechanisms to pay for managed retreat of coastal infrastructure, allowing coastal ecosystems to sequester blue carbon.

CRSAP Budget

Key Points

- 65% of the CRSAP budget is for public and active transport, part of Council's BAU costs;
- 25% of the budget is for waste and/or landfill management;
- There is a very limited remaining budget for all other climate initiatives;
- There is no budget allocated to Leadership and Information outcomes;
- There is no budget allocated to several initiatives.

Details

We are concerned that large parts of CRSAP are unfunded, including the entirety of outcomes 3 and 4 – Leadership and Information. It is particularly concerning the Informing and Enabling the Community is budget-less. The initiatives contained therein will need funding, as will many of the initiatives across CRSAP that are currently unfunded.

We appreciate that staff time has been highlighted as the funding mechanism for large components of CRSAP but are concerned that staff time may include the time of staff who are already fully engaged on other work.

Leaving outcomes and initiatives unfunded risks losing them entirely from the activities and the consciousness of Council. We ask that funding be apportioned to outcomes and initiatives, to ensure they will be achieved.

Only 10% of the \$60 m budget (over 10 years) has been set aside for a wide range of activities and initiatives that are climate-positive, with the remainder of the budget tagged to transport and waste management. While the transport and waste management initiatives are critical to Council achieving new zero by 2050, it is disappointing that there is insufficient funding to really kick climate goals with this LTP. An annual budget of \$600,000 is but a drop in the (ever-rising) ocean and undermines the integrity of the CRSAP.

Council cannot expect volunteers, the community, industries and businesses to do the heavy-lifting in driving down emissions, building resilience, showing leadership and communicating information. Council has a pivotal role to play in this mahi and we urge greater investment in the outcomes and initiatives outlined in CRSAP.

Financial Implications and Funding for Stranded Assets

Key Point

- Climate change will result in a deteriorating financial climate for Council and the district.

Details

As climate change and its impacts continue to escalate, major risks to Council's financial assumptions will develop. Specifically, land, properties, facilities and other assets (both Council and private) that are vulnerable to climate impacts (flooding, sea level rise and storm surges, wildfires etc.) will lose value and also face either higher insurance premiums, or the prospect of not being able to access any insurance. As land and capital values decrease, so will their rateable value.

As insurance becomes more difficult to access with increasing climate hazards, mortgages will become unobtainable, and the residential and commercial property markets in vulnerable locations will suffer accordingly, now that insurers are adopting risk-based premiums, based on climate vulnerabilities (and other hazards such as earthquakes). It is highly likely that such scenarios will start to play out within the 10 year planning period of this LTP, especially if more extreme weather events occur in the district.

We believe that some funding mechanism will be required for stranded assets that become uninsurable and/or unusable, particularly with flooding and with sea level rise. One option would be that prior to development commencing, developers of residential and commercial buildings built in areas threatened by flooding or sea level rise pay Council a levy commensurate with the likely cost of bailing out future owners as flooding, storm surge, saltwater intrusion and sea level rise make buildings unfit for occupation. It is not appropriate that Council and ratepayers become responsible for building demolition and removal as abandoned developments are claimed by flooded rivers or the rising sea.

Short Notes

Page 2: An additional risk:

- increased minimum temperatures and loss of winter chilling negatively impacting returns from current horticulture enterprises.

Appendix 1, 1(d) (ii): Replace "**Encourage** low emissions materials..." with "**Mandate** low emissions materials..."

Appendix 1, 1(d) (iii): Provide budget to retro-fit insulation

Page 21: Please change wording in sections "Coastal hazards", "Heavy rainfall" and "Biosecurity" from **may/could** to **will**. For example, "There **will** be increased risk to coastal roads..." There is no doubt that they will have the listed impacts, it is not up for debate any more.

Page 21: Currently reads: "*Biodiversity* – Climate change increases pressures on our indigenous biodiversity through changes to habitat and food webs, as well as increasing competition pressures from pest species. These pressures are highest in our coastal and lowland ecosystems."

Please change this to: "Biodiversity – Climate change increases pressures on our indigenous biodiversity through changes to habitat and food webs, increasing competition pressures from pest species, increases in maximum and minimum temperature profiles, changes in rainfall patterns, and increases in sea level and storm surges. These pressures will be felt from coastal and lowland ecosystems through to upland ecosystems."

Page 21: "Agriculture and horticulture – Warmer temperatures, a longer growing season and fewer frosts could provide opportunities to grow new crops." True, but we will also potentially lose the ability to grow crops that need winter chilling.

Page 23: typo in Paris Agreement paragraph:

Change "reduce greenhouse gas emissions by **30%** below 2005 levels..." to **50%**

Submission collated by Group Convenor: Dr Fiona Ede