

Climate Emergency Review: Working Draft for further investigation at proposed Climate Action Tank in early 2020

On 6 November 2019, across 153 nations, 11,000 scientists declared that earth is facing a climate emergency and to secure a sustainable future, we must change how we live (Ripple et al., 2019). Climate emergency declarations from around the globe (21 November, 2019) number 1203 government bodies, at local, state and country level (Figure 1) and include seven nations declaring for their entire populations (in red).

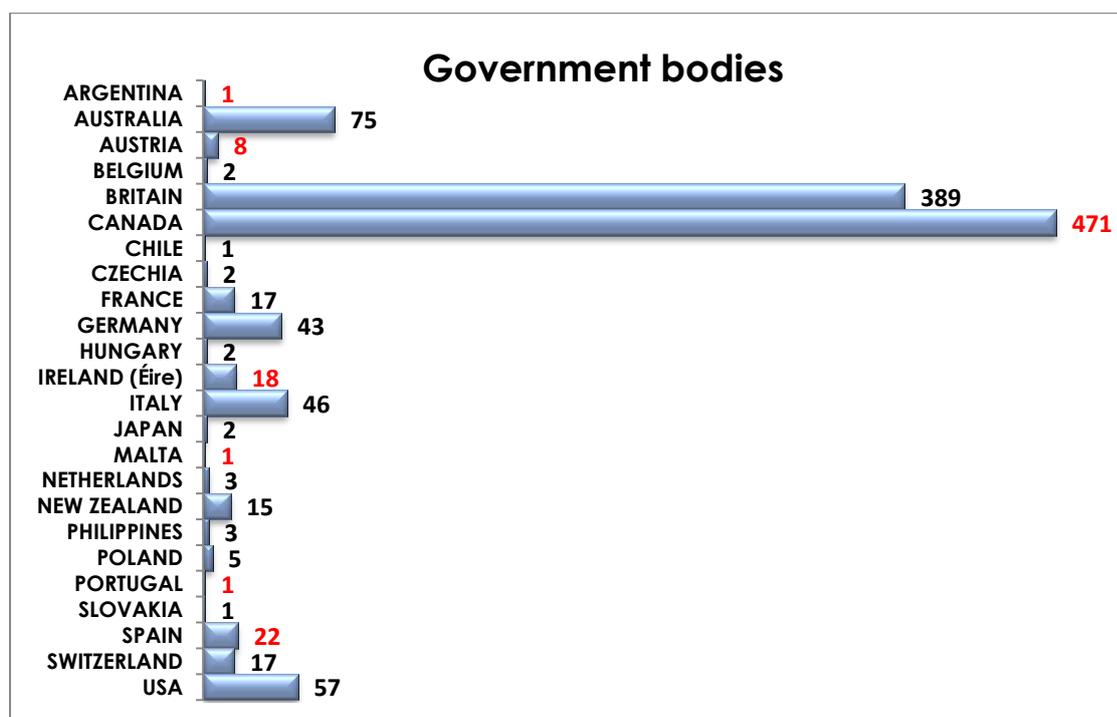


Figure 1: Government bodies who have declared Climate Emergency (Source; Cedamia, 21 Nov 2019).

In Australia, Byron Shire joins 75 local Councils (ACT (1), NSW (29), NT (1), QLD (1), SA (11), TAS (3), VIC (20) & WA (9)) declaring a Climate Emergency through Council resolutions. Of these, 50 Councils have made commitments to mitigate the affects of Climate Change through carbon reductions and 100% renewable targets (across varying timeframes) and 24 resolved to either commit to or develop adaptation actions. *Mitigation seeks to minimise climate change effects by reducing emissions, whereas adaptation is focussed on increasing resilience to reduce harm from climatic impacts* (Table 1).

Table 1: Examples of the relationship between Adaptation & Mitigation of Climate Change

Mitigation	Cross over	Adaptation
Enhanced energy efficiency	Environmentally responsible design	Change in land use / protection of carbon sinks
Increased uptake of renewables	Mangrove reforestation / planting & restoration of water catchments	Upgrade / hardening building & infrastructure design
Improvements in industrial processes	Water conservation	Adjusting activities & lifestyle
Increased uptake of sustainable transport	Urban greening / growing	Emergency / Business planning
Enhanced carbon sinks		Increasing community understanding of climate impacts & risks

Council's with the most comprehensive response include; Darebin, Sydney, Melbourne, Indigo Shire, Central Coast, Northern Beaches, Bega Valley, Port Phillip (Act & Adapt), Moonee Valley (MV2040), Warrnambool (W2040) and Willoughby Council's. State wide declarations have been made by the Municipal Association of Victoria (MAV), the Western Australia Local Government Association (WALGA) and the Parliament of South Australia Upper House. In addition, other Council actions include;

- ✓ Indigo Shire will apply for a rate cap variation to fund sustainability actions and has committed to selling Buller gas,
- ✓ Cardinia Shire is investigating divestment from fossil fuels and
- ✓ Lane Cove has a sustainability levy in place.

Byron Shire Council's current commitments:

Council's past strategies for mitigation include the *Greenhouse Actions Strategy 2004* and the *Byron Shire Low Carbon Strategy 2014*. Responding to resolution **17-086**, the *Net Zero Emissions Strategy for Council Operations 2025* was endorsed by Council on 20 June 2019 (Res **19-268**), and sets out the actions to achieve net zero emissions by 2025 and sourcing 100% renewable energy by 2027.

The *Climate Change Strategic Planning Policy 2014* (Res **14-315**) sets out three objectives to guide future strategic planning regarding floods, coastline and biodiversity through;

1. Setting out Council's accepted climate change parameters to inform the decision making process for strategic, infrastructure and operational planning.
2. Mitigating impacts associated with climate change on future generations through commitment to the precautionary principle.
3. Reviewing climate change parameters as further information becomes available from leading government organisations.

On 18 October 2018, Council resolved to declare a climate emergency (Res **18-860**) and further resolved on 21 February 2019 (Res **19-011**) to consider a budget allocation of \$80K (which was not given in full) for the development of an updated Climate Change Adaptation Implementation Plan for Council operations. At the 27 June 2019 meeting, Council resolved to deliver six actions (Res **19-341**) in lieu of the full budget allocation over six months. Two of the actions were;

(iv) Undertake a review relevant climate policy and literature to establish an overarching framework for attracting grant funding and developing and delivering climate adaptation projects, and

(v) In concert with item (iv) undertake a review of all Council programs (Table 2) to ensure alignment with Council's Climate Emergency commitment.

These actions support the delivery of resolution **18-860**;

'to assist in the development of a 'Shire-wide Community Emergency Plan to further enhance resilience and reduce climate impacts in a timeframe that is as fast as practicably possible.'

Table 2: Reviewed Council Programs arranged by year

	Program	Year	Mitigate	Adaptation
1	Byron & Tweed Climate Change Risk Assessment - Identifies and ranks 22 risks.	2009	No	No –Risk assessment only. Phase 3 not undertaken. Uses data from 2007 (IPCC) and 2008 (CSIRO) however risks are still relevant – good baseline info.
2	Byron & Tweed Climate Change Adaptation Action Plan	2009	Yes	Yes –As above uses old data (CSIRO 2008/IPCC 2007) for projections. Needs to be updated with new projections data. Good baseline info.
3	Corporate Sustainability Policy	2012	Yes	Partial – broadly advocates sustainable food production & consumption, chem free & organic food increase. Commits to improve biodiversity, protect remnant veg & promote ecological restoration. Ensures recycling and composting facilities are available at all Council-owned facilities. No actions included.
4	Climate Change Strategic Planning Policy	2014	Yes	Partial – Mainly deals with flooding. Adaptation for wildlife corridors and buffering ecosystems. Needs parameters updated with new data. Re-wording of principle. Needs to include bushfire & emergency.
5	DCP Chapter C2 Areas affected by Flood (Res 14-315)	2014	Yes	Yes References CC Strategic Planning Policy – old data, only for flooding.
6	Asset Management Policy	2015	No	No – risk of natural disasters to be addressed in the development of asset strategies is an objective.
7	Strategic Asset Management Plan	2016	No	No – considers climate change as an impact that will incur additional costs & major storm events as a very high risk on assets. States these are unable to be managed within Council resourcing.
8	Procurement & Purchasing Policy	2017	Yes	Crossover – Sustainability Goals - 6.2; Minimise waste, pollution & environmental impacts and maximise conservation of water energy & resources.
9	Rural Land Use Strategy	2017	No	Partial – planning policy directions are generally good but need new flooding info and a ramp up to be considered adaptation.
10	Draft Social & Economic Disaster Resilience Plan	2018	No	No -Support plan to assist community after disaster event. Who does what and responsibilities of stakeholders.
11	Draft Employment Lands Strategy	2018	No	No – However, some principles are of use. Principle 1 broadly outlines constraints, but has no definitions and is missing fire. Principle 2 outlines reliable access (good for emergency). However, it relies on West Byron?
12	Recycled Water Management Strategy	2018	Yes	Yes – use of sustainable practices to provide long term demand security; biomass cropping, recycled water for irrigation. Rural scheme in place by 2027.
13	Towards Zero Draft Integrated Waste & Resource Recovery Strategy	2019	Yes	Transitional -Introduces circular economy with an action to develop & implement measures. Goals include 80% tourism/hospitality participation in commercial waste reduction by 2025.
14	Strategic Transport Statement (Transport Policy)	2019	Yes	Yes objectives include support adaptation and mitigation but no

				actions.
15	Car Share Policy	2019	Yes	Transitional – supports sustainable transport.
16	Council Investment Policy	2019	No	Partial – where Council gives preference to financial institutions that invest in or finance Environmentally and Socially Responsible Investments. Also outlines 'desirable but not mandatory' criteria.
17	Net Zero Emissions Strategy for Council Operations 2025	2019	Yes	No – uses stats from AdaptNSW (old data A2 scenario). Has excellent contextual info and projects / milestones achieved. Also outlines current & future sustainability projects.
18	Integrated Pest Management Policy	2019	No	Yes – advocates the timely, efficient and effective management of biosecurity risks while protecting human health & the environment.
19	Draft Water Sensitive Urban Design (WSUD) Policy and Strategy	2019	Yes	Transitional - incorporates 2 actions from Rous County Council's Future Water Strategy, supports recycled water, improving water catchments, developing catchment management plans which could then incorporate adaptation actions. Advocates a WSUD DCP by 2021.
20	Draft Byron Shire Bike Plan	2019	Yes	Partial -By default this will support adaptation by providing increased connectivity and alternatives to driving. Climate impacts are not a driver of the plan. A NSW govt. initiative.
21	Draft Pedestrian Access & Mobility Plan	2019	Yes	Partial -In conjunction with the Bike Plan this will deliver a healthier more connected community and support a reduction in vehicle use.
22	Draft Residential Strategy	2019	No	No – only flood risk analysis for infill areas
23	Draft Integrated Pest Management Strategy	2019	No	Yes – is focused on increasing resilience of natural systems over time as an outcome.

Council collaborations for mitigation actions

Organisation	Year	Commitment
International Council for Local Environmental Initiatives (ICLEI)	2015	Sustainable development
Global Covenant of Mayors for Climate & Energy (CoM).	2015	Reporting on; -The greenhouse gas emissions inventory for our Shire consistent with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) -The climate hazards faced by our Shire. - Supporting ZEB's target to reduce Shire-wide greenhouse gas emissions. - The climate vulnerabilities faced by our Shire. - Our plans to address climate change mitigation and adaptation.
Cities Power Partnership (CPP)	2017	Pledged actions include; - Install renewable energy (solar PV and battery storage) on Council buildings
Sustainability and Emissions Reduction Advisory Committee (SERAC)	2018	Includes members from ZEB & COREM to assist Council and implement sustainability and emission reduction programs, plans and projects.
Zero Emissions Byron Limited (ZEB)	2015	Aims to reduce the Shire's emission to net zero by 2025 across 5 sectors. Supports commercial, community and residential emission reduction projects.
Community-Owned Renewable Energy Mullumbimby (COREM)		Aims to transition the Shire to 100% renewable energy.

Global context

The Intergovernmental Panel on Climate Change (IPCC) assesses climate change and its impacts via expert scientific analysis from scientists around the world. Released in 2013/14, the current report (AR5) asserts *'that anthropogenic emissions of greenhouse gases are the highest in history'*. These findings resulted in the Paris Agreement (2015) where 197 countries committed to limit global warming to below 2°C.

Under the Paris Agreement, governments agreed to Nationally Determined Contributions (NDC's) through emissions reduction targets. Australia's NDC is an emission reduction of 26-28% below 2005 levels by 2030, including land use, land use change and forestry (LULUCF) or 14-17% below 2005 levels excluding LULUCF. Current Climate Action Tracker (CAT, 2019) data shows that *this will not achieve the agreed 1.5°C*. To meet our obligation, emission reductions of more than 47% (excluding LULUCF) are necessary by 2030 (Figure 2). Currently, Australia is on track to exceed our NDC by 8% (excluding LULUCF).

Australia's Nationally Determined Contribution			
Reduce emissions to 26 to 28% below 2005 levels by 2030 including the forestry sector			
Comparison of targets	Excluding forestry (LULUCF) emissions		
Reference year - 2005	522	MtCO ₂ e	
Current Path	↑ 8%	above 2005 levels by 2030	
Australia's Nationally Determined Contribution	14% — 17%	below 2005 levels by 2030	
Improve By One Rating	> 27%		
Meet 1.5°C	> 47%		

Figure 2: Australia's NDC pathways (Source; CAT, 2019)

In addition, climate policies currently in place across the globe and the gap in what governments have committed to do, will see the world **exceeding 1.5°C warming by 2035** (Wuebbles et al., 2017; IPCC, 2019), 2°C around 2053 and 3.2°C by the end of the century (Figure 3) (CAT, 2019).

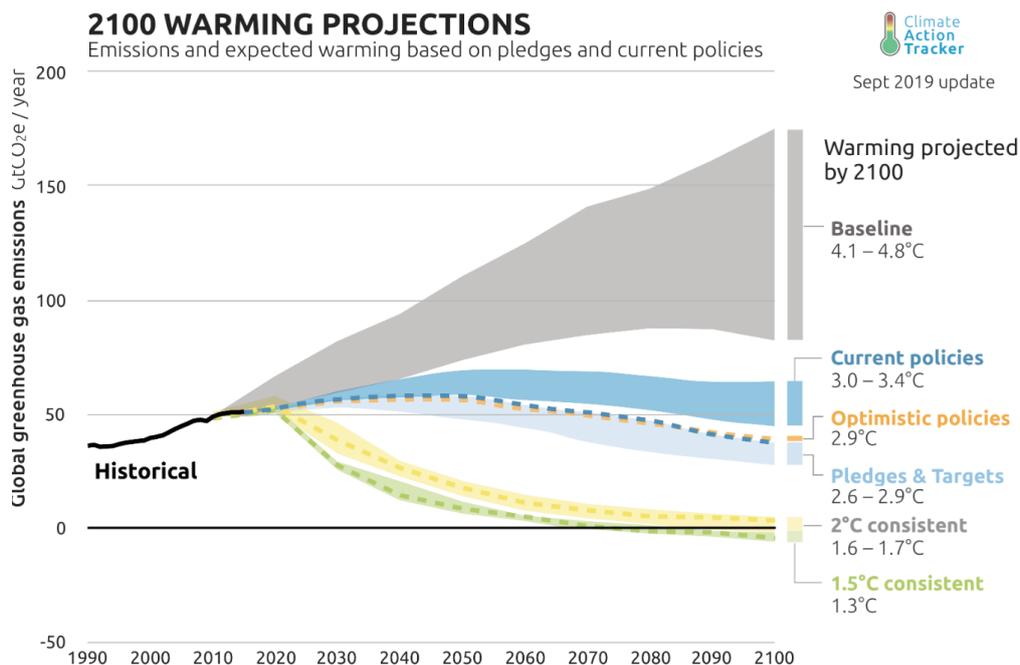


Figure 3: Projected Global warming by 2100 (Source: CAT, 2019)

In Australia, emissions derived from fossil fuels and industry have increased by 1% per year since 2014 (currently 7% above 2005), when the carbon pricing scheme was repealed. Our emissions are projected to increase 8% by 2030 (CAT, 2019; OECD, 2019) however the federal government is utilising 'carry over' credits from the Kyoto protocol to offset our emission reductions committed under the Paris Agreement. These 'carry over' credits will result in a reduction of our emissions target by approximately 50%. To date, Australia is the only country in the world to utilise such credits.

Current science states that Australia should be heading towards net zero emissions well before 2050 (The Club of Rome, 2018; CAT, 2019), yet our only emissions target is the Paris Agreement for 2030 (Climate Council, 2019). While emission reductions are an obvious mitigation action, the absence of clear direction from either federal or state policy is apparent. As a result, State and local governments have been left to outline mitigation and adaptation plans under an existential threat (Spratt & Dunlop, 2018; 2019) to our and the world's, national security (Australia, Foreign Affairs, Defence and Trade References Committee, 2018).

IPCC current data

Over the last 12 months, three special reports have been released by the IPCC regarding the impacts projected under 1.5°C and 2°C warming and information on sea level rise, that for the first time incorporates ice melt, permafrost and sea ice retreat. These three reports are summarised below:

IPCC Special Report on 1.5°C Warming (2018)	
1.5°C	2°C
6% of insects, 8% plants, 4% of vertebrates will lose >50% geographic range	18% insects, 16% plants, 8% vertebrates will lose >50% geographic range
Coral reef decline by a further 50-70%	Coral reef decline >99%
Severe & widespread impacts to unique & threatened systems e.g. Biodiversity hotspots	Significant irreversible impacts to unique & threatened systems.
Severe & widespread impacts from extreme weather events such as heatwaves, heavy rain, drought, coastal flooding and heatwaves.	Severe & widespread impacts from extreme weather events such as heatwaves, heavy rain, drought, coastal flooding and heatwaves.
Warming of temperature extremes by 3°C mid latitude.	Warming of temperature extremes by 4°C mid latitude.
6.5% biome (major ecosystem type) transformation/movement	13% biome (major ecosystem type) transformation/movement
Increase in temperature reducing soil carbon storage	Further increasing temperature & further reduced soil carbon storage

IPCC Special Report on Climate Change & Land (2019)	
1.5°C	2°C
Detectable impacts to dryland water scarcity	Significant impacts to dryland water scarcity
Detectable impacts to soil erosion	Detectable impacts to soil erosion
Detectable impacts to vegetation loss	Significant impacts to vegetation loss
Significant & widespread impacts from wildfire damage	Significant & widespread impacts from wildfire damage
Significant impacts from permafrost degradation	Significant & widespread impacts from permafrost degradation
Detectable impacts to tropical crop yield decline	Significant impacts from tropical crop yield decline
Significant impacts to food supply instabilities	Severe impacts & irreversibility of food supply instabilities

The impacts outlined will grow exponentially by severity as temperatures increase, leading to cascading effects. Responses that will reduce risk and support mitigation and adaptation include;

- An immediate impact response; conservation of high-carbon ecosystems such as peatlands (which continue to sequester carbon for centuries), wetlands, rangelands, mangroves and forests.
- Longer term responses include; afforestation, reforestation and restoration of high-carbon ecosystems, agroforestry and degraded soil reclamation.
- Developing, enabling and promoting access to cleaner energy sources and technologies combating both desertification and forest degradation.
- Diversification of the food system featuring plant-based diets and animal-sourced food produced in resilient, sustainable and low-GHG emission methods.
- Reduction of food loss and waste; currently 25-30% of total food produced is lost or wasted (contributing 8-10% of total anthropogenic GHG emissions).

IPCC Special Report -The Ocean and Cryosphere in a Changing Climate (September,2019)

In the special report on Oceans and Cryosphere, projections are based on CMIP5 climate models using Representative Concentration Pathways (RCPs). RCP's are a set of scenario's that take into account emissions and land use/cover. The two RCP's illustrated are;

RCP 2.6	RCP 8.5
Low GHG emissions	High GHG emissions
High mitigation	Lack of policies to combat climate change
1.1 to 2.0 °C by 2030	1.5 to 2.4°C by 2030
66% chance limiting <2°C by 2100	3.2 to 5.4°C warming by 2100

As sea level continues to rise at an increasing rate, extreme sea level events that were considered historically rare (1:100yr) are projected to occur **at least annually by 2050 in all RCP scenario's ,especially in tropical regions (IPCC, 2019)**. In addition, sea levels will continue to rise beyond 2100 in all RCP scenarios exacerbating coastal hazards and projections of increased cyclone intensity and precipitation (IPCC, 2019).

NSW State Government

In 2016, the NSW government released its *Climate Change Policy Framework 2016* endorsing the Paris Agreement and committing to take action to support it. The primary objectives being *to achieve net zero emissions by 2050* and for *NSW to be more resilient to a changing climate*. Supporting this, the Climate Change Fund Draft Strategic Plan (2017-2022) describes potential actions to be funded by \$500m over the next five years, of which \$100m was allocated to 'Preparing for Climate Change'. On the AdaptNSW website, that figure is \$30m, of which \$3.5m is allocated 'to support local government respond to identified climate risks and vulnerabilities through the *Increasing Resilience to Climate Change* local government grant scheme.

Under a partnership program between LGNSW and the Department of Planning, Industry and Environment (DPIE), the *Increasing Resilience to Climate Change* program has \$2.8m of funding available from the Climate Change Fund over 3 rounds. Grants of \$30K-\$100K are available to individual Council's to implement projects aligning with the transition pathways identified in the *North Coast Enabling Regional Adaptation* report released in June 2019. The last round of funding (Round 3) opens for applications mid 2020.

EDO's Summary of the NSW Climate Change Policy Framework 2016

- The *NSW Climate Change Policy Framework 2016* is a high level State Government policy whose framework has no statutory basis and is not linked to or underpinned by any Act of Parliament.
- The two objectives of; *Achieving net –zero emissions by 2050* and; *to be more resilient to a changing climate* – are delivered within a framework that sets out broad high-level actions including policy, operations and advocacy. However, the directions are ‘tentative, non-enforceable and have no meaningful links to the planning system or other relevant legislation’.

Given there is no overarching legal framework such as legal targets and responsibilities on emissions, or for making NSW more resilient (Figure 4), local Council's are left to develop plans that are ad hoc and without support from the State.

State	Key legislation	Emissions reduction targets	Renewable energy targets
VIC	<i>Climate Change Act 2017</i> <i>Renewable Energy (Jobs and Investment) Act 2017</i>	Zero net greenhouse gas emissions by 2050. ²² Legislative obligation to set interim greenhouse gas emissions targets (at future dates) using 2005 baseline. ²³ Legislative obligation for decision makers to consider the potential contribution to the State's greenhouse gas emissions when making decisions under certain legislation. ²⁴	25% renewable energy by 2020, and 40% renewable energy by 2025. ²⁵
TAS	<i>Climate Change (State Action) Act 2008</i>	60% reduction in emissions by 2050 (1990 baseline). ²⁶	100% renewable energy by 2022 (policy). ²⁷
ACT	<i>Climate Change and Greenhouse Gas Reduction Act 2010</i>	Zero net greenhouse gas emissions by 2045 ²⁸ with interim targets: 40% reduction in emissions by 2020 (1990 baseline) ²⁹ . Peaking per capita emissions by 2013. ³⁰	100% of electricity generated from renewables by 2020. ³¹
SA	<i>Climate Change and Greenhouse Emissions Reduction Act 2007</i>	60% reduction in emissions by 2050 (1990 baseline). ³²	20% of electricity generated and consumed in the State by 31 December 2014 to be renewable. ³³
CTH	<i>Renewable Energy (Electricity) Act 2000</i>	5% reduction in emissions by 2020 (2000 baseline) (Kyoto Protocol, policy target). ³⁴ 26-28% reduction in emissions by 2030 (2005 baseline) (Paris Agreement, policy target). ³⁵	33,000 GWh renewable energy by 2020. ³⁶
QLD	No climate law	Net zero greenhouse gas emissions by 2050 (policy). ³⁷	50% renewable energy by 2030 (policy). ³⁸
NSW	No climate law	Net zero emissions by 2050 (policy). ³⁹	No targets
NT	No climate law	No targets	50% renewable energy by 2030 (policy). ⁴⁰
WA	No climate law	No targets ⁴¹	No targets

Figure 4: Summary of current policy in Australia (Source: EDO, 2019)