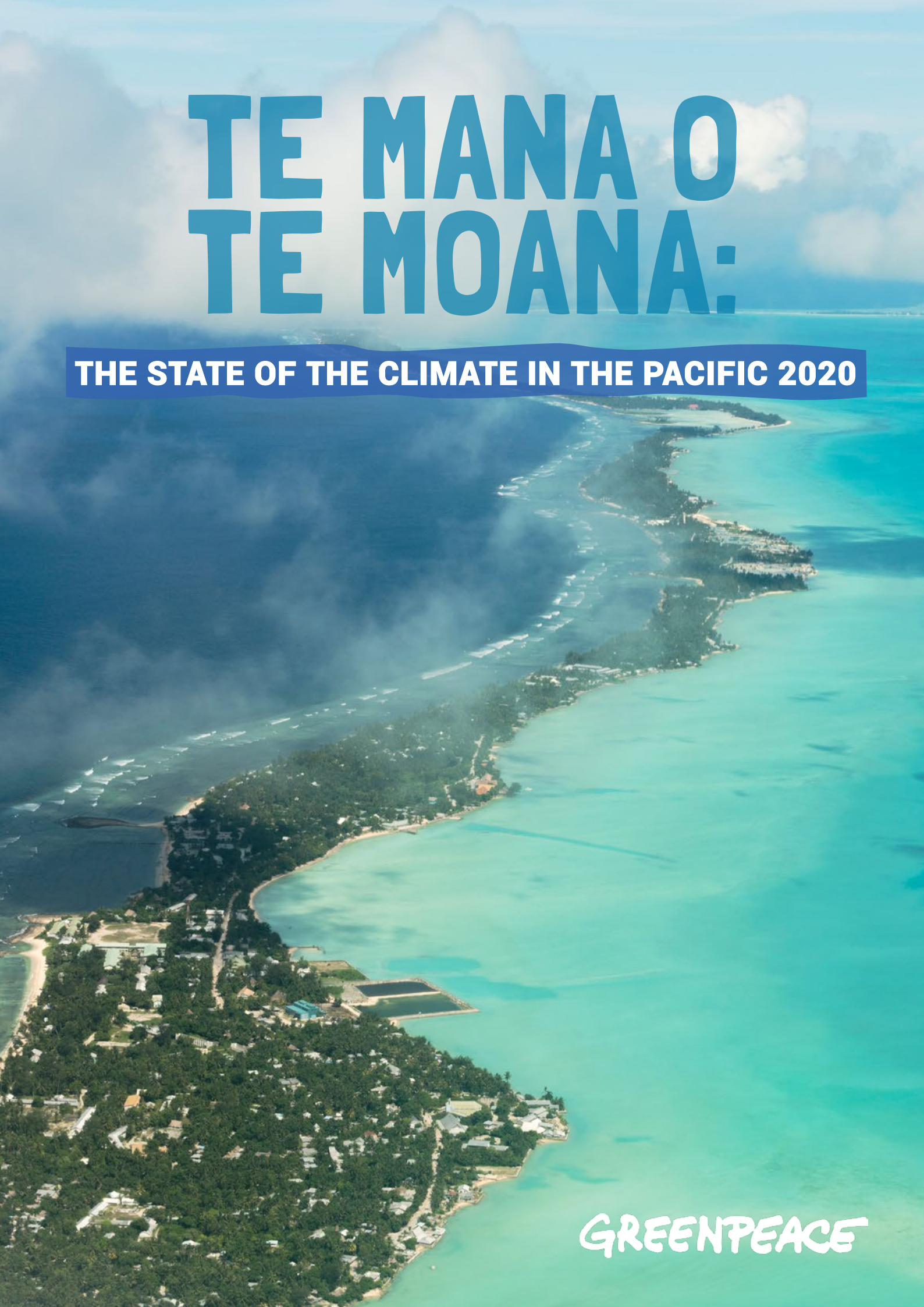
TE MANA O TE MOANA:

THE STATE OF THE CLIMATE IN THE PACIFIC 2020



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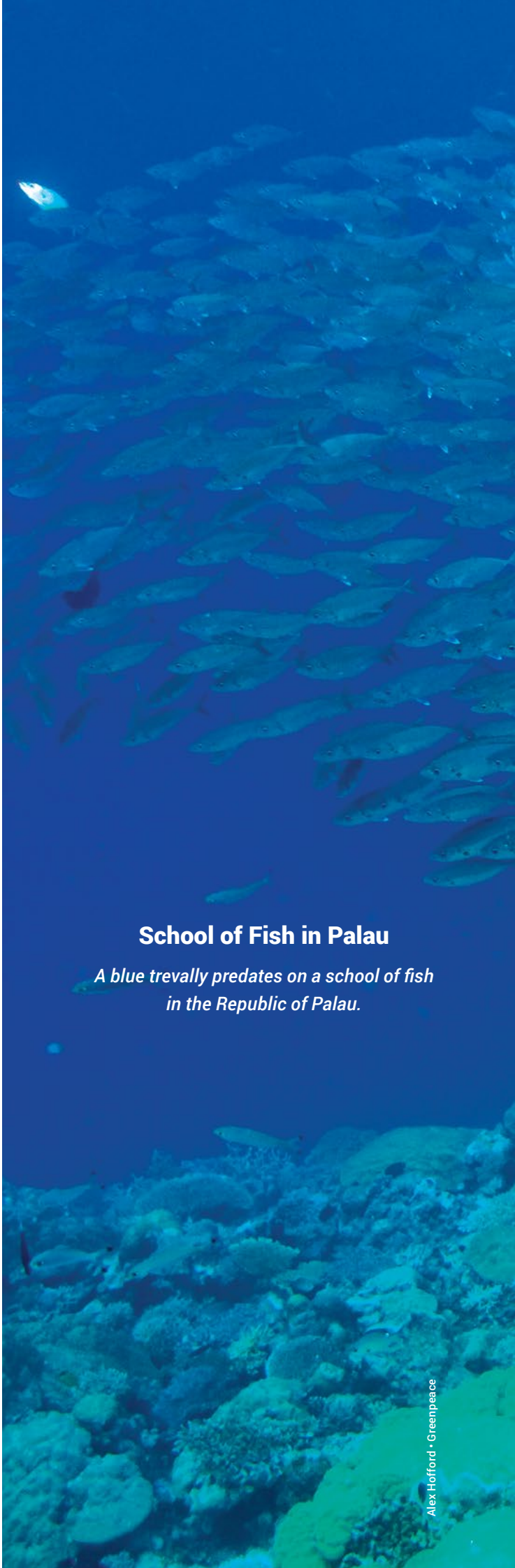

School of Fish in Palau

A blue trevally predates on a school of fish in the Republic of Palau.

Alex Hofford • Greenpeace

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Greenpeace Australia Pacific acknowledges the Traditional Owners of Country throughout Australia and recognises their continuing connection to land, waters, and culture. We pay our respects to their Elders past, present and emerging.

Greenpeace Australia Pacific thanks the peer reviewers who generously volunteered their time to this report. We are grateful for the support of the Sydney Environment Institute at the University of Sydney, Australia.

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And we would especially like to thank the Pacific communities who lent their voices to this project. We honour your stories and the resilience you have shown throughout this process

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PREFACE

And so it is

we want so many things and much
What is real and not? What is the plan?

Our garden is an endless performance
of light and shadow quick bird and insect palaver

The decisive wisdom of cut basil informs everything
teaches even the black rocks of the back divide to breathe

Blessed are the flowers herbs and vegetables
Reina has planted in their healing loveliness

The hibiscus blooms want a language to describe their colour
I say the red of fresh blood or birth

A lone monarch butterfly flits from flower to flower
How temporary it all is how fleeting the attention

The boundary palm with the gigantic Afro is a fecund nest
for the squabble of birds that wake us in the mornings

In two weeks of luscious rain and heat our lawn
is a wild scramble of green that wants no limits

Into the breathless blue sky the pohutukawa
in the corner of our back yard stretches and stretches

Invisible in its foliage a warbler weaves a delicate song
I want to capture and remember like I try to hold

all the people I've loved or love
as they disappear into the space before memory

Yesterday I pulled up the compost lid
to a buffet of delicious decay and fat worms feasting

Soil earth is our return our last need and answer
beyond addictive reason fear and desire

Despite all else the day will fulfil its cycle of light and dark
and I'll continue to want much and take my chances

Albert Wendt

Genevieve French / Greenpeace

FOREWORD

Rt. Hon. Enele Sopoaga

Talofa,

At the outset I would like to congratulate Greenpeace Australia Pacific on a landmark report, detailing with great care the Pacific's plight and fight. For nearly 50 years, Greenpeace has been synonymous with the struggles our region has faced: from facing down nuclear bombs for which it paid the ultimate price to protecting our fishing grounds and supporting our climate advocacy work. Today, our very existence now depends on the continued success of our collective efforts. From the days of nuclear protest to today's march for climate justice, the work of all our civil society partners and fellow Pacific Governments and communities have lifted the voices of those of us who must now contend with the consequences of environmental degradation. And while we here in the Pacific are on the very frontlines of this crisis, we remain steadfast at the very forefront of the fight against it. The launch of this report today is another arrow in our quiver.

For many years, our grand coalition of Pacific leaders and civil society organisations have had to carry a huge burden and responsibility. As the Prime Minister of Tuvalu, I bore the weight of this responsibility, to ensure that there will be a future for Tuvalu. Like my fellow leaders in the region, it kept me awake at night. No national leader in the history of humanity has ever faced this question: will we survive or will we disappear under the sea? I ask you all to think what it is like to be in my shoes. If you were faced with the threat of the disappearance of your nation, what would you do? I ask you to pause and ask yourself, what would you do? We have said many times over: Climate change is the single greatest threat to the prosperity and security of Pacific nations. It is threatening the livelihood, security and wellbeing of the entire Pacific – including my nation of Tuvalu. The plight of the Pacific is clear: we must fight this crisis with all the political courage, scientific and technological innovation we can muster. We cannot falter.

The great Italian poet Dante once wrote: "The darkest places in hell are reserved for those who maintain their neutrality in times of moral crisis". These words are no less relevant today. Political leaders must summon what character, wisdom and courage they have to make the right choice – not just for today but for the long-term advancement of humanity. We are all facing the biggest moral crisis of humanity, where there is no place for neutrality or denial. There must be no quarter given to proponents of the same, stale ideologies that place short-term profits of the few over the long-term prosperity of the people. If the fossil fuel industry refuses to prioritize people over profit, then let us relegate these fossil billionaires to the waste-heap of history, and continue moving forward. I ask you all to think for a moment about the term, fossil fuel. It is very apt. The fossil fuels we are burning today are made from extinct plants and animals. Fossil fuels signify extinction. We must not condemn ourselves to extinction riding on the back of the extinct. We must strive for renewal. We must dramatically change our future to renewable energy, renewable jobs and a renewed sense of stewardship over the earth.

I am heartened by the recent announcements made by China and the restoration of sense in the United States. But let us not rest on false hope. We must continue to move forward faster, building back better, moving towards that sustainable world our children and grandchildren deserve to inherit. It is for them that we engage in the struggle today.

I ask everyone who reads this report to take time to reflect carefully on the data and the science. And then to look into the eyes of the first child they see. Climate change is more than just reports and data – it is first and foremost a question about our humanity. We in the Pacific are more than just sinking islands, broken seawalls and cyclones – we are your brothers and sisters. I want everyone to look into the child's eyes and imagine what those eyes will see in ten or twenty years. Will they see Dantes' hell or will they see a sustainable planet?

I offer my congratulations to Joe and the team at Greenpeace for their continued solidarity with us in this struggle and for this landmark report which I encourage all to read, study and share. Let us continue working together as a grand coalition of Governments, civil society and communities to build the world our children deserve. Let us look into the eyes of our children and say, yes we have a real future for you. And let us all do our utmost to save this planet that God has gifted to us all. Tuvalu and the entire Pacific depends on what you choose to do today.

For if we save Tuvalu, we save the world.

TUVALU MO TE ATUA.

Rt. Hon. Enele Sopoaga is the former Prime Minister of Tuvalu (2013-2019), the current opposition leader and one of the principal architects of the Paris Agreement.

Seawall on Majuro Atoll

Marshall Islands

King tides have affected this end of the island particularly with many houses in the area damaged and abandoned due to flooding and coastal erosion. Damage is often so severe that families abandon houses and look to build anew or stay with other family members. Sea walls are increasingly being built to protect homes and land from king tides, which have increased significantly in the last decade. Inundation continues to affect sources of fresh drinking water and crops across the Marshall Islands.

Genevieve French • Greenpeace

Mr Adam Bandt MP

The poem by Samoan writer, Albert Wendt, used to preface this Greenpeace report writes of 'decisive wisdom' that 'informs' and 'teaches'. We have all heard how the Pacific is particularly vulnerable to climate change and read stories of unprecedented tides washing through villages. Now Greenpeace have gathered all the information in one report, and in a way that teaches us about the climate crisis' destructive impact on the Pacific and how this worsening situation is driven by external, global factors.

Of all the world's regions the Pacific is bearing the brunt of the global climate emergency in the severest of forms. Pacific Island countries face a threat to their very survival. Pacific leaders have been telling the world this for years. So, yes, climate change, in addition to being commonly represented as the great moral challenge of our generation, is, for Pacific people, truly an existential matter.

They face this future through no fault of their own. This destruction is happening because of global warming, overwhelmingly driven by the actions and political leadership of 15 nations, one of which is Australia. Between them, these countries produce 73.5% of all global greenhouse gas emissions. Pacific Island Countries together contribute a trifling 0.14%.

Pacific Island countries recognise this. They have been powerfully calling for urgent action on climate change for years, including the rapid phase-out of fossil fuels, especially coal. They understand that we are in a critical decade and there is no time for delay.

This report is important for Australia, given our federal government's denial of the realities of climate change. This account of the impact of climate change upon the Pacific is a portentous example of what the world faces from runaway global heating. We know this already. We are seeing our own version of the severe impacts of climate change here in Australia, with rising temperatures, changes in rainfall, longer drought, worsening cyclone activity, and massive devastating bushfires. The Pacific is in need and we, along with all peoples and countries of the world, also face unprecedented and irreversible harm.

That is why the Australian government must act urgently. Science tells the global community must at least halve pollution by 2030 and get to zero emissions as fast as possible. Given Australia's position as one of the wealthiest nations and a global exporter of fossil fuels, we have a moral obligation to go even faster. We must leave coal, oil, and gas in the ground and move at emergency speed to stop the threat of climate change. We must transition electricity, transport and manufacturing sectors to zero pollution and create new clean, green industries to replace existing carbon intensive exports.

This is the critical decade for action if we hope to limit warming to 1.5°C. Australia must take note of this report and act. We must act to retain political and neighbourly credibility in the region. We must act to do our bit to minimise the devastation already affecting Pacific people's lives and futures. We must act because it is in our interests to reduce the impact of climate change upon Australia. And finally, we must act because, as Albert Wendt tells us, once we have read reports like this, we are informed and taught and thus have the decisive wisdom to know what to do and why.

It is up to us and our governments to learn from this and to act with the decisive wisdom this report engenders and demands.

Adam Bandt is the federal member for Melbourne in the Parliament of Australia and the Leader of the Australian Greens.

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EXECUTIVE SUMMARY

The world is in an unprecedented climate crisis, caused by human-made greenhouse gas emissions. The environmental impacts of burning coal, oil, and gas are well documented. They include more intense extreme weather events, such as droughts, bushfires and cyclones, rising sea levels, ocean acidification, biodiversity loss, more extreme heat, and the resulting damage to the natural and built systems required to sustain human life on our planet.

The Pacific region, and the Pacific island communities who depend on it for their livelihoods and culture, are already facing some of the most severe climate impacts anywhere on earth. As inhabitants of predominantly low-lying islands, the people of the Pacific have already seen rising sea levels and higher king tides flood coastal communities, eroding coastlines, raising water table salinity, and reducing crop yields and supplies of fresh water. Some communities have already been forced to relocate due to rising sea levels, such as the Fijian village of Vunidogoloa, whose inhabitants had to move 2km inland in 2014. A further 830 vulnerable communities have been given priority status for relocation in Fiji alone.

Heating oceans have resulted in more intense tropical hurricanes, whose devastating damage affects low-lying communities most severely. Key examples include Cyclone Pam in March 2015, which affected around half of Vanuatu's population and destroyed 95 per cent of crops in affected areas; Cyclone Winston in February 2016, the strongest cyclone to make landfall in the southern hemisphere, which caused $470 million worth of damage to Fiji, or around 10 per cent of that nation's GDP; and Cyclone Harold in April 2020, which devastated Solomon Islands, Vanuatu, Fiji and Tonga.

Despite being forced to bear the brunt of the harm caused by global heating, Pacific Island Countries (PICs) are among the nations of the world least responsible for creating the climate crisis. The highest 15 emitting nations together produce 73.51 per cent of global emissions, while Pacific Island Countries (14) produce just 0.141 per cent. More critically, the current plans of those responsible for this situation are grossly insufficient. None of the top 15 greenhouse gas emitters have pledged emissions reductions, via their Nationally Determined Contributions (NDCs), that are consistent with the Paris Agreement's 1.5 degree heating limit or with the more lenient 2 degree Copenhagen limit, with the exception of India's 2 degree compatible goal.

'Critically insufficient' NDCs, which would lock in over 4 degrees of heating if extrapolated across all nations, comprise 19.09 per cent of annual global emissions. 'Highly insufficient' NDCs, which would lock in between 3 and 4 degrees of heating if extrapolated across all nations, comprise a further 32.87 per cent of annual global emissions. 'Insufficient' NDCs, which would lead to between 2 and 3 degrees of heating if extrapolated across all nations, comprise a further 13.22 per cent of annual global emissions. Countries with NDCs that lock in at least 2 degrees of heating are therefore responsible for 65.18 per cent of annual global emissions.

Unless the world's top emitters quickly move to rectify the injustice inherent in this situation, the outlook for the Pacific is dire. The world in 2020 is 1.1 degrees celsius hotter than the pre-industrial average. If all current pledges to reduce global greenhouse gas emissions by the world's nations are achieved, the world is projected to heat by a median estimate of 2.7 degrees by 2100, with a possible range of 2.2 to 3.4 degrees celsius. When taking into account only the emissions reduction policies currently in place, the world is projected to heat by a median estimate of 2.9 degrees by 2100, with a possible range of 2.1 to 3.9 degrees celsius.

As the IPCC's landmark research has recently demonstrated, global heating of even 1.5 or 2 degrees would be catastrophic for Pacific Island Countries.[1] As predominantly low-lying geographies, PICs are especially vulnerable to even small rises in sea level, including the associated loss of freshwater resources. They are highly reliant on healthy marine ecosystems and fisheries for food and economic prosperity, both of which would be severely degraded. Many PICs are also situated at low latitudes, where loss of coastal resources and decline of fisheries and aquaculture is predicted to be especially severe. As small island developing states, PICs will experience some of the highest water stress of any nations. They will also experience the largest projected falls in economic growth globally. Finally, they are among some of the most vulnerable nations to cyclones, which are projected to increase with additional heating.

Despite this, the Pacific story is one of resilience amid crisis. The solutions are being found in both age-old traditions and modern technology, and give cause for hope if we act in time. The nations of the world therefore need to rapidly reduce their emissions and go well beyond their current commitments, with the most-polluting countries, such as China, the USA and Australia leading the way. Australia, as a nation with significant interests in the Pacific and which claims a special friendship with Pacific Island Countries, has a particular responsibility to lead in this arena, if it is to meet its obligations to the communities of the Pacific, and to the world as a whole.

Villagers at Point Cross Village, Vanuatu

Steven Lyon • Greenpeace

INTRODUCTION

Te Mana o te Moana ('The Spirit of the Sea') is the Pacific's challenge to the world in the face of the climate crisis.

It begins by outlining the impacts that the Pacific has already felt from global heating (Chapter 1). It proceeds to establish where responsibility for this situation lies, by analysing the current state of global emissions, and the adequacy of the climate reduction commitments of the largest 15 greenhouse gas emitting nations (Chapter 2). The report explores the projected rises in global temperatures if those commitments were to be met, along with what temperature rises will take place based on the current policies that are in place alone (Chapter 3.1).

The report then discusses the impacts that are projected to be felt in the Pacific at even 1.5 degrees of warming (Chapter 3.2), focusing on the IPCC's recent landmark study, and concludes with a discussion of necessary emissions commitments and policy changes to prevent this situation becoming a reality, with a particular focus on Australia (Chapter 4).

Case studies of individual Pacific Island people and their communities are interspersed throughout the report, grounding its findings in the lived experience of the region in the face of the climate crisis, and to highlight their demands for change.

Genevieve French • Greenpeace

1. THE PACIFIC UNDER THREAT

1.1 What is the harm that global heating has already caused to the Pacific?

The Pacific region encompasses approximately 165 million square kilometres, covering one-third of the Earth's surface. With over 25,000 islands, many of which are low-lying, Pacific communities are facing an existential threat from global heating-driven impacts such as sea level rise and more intense cyclones. Moreover, Pacific Island Countries (PICs) are only responsible for 0.14 per cent of global emissions and yet are among the most vulnerable to impacts from the climate crisis.[2]

In 2018, the Intergovernmental Panel on Climate Change (IPCC) published a *Special Report on Global Warming of 1.5°C* which showed that human activities have caused global temperatures to rise by around 1.1°C above pre-industrial levels, and are already causing devastating climate impacts.[3] Over 9.2 million people have been affected by extreme events in the Pacific over the past 70 years, which have led to approximately 10,000 reported deaths and damages of about US$3.2 billion. Tropical cyclones have been the major cause of this loss and damage.[4]

Along with adaptation challenges, Pacific communities are already facing loss and damage from climate change. Loss and damage encompass climate change impacts which go beyond communities' capacity to adapt. This includes slow onset events such as sea level rise, warming oceans, ocean acidification, and salinisation, as well as extreme weather events such as cyclones, flooding and drought. While these categories are useful distinctions, it is important to note that both are occurring concurrently: as global heating drives slow onset events, it is exacerbating extreme weather events.

Loss and damage can be categorised into economic (income, infrastructure, property) and non-economic (life, cultural heritage, indigenous knowledge, mental and physical human health) losses. In low- and middle-income countries, damage to power generation and transport infrastructure from extreme weather events are estimated to cost $18 billion per year; additional losses of $390 billion per year are caused by disruptions to households and businesses.[5] The IPCC projects a significant cost difference between heating of 1.5°C and 2°C with $54 and $69 trillion respectively, compared to 1961-1990.[6] With each new disaster, the Pacific loses an intrinsic part of its identity and future.

1.1.2 Slow onset events

Global sea level rise is a critical threat to Pacific Island Countries. Failing to achieve net zero emissions by 2050 will mean at least 0.6m of sea level rise by 2100 compared to business as usual.[7] Seas are now rising twice as fast as the average in the twentieth century; when once habitable areas are swallowed up by the sea, communities are forced off their land and become internally displaced people, essentially refugees in their own countries.[8] Rising seas also cause inundation, leading to salinisation of agricultural land. The IPCC's *Special Report on the Ocean and Cryosphere* highlights the cultural risks caused by climate impacts on marine ecosystems. Through changes in the availability of particular species and reduced access to fishing or hunting areas, climate impacts may cause rapid and irreversible loss of culture and indigenous knowledge, as well as adverse impacts on traditional diets, food security, and marine recreation activities.[9]

Pacific countries are already being affected by sea level rise, which has caused land loss and led to relocation for a number of communities. Research shows sea level rise at a rate of 3-6mm per year for the Pacific, with variations between islands. Islands in the Western Pacific, such as Solomon Islands and Papua New Guinea, have experienced sea level rise of up to 6mm per year, in contrast to islands further east, such as Samoa and Kiribati, which are impacted less by slow-onset events but no less vulnerable to extreme weather events.[10] In 2019, the Solomon Islands lost significant amounts of land including five uninhabited islands; sections of land from six other islands have substantially eroded, forcing communities to relocate.[11] These six islands lost 20 per cent of their land between 1947 and 2014. Shoreline erosions in two areas have destroyed villages which have been there since 1935, leading to community relocation, including Nuatambu Island which lost 11 houses and was home to 25 families. Since 2011, Nuatambu has lost half its inhabitable area. Relocated families from Nuatambu are now living on the nearby large island of Choiseul, and what was once a single village is now broken up into five separate communities, harming generations-old relationship and kinship ties.[12]

Saltwater intrusion from coastal flooding disrupts farming and can result in relocation. It is estimated that the cost of saltwater intrusion on Fiji's largest island, Viti Levu, is $52 million per year or 4 per cent of Fiji's GDP. In 2014, the village of Vunidogoloa became the first community in Fiji to relocate because of climate change after several failed attempts to adapt by building sea walls. With rising sea levels causing coastal erosion and inundation, flooding became an increasing threat. The villagers of Vunidogoloa moved two kilometres inland from their original coastal settlement and jointly contributed to the cost of relocating. The relocation was culturally, emotionally, and spiritually difficult for those affected. It meant moving from their ancestral land and the place they called home – a powerful, culturally important tie to country that is often difficult for a western reader to understand – changing their way of life, and adjusting to a new place of residence. The move inland has meant, for example, that women who usually went fishing as part of their livelihood can no longer take the lengthy absences from their usual care work that this would require.[13]

Vunidogoloa is the first case of many. The Fijian Government has identified 830 vulnerable communities, with 48 highlighted as priority relocations.[14] These relocations will not only come with economic costs of materials and construction – the Vunidogoloa relocation is estimated to have cost FJD$980,000 (AUD$630,000) of which the government contributed FJD$740,000 (AUD$476,000) and the community provided FJD$240,000 (AUD$154,000) worth of timber as building materials – but also bring the social and cultural trauma of moving from established homes, loss of culture, identity, language, and change in traditional lifestyles.[15]

Globally, the alkalinity of the ocean has decreased compared to pre-industrial levels and acidity has increased by at least 26 per cent as oceans continue to absorb carbon. Ocean acidification leads to coral stress which can have a major impact on marine ecosystems, livelihoods, and food security.[16] Heating oceans also cause coral bleaching which, if allowed to persist for long enough, eventually leads to coral death. Hotter, more acidic oceans, combined with non-climate pressures such as overfishing, pollution and coastal development, can cause a reduction in live coral, greater algae cover and diseases, and weakened reef structures.[17] The longest coral bleaching event on record occurred from 2015 to 2016, causing significant habitat and biodiversity losses around the world and in the Pacific, including at Ofu Island in Samoa and reefs around Gau Island and the Vatu-I-ra seascape in Fiji.[18] It is therefore fitting that in 2019 Pacific Island leaders came together to declare a climate crisis at the 50th Pacific Islands Forum in Tuvalu.[19]

These immediate, direct impacts make the longer-term economic outlook for the states in question more perilous. As ecosystems become degraded, and coastlines erode, Pacific Island Countries (PICs) are in danger of losing crucial marine resources, such as tuna fisheries, which bring in over $460 million in revenue through licence fees to PICs.

1.1.3 Extreme weather events

Climate change is increasing the intensity of cyclones, leading to devastation across the region. The Pacific was recently hit by two category 5 cyclones in the space of twelve months. The first was Cyclone Pam which struck Vanuatu in March 2015, causing widespread damage across all six provinces, amounting to 64 per cent of the country's GDP, or close to AUD$1 billion. Over half the population, about 166,000 people, were affected and an estimated 95 per cent of crops were destroyed in affected areas.[20] There was also extensive destruction of pandanus leaves which led to loss of livelihoods for women who rely on pandanus leaves for weaving mats and handicrafts to sell.[21] In February 2016, Cyclone Winston, the strongest cyclone to make landfall in the Southern Hemisphere, caused mass damage with 350,000 people (40 per cent of the population) of Fiji affected, including more than 60,000 people displaced and 40,000 homes damaged. Cyclone Winston caused $1.4 billion worth of damage, equivalent to over 30 per cent of Fiji's GDP.[22] At the time of publication of this report, there are six cyclones projected for the 2020/2021 cyclone season.

Similarly intense and damaging cyclones have been seen since. Category 4 Tropical Cyclone Gita devastated Tonga in February 2018: the worst storm the kingdom had experienced in 60 years at the time. Gita caused flooding, displacement, and destruction of significant landmarks including Tonga's Parliament House.[23] During the first week of April 2020, Cyclone Harold devastated communities in Solomon Islands, Vanuatu, Fiji and Tonga. On April 2, Cyclone Harold swept through Solomon Islands. During strong winds and heavy rain across the country, the ferry MV Taimareho encountered rough seas and 27 of the 738 passengers died after being thrown overboard. A few days later, Cyclone Harold hit Vanuatu as a Category 5 cyclone, the strongest to land in Vanuatu since Cyclone Pam in 2015. Due to COVID19 measures, humanitarian relief supplies that arrived had to be quarantined for days, delaying their delivery to communities in need. From 6 April, Fiji faced destruction from Cyclone Harold including whirlwind damage to homes and buildings on Viti Levu. About 1,700 people had to be evacuated to 61 evacuation centers while continuing to practise COVID19 precautionary measures.[24] The climate-driven harm faced in 2020 highlights

the dual impact of the climate crisis and COVID19. As Pacific communities build resilience, they must also now take into consideration the challenges of a global pandemic which is acting as a force multiplier.

Between 1970 and 2007, there were 41 documented flood events in Fiji, affecting approximately 220,000 people and resulting in 88 deaths.[25] In January 2009, several parts of the country were affected by multiple flooding events. The impact was greatest in Western Viti Levu, including the Nadi and Ba areas. The Fiji Meteorological Service identified this as a one-in-50-year event. The Fijian government requested the Pacific Islands Applied Geoscience Commission (SOPAC) to conduct an assessment of economic losses, which were defined as structural damage, lost assets or possessions, medical impacts, evacuation or relocation of people or goods, and the loss of wages and or business. The assessment concluded that costs totalled approximately FJD$330 million (AUD$212) from families and businesses in the area.[26]

The climate crisis has exacerbated drought conditions in the Pacific, a situation that has been particularly devastating for atoll islands whose freshwater sources are already scarce. In 2011, several countries suffered drought conditions. One of the most severely affected was Tuvalu, whose government declared a state of emergency in the face of a water shortage. Very little rain was seen for months and crops failed across the Tuvalu archipelago. Relief efforts from Australia, New Zealand, Japan and the Red Cross brought emergency bottled water and desalinisation equipment.[27] The risk of droughts is concerning for the Pacific especially as more than 70 per cent of Pacific populations directly or indirectly rely on agriculture as a source of livelihood and historical trends show movement towards a drier and warmer climate for the southern Pacific.[28]

King tides are especially high tides that can cause coastal flooding, at times reaching up to 80 per cent higher than the average tide levels. Over time, rising sea levels are raising the limits of high tides. As sea levels continue to rise, king tides will cause increasing damage to coastal communities and territories. In 2014, king tides in the Marshall Islands led the government to declare a state of emergency. 70 homes were damaged in the capital, Majuro, and 940 people evacuated. Outer islands were also affected with loss of food stock: most of the breadfruit, pandanus and banana trees were destroyed; and water sources were contaminated, with 80 per cent of desalinisation facilities affected.[29] In February 2015, Kiribati experienced king tides which severely affected South Tarawa and flooded Betio Hospital, destroying food crops and contaminating fresh water sources. Kiribati's sea walls were not able to stop the king tides from washing over them: a phenomenon that will happen more frequently as king tides grow worse due to climate change.

As global heating continues to increase, these kinds of impacts will grow more serious. The IPCC *Special Report on Global Warming of 1.5°C* outlines the harm that will result from 1.5°C compared to 2°C, highlighting the fact that climate impact risks are lower for a temperature rise of 1.5°C compared to 2°C, and that half a degree is critically important for the future of the Pacific.[30] In the face of increasingly severe impacts, Pacific Island Countries continue to fight and call for more ambitious action from the world's biggest polluters.

Local population greets the Rainbow Warrior in Vanuatu

Port Vila, Vanuatu.

The Rainbow Warrior arrives in Vanuatu to assist in relief efforts for the Pacific Island nation following Cyclone Pam in March. The ship and crew will bring much needed supplies to the outer islands. Extreme weather events, such as Cyclone Pam, threaten to become the new normal for Pacific island states as the global climate changes, underscoring the urgency to cut global emissions to avert a climate crisis.

Steven Lyon / Greenpeace

CASE STUDY

Tarita Holm (Palau)

In the last eight years, Palau has had two super typhoons hit back-to-back in less than 12 months despite the fact that Palau sits outside the typhoon belt. This was something Tarita had never experienced. Salt water inundation and high tides means that Palauans sometimes need to relocate people from low-lying communities. Palau has also experienced increasingly intense drought events and rising sea temperatures. All of these impacts risk food security in the Pacific.

Pacific Islanders have been growing and consuming taro, a starchy root vegetable and staple food source for thousands of years. In Tarita's village, women had noticed that taro patches had been abandoned so a lot of women got together to revive traditional growing and harvesting. At some point, if and when imports are disrupted by climate impacts, they will need to be able to feed themselves; through this revival, they are also ensuring that their traditional knowledge and practices are not forgotten.

Tarita believes that the root of the climate crisis goes back to the current development paradigm. She acknowledges that we cannot separate consumption from climate change; our Earth systems can't continue to support mass consumption societies. In Palau, this means redesigning the economy to reduce dependence on imports, and growing food on the island, as the women in her village are doing.

> *"Humanity's future is in the hands of those responsible for the climate crisis and they must make wiser choices, reconnect with the land they are living on, reconnect with people and focus on relationships. Value the group not just the individual and work towards a greater good. My hope for the future is that we all realise these truths, as soon as possible. I have hope, a lot of times from the younger generations. When I see what the young people are doing and saying, around the world, it gives me a lot of hope."*

Images supplied by Tarita Holm

CASE STUDY

Claire Anterea (Kiribati)

Claire is from Kiribati, a low-lying atoll nation, which is severely affected by impacts from sea level rise. She experiences regular king tides which displace families in her community, forcing them to temporarily move from their homes as tides flood the area. This flooding also leads to salinisation as sea water inundates land used to grow crops and contaminates water sources. Water is the main source of life but fresh water is often scarce in South Tarawa and the outer islands.

In the face of these impacts, Claire is building resilience by encouraging self-sufficiency. Driven too by the necessary response to COVID19, she is working with communities to prepare their people, supporting them to build their own gardens, including 'key-hole gardens' since land area is limited, learning composting, and working with the Kiribati government to provide clean water. In her village, everyone is planting something and there is now a full vegetable market along the road. Each evening, her family now has greens and papaya on their table.

In South Tarawa there are plans to set up a desalinisation plant to produce fresh water. Claire is also part of a resilient village project which has established a garden to provide seeds and is an example for those in the community to follow. There is great value in her community living simply and healthily, following the examples of their elders who were self-reliant and self-sufficient.

Claire's message to those responsible is that we all live on one planet and the global village is being affected. Major polluters can move towards renewable energy as they are trying to do in Kiribati. There are several buildings that are using solar, including the main hospital. Kiribati is setting a good example for rich countries to follow.

> *"It's important to use renewable energy so that small islands like Tuvalu, Maldives, Marshall Islands and especially Kiribati can survive. And our children can live healthy lives"*

Images supplied by Claire Anterea

2. WHO IS RESPONSIBLE?

2.1 Who is causing the climate crisis? Which nations are the biggest greenhouse gas emitters?

Global emissions in 2016 were 49.63 gigatonnes of carbon dioxide equivalent (49.63 Gt CO2e).[31] The biggest emitter was China, with 23.46 per cent of global emissions, followed by the USA, with 11.81 per cent of global emissions. Australia was the 14th largest emitter, with 1.05 per cent of global emissions. Taken together, the 14 Pacific Island Countries (PICs) that have ratified the Paris Agreement comprise just 0.14 per cent of global emissions.

The top 15 greenhouse gas emitting nations or national groupings and those of Pacific Island Countries are shown in the table below.

Rank	Nation	Gt CO2e	% of global total
1	China	11.58	23.46%
2	USA	5.83	11.81%
3	India	3.24	6.56%
4	EU (27)	3.16	6.40%
5	Russia	2.93	5.94%
6	Indonesia	2.23	4.52%
7	Brazil	1.38	2.80%
8	Japan	1.26	2.55%
9	Iran	0.86796	1.76%
10	Canada	0.77927	1.58%
11	Mexico	0.68838	1.39%
12	Saudi Arabia	0.66358	1.34%
13	South Korea	0.6574	1.33%
14	Australia	0.51909	1.05%
15	South Africa	0.49739	1.01%
	Top 15 emitters	36.28307	73.51%
	Pacific Island Countries (14)	0.0698	0.141%
	World total	49.36	100%

FIGURE 1

Top 15 greenhouse gas emitters, 1990-2016 (line chart)

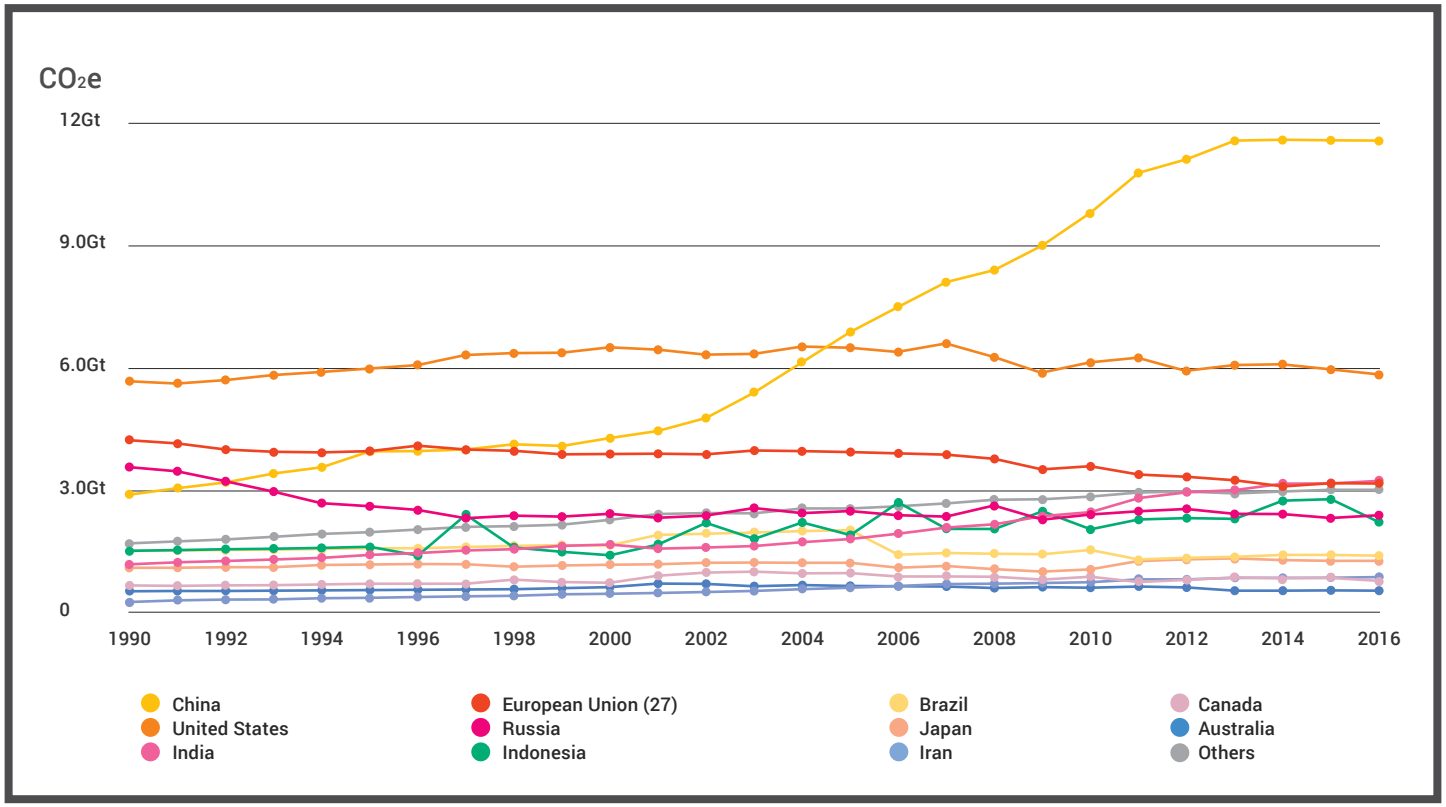
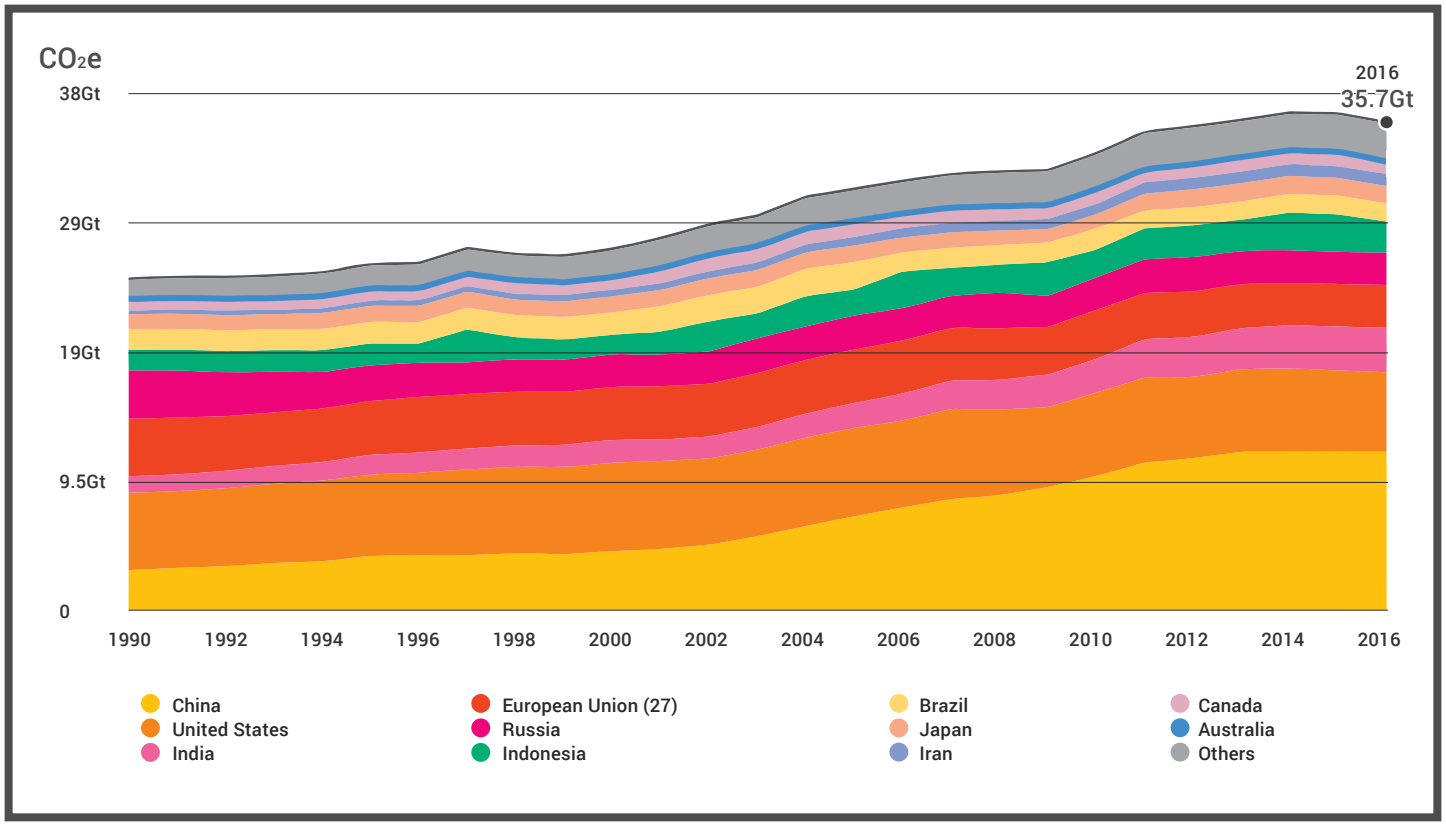


FIGURE 2

Top 15 greenhouse gas emitters, 1990-2016 (stacked area chart)



2.2 What are the Nationally Determined Contributions of the 15 highest emitting nations under the Paris Agreement to 2030?

The NDCs of the top 15 greenhouse gas emitting nations or national groupings under the Paris Agreement are shown in the table below.[32]

CHINA

- Peak CO2 emissions by 2030 at latest
- Non-fossil fuel share: 20% by 2030
- Forest stock: +4.5 billion m³ above 2005 by 2030
- Carbon intensity: 60% to 65% below 2005 by 2030
- [33-47% above 2010 by 2030 excl. LULUCF for peaking and non-fossil targets]
- [36-53% above 2010 by 2030 excl. LULUCF for carbon intensity targets]
- Coverage: economy wide

USA

- [NB: The US formally withdrew from the Paris Agreement on 5 November 2020. President-elect Joe Biden has signalled that his administration will rejoin the Agreement.]
- 26-28% below 2005 by 2030 incl. LULUCF
- [10-17% below 1990 by 2025 excl. LULUCF]
- Coverage: economy-wide incl. LULUCF
- Long term goals: Obama Administration mid-century strategy: 80% below 2005 levels by 2050 incl. LULUCF
- [68-76% below 2005 by 2050 excl. LULUCF]
- 76% below 1990 incl. LULUCF

INDIA

- 33-35% below 2005 emissions intensity of GDP by 2030
- [413-445% above 1990 by 2030 excl. LULUCF]
- [146%-161% above 2010 by 2030 excl. LULUCF]
- Non-fossil share of cumulative power generation capacity to be 40% by 2030
- LULUCF: additional carbon sink of 2.5-3 GtCO2e by 2030

EU (27)

- At least 40% below 1990 emissions by 2030
- [29% below 2010 by 2030]
- Long term goal: 91-94% reduction below 1990, excl. LULUCF by incl. carbon removal

RUSSIA

- 25-30% below 1990 by 2030
- [19-24% below 1990 by 2030 excl. LULUCF]
- [18-25% below 2010 by 2030 excl. LULUCF]
- Coverage: economy-wide, incl. LULUCF
- Long term goals: none

INDONESIA

- Unconditional targets:
- 29% below BAU by 2030 incl. LULUCF
- [535% above 1990 by 2030 excl. LULUCF]
- [158% above 2010 by 2030 excl. LULUCF]
- Conditional targets:
- Up to 41% below BAU by 2030 incl. LULUCF.
- [469-502% above 1990 by 2030 excl. LULUCF]
- [131-145% above 2010 by 2030 excl. LULUCF]
- Coverage: economy-wide incl. LULUCF
- Long-term goals: none

BRAZIL

- 1.3 GtCO2e by 2025 incll LULUCF
- [76% above 1990 levels by 2025 excl. LULUCF]
- 5% above 2010 levels by 2025 excl. LULUCF]
- 'Indicative': 1.2 GtCO2e by 2030 incl. LULUCF
- [58% above 1990 levels by 2030 excl. LULUCF]
- [6% below 2010 levels by 2030 excl. LULUCF]
- Coverage: economy-wide incl. LULUCF

JAPAN

- 26% below 2013 by 2030
- [15% below 1990 by 2030 excl. LULUCF]
- [17% below 2010 by 2030 excl. LULUCF]
- Coverage: economy-wide incl. LULUCF and overseas credits for 2030
- Long-term goals: Net zero by 2050 (base year not specified)
- [78% to 80% below 1990 by 2050 excl. LULUCF]
- [79%-81% below 2010 by 2050 excl. LULUCF]

IRAN

- Unconditional target: 4% below a BAU scenario by 2030
- Conditional target: 8% below the unconditional target (i.e. 12% reduction on BAU by 2030).
- Coverage: sectors not specified.
- Long-term goals: none.

CANADA

- 30% below 2005 by 2030
- [13% below 1990 by 2030 excl. LULUCF]
- [24% below 2010 by 2030 excl. LULUCF]
- Coverage: economy-wide incl. LULUCF
- Long-term goals: net zero by 2050.
- [65% below 2005 levels excl. LULUCF]

MEXICO

- Unconditional targets: 22% GHG, 51% black carbon, total 25% below baselines provided in NDC document by 2030
- [74% above 1990 by 2030 excl. LULUCF]
- [18% above 2010 by 2030 excl. LULUCF]
- Conditional targets: 36% GHG, 70% black carbon, total 40% below baselines provided in NDC document by 2030
- [42% above 1990 by 2030 excl. LULUCF]
- [3% below 2010 by 2030 excl. LULUCF]
- Coverage: economy-wde, incl. LULUCF
- Long-term goals: 50% below 2000 by 2050.
- [27-37% below 1990 by 2050 excl. LULUCF]
- [50-57% below 2010 by 2050 excl. LULUCF]

SAUDI ARABIA

- [416-562% above 1990 by 2030 excl. LULUCF]*
- [62-108% above 2010 by 2030 excl. LULUCF]*
- Conditional targets: Reduction of up to 130 MtCO2e below BAU by 2030
- Coverage: individual measures
- Long-term goals: none

SOUTH KOREA

- 37% below BAU by 2030
- [78% above 1990 by 2030 excl. LULUCF]
- [20% below 2010 by 2030 excl. LULUCF]
- Coverage: economy-wide (including international market mechanisms)
- Long-term goals: net zero by 2050.[53]

AUSTRALIA

- 26-28% below 2005 by 2030
- [5-10% above 1990 levels by 2030, excl. LULUCF]
- [14-18% below 2010 levels by 2030, excl. LULUCF]
- Coverage: economy-wide, incl. LULUCF
- Long-term goals: none.

SOUTH AFRICA

- Emissions incl. LULUCF of between 398-614 Mt CO2e over 2025-2030
- [17-78% above 1990 by 2030 excl. LULUCF]
- Coverage: economy-wide.
- Long-term goals: Stable emissions over 2025-2030, followed by a decline to 212-428 Mt CO2e by 2050.

2.3 Where does responsibility for emissions reduction lie? How sufficient are the top emitting nations' commitments? Do they have policies in place to meet them?

As noted in 2.1 above, greenhouse gas emissions are not equally shared by the world's nations. The top 15 emitters together produce 73.51 per cent of global emissions, while Pacific Island Countries (14) produce 0.141 per cent. Moreover, historic emissions have been overwhelmingly produced by 'developed' nations in the global North because their economies industrialised earlier than 'developing' countries. Both factors must be taken into account when determining responsibility for the impacts of global heating that are already being felt, as well as those projected to occur.

Nations' NDCs may be classified into 5 categories.[33]

Category	Definition
Critically insufficient (4°C+ world)	**NDCs with this rating are well outside a country's 'fair share' range. If all government NDCs were within this range, global heating would exceed 4°C.**
Highly insufficient (<4°C world)	**NDCs with this rating are outside a country's 'fair share' range, but to a lesser extent than the previous category. If all government NDCs were within this range, global heating would reach 3-4°C.**
Insufficient (<3°C world)	**NDCs with this rating fall in the least stringent part of a country's 'fair share' range. If all government NDCs were within this range, global heating would reach 2-3°C.**
2°C Compatible	**NDCs with this rating are consistent with the 2009 Copenhagen 2°C goal. If all government NDCs were within this range, global heating would reach 2°C, still exceeding the Paris Agreement's goal of 1.5°C.**
1.5°C Paris Agreement Compatible	**NDCs with this rating are consistent with the Paris Agreement's goal of limiting heating to 1.5°C.**

The below table outlines the extent to which countries' Nationally Determined Contributions are sufficient to meet their 'fair share' of emissions reduction, and whether their current policies are sufficient to meet their NDC.

Nation	Gt CO2e	% of global total	NDC rating	Will their policies meet their NDC target?[34]
China	11.58	23.46%	Highly insufficient (<4°C world)	YES
USA	5.83	11.81%	Critically insufficient (4°C+ world)	NO
India	3.24	6.56%	Compatible with 2°C world	YES
EU (27)	3.16	6.40%	Insufficient (<3°C world)	CLOSE
Russia	2.93	5.94%	Critically insufficient (4°C+ world)	YES
Indonesia	2.23	4.52%	Highly insufficient (<4°C world)	YES
Brazil	1.38	2.80%	Insufficient (<3°C world)	NO
Japan	1.26	2.55%	Highly insufficient (<4°C world)	CLOSE
Iran	0.86796	1.76%	-	-
Canada	0.77927	1.58%	Insufficient (<3°C world)	NO
Mexico	0.68838	1.39%	Insufficient (<3°C world)	NO
Saudi Arabia	0.66358	1.34%	Critically insufficient (4°C+ world)	CLOSE
South Korea	0.6574	1.33%	Highly insufficient (<4°C world)	NO
Australia	0.51909	1.05%	Insufficient (<3°C world)	NO
South Africa	0.49739	1.01%	Highly insufficient (<4°C world)	YES
Top 15 emitters	36.28307	73.51%	-	-
World total	49.36	100%	2.2-3.4°C of heating	NO

None of the top 15 greenhouse gas emitters have pledged NDCs that are consistent with the Paris Agreement's 1.5 degree heating limit or with the more lenient 2 degree Copenhagen limit, with the exception of India's 2 degree compatible goal.

'Critically insufficient' NDCs, which would lock in over 4 degrees of heating if extrapolated across all nations, comprise 19.09 per cent of annual global emissions. 'Highly insufficient' NDCs, which would lock in between 3 and 4 degrees of heating if extrapolated across all nations, comprise a further 32.87 per cent of annual global emissions. 'Insufficient' NDCs, which would lead to between 2 and 3 degrees of heating if extrapolated across all nations, comprise a further 13.22 per cent of annual global emissions.

Countries with NDCs that lock in at least 2 degrees of heating are responsible for 65.18 per cent of annual global emissions.

CASE STUDY

Itinterunga (Rae) Bainteiti (Kiribati)

"One of the things that some of our elders always say is as long as you're breathing, just keep doing your part. Keep making that noise and also mobilise communities to build that resilience, using the local knowledge, traditional knowledge, and whatever resource that there is for building resilience of these communities, because the conversation on climate change is already mature enough to understand the cost of climate change and we haven't seen anything tangible"

Rae moved with his family to Kiribati in 2004 as his parents wanted to reconnect with their family. At many places on the island you can see both the ocean side and the lagoon side. From 2004 to 2007 there were normal king tides that came in and out but when Rae went back in 2011 there were extreme king tides, 3 or 4 times greater than what he saw in 2004. Recently, water has now flooded 200 metres inland.

In 2014 while driving home, Rae had to stop because the causeway was flooded. The water had reached his house: sea water had never crossed that far before. In Betio, his grandmother's garden was destroyed and her breadfruit trees damaged. People are now having to leave their houses and relocate inland each month in preparation for the king tide, then going back to clean up and rebuild.

Rae believes we need to do more than talk. Through KiriCAN, the Kiribati Climate Action Network, people have moved from talking to accelerating adaptation projects in communities. These projects include a rain water harvesting project, building sea walls, and a food security project to build traditional farms to grow traditional crops. In the long run, there is a need for a funding facility that can respond immediately after a disaster rather than waiting weeks for relief supplies while children's education, sanitation and health are impacted. Young people are often first responders in communities; they don't have formal training but the waiting period for relief can be unbearable. There needs to be a commitment towards capacity strengthening and programs for community members themselves, especially young people, to build self-resilience.

> *"Those responsible need to understand that they are leaving behind a polluted world and there is a lack of political will to change. Those responsible have a moral obligation to communities being impacted and must stop using the climate conversation for their own benefit and instead work towards a safe environment and safe planet for everyone."*

Image supplied by Itinterunga Bainteiti

CASE STUDY

Miriama Taukei (Tuvalu)

Miriama's home is situated between the ocean and the lagoon, 5 to 10 metres from each.

> *"In Tuvalu we are affected a lot, sea level rise is impacting the low-lying areas of the island and high tides bring in waste that floats on the ocean which ends up in our coastal areas."*

The community uses sea walls to try and stop the tides and builds houses higher to reduce the risk of flooding. As part of a group of young leaders, Miriama goes to the outer islands to collect waste and bring it back to the main island. The Department of Waste Management provides them with information on single use plastics and impacts on the island, and also on separating and recycling the recyclable materials.

> *"Resilience can be built by working together, helping one another and sharing information on what we can do to take care of our island. Here, in a small country, we can see the impacts every day. Even a small storm surge can destroy homes and take lives. In Tuvalu, people encourage small actions to live more sustainably, such as less travel and no burning of waste but bigger countries can and should do so much more. Stop mining, stop emissions and move towards renewable energy. My hope for the future is a greener island. I don't want to see my children, or my grandchildren, being raised in a country, on an island where there's no hope. I want hope for our children, for my children, my grandchildren so that they see what we are doing now in raising our voice, fighting climate change so they may not suffer in the future. So, this is a voice for everyone in the world that we should work together. Think about each other, so that our future generations can thrive tomorrow."*

Images supplied by Miriama Taukei

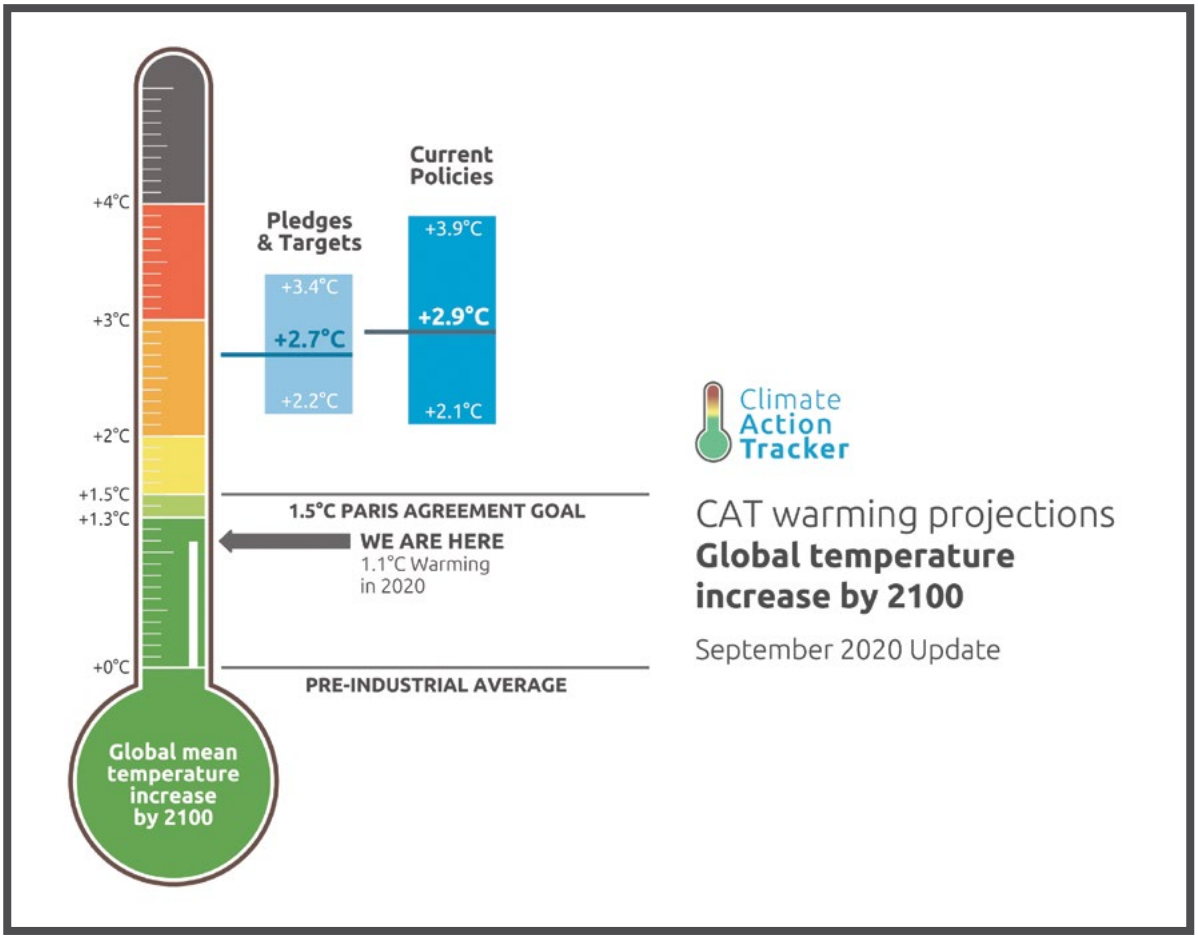
3. WHAT DO THESE COMMITMENTS MEAN?

3.1 What amount of heating is likely?

The world in 2020 is 1.1 degrees celsius hotter than the pre-industrial average. If all current pledges to reduce global greenhouse gas emissions by the world's nations are achieved, the world is projected to heat by a median estimate of 2.7 degrees by 2100, with a possible range of 2.2 to 3.4 degrees celsius.[35]

However, many countries do not yet have policies in place that are likely to deliver on their NDC commitments. When taking into account only the emissions reduction policies currently in place, the world is projected to heat by a median estimate of 2.9 degrees by 2100, with a possible range of 2.1 to 3.9 degrees celsius.[36]

FIGURE 3
NDC assessment (Climate Action Tracker)[38]



3.2 What is the projected extent of climate-related harm that will be caused to the Pacific under current emission reduction settings?

The global consensus on limiting global heating and the damage it will cause, as embodied in the Paris Agreement, is that signatories must do all they can to prevent heating exceeding 1.5 degrees. This is because, even though heating of between 1.1 and 1.5 degrees presents risks, the worst harm is not estimated to take place until temperatures breach the 1.5 degrees threshold.

The most authoritative, up-to-date assessment of the impacts of 1.5 degrees of heating is the IPCC's landmark *Special Report: Global Warming of 1.5°C*.[37] According to the IPCC:

'Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate. (high confidence)'38

Key findings of the *Special Report* include:

- By 2100, sea levels will rise by between 0.26 and 0.77m under 1.5 degrees of heating. Under 2 degrees of heating, sea levels will rise a further 0.1m. This will result in up to 10 million more people being exposed to sea-level rise related risks. Sea level rise will continue beyond 2100 even under 1.5 degrees of heating.
- Sea level rise of 0.40m, which is well within the 1.5 degrees heating scenario, will degrade freshwater resources in Pacific atolls.[39]
- 'Increasing warming amplifies the exposure of small islands, low-lying coastal areas and deltas to the risks associated with sea level rise for many human and ecological systems, including increased saltwater intrusion, flooding and damage to infrastructure *(high confidence)*. Risks associated with sea level rise are higher at 2°C compared to 1.5°C. The slower rate of sea level rise at global warming of 1.5°C reduces these risks, enabling greater opportunities for adaptation including managing and restoring natural coastal ecosystems and infrastructure reinforcement *(medium confidence)*.'[40]
- Extreme weather events, including cyclones, are projected to increase as the planet heats.
- 6 per cent of insects, 8 per cent of plants and 4 per cent of vertebrates are projected to lose over half of their climatically determined geographic range for global heating of 1.5°C. This compares with 18 per cent, 16 per cent and 8 per cent respectively for heating of 2°C.[41] These changes would significantly impact food security in the Pacific, which is already threatened due to overfishing.
- 'Global warming of 1.5°C is projected to shift the ranges of many marine species to higher latitudes as well as increase the amount of damage to many ecosystems. It is also expected to drive the loss of coastal resources and reduce the productivity of fisheries and aquaculture (especially at low latitudes).'[42]

- Coral reefs are projected to decline by a further 70-90 per cent with heating of 1.5°C. At 2°C, coral reef decline is projected to be over 99 per cent. As key bulwarks against king tides and erosion, the decline of coral reefs will act as a force multiplier for these events.
- 'The level of ocean acidification due to increasing CO2 concentrations associated with global warming of 1.5°C is projected to amplify the adverse effects of warming, and even further at 2°C, impacting the growth, development, calcification, survival, and thus abundance of a broad range of species, for example, from algae to fish (*high confidence*).'[43]
- 'Populations at disproportionately higher risk of adverse consequences with global warming of 1.5°C and beyond include disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods (*high confidence*).'[44]
- Small island developing states may experience 'higher water stress' – that is, they will struggle to get enough water for their usual needs – due to increasing aridity when global heating is allowed to reach 2°C, as compared to 1.5°C.[45]
- 'Countries in the tropics and Southern Hemisphere subtropics are projected to experience the largest impacts on economic growth due to climate change should global warming increase from 1.5°C to 2°C (*medium confidence*).'[46]

Global heating of 1.5 or 2 degrees would be catastrophic for Pacific Island Countries. As predominantly low-lying geographies, PICs are especially vulnerable to even small rises in sea level, including the associated loss of freshwater resources. They are highly reliant on healthy marine ecosystems and fisheries for food and economic prosperity. Many PICs are also situated at low latitudes, where loss of coastal resources and decline of fisheries and aquaculture is predicted to be especially severe. As small island developing states, PICs will experience some of the highest water stress of any nations. They will also experience the largest projected falls in economic growth globally, as tropical and Southern Hemisphere subtropical nations. Finally, they are among some of the most vulnerable nations to cyclones, which are projected to increase with additional heating.

However, the *Special Report: Global Warming of 1.5°C* also notes:

> *'[T]he cultural resilience of Pacific Island inhabitants is also recognized. In Fiji and Vanuatu, strategies used to prepare for cyclones include building reserve emergency supplies and utilizing farming techniques to ensure adequate crop yield to combat potential losses from a cyclone or drought. Social cohesion and kinship are important in responding and preparing for climate-related hazards, including the role of resource sharing, communal labour, and remittances. There is a concern that indigenous knowledge will weaken, a process driven by westernization and disruptions in established bioclimatic indicators and traditional planning calendars.'* [47]

Pacific Island Countries are already bearing the brunt of today's climate impacts. These impacts are projected to be significantly worse under 1.5 and 2 degrees of heating. However, as noted above, even if all current NDCs were to be met, the world would still be on track for between 2.2 and 3.4 degrees of heating by 2100. It is clear, therefore, that the nations of the world must do everything within their power to rapidly reduce their emissions on an equitable basis.

CASE STUDY

Lavetanalagi (Lagi) Seru (Fiji)

As a young Pacific leader, Lagi has seen how climate change disproportionately impacts young people. When disasters such as tropical cyclones have hit Fiji, it has reduced access to education and employment. Livelihoods are impacted, particularly for those who have farms or rely on agriculture, and there are concerns about food and water security.

Lagi comes from a coastal community in Rakiraki and has witnessedsea level rise first-hand in his village. This is what inspired him to lead by working with young people to build resilience through training and workshops on various issues, human rights, oceans, disaster risk reduction, and more.

> *"We are educating and empowering young people to create the change and call for greater accountability from those responsible to increase climate ambition. We also build resilience through hands-on activities including mangrove planting, coral restoration projects, and coastal clean-ups. In strengthening capacity and building resilience, we are also utilising intergenerational spaces where young people are provided a safe space to dialogue with the older generation. To learn how they have sustainably practised stewardship, how they manage their resources sustainably whether it's land resources, or ocean resources. What are some of the traditional concepts that have been utilised over time around food security and food preservation that young people today will be able to learn and use, so that they are better prepared for climate impacts."*

Lagi is afraid that if we continue with our current practices of unsustainable consumption, production and distribution, we're going to end up with ecocide at a massive scale where Pacific Island Countries will face food shortages and depleted ocean resources.

> *"We must work to increase public participation and engagement because people power can bring about real change. The kind of legacy we leave behind will speak to the courage or the lack thereof of the actions that we take today. Those responsible will be judged by the merits of their courage; did they increase climate ambition or did they advance their greed before the people? Climate action requires courage, boldness, forward thinking and innovation. Money shouldn't be the end game, it should be human rights, human dignity and most importantly, the future of the only habitable planet we have."*

Images supplied by Lavetanalagi Seru

CASE STUDY

Teruabine (Anna) Nuariki (Kiribati)

Anna is working on food and water projects in the outer islands of Kiribati. She has seen the impacts on communities of king tides that have led to flooding, devastation of home gardens, displacement, and salination of water sources. Recently, a flooding event happened at midnight, with waves crashing into homes in the dark.

Communities in the outer islands are building resilience through traditional farming practices to provide for themselves. Anna is also working to strengthen the capacity of women and young people through training to encourage self-awareness, sharing skills and first-hand experiences.

Her message for those responsible for this crisis is:

> *"Come and see our experiences. You need to put your feet in our shoes so you can experience how devastating and difficult it is for us facing the impacts. Stop polluting the air, stop carbon emissions. This will help future generations. Look at our children as if they're your own children. I believe you want better for them."*

Images supplied by Teruabine Nuariki

House with Sea Wall on Tarawa Island

House with a sea wall in front of it in the community Temwaiku-Tenei, on Tarawa Island, where the rising ocean is encroaching on their community. Kiribati, is a group of islands in the Pacific Ocean in risk of disappearing because of sea level rise caused by melting sea ice and and ice sheets in Greenland and Antarctica. The rising sea levels also contaminates their drinking wells with salt water.

Christian Åslund • Greenpeace

4. WHAT SHOULD HAPPEN?

4.1 What is the level of emissions reduction and under what timeline will that ensure the minimum level of harm to the Pacific?

The Paris Agreement, signed by virtually all nations of the world, requires signatories to do all they can to keep global heating to below 1.5 degrees celsius. While each nation's individual circumstances vary, each bears a responsibility to do its fair share to meet this goal. This is especially true for developed nations and for the highest-emitting nations.

As demonstrated in the previous section, none of the top 15 greenhouse gas emitters are currently on track to meet this obligation. The highest priority for each of these 15 nations, therefore, is to submit an updated NDC and a long-term goal that meets its obligation to keep heating to below 1.5 degrees. This is all the more pressing, considering that the Pacific Island Countries who have ratified the UNFCCC have nominated far more ambitious targets for their 0.14 per cent of global annual emissions than their more polluting counterparts.

The world's biggest emitters have already agreed to the process for increasing their ambition by signing the Paris Agreement.[48] Under the Agreement, signatories accept that NDCs at the time of signing were insufficient to limit heating to acceptable limits. The agreement therefore includes a 'ratchet mechanism' to periodically increase those NDCs through the submission of updated targets.

The deadline for the first round of updated NDCs under that mechanism is the end of 2020. As of October 2020, just 12 countries have submitted new NDC targets and two countries have proposed (but not submitted) new NDCs targets. 168 countries have not updated their targets, while seven countries have signalled that they will not update their NDCs.[49]

None of the top 15 global emitting countries have submitted updated NDCs, while five of the 15 have stated that they will not update their NDC, including the USA, Russia, Indonesia, Japan and Australia.[50]

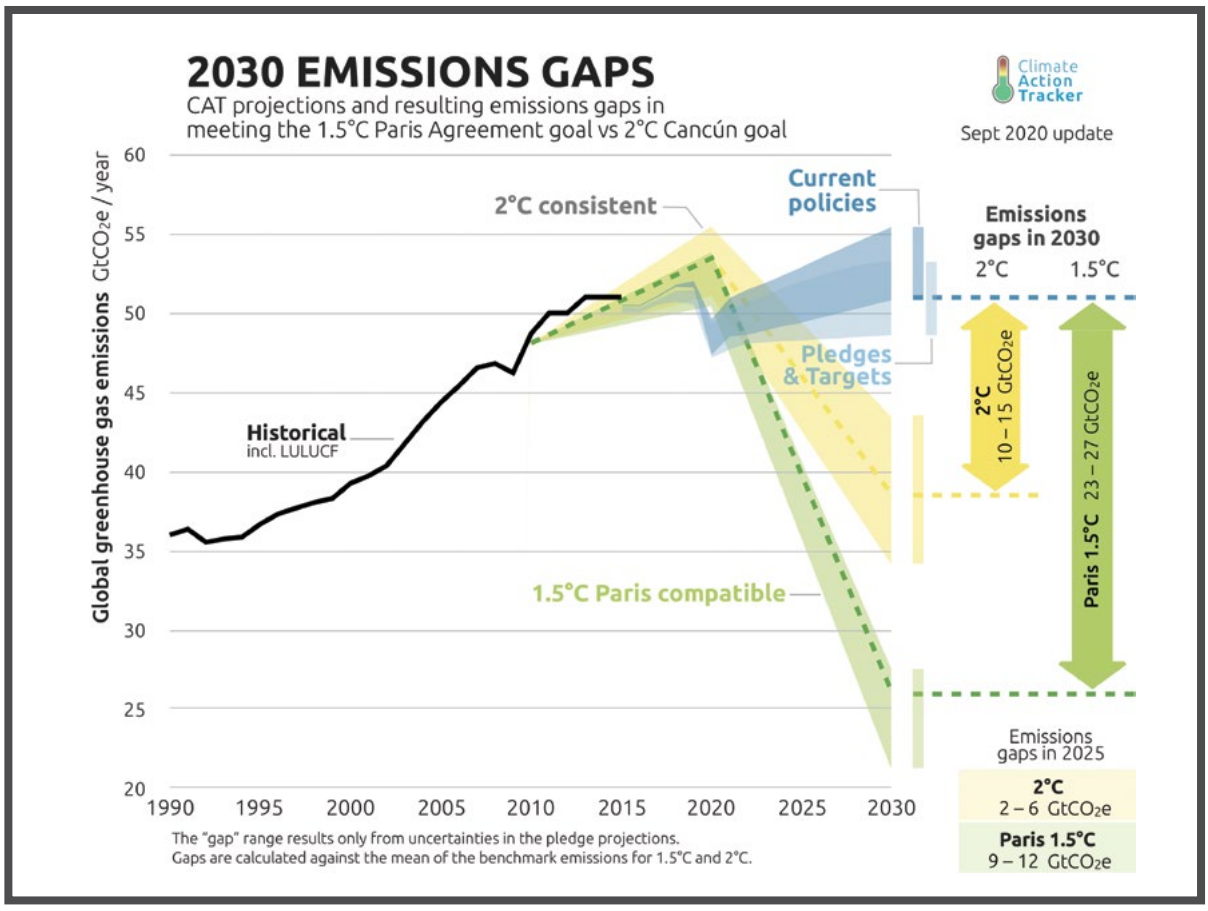
Nation	Gt CO2e	% of global total	NDC update status
China	11.58	23.46%	Not yet updated
USA	5.83	11.81%	Will not update
India	3.24	6.56%	Not yet updated
EU (27)	3.16	6.40%	Not yet updated
Russia	2.93	5.94%	Will not update
Indonesia	2.23	4.52%	Will not update
Brazil	1.38	2.80%	Not yet updated
Japan	1.26	2.55%	Will not update
Iran	0.86796	1.76%	Not yet updated
Canada	0.77927	1.58%	Not yet updated
Mexico	0.68838	1.39%	Not yet updated
Saudi Arabia	0.66358	1.34%	Not yet updated
South Korea	0.6574	1.33%	Not yet updated
Australia	0.51909	1.05%	Will not update
South Africa	0.49739	1.01%	Not yet updated

The longer that the nations of the world wait to enact significant emissions cuts, the more that emissions will have to fall in each subsequent year, and the more difficult the overall task will become.

The present 'emissions gap' between global emissions produced under current policies and the emissions level required to keep heating under 1.5°C is already estimated to be between 23 and 27 GtCO2e by 2030. The 'emissions gap' between global emissions produced under current policies and the emissions level required to keep heating under 2°C is estimated to be between 10 and 15 GtCO2e by 2030.[51]

FIGURE 4

Emissions Gaps to 2030 (Climate Action Tracker)[54]



4.2 Australia as a Pacific neighbour: what it needs to do

Australia's NDC falls within the 'Insufficient' category. This means that were Australia's level of ambition to be extrapolated across all nations, it would lock in between 2 and 3 degrees of heating. This would be disastrous for many Pacific Island Countries which are already facing serious climate-driven impacts at the present 1.1 degrees of heating, as outlined in Chapter 1, above. The predictions of harm to Pacific Island Countries under even a 1.5 degrees scenario, as outlined in Section 3.2 above, are harsher still.

As one of the major powers in the Pacific, with strategic interests in the region, it is in Australia's interest to do all it can to reduce its national emissions in line with the Paris Agreement's 1.5 degrees pathway. This would require a serious engagement with the Paris Agreement's ratchet mechanism, through the submission of increasingly stringent reduction targets that would deliver the following emissions reduction outcomes:

- 40-60 per cent reduction by 2025 from 2000 levels
- 60-80 percent reduction by 2030 from 2000 levels
- Net zero emissions by 2040

These targets should be accompanied by clear policies on how they will be met, including a moratorium on new coal-burning power stations and coal mines, and commitment to the Green Climate Fund.

Australia's proposed use of Kyoto 'carry-over credits' has been widely condemned by the international community for representing a form of double counting that undermines the intent of the Paris Agreement. Australia is the only ratifying nation which is attempting to use carry-over credits to meet its Paris Agreement obligations.[52] As many nations have stated, Australia should abandon its efforts to use these credits and lay out a pathway to real emissions reduction that does not rely on manipulative accounting. Australia should also commit to not block international litigation that seeks to further consensus on the scientific evidence of climate change.

Finally, as an influential 'middle power', Australia also has potential to act as a fair broker at international climate summits and leverage its diplomatic influence with its allies to achieve more ambitious emissions reduction agreement outcomes, and a fairer result for Pacific Island Countries. This is all the more pressing, as runaway global heating will force Australia to bear the cost of resulting regional instability, including a new category of climate refugees.

CASE STUDY

Frances Namoumou (Fiji)

Frances started working on climate change issues in 2004 as a young intern and has seen communities face impacts on a daily basis. As she sees communities trying to build back after a disaster or trying to adapt to current impacts, she wonders when the discussions on policy will stop and action begin to support those already impacted by the climate crisis.

Frances has worked with Vunidogoloa, the first community in Fiji to be relocated. Relocation can seem like a good response for the sake of safety of the community but there are more complex issues to consider including cultural and spiritual aspects.

> *"Villagers wondered why they needed to leave their homes, burial sites and ancestors behind, and who is going to look after the land now? For indigenous Fijians, there is a traditional way of saying goodbye when you are visiting someone called an I-tautau where you present kava and say goodbye. In this way you leave with peace and leave them with peace as well."*

Frances wonders if communities can also do this with their land. Would it be considered un-Christian to carry out a traditional ritual with land that you usually do with people?

> *"This comes back to traditional roles in the land you are born and you are supposed to protect it, this is where your animal lives, where your ancestors are buried and you have to leave them behind. At the end of the day, the decision to relocate must come from communities and community members must be involved in decision making throughout the process."*

The Vunidogoloa community is building resilience and adapting to their new normal. The village chairman sees this as a chance to provide better for the younger generation. They now don't need to worry about tides inundating their village every day. They are finding ways to build a new community social structure, shifting to agricultural practices and away from relying on marine resources, and using the lessons learnt from the old village site to prepare for future disasters. Frances has seen the incredible ways people are fighting: not being victims but, recognizing that relocation has happened, striving to make the situation better, and changing to improve everyone's lives.

> *"Often, we learn through experience. Before Cyclone Winston, we didn't know how bad a category 5 cyclone was and now that is what we prepare for."*

Frances feels that we need to recognise the resources we have available and maximize these resources: we can find ways to infuse indigenous knowledge with modern technology and we can make this effective for communities in remote areas.

> *"It's our Christian responsibility, as custodians of the land, as a person. I think being a neighbour, we need to look after each other. Listen to the hopes and the message of resilience, the messages of the strong voices of young people, children that are coming from the Pacific that might actually change the current status quo. There is hope all around us."*

Images supplied by Frances Namoumou

CASE STUDY

Gareth Quity (Solomon Islands)

"I grew up to see beautiful, beautiful beaches and islands, noting the abundance of nature and the ecosystems and our sustainable livelihood. I can say that this has been affected by the unequivocal nature of climate change."

In the Solomon Islands, Gareth has seen an increase in temperatures which have led to changes in gardening times; rather than 9am-4pm as before, many women now have to go to gardens very early, from 6am or late in the afternoon, after 4pm. These women farmers plant primarily for their own families and at times sell when they have an abundance of produce. Changes in rainfall patterns, increases in flooding, and intense cyclones all affect lives and livelihoods. Sea level rise has led to the loss of islands, especially atoll islands, and has inundated fresh water sources in coastal communities.

Solomon Islands can build resilience through climate finance and being able to access finance flows and making sure it is going to communities to adapt to the climate crisis. Communities are also responding through ecosystem-based adaptation, including planting mangroves and using traditional farming techniques.

Gareth believes that we can build resilience by working in collaboration and through partnerships, by influencing leaders to stop emissions, and by ensuring vulnerable and marginalised groups are part of the decision-making process.

> *"Let's build a renewable society and stop coal mining. Those responsible for this crisis should not be afraid to walk away from something that doesn't work."*

Images supplied by Teruabine Nuariki

Village life, near Gizo, Solomon Islands

Karen English • elevenacross

5.
CONCLUSIONS

It is not too late for the Pacific to recover in the face of global heating, and to prosper for generations to come.

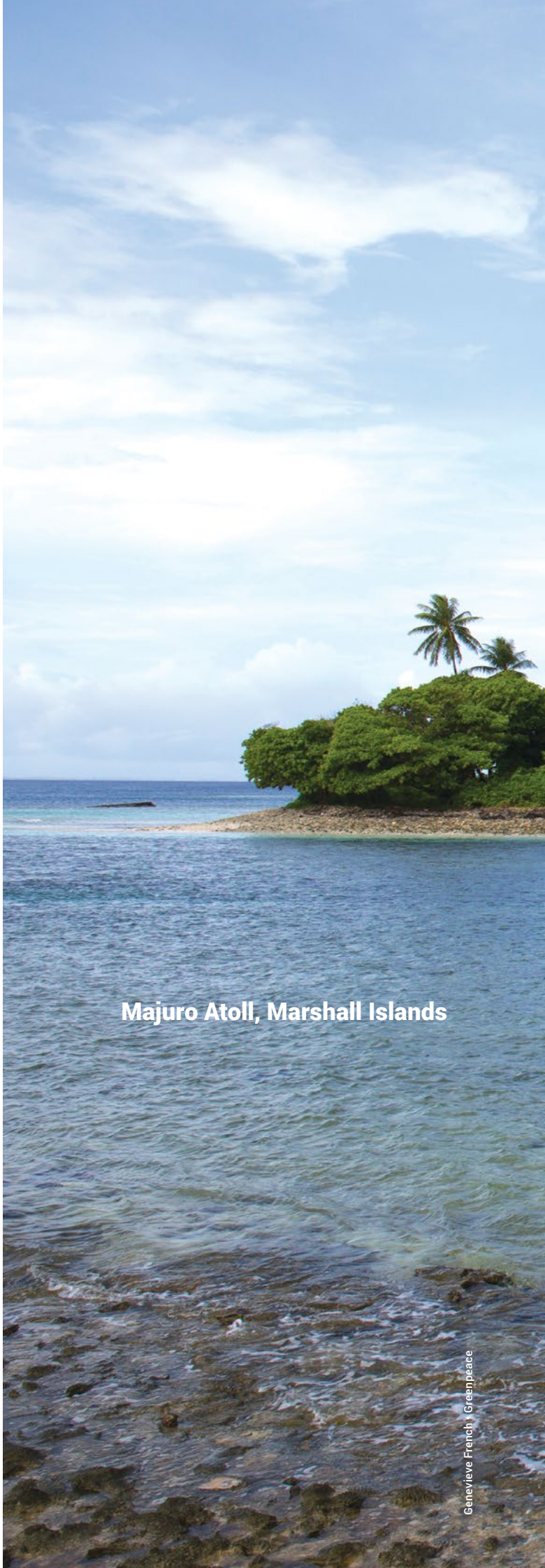
For this vision to move from ambition to reality requires first recognising the uniquely critical danger that Pacific Island Countries find themselves in.

It requires acknowledging that global emissions are unjustly shared, with the Pacific's people being the least responsible for the current climate crisis, and especially compared to the world's biggest 15 emitters.

It demands that the world's biggest polluters therefore accept that they bear the greatest responsibility to change course and agree to rapidly reduce their greenhouse gas emissions through increased commitments, backed by concrete policies to achieve them.

And it requires unprecedented global cooperation to ensure this takes place.

The time is now.



Majuro Atoll, Marshall Islands

Genevieve French / Greenpeace

Endnotes

1 (Masson-Delmotte et al. 2019).

2 'Pacifc Island Countries' refers to the 14 Pacific Island Parties who have signed and ratified the UNFCCC: Cook Islands, Fiji, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu. For specific emissions figures, see Section 1.2 below.

3 (Masson-Delmotte et al. 2019).

4 (The World Bank 2012).

5 (The World Bank 2020).

6 (IPCC 2019a).

7 (IPCC 2019b).

8 (Climate Analytics 2019).

9 (IPCC 2019b).

10 (Aucan 2018).

11 (Albert et al. 2016).

12 (Guarino 2016).

13 (Morioka 2016).

14 (McMichael, Powell, and Ramatu 2019).

15 (Charan, Kaur, and Singh 2017)

16 (Lenton, Matear, and Mongin 2018).

17 (Dutra et al. 2018).

18 (NOAA 2020).

19 (Taylor 2019).

20 (OCHA 2020a).

21 (Morioka 2016).

22 (COP23 Fiji 2018).

23 (Roy 2018).

24 (OCHA 2020b).

25 (The World Bank 2020).

26 (SOPAC 2009).

27 (The World Bank 2012).

28 (Wairiu, Lal, and Iese 2012).

29 (OCHA 2014).

30 (Masson-Delmotte et al. 2019); see further Section 3.2, below.

31 This figure is inclusive of Land Use, Land Use Change and Forestry (LULUCF). 2016 is the latest year that we have full, globally comprehensive emissions data at time of publication. This report uses CAIT emissions figures: (Climate Watch 2020a). Emissions graphs are generated using Climate Watch's open source historical emissions tracker: (Climate Watch 2020a).

32 Data obtained from (UNFCCC 2020), (Climate Watch 2020b). Nationally Determined Contributions are the greenhouse gas emission reduction targets to which signatory nations to the Paris Agreement voluntarily commit, as their contribution towards keeping global heating to below 1.5 degrees. Iran is a signatory to the Paris Agreement but has not ratified the agreement at the time of writing.

33 This report uses Climate Action Tracker's classification system for its comparison of NDCs, as reflected in this table: (Climate Action Tracker 2020d). For policy assessments, see (Climate Action Tracker 2019).

34 (Climate Action Tracker 2019).

35 Heating estimates are based on Climate Action Tracker assessment of NDCs and projected heating, based on data available as of September 2020: (Climate Action Tracker 2020b). The estimate is a 'median' figure, meaning that temperatures have a 50 per cent likelihood of going above the calculated figure. For further details, see (Climate Action Tracker 2020c).

36 (Climate Action Tracker 2020b).

37 (Masson-Delmotte et al. 2019).

38 (IPCC 2019c).

39 (Masson-Delmotte et al. 2019, 232).

40 (Masson-Delmotte et al. 2019, 8).

41 (Masson-Delmotte et al. 2019, 218).

42 (Masson-Delmotte et al. 2019, 8, 237).

43 (Masson-Delmotte et al. 2019, 9).

44 (Masson-Delmotte et al. 2019, 9).

45 (Masson-Delmotte et al. 2019, 234).

46 (Masson-Delmotte et al. 2019, 9).

47 (Masson-Delmotte et al. 2019, 360).

48 As noted above, Iran is a signatory but has not yet ratified the Paris Agreement.

49 (Climate Action Tracker 2020e).

50 The information regarding the United States of America is based on current available data. However, the election of Joseph R. Biden as the 46th US President is likely to improve the US's standing with regard to climate mitigation ambition, once he assumes office.

51 (Climate Action Tracker 2020f).

52 (Redfearn and Morton 2019).

53 (Gerretsen 2020).

54 (Climate Action Tracker 2020f).

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