

# **Submission**

## **National Climate Resilience & Adaptation Strategy**

**Hannah Melville-Rea**  
**Mark Ogge**  
**Dr Johanna Nalau (Griffith University)**

**September 2021**

## **ABOUT THE AUSTRALIA INSTITUTE**

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. We barrack for ideas, not political parties or candidates. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

## **OUR PHILOSOPHY**

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

## **OUR PURPOSE - 'RESEARCH THAT MATTERS'**

The Institute publishes research that contributes to a more just, sustainable and peaceful society. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

The Institute is wholly independent and not affiliated with any other organisation. Donations to its Research Fund are tax deductible for the donor. Anyone wishing to donate can do so via the website at <https://www.australiainstitute.org.au> or by calling the Institute on 02 6130 0530. Our secure and user-friendly website allows donors to make either one-off or regular monthly donations and we encourage everyone who can to donate in this way as it assists our research in the most significant manner.

Level 1, Endeavour House, 1 Franklin St  
Canberra, ACT 2601

Tel: (02) 61300530

Email: [mail@australiainstitute.org.au](mailto:mail@australiainstitute.org.au)

Website: [www.australiainstitute.org.au](http://www.australiainstitute.org.au)

ISSN: 1836-9014

# Executive Summary

Australia faces severe climate impacts, having already reached over 1.4 degrees of warming on pre-industrial levels, with significant further warming locked in.<sup>1</sup> Climate concern has reached record levels following the Black Summer Bushfires. Eight in ten Australians (82%) are concerned that climate change will result in more bushfires, up from 76% in 2019.<sup>2</sup>

Yet despite the clear warnings, Australia is ill-prepared, and lags in planning and progress towards climate adaptation.

The existing resilience and adaptation strategy from 2015 does not align with Paris Agreement objectives. A peer reviewed study of 54 national climate adaptation plans and strategies ranked Australia's strategy last, with a low score of 18 out of a possible 46.<sup>3</sup>

Australia does not have a national adaptation plan nor a national climate risk assessment – despite these documents being prescribed by the United Nations Framework Convention on Climate Change. This is not the norm and certainly not best practice.

The majority of Parties to the Paris Agreement, at least 106 countries, have fulfilled their adaptation responsibilities to the Paris Agreement by adopting national climate adaptation plans or policies.

More than 7 in 10 (71%) of OECD nations, a group of high-income economies, have adopted climate adaptation plans or policies.<sup>4</sup>

Regarding national climate risk assessments, the United Kingdom and United States have developed mechanisms that mandate periodic assessments. Both provide models Australia could draw on, and it is unclear why the Australian Government has failed to undertake a single national risk assessment.

---

<sup>1</sup> CSIRO and BoM (2020) *State of the Climate 2020*, <http://www.bom.gov.au/state-of-the-climate/documents/State-of-the-Climate-2020.pdf>

<sup>2</sup> Quicke and Bennett (2020) *Climate of the Nation*. <https://australiainstitute.org.au/report/climate-of-the-nation-climate-change-concern-hits-82/>

<sup>3</sup> Morgan, Nalau, and Mackey (2019) *Assessing the alignment of national-level adaptation plans to the Paris Agreement*, <https://doi.org/10.1016/j.envsci.2018.10.012>.

<sup>4</sup> See Appendix 1 for methodology.

Without an overarching adaptation plan, Australia suffers from ad hoc policies that often lead to maladaptation. For instance, the federal government's \$10 billion insurance guarantee for Northern Queensland runs the risk of backing in residents to remain in disaster prone areas. Furthermore, the failure of the national government has led to a fractured and piecemeal approach at the state level, and confusion at the local government level, especially around sea level rise.

The National Climate Resilience and Adaptation Strategy (NCRAS) consultation website shows concerning signs of glossing over the underlying causes of climate change. For instance, the NCRAS page makes no mention of human caused climate change, appearing to imply that changes in the climate are part of the continuum and nothing out of the ordinary:

[Australia is the driest inhabited continent. Indigenous Australians have been adapting to our extreme climate for thousands of years. As our climate changes, Australians continue to develop practical measures to adapt.](#)<sup>5</sup>

This is profoundly misleading. The landmark sixth assessment report by the Intergovernmental Panel on Climate Change (IPCC) finds that human influence on the climate is 'unequivocal', primarily from burning fossil fuels.<sup>6</sup>

Similarly, the apparent scope of the new strategy intends to uncouple adaptation from Australia's emissions reduction strategy.

[The new strategy will focus on climate adaptation and resilience only. Further information on Australia's emissions reductions policy is available \[online\].](#)<sup>7</sup>

Emissions reductions are the world's first line of defence against climate impacts and are important to consider alongside adaptation strategies. Its absence is a worrying departure from the 2015 strategy that covered both mitigation and adaptation measures.

These shifts mirror broader changes in the federal government's climate strategy. The newly established National Recovery and Resilience Agency (NRRA), tasked with

---

<sup>5</sup> Australian Government, Department of Agriculture, Water and the Environment (2021) *National Climate Resilience and Adaptation Strategy*, <https://www.environment.gov.au/climate-change/adaptation/strategy>

<sup>6</sup> International Panel on Climate Change (2021) Sixth Assessment Report – Climate Change 2021: The Physical Science Basis, <https://www.ipcc.ch/report/ar6/wg1/>

<sup>7</sup> Australian Government, Department of Agriculture, Water and the Environment (2021) *National Climate Resilience and Adaptation Strategy*, <https://www.environment.gov.au/climate-change/adaptation/strategy>

climate resilience, does not mention 'climate change' in its 26-page strategic direction.<sup>8</sup>

The renewed National Climate and Resilience Strategy must shift Australia's efforts from disaster clean-up and recovery to pro-active prevention; for instance, expanding cool burning to prevent bushfires, green spaces to combat urban heat, and incentives for residents to relocate from disaster-prone areas especially after disasters strike.

Importantly, the strategy must interlink with an ambitious emissions reduction plan.

The updated strategy should be underpinned by:

- Scientifically robust climate scenarios, based on emissions reduction pathways.
- Reoccurring national climate risk assessments that evaluate the projected risks from climate change to various sectors and regions.
- Periodic projections by federal Treasury for the cost of climate change impacts and adaptation measures.
- Vulnerability assessments that identify sections of the population most at risk to climate impacts, and most in need of support.
- A clear plan for funding diverse climate adaptation measures.

The costs of climate change and adaptation to Australia are already very high and will continue to increase.

Currently the burden falls almost entirely on ordinary Australian households and businesses, while the handful of companies primarily responsible for driving climate change contribute virtually nothing to the costs, and most pay little if any tax in Australia. It is untenable for these increasing costs to continue to be borne by those on the front line.

The Australia Institute's Climate of the Nation Report is the longest running survey of Australian attitudes to climate change. In July 2020, 1,998 Australians were asked who should primarily pay the costs of preparing for, adapting to, and responding to global warming impacts, and half said fossil fuel producers (50%), up five percentage points from the previous year.

The Australia Institute recommends that the costs of adaptation should be partially and directly funded by a levy on fossil fuel exports.

---

<sup>8</sup> Prime Minister and Cabinet (2021) *Portfolio Budget Statements 2021–22 Budget Related Paper No. 1.11*, p.253- 278. <https://pmc.gov.au/sites/default/files/publications/portfolio-budget-statements-2021-22.pdf>

A \$12 per tonne levy on embodied carbon on fossil fuel exports from Australia (lower than current Australian carbon credit unit prices) would raise around \$16 billion per year, would shift the burden of adaptation costs from Australian households and businesses to the multinational fossil fuel companies who are largely responsible for the problem, and create around 60,000 ongoing jobs.

When asked specifically about supporting a levy on fossil fuel exports to pay for climate disasters, 65% of Australians supported it with only 21% opposed.

# Introduction

The Australia Institute welcomes the opportunity to make a submission on the upcoming *National Climate Resilience and Adaptation Strategy (NCRAS)*.

In the lead-up to the United Nations 26<sup>th</sup> Convention of Parties (COP26) in Glasgow this November, Australia plans to release an Adaptation Communication that is mandated under the Paris Agreement in Article 7.10.<sup>9</sup> It will also release its updated NCRAS.

The Adaptation Communication will reportedly showcase the role that Australia plays in funding climate adaptation initiatives in the Pacific Islands. It is important that Australia support its Pacific neighbours, who have voiced their consistent disappointment with the level of Australia's climate action.<sup>10</sup> Yet, it is puzzling that Australia funds significant climate adaptation abroad but lacks the same commitment to supporting adaptation at home.

The NCRAS was first drafted in 2015, broadly describing the challenges and guiding principles in Australia's climate adaptation efforts, while showcasing various initiatives.<sup>11</sup> It did not provide tangible objectives or timelines, and according to a peer reviewed assessment, does not align with Paris Agreement objectives.<sup>12</sup>

The updated NCRAS must move beyond its 2015 template, to include concrete commitments, timelines and funds. As demonstrated by recent climate disasters and worsening projections, Australia is in critical need of climate resilience measures, especially for vulnerable populations and sectors.

## INITIAL CONCERNS

---

There are concerning signs that the NCRAS is glossing over the underlying causes of climate change. The NCRAS consultation page makes no mention of human induced

---

<sup>9</sup> United Nations (2015) *Paris Agreement*, Article 7.10, [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf)

<sup>10</sup> Morgan (2021) *Ripple Effect: The cost of our Pacific neglect*, Australian Foreign Affairs Vol 12. <https://www.australianforeignaffairs.com/articles/extract/2021/08/ripple-effect>

<sup>11</sup> Australian Government, Department of Agriculture, Water and the Environment (2015) *National Climate Resilience and Adaptation Strategy*, <https://www.environment.gov.au/climate-change/adaptation/publications/national-climate-resilience-and-adaptation-strategy>

<sup>12</sup> Morgan, Nalau, and Mackey (2019) *Assessing the alignment of national-level adaptation plans to the Paris Agreement*, <https://doi.org/10.1016/j.envsci.2018.10.012>.

climate change, appearing to imply that changes in the climate are part of the continuum and nothing out of the ordinary:

Australia is the driest inhabited continent. Indigenous Australians have been adapting to our extreme climate for thousands of years. As our climate changes, Australians continue to develop practical measures to adapt.<sup>13</sup>

This is profoundly misleading. The landmark sixth assessment report by the Intergovernmental Panel on Climate Change (IPCC) finds that human influence on the climate is ‘unequivocal’, primarily from burning fossil fuels.<sup>14</sup>

The world is warming to unprecedented levels. Even under the lowest emissions scenarios, the IPCC report shows that temperatures will more likely than not reach 1.5 degrees within 20 years.<sup>15</sup> Australia is unfortunately ahead of the curve and has already warmed on average by 1.44 degrees.<sup>16</sup>

These scientific findings are devastating, underscoring that Australia must urgently prepare for the unavoidable impacts of climate change.

Unless Australia’s strategy builds on a clear science-based understanding of the climate and how it is changing and projected to change, any response will fall short of the actual conditions we are facing. This will leave the majority of Australian families and businesses unprepared to what is to come, including significant impacts across our economic sectors, supply chains and markets.

The apparent scope of the new strategy is also concerning. The consultation website for the NCRAS indicates that a resilience strategy is separate from Australia’s emissions strategy. It notes:

The new strategy will focus on climate adaptation and resilience only. Further information on Australia’s emissions reductions policy is available [online].

Yet, emissions reductions are the world’s first line of defence against climate impacts. This is a concerning change from the 2015 strategy that covered both mitigation and adaptation measures.

---

<sup>13</sup> Australian Government, Department of Agriculture, Water and the Environment (2021) *National Climate Resilience and Adaptation Strategy*, <https://www.environment.gov.au/climate-change/adaptation/strategy>

<sup>14</sup> International Panel on Climate Change (2021) *Sixth Assessment Report – Climate Change 2021: The Physical Science Basis*, <https://www.ipcc.ch/report/ar6/wg1/>

<sup>15</sup> Ibid.

<sup>16</sup> CSIRO and BoM (2020) *State of the Climate 2020*, <http://www.bom.gov.au/state-of-the-climate/documents/State-of-the-Climate-2020.pdf>

Instead, the new strategy is described on the consultation website as follows.

Our new National Climate Resilience and Adaptation Strategy will provide a clear and practical pathway for a resilient Australia by:

- showcasing our national adaptation and resilience efforts
- strengthening national coordination to manage physical climate impacts. Physical climate impacts include floods, bushfires, droughts, sea level rise and marine heatwaves.

It is unclear how “showcasing our national adaptation and resilience efforts” is relevant to an effective adaptation strategy. A serious strategy must be forward looking and commitment oriented. It should not be used as a marketing tool to deflect critiques.

Missing from this description are references to science-based climate scenarios, funding options, risk and vulnerability assessments for sectors and populations – assessments that usually underpin serious adaptation strategies.

Australia’s renewed climate adaptation strategy must focus on preparing for the unavoidable impacts of climate change. Focus should be placed on providing real and tangible measures to reduce the impacts of climate change across the country.

# Australia falling behind

The head of the Australian Defence Force, General Angus Campbell, observed that Australia is in “the most natural disaster-prone region in the world” and that “climate change is predicted to make disasters more extreme and more common.”<sup>17</sup>

Extreme events such as the black summer bushfires in 2019-2020 are a stark reminder of the significant challenges climate change poses to Australia, and it is equally important to note that many slow onset events (reduced rainfall, drought, increased floods) are already making many regions in Australia highly vulnerable.

In spite of these very visible warnings, Australia lags behind other nations in climate preparation. The national government does not have a climate adaptation plan or climate risk assessment. Further, its existing climate adaptation strategy does not meet the Paris Agreement objectives.

Significant improvements must be made to the renewed NCRAS to catch up to global best practices for climate resilience.

## 2015 STRATEGY

---

A peer-reviewed assessment of 54 national adaptation plans and strategies, assessed the documents according to criteria developed from objectives in the Paris Agreement.<sup>18</sup>

Australia and Spain’s strategies ranked last with a score of 18, out of possible maximum of 46.

Despite significant exposure to climate risks, Australia has the lowest-scoring strategy. The assessment concludes that “there are outliers such as Japan and Australia that face significant exposure but whose plans are less aligned to the Paris Agreement.” It is

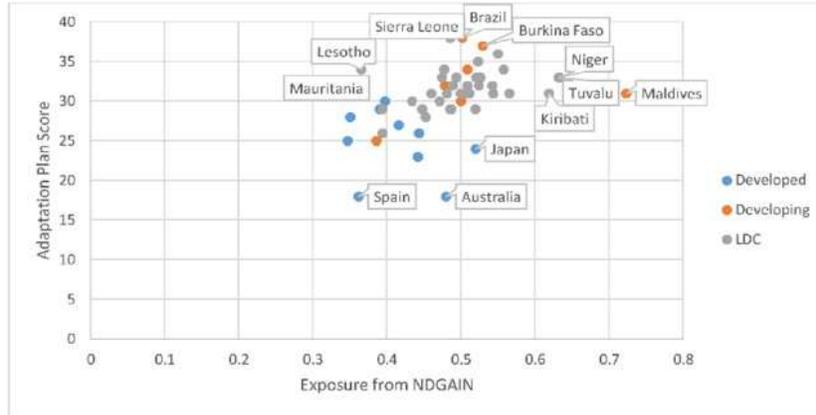
---

<sup>17</sup> Clarke (2019) *Climate change could stretch our capabilities, Defence Force chief speech warns*, <https://www.abc.net.au/news/2019-09-25/australian-defence-force-angus-campbell-climate-changespeech/11543464>

<sup>18</sup> Morgan, Nalau, and Mackey (2019) *Assessing the alignment of national-level adaptation plans to the Paris Agreement*, <https://doi.org/10.1016/j.envsci.2018.10.012>.

notable that since the assessment Japan has significantly increased its emission reduction efforts.<sup>19</sup> This pattern is shown in Figure 1.

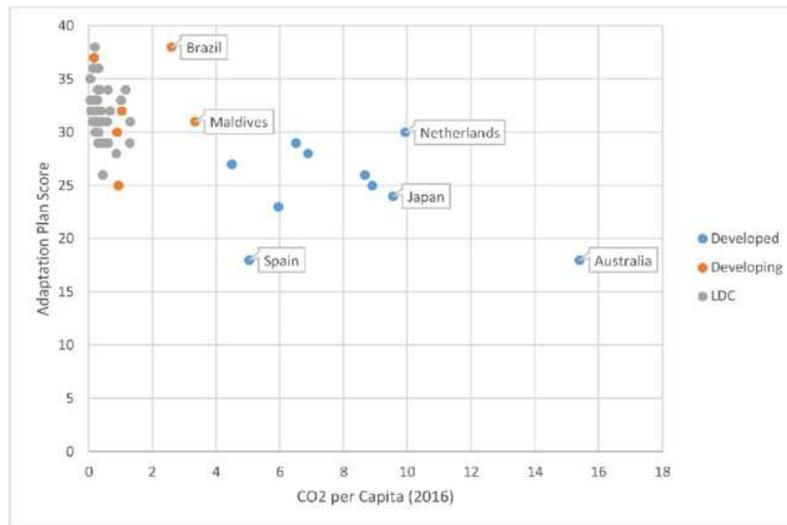
**Figure 1: Adaptation strategy score vs. exposure (2016) from ND-GAIN.**



Adapted from “Assessing the alignment of national-level adaptation plans to the Paris Agreement”.<sup>20</sup>

When broken down by emissions per capita, the researchers find that higher emitting nations tend to have weaker adaptation plans. Australia is especially an outlier.

**Figure 1: Adaptation strategy score vs. CO2 per capita 2014 (from World Bank, 2018).**



Adapted from “Assessing the alignment of national-level adaptation plans to the Paris Agreement”.<sup>21</sup>

<sup>19</sup> Yamaguchi (2021) *Japan raises emissions reduction target to 46% by 2030*, <https://abcnews.go.com/Technology/wireStory/japan-raises-emissions-cut-target-26-2030-77237114>

<sup>20</sup> Morgan, Nalau, and Mackey (2019) *Assessing the alignment of national-level adaptation plans to the Paris Agreement*, <https://doi.org/10.1016/j.envsci.2018.10.012>.

<sup>21</sup> Ibid.

## NO NATIONAL ADAPTATION PLAN

Under the Paris Agreement, all countries (not just developing countries, which was the focus prior to 2015) are encouraged to submit a National Adaptation Plan (NAP) that outlines the key actions, strategies and priorities for adaptation at a country level.

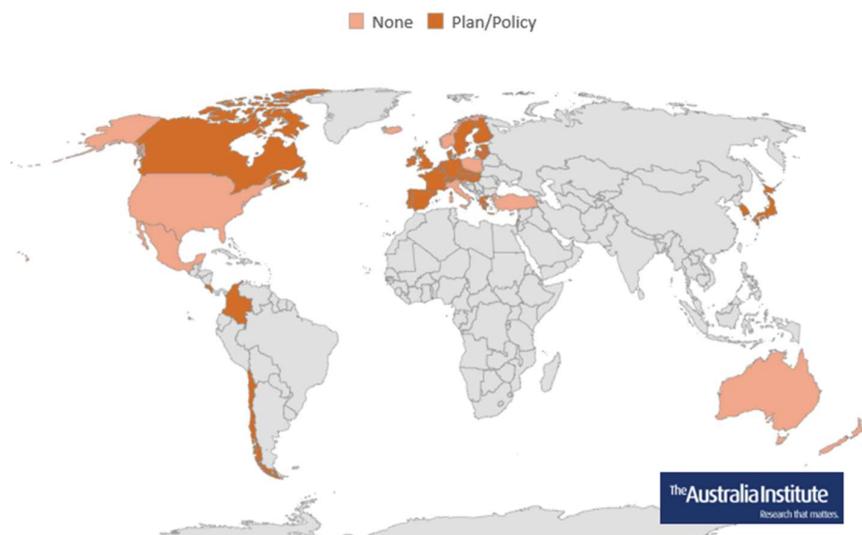
NAPs inform how countries progress in adaptation and feed into the Global Stocktake and the Global Goal on Adaptation that measure global progress towards the Paris Agreement goals.

Australia does not have a national adaptation plan, nor has it indicated it will develop a plan. This is certainly not best practice and renders Australia an outlier on the international stage.

Our analysis finds the majority of Parties to the Paris Agreement, at least 106 countries have fulfilled their adaptation responsibilities to the Paris Agreement by adopting national climate adaptation plans or policies (full list in Appendix 1).

More than 7 in 10 (71%) of OECD nations, a group of high-income economies, have adopted climate adaptation plans or policies.<sup>22</sup> Further, the United States is likely to renew its adaptation plans, originally drafted under the Obama Administration.<sup>23</sup>

**Figure 3: OECD Countries with Adaptation Plans or Policies**



Source: ClimateAdapt for countries in the European Economic Area. Otherwise, Grantham Research Institute on Climate Change and the Environment. Notes on methodology in Appendix 1.

<sup>22</sup> This equates to 27 of the 38 OECD member states. See Appendix 1 for methodology.

<sup>23</sup> EPA (2014) *Climate Change Adaptation Plans*, <https://www.epa.gov/greeningepa/climate-change-adaptation-plans>

## NO NATIONAL CLIMATE RISK ASSESSMENT

---

Australia has never undertaken a national climate risk assessment. A comprehensive climate risk assessment would be needed to adequately inform a national climate resilience strategy.

This aligns with the recommendations Australia made to UNFCCC process on the development of National Adaptation Plans ten years ago.

The initial step is to identify and, where possible, address key information gaps ahead of planning. National priorities are best shaped once risks have been thoroughly assessed.<sup>24</sup>

A number of developed countries have undertaken such assessments. The United States (US) and United Kingdom (UK) have each developed mechanisms that require their governments to undertake regular risks assessments.

### US National Climate Assessment (NCA)

In the US, the Global Change Research Act (1990) mandates the US Global Research Program (USGCRP) delivers a National Climate Assessment to Congress and the President every four years.<sup>25</sup>

The fourth National Climate Assessment (NCA4) was delivered 2018 and includes detailed examination of risks to sectors and regions of the US.<sup>26</sup> It also includes an assessment of the economic costs and responses to the identified risks including both adaptation and (in contrast to the current Australian Strategy) mitigation. The full report is 1,500 pages.

### UK Climate Change Risk Assessment (CCRA)

Under the UK's climate legislation, the Government is required to undertake a Climate Change Risk Assessment (CCRA) every five years, specifically to inform their national adaptation plans.<sup>27</sup>

---

<sup>24</sup> UNFCCC (2011) *Views on the process and the modalities and guidelines for national adaptation plans*, <https://unfccc.int/sites/default/files/resource/docs/2011/sbi/eng/misc07.pdf>

<sup>25</sup> USGCRP (2021) *Legal Mandate*, <https://www.globalchange.gov/about/legal-mandate>

<sup>26</sup> USGCRP (2018) *Fourth National Climate Assessment*, <https://nca2018.globalchange.gov/>

<sup>27</sup> UK Climate Risk (2021) *Independent Assessment of UK Climate Risk (CCRA3)*, <https://www.ukclimaterisk.org/>

The UK Government is required by the Climate Change Act 2008 to conduct such an assessment every five years to inform the National Adaptation Plans for England, Scotland, Wales and Northern Ireland.<sup>28</sup>

The aim of the CCRA Independent Assessment is to address the following question: “Based on our latest understanding of current, and future, climate risks/opportunities, vulnerability and adaptation, what should the priorities be for the next UK National Adaptation Programme and adaptation programmes of the devolved administrations?”<sup>29</sup>

Climate Risk UK has already undertaken three rich assessments and is undertaking its fourth. They include a detailed methodology and technical report, with in depth national summaries (for England, Scotland, Wales and Northern Ireland) that cover risks to natural environment, infrastructure, human health, built environment, business and international dimensions.

Both the US and UK provide models with mandates and independent assessments, that Australian can draw from.

It is unclear why the Australian Government has failed to undertake a single national risk assessment. The failure of Australia’s national government to deliver a climate risk assessment has led to a fractured and piecemeal approach at the state level,<sup>30</sup> and confusion at the local government level.<sup>31</sup>

## RE-BUILDING ADAPTATION LEADERSHIP

---

Australia’s current strategy for climate adaptation is severely lacking. Yet, the nation was not always a laggard in climate adaptation.

From 2008, Australia was a globally recognised leader in climate change adaptation. It established the world’s first National Climate Adaptation Research Facility (NCCARF)

---

<sup>28</sup> UK Climate Risk (2021) *Evidence for the third UK Climate Change Risk Assessment (CCRA3) Summary for England* p.6, <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/CCRA-Evidence-Report-England-Summary-Final.pdf>

<sup>29</sup> UK Climate Risk (2021) *The Third UK Climate Change Risk Assessment Technical Report*, <https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Technical-Report-The-Third-Climate-Change-Risk-Assessment.pdf>

<sup>30</sup> Hannam (2021) *‘Insufficient’: Audit Office lashes lack of climate planning in NSW*, <https://www.smh.com.au/environment/climate-change/insufficient-audit-office-lashes-lack-of-climate-planning-in-nsw-20210907-p58piv.html>

<sup>31</sup> Adcock (2019) *Rising tide*, <https://www.themonthly.com.au/issue/2019/october/1569374459/bronwyn-adcock/rising-tide#mtr>

hosted at Griffith University. NCCARF created research networks that brought climate adaptation scientists and practitioners together, publishing over 150 research reports, conducting over 80 case studies, and providing policy information and guidance.

Key insights included Australia's adaptation limits across the Great Barrier Reef, Alpine areas, the Coorong and Lower Lakes, the Macquarie Marshes, The Torres Strait Islands, and small inland communities in the Murray-Darling Basin.<sup>32</sup> It also produced CoastAdapt, which is a nationally strategic and practical tool to assess climate risks and identify best practice climate change adaptation strategies.

In 2010, NCCARF and CSIRO hosted the very first Adaptation Futures Conference in the Gold Coast.<sup>33</sup> The event brought together over 1,000 adaptation scientists and professionals for the first time and is now 'the' ultimate event on adaptation globally.

The de-funding of NCCARF has meant that Australia has lost its leading role in adaptation science and a significant number of adaptation professionals.

Australia could kickstart its adaptation commitments to regain its authority in adaptation science. This would not only indicate progress towards meeting the commitments for adaptation reporting under the UNFCCC but would signal Australia's return as the global leader in adaptation science and policy through a strong evidence-based and practice-oriented approach.

At the national level, Australia needs a consistent approach to adaptation. Establishing, for example, a National Adaptation Taskforce or Committee, similar to many that have been set up in European countries such as the United Kingdom and Finland, could provide advice on where adaptation finance is most urgently needed.<sup>34</sup> It could become a body for identifying adaptation innovations that can be scaled up across the country leading to real improvements, while also assisting in the drafting of the national adaptation plan as required under the Paris Agreement.

---

<sup>32</sup> NCCARF (2012) *Limits to Climate Change Adaptation: Key Findings*, <https://nccarf.edu.au/limits-climate-change-adaptation-key-findings-4pp-factsheet/>

<sup>33</sup> NCCARF (2012) *Promoting Excellence in Adaptation: Climate Adaptation Futures: The 2010 International Climate Change Adaptation Conference*, <https://nccarf.edu.au/promoting-excellence-adaptation-climate-adaptation-futures-2010-international-climate/>

<sup>34</sup> Nalau (2019) *Adapting to climate change: the priority for Australia*, <https://www.lowyinstitute.org/the-interpretor/adapting-climate-change-priority-australia>

# Prevent, then recover

A major focus of the new strategy must be to shift Australia's efforts from disaster recovery to prevention and preparation.

Preventing measures for disasters are significantly more cost effective than recovery. In fact, some studies estimate that every dollar spent on disaster prevention save as much as \$15 in recovery efforts.<sup>35</sup>

Yet, Australia chronically underinvests in disaster prevention. In 2014, the Productivity Commission examined the Commonwealth's Natural Disaster Relief and Recovery Arrangements. Commissioner Karen Chester said:

We found that natural disaster funding is overwhelmingly biased towards rebuilding and needs to focus more on planning to actually reduce disaster risk and cost.

The total natural disaster spend by the Australian Government, three per cent is on mitigation and 97 per cent is on post-disaster recovery.<sup>36</sup>

These trends persist and permeate government structures. Notably, the National Recovery and Resilience Agency (NRRRA) established May 2021, is a conglomerate of recovery agencies, with weak links to forward-looking climate change adaptation. The website almost entirely focuses on clean-up and recovery efforts, bar one page on the 'Preparing Australia Program'.<sup>37</sup>

In fact, the NRRRA's 26-page strategic direction does not mention 'climate change'.<sup>38</sup> It is concerning that the new agency tasked with climate resilience ignores the root cause of Australia's increasingly severe disasters. This is not conducive to proactive disaster risk reduction.

---

<sup>35</sup> Healy and Malhotra (2009) *Myopic voters and natural disaster policy*, The American Political Science Review 103, p. 387–406.

<sup>36</sup> Zonca (2014) *Productivity Commission draft report recommends state and local governments pay a greater share of disaster re-build*, <https://www.abc.net.au/news/rural/2014-09-25/disaster-funding-changes-productivity-commission/5769470>

<sup>37</sup> Australian Government (2021) *National Recovery and Resilience Agency*, <https://recovery.gov.au/>

<sup>38</sup> Prime Minister and Cabinet (2021) *Portfolio Budget Statements 2021–22 Budget Related Paper No. 1.11*, P 253- 278. <https://pmc.gov.au/sites/default/files/publications/portfolio-budget-statements-2021-22.pdf>

## PROACTIVE ADAPTATION

---

The national strategy should commit to spending as much, if not more, on prevention than recovery. The renewed NCRAS should majorly focus on diverse sets of adaptation initiatives that help Australians prevent and prepare for climate disasters. Examples of proactive adaptation measures include:

- Expanding Indigenous cool burning programs to prevent bushfires.
- Establishing grants programs to finance green spaces in low-income urban centres at risk to heat island impacts.
- Providing climate risk information that is accessible and available for vulnerable sectors and populations.
- Partnering with insurance providers and re-insurers to evaluate the projected costs of climate risks and adaptation, in all new infrastructure decisions.

### Correct perverse incentives

The renewed NCRAS should consider and correct existing structural incentives for maladaptation. The following two examples demonstrate how without a comprehensive national plan, reactive policies and conflicts of interest undermine long-term climate safety.

**Insurance guarantee for Northern Australia:** This year, the Commonwealth Government committed \$10 billion to underwrite insurance costs in Northern Australia.<sup>39</sup> The policy was prompted by high insurance premiums.<sup>40</sup> It will transfer the costs of climate change from Northern Australian residents to Australian taxpayers.

Concerningly, the policy may incentivise people to remain in, or even move to areas that are particularly vulnerable to climate change. The very problem was created in the United States, with the establishment of the National Flood Insurance Program in 1968. The program artificially supported property sales in flood-risk zones, at the cost

---

<sup>39</sup> Prime Minister of Australia (2021) *Media Release: More Affordable Access to Insurance for Northern Australians* 04 May 2021, <https://www.pm.gov.au/media/more-affordable-access-insurance-northern-australians>

<sup>40</sup> Ludlow (2021) *PM 'listening' to North Queensland with \$10b reinsurance pool*, <https://www.afr.com/companies/financial-services/pm-listening-to-north-queensland-with-10b-reinsurance-pool-20210504-p57oqc>

of American taxpayer funds. In 2017, it maxed out the \$30.4 billion it had been authorized to borrow from the U.S. Treasury.<sup>41</sup>

Instead, the government could support residents to move away from disaster prone areas. For instance, support packages for households after they are exposed to floods could include incentives to relocate out of inundation zones.

**Sea-level rise and coastal flooding policies:** Local governments currently face perverse incentives to underestimate risks from sea level rise, in their assessments of coastal inundation risks in their jurisdictions.

In 2010, a House of Representatives committee examined coastal management and called for strong national leadership, issuing a bipartisan report subtitled “The time to act is now”.<sup>42</sup> Following, New South Wales, Queensland and Victoria, state governments introduced new coastal management plans, directing local councils to consider projected sea-level rise in their future planning decisions.

Yet by 2012, the Liberal and National state governments in New South Wales, Victoria and Queensland wound back sea-level rise policies, making it easier to develop in at-risk areas, and repealing sea-level planning benchmarks.

Local governments gain revenue from property sales and make more when property prices are high. They are also likely to consist of local property owners. This creates perverse incentives to understate the risk that properties face from sea level rise, so as not to jeopardise their revenue stream and asset values.

Take Shoalhaven City Council. In 2015, the councillors voted for a seemingly arbitrary benchmark, to plan for 0.23 meters of sea level rise by 2050 and 0.35 meters by 2100.<sup>43</sup> This decision ignored the findings of a scientific assessment the council itself commissioned, which found Shoalhaven should plan for 0.26 by 2050 and 0.98 by 2100. Based on IPCC modelling, Shoalhaven’s benchmark could barely be achieved even if the entire world immediately cut emissions to zero.

---

<sup>41</sup> Schwartz (2018) *National Flood Insurance Is Underwater Because of Outdated Science*, <https://www.scientificamerican.com/article/national-flood-insurance-is-underwater-because-of-outdated-science/>

<sup>42</sup> Commonwealth of Australia (2009) *Managing our coastal zone in a changing climate: the time to act is now*, [https://www.aph.gov.au/parliamentary\\_business/committees/house\\_of\\_representatives\\_committees?url=ccwea/coastalzone/report/index.htm](https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=ccwea/coastalzone/report/index.htm)

<sup>43</sup> Adcock (2019) *Rising tide*, <https://www.themonthly.com.au/issue/2019/october/1569374459/bronwyn-adcock/rising-tide#mtr>

## EMISSIONS REDUCTION

---

The consultation website for the NCRAS indicates that a resilience strategy is separate from Australia's emissions strategy. It notes:

The new strategy will focus on climate adaptation and resilience only. Further information on Australia's emissions reductions policy is available [online].

Yet, emissions reductions are the world's first line of defence against climate impacts. Further, emissions scenarios are used by global scientists to project temperature change, including all IPCC reports.

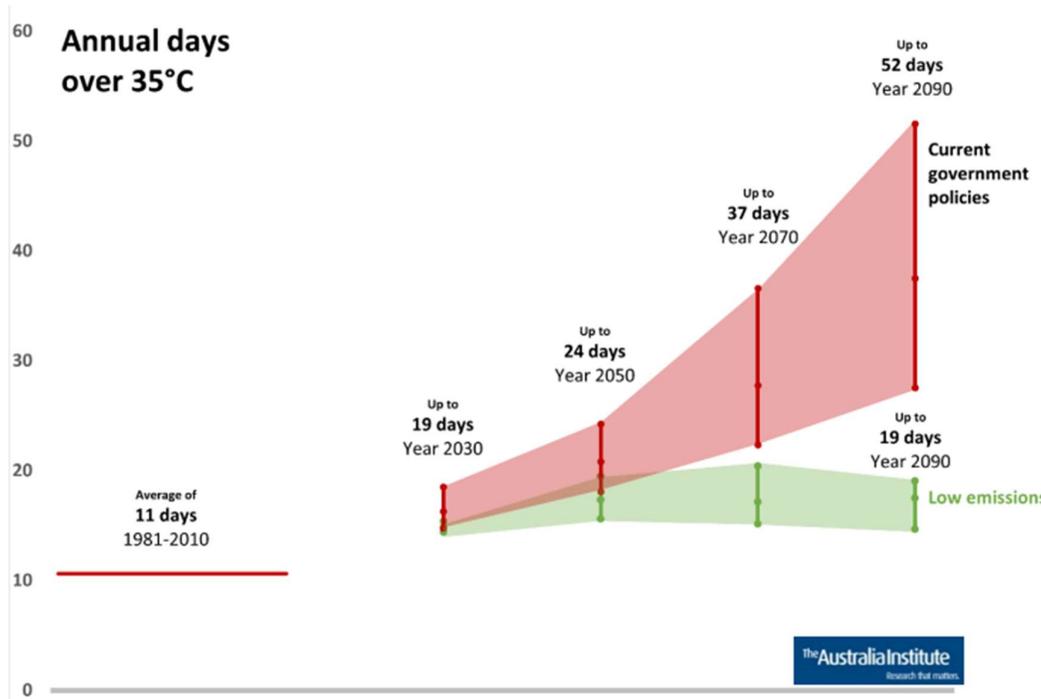
Meanwhile, 'adaptation limits' are well recognised in Australia.<sup>44</sup> This refers to the severe limits to human capacity to adapt, especially if the mitigation goals under the Paris Agreement are not upheld. The updated strategy should include a clear assessment of the costs of adaptation, the limits we face in Australia at differing temperature increases and identify best practice on implementing effective and successful adaptation initiatives that also consider potential maladaptation in the process.

Indeed, Australia's heat projections are highly depended on global emissions. Figure 4 illustrates how adapting to temperature rise is highly dependent on emissions reduction.

---

<sup>44</sup> NCCARF (2012) *Limits to Climate Change Adaptation: Key Findings*, <https://nccarf.edu.au/limits-climate-change-adaptation-key-findings-4pp-factsheet/>

**Figure 4: Forecast annual days over 35 degrees Western Sydney**



Source: CSIRO and Bureau of Meteorology (2018) *Climate projections*, provided on request. Originally appeared in *HeatWatch: Extreme heat in Western Sydney*<sup>45</sup>

Under the business-as-usual emissions scenario, Western Sydney could experience up to 52 annual days over 35 degrees by 2090. This is diminished to 19 days under the lowest emissions scenario. Australian’s ability to adapt to temperature rise is undeniably linked to carbon emissions.

Hence, a dual approach of adaptation and mitigation is needed to secure a resilient and adapted future for Australia. This can be achieved through an updated NCRAS that is intimately connected to Australia’s emission reduction strategy.

A strong adaptation approach would call for urgent mitigation action and climate diplomacy to ensure Australia is at the forefront of shaping the most ambitious efforts to reduce emissions.

<sup>45</sup> Ogge, Browne & Hughes (2018) *HeatWatch: Extreme heat in Western Sydney*  
<https://australiainstitute.org.au/report/heatwatch-extreme-heat-in-western-sydney/>

# Financing Climate Impacts

Climate change is increasing the frequency and intensity of many natural disasters. As the 2020 Royal Commission into National Natural Disaster Arrangements put it, “what was unprecedented is now our future”.<sup>46</sup>

The economic cost of disasters to Australia has been estimated by Deloitte Access Economics at around \$18 billion per year on average, rising to \$40 billion per year by 2050 – this figure is higher if the impact of future climate change is considered.

Previously, the costliest climate-related disasters were the Queensland floods of 2011 (\$14 billion) and Victoria’s Black Saturday bushfires in 2009 (\$7 billion).<sup>47</sup> However, the 2019-2020 Black Summer bushfire catastrophe appears to represent a step change in disaster costs, with estimates of \$50-60 billion in direct costs for a single event.<sup>48</sup>

Because the cost of individual climate-related disasters is already so high, additional disasters will greatly increase the overall costs as they increase in coming years

Climate change increases the frequency and severity of disasters. For instance another fire on the scale of the 2019-20 NSW and Victorian bushfires would be at least double the current \$18 billion average annual cost disasters in Australia for that year. World Weather attribution have estimated that climate change has increased the likelihood of a fire of similar severity and scale by at least 30 percent.<sup>49</sup>

The Australian Bureau of Meteorology has estimated climate change has increased the frequency of “pacific rainfall disruptions” such as droughts and floods in eastern

---

<sup>46</sup> Royal Commission into National Natural Disaster Arrangements (2020) *Report*, p.6, <https://naturaldisaster.royalcommission.gov.au/publications/royal-commission-national-natural-disaster-arrangements-report>

<sup>47</sup> Deloitte Access Economics (2017) *Building resilience to natural disasters in our states and territories*, [http://australianbusinessroundtable.com.au/assets/documents/ABR\\_building-resilience-in-our-states-and-territories.pdf](http://australianbusinessroundtable.com.au/assets/documents/ABR_building-resilience-in-our-states-and-territories.pdf) (Note, this estimate assumes the same distribution of natural disasters as the previous 20 years. This includes the impact of climate change up to 2017, but the future projections do not include the further impact of climate change).

<sup>48</sup> Quiggin (2020) *Economic cost of the bushfire catastrophe: some preliminary estimates*. Paper presented to the Australian Agricultural Resource Economics Society, Adelaide, March 2020.

<sup>49</sup> Phillips (2020) *Climate change made Australia’s devastating fire season 30% more likely*, <https://www.nature.com/articles/d41586-020-00627-y>

Australia by 30 percent to date, rising to 90 percent by mid-century and 130 percent in the second half of the century.<sup>50</sup>

The 2020 CSIRO and Australian Bureau of Meteorology State of the Climate report projects that Australia will have increasingly worse fires, more drought, increasing levels of extreme heat, increasing sea level rise, more intense cyclones as well as ocean heatwaves and acidification.<sup>51</sup>

These increasingly frequent and severe natural disasters will not just increase the damage bill in a linear fashion. What Australia faces, in the words of the recent Natural Disaster Royal Commission, are cascading, concurrent and compounding natural disasters.

Relying on the public to foot the steep climate damage bill is no longer an option.

## WHO CURRENTLY PAYS THE COSTS OF CLIMATE DISASTERS?

---

Currently, virtually all of the costs of climate disasters are paid by the Australian community.

Emergency response and relief as well as repairing and rebuilding public infrastructure is mostly funded by governments through the taxes and rates paid by the Australian community. Sometimes an ad hoc tax is applied on the public, like the Temporary Flood and Cyclone Reconstruction Levy which was used to cover the costs of devastating 2011 Queensland floods.

Insurance only covers some property damage, and ultimately insured losses are paid by the community through higher premiums. There are almost half a million addresses where insurance is expected to become unaffordable or unavailable within 30 years.<sup>52</sup>

Individuals absorb many of the costs of property damage, disruption to their lives and health impacts. Longer term health impacts, including mental health impacts will be absorbed by individuals and the public health system.

---

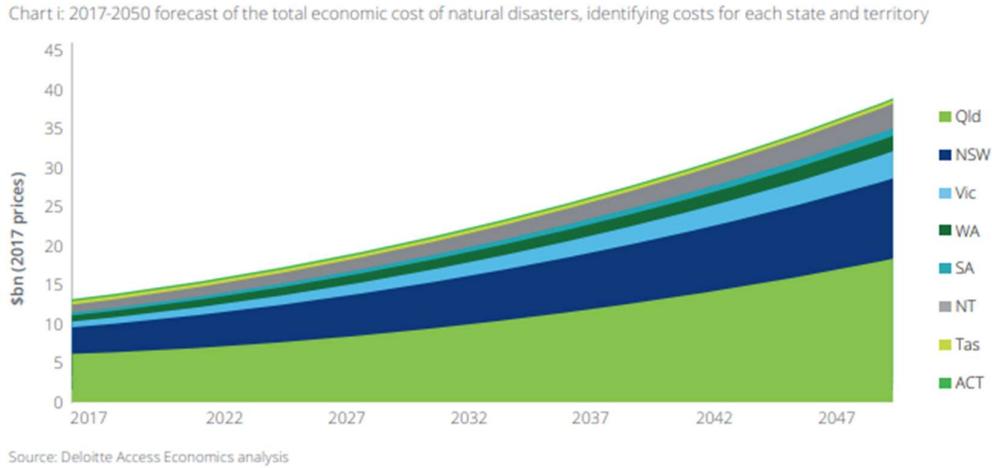
<sup>50</sup> Australian Bureau of Meteorology (2017) *Droughts and flooding rains already more likely as climate change plays havoc with Pacific weather*,

<http://www.bom.gov.au/climate/updates/articles/a023.shtml>

<sup>51</sup> CSIRO and BoM (2020) *State of the Climate 2020*, <http://www.bom.gov.au/state-of-the-climate/documents/State-of-the-Climite-2020.pdf>

<sup>52</sup> Ting, Scott, Palmer & Slezak (2019) *The rise of red zones of risk*, <https://www.abc.net.au/news/2019-10-23/the-suburbs-facing-rising-insurance-costs-from-climate-risk/11624108?nw=0>

**Figure 5: 2017-2050 forecast of the total economic cost of natural disasters, identifying costs for each state and territory**



Source: Deloitte Access Economics (2017) *Building resilience to natural disasters in our states and territories*, <https://www2.deloitte.com/au/en/pages/economics/articles/building-australias-natural-disaster-resilience.html>

## WHO DOES NOT PAY?

The largest single cause of climate change is burning fossil fuels. Over half of these emissions are from fossil fuels produced by just 25 companies. 100 companies are responsible for 71% of these emissions. Many of these companies operate in Australia.<sup>53</sup>

Australian governments allow these mainly global coal, oil and gas companies to extract and export vast quantities coal and gas (and some oil) from Australia.

Not only do these companies make little, if any, contribution to paying the costs of the climate disasters they are fuelling, but, as shown in Table 1 below, most pay little if any company tax in spite of the billions of dollars they make from exploiting these finite Australian resources.

<sup>53</sup> Griffin (2017) *The Carbon Majors Database: CDP Carbon Majors Report 2017*  
<https://www.cdp.net/en/articles/media/new-report-shows-just-100-companies-are-source-of-over-70-of-emissions>

**Table 1: Tax and PRRT paid by LNG producers in Australia 2018-19**

LNG Producer	Total Income	Taxable Income	Tax Paid	PRRT Paid
BHP Companies*	\$43,059,226,136	\$16,278,812,031	\$0	\$604,858,173
BP Regional Australiasia Holdings Pty Ltd	\$23,677,819,311	\$1,535,208,625	\$455,846,218	\$0
ExxonMobil Australia Pty Ltd	\$13,293,222,200	\$0	\$0	\$0
Chevron Australia Holdings Pty Ltd	\$11,986,037,153	\$900,117,295	\$0	\$0
Woodside Petroleum Ltd	\$8,199,321,733	\$1,991,703,841	\$0	\$0
Shell Energy Holdings Australia Ltd	\$5,531,026,873	\$318,645,923	\$0	\$0
Santos Companies*	\$5,322,312,733	\$46,289,914	\$3,112,393	\$78,767,439
QGC Upstream Holdings Pty Limited	\$3,985,352,867		\$0	\$0
Japan Australia LNG (MIMI)	\$2,224,454,174	\$1,171,615,733	\$348,888,493	\$0
CNOOC Companies*	\$2,100,806,238	\$117,661,600	\$35,298,480	\$0
ConocoPhillips Australia Gas Holdings Pty Ltd	\$1,592,059,105	\$29,214,658	\$0	\$0
KUFPEC Australia Pty Ltd	\$1,297,068,670		\$0	\$0
Inpex Companies*	\$1,132,212,147	\$18,928,641	\$5,645,305	\$0
Petronas Australia Pty Limited	\$1,107,168,028		\$0	\$0
Tokyo Gas	\$720,498,931	\$44,920,448	\$0	\$0
Kogas Australia Pty Ltd	\$667,825,073		\$0	\$0
PE Wheatstone	\$391,547,912		\$0	\$0
Sinopec Oil and Gas Australia Pty Ltd	\$370,722,823	\$0	\$0	\$0
Kansai Electric Power Holdings Pty Ltd	\$267,359,092	\$86,544,485	\$0	\$0
Osaka Gas Australia Pty Ltd	\$159,870,052		\$0	\$0
Kyushu Electric Australia Pty Ltd	\$133,259,277	\$4,783,353	\$0	\$0
Australia Pacific LNG Pty Ltd	\$7,207,473,146		\$0	\$0
ConocoPhillips Australia Gas Holdings Pty Ltd	\$1,592,059,105		\$0	\$0
Sinopec Oil and Gas Australia Pty Ltd	<b>\$370,722,823</b>		\$0	\$0
<b>Total E&amp;P Holdings</b>	1,021,427,560		\$0	\$0

Source: ATO (2020) 2018-19 Report of Entity Tax Information, <https://data.gov.au/data/dataset/corporate-transparency/resource/827f68ea-83c0-440e-bb6d-4118644b7efd>

\*Note: BHP Companies refers to BHP Billiton Petroleum’s Australia, Bass Strait and Victoria subsidiaries; Santos Companies refers to Santos Limited and Santos WA Energy Holdings Pty Ltd; CNOOC Companies refers to CNOOC Australia Energy Capital Management Pty Ltd and CNOOC Gas and Power (Aus) Investment Pty Ltd, Inpex Companies refers to Inpex Australia Pty Ltd and Inpex Holdings Australia Pty Ltd.

## NATIONAL CLIMATE DISASTER LEVY PROPOSAL

The Australia Institute has proposed a National Climate Disaster Levy of \$12 per tonne of embodied carbon on all fossil fuel exports from Australia. This would raise around \$16 billion annually based on 2018 export levels.

This money would in turn go towards adaptation measures including emergency response, relief and recovery from climate disasters and adaptation.

**Table 2: Climate Disaster Levy revenue**

Fuel type	Exports 2018/19, physical units	Exports 2018/19 energy units	CO2	Levy	Total revenue	Levy per tonne of fuel
	Mt	PJ	Mt CO2	\$/t CO2	\$ million	\$
<b>Black coal</b>	394	11,006	1,041	12	12,496	31.7
<b>Crude oil</b>	13	586	43	12	515	29.6
<b>LNG</b>	75	4,080	229	12	2,747	36.6
<b>Total</b>		<b>18,602.9</b>			<b>15,756</b>	

Source: Australian Government (2020) *Australian Energy Update 2020*, <https://www.energy.gov.au/publications/australian-energy-update-2020>, IPCC (2006) *2006 IPCC Guidelines for National Greenhouse Gas Inventories - Volume 2 Energy Table 1.4*

Implementing this measure would create jobs in adaptation across the economy. These would likely be concentrated in construction. Australia Institute analysis using National Accounts Input- Output Tables finds that if half the \$16 billion raised annually from the proposed levy was spent on construction (split evenly between building construction and civil and heavy engineering construction), and the other half spread across the rest of the economy, around 65,000 jobs would be created. This represents more than total employment in the coal industry in Australia, and double that of the oil and gas industry.

**Table 3: Jobs created by adaptation funding from fossil fuel export levy of \$12 tonne CO2e**

Sector	Adaptation spending \$ billion	Jobs
Building construction	4	14,816
Civil and heavy engineering	4	10,178
Australian production	8	40,081
<b>Total</b>	<b>16</b>	<b>65,074</b>

Source: ABS (2017) *Australian National Accounts: Input-Output tables*, <https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-input->

[output-tables/latest-release, ABS \(2018\) Australian Industry, industry by subdivision 8155.0, https://www.abs.gov.au/statistics/industry/industry-overview/australian-industry/latest-release, Authors calculation.](https://www.abs.gov.au/statistics/industry/industry-overview/australian-industry/latest-release)

A levy of \$12 per tonne of carbon dioxide is a small price to pay considering the scale of the economic harm caused by fossil fuel emissions. The Social Cost of Carbon (SCC), a measure of the economic harms of carbon, is conservatively estimated at around US\$60 per tonne by the US Environmental Protection Authority (EPA),<sup>54</sup> with more recent analysis finding a median estimate of US\$417 per tonne.<sup>55</sup>

It is important to note that the proposed levy is on exports, and as such will not affect energy prices in Australia, as the fuels are not used locally.

The levy would raise costs for fossil fuel exporters and is therefore likely to lead to a reduction in fossil fuel production in Australia. This is a reduction that will occur naturally anyway, with trade partners beginning to shift to renewable energy and less carbon intensive manufacturing processes in order to drastically reduce emissions and prevent catastrophic climate change.

The levy is an opportunity for Australia to extract funds from the fossil industry to pay for the damage they are causing as they inevitably wind down, while simultaneously avoiding an increase in domestic energy prices and creating tens of thousands of jobs in climate adaptation.

To prevent reliance on fossil fuel income for adaptation, the levy can be increased as production falls to keep the actual revenue constant. The levy could be increased to align with the value of official Australian Carbon Credit Units (ACCUs) and increased more than threefold before it reaches the lower estimate of the economic harm it is causing.

## Australians support a levy on fossil fuel exports

The Australia Institute's Climate of the Nation Report is the longest running survey of Australian attitudes to climate change. In July 2020, 1,998 Australians were asked who should primarily pay the costs of preparing for, adapting to, and responding to global warming impacts. Half of the respondents said fossil fuel producers (50%), up five

---

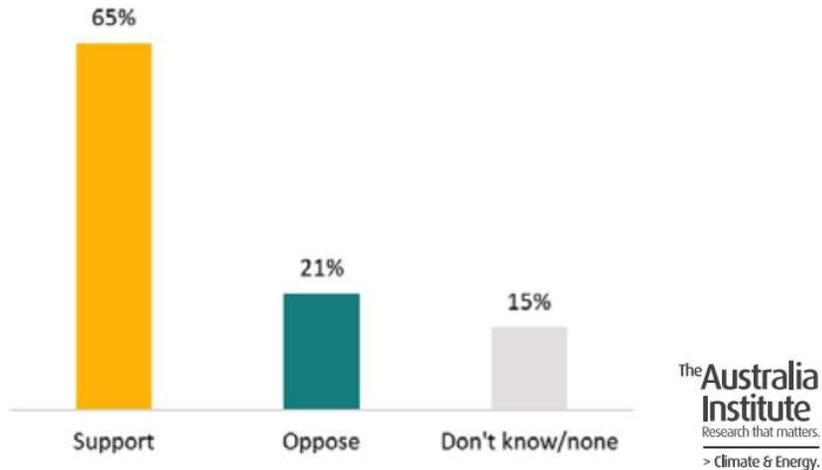
<sup>54</sup> United States Environmental Protection Agency (2016) *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, [https://19january2017snapshot.epa.gov/sites/production/files/2016-12/documents/sc\\_co2\\_tsd\\_august\\_2016.pdf](https://19january2017snapshot.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf)

<sup>55</sup> Ricke et al (2018) *Country-level social cost of carbon*, <https://www.nature.com/articles/s41558-018-0282-y>

percentage points from 45% in 2019. Majority support for this response was consistent across all political voting intention. Only one in six respondents (14%) say taxpayers should pay and only one in ten (10%) say people facing climate impacts should pay.<sup>56</sup>

When asked specifically about supporting a level on fossil fuel exports to pay for climate disasters, 65% of Australians supported it with only 21% opposed (Figure 6).

**Figure 6: Support for levy on fossil fuel exports to pay for climate disaster impacts**



Source: The Australia Institute (2020) *Climate of the Nation 2020*, [https://www.tai.org.au/sites/default/files/Climate%20of%20the%20Nation%202020%20cover%20\[WEB\].pdf](https://www.tai.org.au/sites/default/files/Climate%20of%20the%20Nation%202020%20cover%20[WEB].pdf)

<sup>56</sup> The Australia Institute (2020) *Climate of the Nation 2020*, [https://www.tai.org.au/sites/default/files/Climate%20of%20the%20Nation%202020%20cover%20\[WEB\].pdf](https://www.tai.org.au/sites/default/files/Climate%20of%20the%20Nation%202020%20cover%20[WEB].pdf)

# Conclusion

Climate concern has reach record levels following the Black Summer Bushfires. Eight in ten Australians (82%) are concerned that climate change will result in more bushfires, up from 76% in 2019.<sup>57</sup> Continued government inaction on adaptation would not only incur severe costs for Australian citizens, but also cause major problems for the government itself as climate impacts become more widespread and frequent.

Now is the time to take adaptation seriously and Australia's current adaptation and resilience strategy is severely lacking. A paradigm shift towards proactive adaptation, linked to drastic emissions reduction, must be urgently pursued in the new strategy.

Importantly, the strategy must not be used as a delay tactic, to slowly build to an eventual national adaptation plan. Nor should Australia wait to have a national climate risk assessment to enact proven proactive adaptation measures.

There is an opportunity to follow the lead of allies like the US and UK not just in their more ambitious 2030 mitigation efforts, but also their national adaptation approaches.

Climate costs are rising as climate impacts become increasingly severe. The window of opportunity to invest in the necessary infrastructure, information services and training is narrowing.

How adaptation will be funded is a fundamental issue. Governments may have to rebuild roads and bridges more often, to higher standards, to withstand extreme conditions. Similarly, households and businesses face increased costs for construction and goods and services due to the impacts of climate change that are often not attributed to climate change.

These costs will radically increase as climate change escalates. We strongly encourage the government to undertake the necessary assessments and plants to prepare Australia for the inevitable impacts on the horizon.

---

<sup>57</sup> Quicke and Bennett (2020) *Climate of the Nation*. <https://australiainstitute.org.au/report/climate-of-the-nation-climate-change-concern-hits-82/>

# Appendix 1: Adaptation Plans & Policies

The following resources, in prioritised order if discrepancies exist, were used to calculate the number of countries with climate adaptation plans or policies. The analysis was completed in early September 2021.

1. United Nations Framework Convention on Climate Change (**UNFCCC**)<sup>58</sup>

The UNFCCC lists Climate Adaptation Plans that have been submitted to them by developing nations.

2. ClimateAdapt database for the European Economic Area (**ClimateAdapt**)<sup>59</sup>

The database distinguishes between national adaptation policies and national adaptation strategies. We only include countries with policies, not strategies, in the list below.

3. *Climate Change Laws of the World* database by the Grantham Research Institute on Climate Change and the Environment (**Grantham**)<sup>60</sup>

The research institute is part of the London School of Economics, and the database was created in partnership with the Sabin Center for Climate Change Law, Columbia Law School.

We downloaded the results for laws and policies tagged as ‘adaptation’ frameworks. Then, we filtered the results to those with a document type of ‘Policy’ or ‘Plan’. Strategies were not included.

---

<sup>58</sup> UNFCCC (2021) National Adaptation Plans, <https://www4.unfccc.int/sites/NAPC/Pages/national-adaptation-plans.aspx>

<sup>59</sup> Climate Adapt (2021), Country Profiles <https://climate-adapt.eea.europa.eu/countries-regions/countries>

<sup>60</sup> Grantham Research Institute on Climate Change and the Environment (2021) Laws and policies database, [https://climate-laws.org/legislation\\_and\\_policies?frameworks%5B%5D=663](https://climate-laws.org/legislation_and_policies?frameworks%5B%5D=663)

**Appendix Table 2: Countries with climate adaptation plans or policies**

	<b>Country</b>	<b>Source</b>
1	Algeria	Grantham
2	Austria	ClimateAdapt
3	Bahamas, The	Grantham
4	Bangladesh	Grantham
5	Belgium	ClimateAdapt
6	Bhutan	Grantham
7	Brazil	UNFCCC
8	Brunei Darussalam	Grantham
9	Bulgaria	ClimateAdapt
10	Burkina Faso	UNFCCC
11	Cambodia	Grantham
12	Cameroon	UNFCCC
13	Canada	Grantham
14	Chile	UNFCCC
15	China	Grantham
16	Colombia	UNFCCC
17	Cook Islands	Grantham
18	Costa Rica	Grantham
19	Côte d'Ivoire	Grantham
20	Croatia	ClimateAdapt
21	Cuba	Grantham
22	Cyprus	ClimateAdapt
23	Czechia	ClimateAdapt
24	Denmark	ClimateAdapt
25	Dominica	Grantham
26	Dominican Republic	Grantham
27	Eritrea	Grantham
28	Estonia	ClimateAdapt
29	Eswatini	Grantham
30	Ethiopia	UNFCCC
31	Fiji	UNFCCC
32	Finland	ClimateAdapt
33	France	ClimateAdapt
34	Gabon	Grantham
35	Gambia	Grantham
36	Germany	ClimateAdapt
37	Ghana	Grantham
38	Greece	ClimateAdapt
39	Grenada	UNFCCC
40	Guatemala	UNFCCC

41	Haiti	Grantham
42	Hungary	ClimateAdapt
43	Ireland	ClimateAdapt
44	Jamaica	Grantham
45	Japan	Grantham
46	Jordan	Grantham
47	Kenya	UNFCCC
48	Kiribati	UNFCCC
49	Kuwait	UNFCCC
50	Latvia	ClimateAdapt
51	Liberia	Grantham
52	Lithuania	ClimateAdapt
53	Luxembourg	ClimateAdapt
54	Madagascar	Grantham
55	Malawi	Grantham
56	Malaysia	Grantham
57	Maldives	Grantham
58	Mali	Grantham
59	Malta	ClimateAdapt
60	Marshall Islands	Grantham
61	Monaco	Grantham
62	Morocco	Grantham
63	Myanmar	Grantham
64	Namibia	Grantham
65	Nauru	Grantham
66	Nepal	Grantham
67	Netherlands	ClimateAdapt
68	Niger	Grantham
69	Nigeria	Grantham
70	Niue	Grantham
71	Pakistan	Grantham
72	Palau	Grantham
73	Papua New Guinea	Grantham
74	Paraguay	UNFCCC
75	Portugal	ClimateAdapt
76	Romania	ClimateAdapt
77	Russia	Grantham
78	Saint Lucia	UNFCCC
79	Saint Vincent and the Grenadines	UNFCCC
80	Samoa	Grantham
81	Sierra Leone	Grantham
82	Singapore	Grantham

83	Slovakia	ClimateAdapt
84	Solomon Islands	Grantham
85	South Africa	Grantham
86	South Korea	Grantham
87	Spain	ClimateAdapt
88	Sri Lanka	UNFCCC
89	State of Palestine	UNFCCC
90	Sudan	UNFCCC
91	Suriname	UNFCCC
92	Sweden	ClimateAdapt
93	Switzerland	ClimateAdapt
94	Tajikistan	Grantham
95	Thailand	Grantham
96	Timor-Leste	UNFCCC
97	Togo	UNFCCC
98	Tonga	Grantham
99	Trinidad and Tobago	Grantham
100	Tuvalu	Grantham
101	Uganda	Grantham
102	United Kingdom	ClimateAdapt
103	Uruguay	UNFCCC
104	Vanuatu	Grantham
105	Zambia	Grantham
106	Zimbabwe	Grantham