CLIMATE COUNCIL

UNINSURABLE NATION: AUSTRALIA'S MOST CLIMATE-VULNERABLE PLACES

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The Climate Council acknowledges the Traditional Custodians of the lands on which we live, meet and work. We wish to pay our respects to Elders past, present and emerging and recognise the continuous connection of Aboriginal and Torres Strait Islander people to Country.

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Key findings

1

Climate change is creating an insurability crisis in Australia due to worsening extreme weather and sky-rocketing insurance premiums.

- Worsening extreme weather means increased costs of maintenance, repair and replacement to properties – our homes, workplaces and commercial buildings. As the risk of being affected by extreme weather events is increasing, insurers are raising premiums to cover the increased cost of claims and reinsurance.

- The Climate Council has produced a ranking of the top 10 most at-risk electorates from climate change and extreme weather events (covering bushfires, extreme wind and different types of flooding), based on the percentage of 'high risk' properties in each federal electorate across Australia. These properties have projected annual damage costs equivalent to 1% or more of the property replacement cost, and are referred to in this report as uninsurable, as – whilst policies might still be available – premiums are expected to become too expensive for people to afford.

- Across Australia approximately 520,940 properties, or one in every 25, will be 'high risk' and uninsurable. In addition, 9% of properties (1 in 11) will reach the 'medium risk' classification by 2030, with annual damage costs that equate to 0.2-1% of the property replacement cost. These properties are at risk of becoming underinsured.

2

Climate change affects all Australians, but some federal electorates face far greater risks than others.

- The top 10 most at-risk federal electorates by 2030 are:

1. Nicholls (Vic)
2. Richmond (NSW)
3. Maranoa (QLD)
4. Moncrieff (QLD),
5. Wright (QLD),
6. Brisbane (QLD),
7. Griffith (QLD),
8. Indi (Vic)
9. Page (NSW) and
10. Hindmarsh (SA).

- In these at-risk electorates, 15% of properties (165,646), or around one in every seven properties, will be uninsurable this decade.

- In the electorate of Nicholls in Victoria, which covers the Local Government Areas (LGAs) of Campaspe, Greater Shepparton, Moira, and parts of Strathbogie and Mitchell, 26.5% properties will be uninsurable by 2030. In the LGA of Greater Shepparton, it is as many as half (56% of properties), and almost 90% in the locality of Shepparton.

- By 2030, 40 federal electorates across Australia will have 4% of properties classified as uninsurable. Eighteen of these electorates (or 45%) are in Queensland. The top five most at-risk electorates in Queensland are: Maranoa, Moncrieff, Wright, Brisbane and Griffith.

- The percentage of properties that will be uninsurable by 2030 in each state and territory is 6.5% in Queensland; 3.3% in NSW; 3.2% in South Australia; 2.6% in Victoria; 2.5% in the Northern Territory; 2.4% in Western Australia; 2% in Tasmania and 1.3% in the ACT.

3

Riverine floods are the most costly disaster in Australia.

- Riverine flooding poses the biggest risk to properties. Of the properties classified as 'high risk' by 2030, 80% of that risk is due to riverine flooding.
- Bushfires and surface water flooding (sometimes called flash flooding) are the other major worsening hazards causing properties to become uninsurable by 2030.
- The five most at-risk electorates for riverine flooding are: Nicholls in Victoria, Richmond in New South Wales (including the towns of Ballina, Bangalow, Brunswick Heads, Byron Bay, Hastings Point, Kingscliff, Lennox Head, Mullumbimby, and Tweed Heads), and Maranoa (in rural southwestern Queensland, including the towns of Roma, Stanthorpe, Winton and Warwick), Brisbane, and Moncrieff in Queensland (part of the Gold Coast).
- Across Australia, 2.5% of properties (360,691 properties) will be at 'high risk' of riverine flooding by 2030, with a further 372,684 at 'medium risk' of riverine flooding.

4

Decisions and actions over this next term of government will influence the future impacts of climate change for generations to come.

- Unfortunately over the last eight years the Federal Government has failed to meaningfully tackle climate change or prepare Australians for worsening extreme weather.
- A key test for all candidates in the upcoming Federal Election is whether they are supporting policies that drive deep emissions cuts now through the 2020s, aligned with limiting the global average temperature rise to well below 2°C.
- There is also an urgent need to upscale investment in national adaptation and disaster risk reduction to help Australians better prepare for worsening extreme weather events.

1. Introduction

Climate Change, driven by the burning of coal, oil and gas is supercharging our weather systems. Already, temperatures have risen around 1.47°C in Australia since 1910, leading to an increase in extreme heat events (BoM 2022a).

Southern Australia is becoming drier – with declines in cool season (April - October) rainfall in southwest Western Australia and southeastern Australia over recent decades. There has been an increase in the length of the fire season and extreme fire weather over large areas of Australia, particularly southern Australia, since around the 1950s. At the same time, northern Australia has become wetter – particularly during the monsoon, and there has been an observed increase in the proportion of rain falling as short-duration intense rainfall events, increasing the risk of flooding (CSIRO and BoM 2020).

Rates of sea level rise around the Australian continent have been similar to the global average around much of the coastline (~ 25 cm since 1880), with significantly higher rates of sea level rise to the north and southeast of the continent (CSIRO and BoM 2020). Coastal communities are already experiencing the impacts on properties and infrastructure, including coastal inundation, erosion and more damaging storm surges.

Worsening extreme weather means increased costs of maintenance, repair and replacement to properties – our homes, workplaces and commercial buildings. As the risk of being affected by extreme weather events increases, insurers will raise premiums to cover the increased cost of claims and reinsurance.

Climate change, driven by the burning of coal, oil and gas, is leading to worsening fires, floods, and heatwaves.

Figure 1: Bushfire rages close to properties in New South Wales during Black Summer. 2019. The Royal Commission Into Natural Disaster Arrangements found that climate change is increasing the severity and frequency of extreme weather events, like bushfires and floods.

Insurance will become increasingly unaffordable or unavailable in large parts of Australia due to worsening extreme weather.

Australia's general insurers paid out $5.47 billion from over 300,000 claims related to the bushfires, floods and hailstorms in the 2019-20 summer (ICA 2021). This led Insurance Australia Group (IAG) and Suncorp to draw on their reinsurance contracts and prompted Swiss Re to publicly criticise the companies for consistently failing to predict the cost of natural disasters (The Guardian 2021). The world's second biggest reinsurer, Swiss Re, has noted that climate change is already resulting in a "new world" of weather uncertainty, driving increased losses from more local flooding, torrential rain, prolonged drought, severe wildfires and other extreme weather events – and that this will push up the cost of insurance in Australia (AFR 2020; Swiss Re 2019).

Already, many Australians do not have insurance, or are underinsured (ICA 2021; ACCC 2019). The rate of home building non-insurance is about 20% in Northern Australia and 11% across the rest of Australia, and this is growing in Northern Australia due largely to unaffordability (ACCC 2019). Underinsurance is also widespread in Australia (i.e. when the level of insurance taken out by a policyholder doesn't fully cover the cost to rebuild or repair), though the extent of underinsurance is not fully known (ICA 2021). High levels of underinsurance, particularly amongst businesses, was one of the major issues revealed in the aftermath of the Black Summer bushfires, and this has also been apparent following the recent flooding events in northern New South Wales and southeast Queensland. Being uninsured or underinsured makes it much more difficult to recover following extreme weather events (ICA 2021).

The availability of affordable insurance is paramount to the safety and well-being of communities, as well as the broader economic resilience of Australia. Households and businesses rely on insurance to protect them financially, to give them the confidence to invest, and to rebuild when extreme weather events strike. People who do not have insurance, or are underinsured, are more likely to experience homelessness after an extreme weather event strikes. Communities that have low levels of insurance will take longer to recover, and more of the financial burden of recovery will fall on governments, and by extension, taxpayers. This can also lead to broader economic impacts, such as higher debt levels and reduced economic productivity (Summerhayes 2020).

The affordability of insurance is particularly relevant for financially vulnerable people, and increasing premiums will exacerbate existing inequities. Insurance companies may also decide that offering policies in some high-risk areas is not viable, withdrawing the option of taking out insurance entirely.

For high risk properties, banks may reduce access to credit, and credit risk for existing loans may rise, leading to declining property values. In some severe instances, areas may

While climate change affects all Australians, the risks are not shared equally. In the most extreme instances, areas may become uninhabitable.

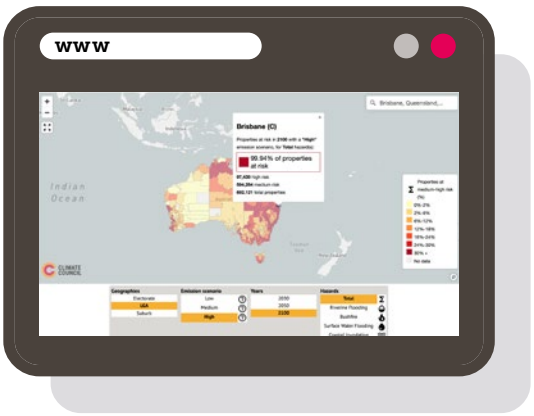
even become uninhabitable as banks no longer consider high-risk properties sensible for lending (RBA 2021).

Although all Australians are affected by climate change, certain areas are at greater risk. The factors that determine risk include not only the probability of an extreme weather event occurring (for example a bushfire), but also how exposed a property is to that event (for example how close a property is to bushland), and how vulnerable it is (for example what the building materials are). The address level climate risk data used for analysis in this report – provided to the Climate Council by Climate Valuation – combine projections from climate models with historical hazard data, and with data on particular localities (for example elevation etc.) to determine where properties are likely to be most severely affected by climate change and extreme weather.

The report outlines the top 20 most at-risk federal electorates to climate change-related extreme weather events, providing a brief profile of the top 10. The report also outlines the most at-risk electorates for each state and territory. The metric used for the ranking is the percentage of 'high risk' properties, which have annual damage costs equating to 1% or more of the replacement cost of the property. These properties are referred to throughout this report as being uninsurable.

Australia is one of most vulnerable developed countries to climate impacts. The decisions of the next Federal Government will influence the future impacts of climate change for generations to come. Every fraction of a degree matters and will be measured in lost lives and livelihoods. If every country in the world was doing as Australia, the world would be on a track for around 3°C to 4°C of warming (Climate Action Tracker 2021). This would be catastrophic.

This report accompanies an interactive online map, which allows users to explore the percentage (and number) of medium-high risk properties in different electorates, local government areas (LGAs), and suburbs across Australia over different time periods (2030, 2050 and 2100) and under different emissions scenarios. This report presents a subset of these data and focuses only on 'high risk' properties.



The map can be found here: www.climatecouncil.org.au/resources/climate-risk-map

2. Methods

ABOUT THE DATA

The data used to develop this ranking were provided by Climate Valuation.[1] Climate Valuation analyse climate risk in terms of the probability of property damage — specifically, the Maximum to Date Value at Risk (MVAR) of extreme weather and climate-related hazards. This has been done using purpose-built 'Climate Risk Engines', which compute the threshold at which the various key components of a building would fail if exposed to various hazards (such as riverine flooding, coastal inundation and bushfires).

MVAR is a measure of the annual risk of damage to an asset. The MVAR captures the costs of expected extreme weather and climate-related damage, relative to the replacement cost of the building. For example, an MVAR of 1% is equivalent to climate-related damage costs of $3,140 per year for a building that costs $314,000 (a conservative estimate of the average home replacement cost for many regions of Australia), noting that this does not include the value of the land. Properties that have an MVAR that is 1% or more of the replacement cost of the dwelling are considered 'high risk' consistent with definitions used by the US Federal Emergency Management Agency.

The 'Climate Risk Engines' combine long-term data from local meteorological stations with information about the specific location, such as flood mapping and depths, elevation above sea level, tides and waves, soil type, and forest cover; and data on the assumed building at that address, such as age, construction materials and design.

The influence of future climate change is derived by extracting the changes in the statistical distribution of key parameters such as heat, precipitation, wind and humidity from global climate change models from agencies such as CSIRO, University of New South Wales, University of Queensland, and the US National Oceanic and Atmospheric Administration (NOAA). Models that predict a wetter future are used to assess flood risks, models that predict a drier future are used to assess drought risks etc. In this way, the models are structured to provide a 'stress test' and alert property owners to the upper range of possible risks, rather than average projections.

To overcome the high levels of variability in climate data a Maximum to Date approach is used, which shows the maximum amount of the Value at Risk up to and including the year being quoted. This avoids a misleading focus on a low impact year which may be anomalous with the trend.

All of these data are then processed to calculate the probability of property damage from climate change and extreme weather for every address in Australia. The Climate Risk Engines assume a standard modern dwelling is located at each address, i.e. a single story detached house which uses design specifications and materials typical of a recent building. The replacement cost of each dwelling is assumed to be $314,000. This is a very conservative estimate given that the average cost of building a new dwelling across Australia was $320,000 in 2018-19 according to the ABS (last update) and that construction costs have risen considerably over the past two years (ABS 2020).

For more on the methodology used by the Climate Risk Engines, visit: www.climateriskengines.com/methodology.html

[1] Climate Valuation are leaders in residential climate risk analysis. To find out information on the climate risks facing a particular residential address, visit their website at: https://climatevaluation.com/

ABOUT THE RANKING

The ranking used in this report is based on the percentage of properties in each electorate across Australia that are classified as 'high-risk'. These properties are referred to in this report as uninsurable, as premiums are expected to become so expensive that insurance becomes inaccessible. This does not necessarily mean that insurance policies are not available, but in regions with a high percentage of 'high risk' properties insurers may decide to refuse to offer policies entirely.

For this report, Climate Valuation forecasted an MVAR for each dwelling in Australia. All properties with an MVAR of 1% or more (i.e. all 'high risk' dwellings) were then aggregated by federal electorates, providing a standardised metric for comparing climate risk. The percentage of 'high risk' properties in each electorate was used (as opposed to the raw number), so the ranking is not biassed towards electorates with a higher number of dwellings.

The ranking used a timeframe of 2030 for comparing climate risks, and a high emissions scenario. Unfortunately, the impacts of climate change in 2030 will be driven by greenhouse gas emissions that have already been released, so the emissions scenario chosen essentially does not have any bearing on the projected impacts.

The total risk from hazards that significantly impact buildings are used in this report: bushfires, riverine flooding, extreme wind, coastal inundation and surface water flooding. The definitions for each of these hazards are as follows:

Riverine flooding is when a river exceeds its capacity, inundating nearby areas.

Coastal inundation is when seawater temporarily or permanently floods an area due to a combination of sea level rise, high tides, wind, low air pressure and/or waves. This definition does not include coastal erosion.

Extreme wind is high-wind conditions that may exceed a building's design specifications (due to projected changes in sea surface temperature, wind regimes and wind speeds).

Bushfires are destructive fires that spread via trees, forests and ground cover. This definition does not include grass fires.

Surface water flooding (sometimes called pluvial flooding or flash flooding) is overland flooding. This occurs when sustained rainfall or short-duration heavy rainfall events cause the ground to reach saturation point and drainage systems to overflow, resulting in the build-up of excess water.

It should be emphasised that this ranking is based on climate change impacts to buildings. In some ways, this provides a proxy for areas that are more at risk than others, but it does not fully reflect the risks of climate change to human health, ecosystems, and other sectors of the economy. For example, whilst extreme heat has killed more Australians than all other natural hazards combined (Coates et al. 2014; Coates et al. 2022), extreme heat does not significantly affect the structural integrity of buildings. Likewise, although declining rainfall in some parts of Australia will significantly affect agricultural yields and ecosystems, it will have a marginal impact on the structural integrity of buildings.

3. Ranking results

The top 10 most at-risk federal electorates by 2030 are:

1. Nicholls (Vic)
2. Richmond (NSW)
3. Maranoa (Qld)
4. Moncrieff (Qld)
5. Wright (Qld)
6. Brisbane (Qld)
7. Griffith (Qld)
8. Indi (Vic)
9. Page (NSW)
10. Hindmarsh (SA)

In these 10 electorates alone 15% of properties (165,646 properties) or around one in seven properties will be uninsurable within 10 years. Profiles of the top 10 electorates, including a breakdown of the main hazards driving risk, are in the following section.

The top 20 most at-risk electorates are shown in Table 1. In the top 20 most at-risk electorates 12% of properties (250,653 properties) either already are, or will be classed as uninsurable within ten years.

Table 1: Top 20 most at-risk federal electorates to climate extremes, 2030.

Rank	Electorate	State	LGAs	Total properties	High risk properties	Medium risk properties	High risk properties (%)
1	Nicholls	VIC	Greater Shepparton, Moira, Campaspe, Mitchell, parts of Strathbogie	94,280	25,801	9,057	27.4
2	Richmond	NSW	Tweed, Byron, Ballina	106,445	22,274	34,884	20.9
3	Maranoa	QLD	17 LGAs including Diamantina, Longreach, Maranoa, Western Downs, Winton, and parts of South Burnett, Southern Downs and Toowoomba	132,078	19,551	13,212	14.8
4	Moncrieff	QLD	Part of Gold Coast	131,924	18,032	9,545	13.7
5	Wright	QLD	Lockyer Valley and parts of Gold Coast, Ipswich, Logan, Scenic Rim and Southern Downs	88,952	12,140	28,502	13.6
6	Brisbane	QLD	Parts of Brisbane	145,103	19,355	22,461	13.3
7	Griffith	QLD	Parts of Brisbane	112,833	14,812	17,894	13.1
8	Indi	VIC	Wangaratta, Alpine Shire, Benalla, Strabogie	99,086	11,215	10,991	11.3
9	Page	NSW	Parts of Ballina, Lismore, Richmond Valley, Clarence Valley,	103,657	11,691	33,177	11.3
10	Hindmarsh	SA	Port Adelaide, parts of Port Adelaide Enfield, Charles Sturt, parts of West Torrens	97,274	10,775	10,500	11.1
11	Wide Bay	QLD	Fraser Coast, Noosa Shire, parts of Gympie	105,327	10,575	32,626	10.0
12	Lyne	NSW	Mid-Coast, parts of Port Macquarie-Hastings, parts of Port Stephens, parts of Maitland and Dungog	106,556	10,283	33,607	9.7
13	Parkes	NSW	Parts of Western Plains Regional, Broken Hill, Narrabri, Moree Plains, Gunnedah, Warrumbungle Shire, Lachlan, Narromine, Cobar, Walgett, Gwydir, Coonamble, Gilgandra,Bourke, Warren, Bogan,Central Darling, Brewarrina, Unincorporated NSW	109,767	10,251	7,450	9.3
14	Forde	QLD	Parts of Logan and parts of Gold Coast	91,510	8,488	19,253	9.3
15	Ryan	QLD	Parts of Brisbane City	80,444	7,177	16,595	8.9
16	Moreton	QLD	Parts of Brisbane City	87,161	7,667	9,027	8.8
17	Fairfax	QLD	Parts of Sunshine Coast	96,900	8,225	13,842	8.5
18	Mallee	VIC	Mildura Rural City, Swan Hill Rural City, Horsham Rural City, Central Goldfields, Northern Grampians, Gannawarra, Loddon, Yarriamback, parts of Pyrenees, Buloke, Hindmarsh, West Wimmera	107,668	9,035	4,969	8.4
19	Tangney	WA	Parts of Gosnells, parts of Melville, parts of Canning	85,401	6,334	3,771	7.4
20	Blair	QLD	Parts of Brisbane City, Ipswitch, Somerset	97,893	6,972	17,610	7.1
Total				**2,080,259**	**250,653**	**348,973**	**12.0**

PROFILES OF THE TOP TEN MOST AT-RISK FEDERAL ELECTORATES

The top 10 most at-risk electorates are profiled below. Riverine flooding drives most of the risk to properties in the top 10 riskiest electorates in 2030. Around 80% of the 'high risk' properties in the top 10 riskiest electorates are classified as such due to the probability and impact of riverine flooding. Bushfire and surface water flooding are the major other hazards affecting 'high risk' properties in 2030 (see Figure 2).

Riverine flooding poses the biggest risk to properties. Of the properties classified as 'high risk' by 2030, 80% of that risk is due to riverine flooding.

Figure 2: Riverine flooding poses the biggest risk to properties. Of the properties classified as 'high risk' by 2030, 80% of that risk is due to riverine flooding.

TOP 10 MOST AT-RISK FEDERAL ELECTORATES TO CLIMATE EXTREMES BY 2030

#5 WRIGHT (QLD)

- 13.6% of properties at high risk (12,140 properties)
- 9% of properties at high risk to bushfire
- 3.6% of properties at high risk to riverine flooding

#7 GRIFFITH (QLD)

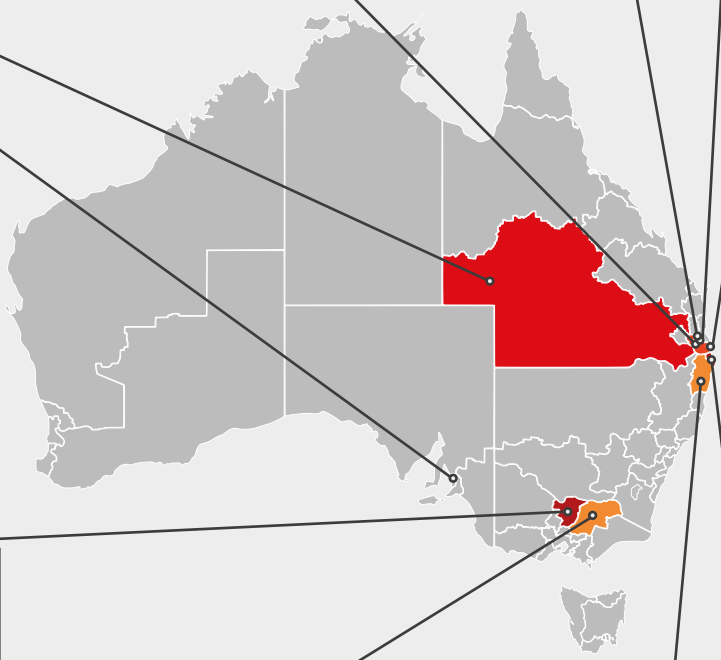
- 13.1% of properties at high risk (14,812 properties)
- 11.4% of properties at high risk to riverine flooding
- 2.2% of properties at high risk to surface flooding water

#3 MARANOA (QLD)

- 14.8% of properties at high risk (19,551 properties)
- 13.9% of properties at high risk to riverine flooding
- 0.6% of properties at high risk to bushfire

#6 BRISBANE (QLD)

- 13.3% of properties at high risk (19,355 properties)
- 12.5% of properties at high risk to riverine flooding
- 3.3% of properties at high risk to surface flooding water



#10 HINDMARSH (SA)

- 11.1% of properties at high risk (10,775 properties)
- 9.5% of properties at high risk to riverine flooding
- 1.2% of properties at high risk to surface flooding water

#4 MONCRIEFF (QLD)

- 13.7% of properties at high risk (18,032 properties)
- 11.9% of properties at high risk to riverine flooding
- 1.7% of properties at high risk to surface flooding water

#1 NICHOLLS (VIC)

- 27.4% of properties at high risk (25,801 properties)
- 26.5% of properties at high risk to riverine flooding
- 1.5% of properties at high risk to surface flooding water

#2 RICHMOND (NSW)

- 20.9% of properties at high risk (22,274 properties)
- 14.5% of properties at high risk to riverine flooding
- 5.2% of properties at high risk to bushfire

#8 INDI (VIC)

- 11.3% of properties at high risk (11,215 properties)
- 10.7% of properties at high risk to riverine flooding
- 1.1% of properties at high risk to surface flooding water

#9 PAGE (NSW)

- 11.3% of properties at high risk (11,691 properties)
- 5.4% of properties at high risk to riverine flooding
- 5.3% of properties at high risk to bushfire

Hazards

Bushfire

Coastal Inundation

Riverine Flooding

Surface Water Flooding

Extreme Wind

#1	NICHOLLS (VIC)
	94,280 total property count
	27.4% of properties at high risk (25,801 properties)
	26.5% of properties at high risk to riverine flooding
	1.5% of properties at high risk to surface water flooding

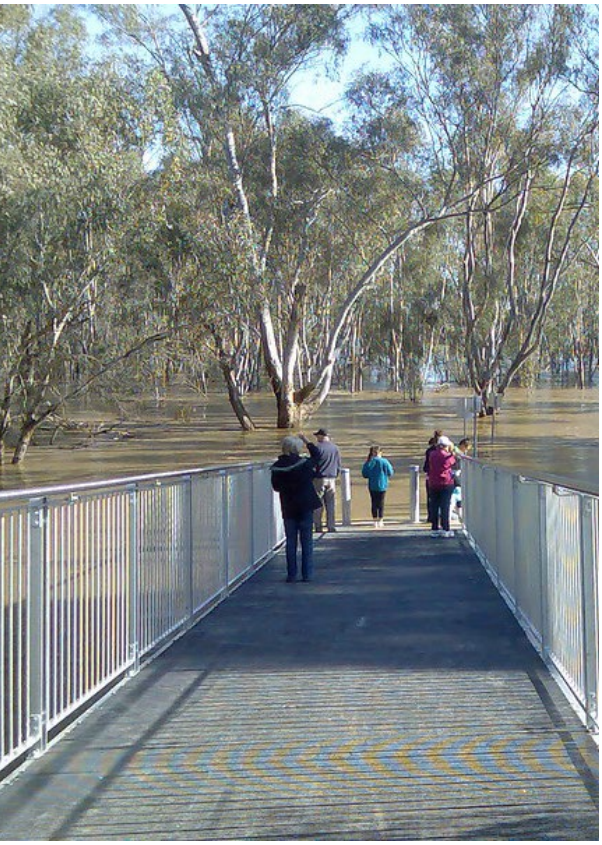


Figure 3: Broken River Pedestrian Bridge, Shepparton, Victoria, during floods in 2010. Up to 90% of properties in some localities around the township of Shepparton will be uninsurable by 2030.

The federal electorate of Nicholls replaced the electorate of Murray in 2019 and covers over 14,000 square kilometres. It starts south of the township of Seymore in central Victoria and heads north past Shepparton to the Murray River in Yarrawonga. It borders the federal electorate of Indi to the east and Bendigo and Mallee to the west. It's home to prime agricultural land, dairy farms, orchards and world class wineries. Agriculture, manufacturing, healthcare and retail account for almost 50% of all employment in this area.

The rivers that support the agriculture industry in Nicholls also present the greatest risk. The Goulburn River for example, just one of the rivers that winds its way through Nicholls, has a long history of flooding, with major floods occurring in 1916, 1917, 1939, 1956, 1958, 1974, 1993 and 2010/11/12 in the Shepparton, Mooroopna and Murchison areas.

> *A warmer atmosphere can hold more moisture and has more energy to fuel storms. With climate change we are getting more of our rain in the form of intense downpours, raising the risk of flooding.*

In 2030 there will be 24,976 properties in the electorate of Nicholls at high risk – rendering them uninsurable – due to the risk of riverine flooding. In some localities around the township of Shepparton (for example Shepparton, Shepparton North, Kialla, and Kialla West), between 80% and 90% of homes will be uninsurable by 2030. Around 6,000 homes in the electorate of Nicholls will also reach a 'medium risk' of riverine flooding by 2030.

In addition to riverine flooding, many properties in localities around Shepparton are also at risk of surface water flooding due to the flat topography, effectively meaning these properties have been built on floodplains. By 2030, there will be 1,607 properties in Nicholls at high risk for surface water flooding and a further 2,140 properties at 'medium risk'.

Demonstrating the multifaceted nature of climate change supercharging extreme weather, in the same electorate, by 2030 there will also be 654 properties that will reach a medium risk of being impacted by bushfires.

#2	RICHMOND (NSW)
	106,445 total property count
	20.9% of properties at high risk (22,274 properties)
	14.5% of properties at high risk to riverine flooding
	5.2% of properties at high risk to bushfire
	0.4% of properties at high risk to surface water flooding

The federal electorate of Richmond sits in the far northeast corner of New South Wales, bordering Queensland to the north and the federal electorates of Page (9th on this list) and Wright (5th on this list) to the west. The main towns include Ballina, Brunswick Heads, Byron Bay, Hastings Point, Kingscliff, Lennox Head, Mullumbimby and Tweed Heads.

Historically considered a rural seat, population growth in the area is seeing the demographic shift towards more urban. Riverine flooding, from the Richmond River and its tributaries, presents the greatest risk in this electorate, particularly to homes and businesses along the coast and near rivers. In coastal towns such as Ballina, high tides compound the risk of riverine flooding. In early March 2022, a 1.8 metre king tide combined with record-breaking floods and impacted roughly 6,000 homes in the Ballina area.

Bushfires are also a risk in this electorate, especially inland, with suburbs like Main Arm, Mount Warning, Mullumbimby Creek, Wilsons Creek and Coorbell all at significant risk.

> *Extreme weather events are very likely to become more severe and destructive over the next couple of decades because past greenhouse gas emissions have "locked in" certain levels of climate change. However, we can still influence how much worse things become.*

What's more, the latest available census data show median weekly family and household incomes in Richmond are well below the national average. Richmond workers are also overrepresented in part time work and underrepresented in full time work compared to national averages, demonstrating that climate impacts are being felt by those who can least afford them.

Figure 4: Tiffany Williamson walks through her parent's burnt out property in Tingha in northern New South Wales. The Tingha fire destroyed 13 houses and 44 outbuildings. Climate change is increasing extreme fire weather, and lengthening the bushfire season across large parts of Australia.

#3	MARANOA (QLD)
	132,078 total property count
	14.8% of properties at high risk (19,551 properties)
	13.9% of properties at high risk to riverine flooding
	0.6% of properties at high risk to bushfire

The electorate of Maranoa, named after the Maranoa River, is a regional electorate covering almost 750,000 square kilometres and is located on the southwestern corner of Queensland. Towns located in Maranoa include Charleville, Cunnamulla, Dalby, Roma, Kingaroy, St George, Stanthorpe, Winton and Warwick. As well as the Maranoa river, it's also home to The Condamine-Balonne river system, one of the major tributaries of the Murray-Darling river system. The division is also home to the aptly named Culgoa Floodplain National Park. In the regional town of St George, which straddles the Balonne River and is home to around 3,000 people, more than 70% of properties will be uninsurable due to flood risk by 2030.

> *By 2030, 40 federal electorates across Australia will have 4% of properties classified as 'high risk.' Eighteen of these electorates (or 45%) are in Queensland.*

Figure 5: A State Emergency Service (SES) crew motors past a flood gauge on the swollen Balonne river in St George, southwestern Queensland, Wednesday, February 26, 2020.

#4	MONCRIEFF (QLD)
	131,924 total property count
	13.7% of properties at high risk (18,032 properties)
	11.9% of properties at high risk to riverine flooding
	1.7% of properties at high risk to surface water flooding
	0.1% of properties at high risk to bushfire

Moncrieff incorporates Surfers Paradise and the central portion of the Gold Coast. The Nerang River, beginning near the McPherson Ranges to the southeast, winds its way through the electorate and out to sea. The Gold Coast local government area has experienced more than 20 floods since 1958 of varying degrees. Moncrief faces the compounding risk of intense east coast lows, which cause flooding when significant rain falls over catchment areas. Since records began in 1920, there have been six floods which have caused moderate to major flooding. Four of these, 1931, 1947, 1954 and 1974, were the result of either ex-tropical cyclones or deep east coast lows. Depending on the flood situation, the Hinze Dam storage can reduce the severity of downstream flooding, although high rainfall can see the dam overflow.

Broadbeach Waters is at greatest risk and by 2030, 45% of properties will be at high risk of riverine flooding; Mermaid Waters and Surfers Paradise are next with around 25% of properties reaching 'high risk' at the same time.

Figure 6: The Nerang River winds its way through Surfers Paradise.

#5	WRIGHT (QLD)
	88,952 total property count
	13.6% of properties at high risk (12,140 properties at high risk)
	9% of properties at high risk to bushfire
	3.6% of properties at high risk to riverine flooding
	0.4% of properties at high risk to surface water flooding

The rural electorate of Wright spans roughly 7,500 square kilometres of the Gold Coast hinterland, the area between Logan and the New South Wales border and the Lockyer Valley west of Ipswich. This division includes the towns of Beaudesert, Jimboomba, Boonah, Laidley, Hatton and Helidon while also encompassing Springbrook and Lamington National Parks. Historically, Wright has suffered from bushfires in its inland coastal rainforests and river flooding. A high proportion of properties in the localities of Yarrabilba, Canungra, Greenbank, Kairabah and Jimboomba will reach high risk by 2030 due to the risk of bushfire.

Figure 7: Fire and Emergency crew battle a bushfire near a house in the rural town of Canungra, QLD, September 2019. Dry and hot conditions, made worse by climate change, increased the severity and damage of the 2019/2020 fires.

#6	BRISBANE (QLD)
	145,103 total property count
	13.3% of properties at high risk (19,355 properties)
	12.5% of properties at high risk to riverine flooding
	3.3% of properties at high risk to surface water flooding

The federal electorate of Brisbane is home to around 160,000 people who live and work in approximately 145,000 residences and buildings. Of these, 19,355 will be at high risk by 2030 and 103,287 will be at medium risk. The Brisbane River acts as a border between the divisions of Brisbane and Griffith (number 7 on this list). Properties in the suburbs of Milton, Newstead, Albion and Brisbane City are at greatest risk in this electorate. The suburbs of Newstead and Brisbane City also face the compounding risk of surface water flooding.

Wivenhoe and Somerset dams, northeast of Brisbane, provide a limited safety net to riverine flooding as they only capture water from the northern section of the Brisbane River catchment. The dams have no control over run-off from the Lockyer Valley, Bremer River or local catchments downstream from Wivenhoe. These dams can also fill rapidly, evidenced by Wivenhoe dam reaching 187% capacity in early 2022, up from 40% just four months prior. Exceptional rainfall in the last week of February 2022 saw many rainfall records across Greater Brisbane. From 23 to 28 February, Brisbane recorded 792.8 mm, which is 78% of the annual average of 1011.5 mm. The previous 6-day record accumulation was 655.8 mm over 25-30 January 1974 (BoM 2022b).

Figure 8: In early 2022, Wivenhoe and Somerset dams filled rapidly and did not prevent the Brisbane River from flooding.

#7	GRIFFITH (QLD)
	112,833 total property count
	13.1% of properties are at high risk (14,812 properties)
	11.4% of properties at high risk to riverine flooding
	2.2% of properties at high risk to surface water flooding

Griffith is an inner metropolitan area covering just 57 square kilometres in Queensland. On the opposite side of the Brisbane River sits the electorate of Brisbane (number 6 on this list). The suburbs of West End, Fairfield and Yeronga are expected to face the greatest risk, where up to 50% of properties will be considered high risk by 2030.

Figure 9: Residents inspect their neighbourhood during flooding in West End, Brisbane, March, 2022. Climate Change is supercharging extreme weather, increasing the likelihood of intense rainfall and floods.

#8	INDI (VIC)
	99,086 total property count
	11.3% of properties at high risk (11,215 properties)
	10.7% of properties at high risk to riverine flooding
	1.1% of properties at high risk to surface water flooding

The division of Indi is a roughly 30,000 square kilometre rural area encompassing the towns of Wodonga, Wangaratta, Glenrowan, Benalla, Bright and the Victorian snowfields and Lake Eildon. It runs along part of the northeast New South Wales border and extends as far south as Kinglake. This part of Victoria is home to many rivers and comprises sections of the Murray-Darling Basin. Significant rivers in the division include the Goulburn River, Broken River, King River, Buffalo River, Ovens River and the Kiewa River.

By 2030, up to 60% of properties in Wangaratta, where the King River joins the Ovens River, will be considered high risk to riverine flooding. Upstream of the Ovens River, in the picturesque tourist town of Bright, almost 20% of properties will be considered high risk by 2030.

Figure 10: The Ovens River floods in the rural town of Myrtleford in 2016.

#9	PAGE (NSW)
	103,657 total property count
	11.3% of properties are at high risk (11,691 properties)
	5.4% of properties at high risk to riverine flooding
	5.3% of properties at high risk to bushfire
	0.4% of properties at high risk to surface water flooding

The electorate of Page covers an approximate 20,000 square kilometres of rural and coastal New South Wales. This encompasses the coastal area between Sapphire Beach (just north of Coffs Harbour) and Nimbin and from the inland Nymboida region in the south to the Queensland border. It also includes the towns of Lismore, Casino, Dunoon, Yamba, Evans Head, Grafton, Iluka, Kyogle and Wooli. Due to its geography, Page's greatest climate threats are bushfire and riverine flooding. This electorate saw record breaking floods in early 2022. The Wilsons River, in Lismore, reached 14.37 metres, two metres above the 1954 and 1974 levels. In the aftermath the town was said to resemble a war zone; thousands of homes were destroyed completely or deemed no longer safe for habitation. Just a few weeks later the flood waters returned, topping the levee for the second time.

> *In Australia, extreme rainfall events are projected, with high confidence, to increase in intensity.*

Figure 11: Rhonda, saved by her two boats, was fully prepared, many were not. Lismore, New South Wales. March. 2022.

CASE STUDY: ELLY BIRD, COUNCILLOR, LISMORE COUNCIL

If we're to learn a lesson from the catastrophic flooding that we are now seeing happen in Australia every few years, it's that we are severely underprepared. We urgently need to address the root cause of the heightened storm threat – climate change.

Local governments, like Lismore City Council, have been trying to work together with our communities to take action against climate change and build resilience. But we need more support and we need it urgently.

That's why after the QLD/NSW floods in March 2022, I joined 31 other mayors and Councillors from Logan City Council in Queensland through to Eurobodalla Shire Council in New South Wales to call on our Federal leaders to immediately step up and reduce the climate impacts that put our communities in the firing line.

Now is the time for our Government to lead the country in delivering on an ambitious emissions reduction target this decade to protect communities like ours from the future climate shocks that we know are coming and that we are living every single day.

Figure 12: Elly Bird, Councillor, Lismore City Council.

#10	HINDMARSH (SA)
	97,274 total property count
	11.1% of properties at high high risk (10,775 properties)
	9.5% of properties at high risk to riverine flooding
	1.2% of properties at high risk to surface water flooding
	0.5% of properties at high risk to coastal inundation

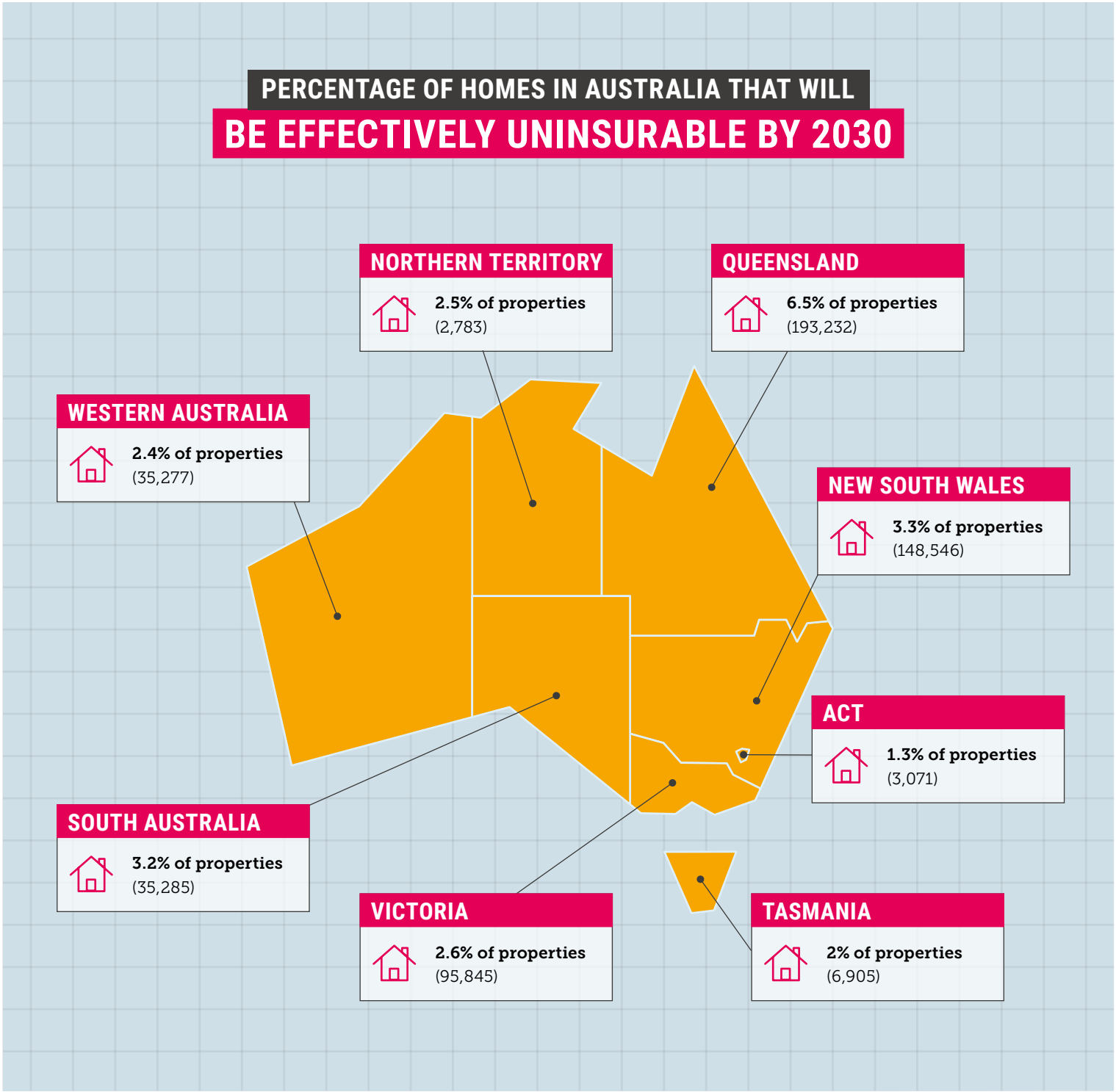
The division of Hindmarsh is an inner metropolitan electorate encompassing approximately 100,000 properties in Adelaide's western suburbs within 122 square kilometres. It stretches along the city's northern beaches all the way to Outer Harbour and includes river channels and both Adelaide Airport and Port Adelaide. Its estuarine features have led to numerous cases of historical flooding, which remains the electorate's biggest threat. The region's relatively flat topography also results in surface water flooding in the event of heavy or persistent rainfall. The suburbs of Port Adelaide, West Lakes, Grange and Ethelton being most at risk.

Figure 13: River Torrens boardwalk at night. October. 2021.

RANKINGS BY STATE AND TERRITORY

The total number of properties (and percentage of properties) that will be effectively uninsurable by 2030 in each state and territory is shown in Figure 14. The most at-risk electorates in each state and territory are shown in the tables on the following pages.

Figure 14: Percentage of homes in Australia that will be effectively uninsurable by 2030.



New South Wales				
Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Richmond	106,445	22,274	34,884	20.9
Page	103,657	11,691	33,177	11.3
Lyne	106,556	10,283	33,607	9.7
Parkes	109,767	10,251	7,450	9.3
Farrer	114,512	7,745	6,009	6.8
Total	**540,937**	**62,244**	**115,127**	**11.5**

Queensland				
Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Maranoa	132,078	19,551	13,212	14.8
Moncrieff	131,924	18,032	9,545	13.7
Wright	88,952	12,140	28,502	13.6
Brisbane	145,103	19,355	22,461	13.3
Griffith	112,833	14,812	17,894	13.1
TOTAL	**610,890**	**83,890**	**91,614**	**13.7**

Across all electorates in Australia, around 3.6% of properties (520,944) or one in every 25 properties will be uninsurable by 2030.

South Australia				
Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Hindmarsh	97,274	10,775	10,500	11.1
Barker	135,787	8,865	6,325	6.5
Mayo	110,680	4,217	20,029	3.8
Boothby	97,282	2,421	6,470	2.5
Makin	82,289	1,651	2,555	2.0
TOTAL	**523,312**	**27,929**	**45,879**	**5.3**

Victoria				
Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Nicholls	94,280	25,801	9,057	27.4
Indi	99,086	11,215	10,991	11.3
Mallee	107,668	9,035	4,969	8.4
Macnamara	147,149	9,975	36,288	6.8
Isaacs	94,361	3,958	12,095	4.2
TOTAL	**542,544**	**59,984**	**73,400**	**11.1**

Western Australia				
Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Tangney	85,401	6,334	3,771	7.4
Durack	137,371	7,001	3,592	5.1
Canning	89,863	3,609	5,883	4.0
O'Connor	138,107	4,810	3,944	3.5
Forrest	96,741	2,941	5,704	3.0
TOTAL	**547,483**	**24,695**	**22,894**	**4.5**

Tasmania

Note: There are only five electoral divisions in Tasmania.

Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Bass	67,320	2,463	2,027	3.7
Lyons	75,297	2,098	2,399	2.8
Braddon	68,227	967	1,035	1.4
Franklin	60,933	698	942	1.1
Clark	65,747	679	780	1.0
TOTAL	**337,524**	**6,905**	**7,183**	**2.0**

The Northern Territory and Australian Capital Territory

Note: There are only two electoral divisions in the NT: Lingiari (4.5% properties at high risk) and Solomon (1% of properties at high risk). There are only three electoral divisions in the ACT.

Electorate	Total properties	High risk properties	Medium risk properties	High risk properties (%)
Canberra	86,905	1,443	2,944	1.7
Bean	74,077	1,008	323	1.4
Fenner	71,247	620	1,002	0.9
TOTAL	**232,229**	**3,071**	**4,269**	**1.3**

4. Conclusion and recommendations

Australians are paying a high price for the lack of meaningful national action to tackle climate change, and prepare for its impacts. Worsening disaster after disaster – with fewer reprieves between – is frequently exceeding the capacity of communities to cope, and we must work hard to avoid catastrophe. Unless we rapidly and drastically cut greenhouse gas emissions this decade – aligned with a path to limit the global average temperature rise to well below 2°C – extreme weather will get much, much worse.

To limit temperature rise to well below 2°C, global emissions need to be halved by 2030, and there is a need to get to net zero by 2040 at the latest. Australia, amongst other countries, must urgently escalate efforts to reduce emissions before the end of this decade. Australia should aim higher than the global average and adopt a target of 75% emissions reductions by 2030 reaching net zero by 2035, given its distinct advantages and the many social benefits and economic opportunities associated with emissions reductions.

As a wealthy nation with a remarkable abundance of renewable energy resources and critical minerals, Australia has boundless potential to become an economic powerhouse in a world that is racing towards net zero. If Australia moves quickly, we have the opportunity to drastically reduce emissions, save money through reduced fuel and power bills, boost economic growth, generate tens of thousands of additional jobs and translate our renewable energy resources into clean energy export industries worth hundreds of billions per annum. Moving away from fossil fuels would also translate into tangible health benefits for Australians.

A key test for all candidates in the upcoming Federal Election is whether they are supporting policies that can drive deep emissions cuts now through the 2020s, aligned with limiting the global average temperature rise to well below 2°C. Warming avoided can be measured in lives, species and ecosystems saved, as well as avoided economic shocks. The decisions and actions of governments this decade will determine how much worse things get.

The Climate Council calls on all federal political parties and candidates to adopt policies that:

1. Enable swift and deep emissions reductions across the whole of the Australian economy

With a target of cutting emissions by 75% below 2005 levels by 2030 and reaching net zero emissions by 2035.

2. Eliminate fossil fuel subsidies

In 2021-22, Australian Federal and state governments provided a total of $11.6 billion worth of spending and tax breaks to assist fossil fuel industries – 56 times the budget of the National Recovery and Resilience Agency (TAI 2022). This is completely at odds with addressing the risks from climate change and extreme weather.

3. Prioritise investment in resilience

Investing in risk reduction and resilience provides a 'triple dividend' of avoided loss and suffering, reduced disaster costs and potential economic and social benefits even in the absence of hazards occurring. There is a need to upscale public investments in resilience and develop innovative financing pathways. The process for allocating public funds towards resilience projects must be independent and data driven, focusing on the most vulnerable communities.

4. Account for climate risks in land use planning

Too many Australians live in dangerous locations that put them at higher risk of being impacted by floods, bushfires, cyclones and actions from the sea. This is because not enough consideration was given to the risks from extreme weather – including worsening risks from climate change – at the time that planning approval was given. Improved policy settings are required across all levels of government to prevent new buildings and infrastructure being constructed in areas that are, or will be, highly exposed to climate change hazards.

5. Improve building standards and compliance

Embedding resilience into building codes is a key tool for reducing the risks associated with worsening extreme weather. The National Construction Code should be amended to ensure that buildings are able to better withstand the risks posed by climate change and worsening extreme weather – whilst simultaneously improving the energy efficiency and thermal comfort of buildings. This should be accompanied by improved compliance and enforcement.

6. Support communities to 'build back better'

Towns, cities and communities must be rebuilt – where appropriate to do so – in a way that takes into account the inevitable future changes in climate and makes them more resilient. In some very high-risk locations, this may mean not rebuilding at all – managed relocations must be discussed as an option for some of the most vulnerable and exposed communities.

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