



NSW Community Plan (2022)

A Plan to Help the NSW Community
Respond to the Climate Crisis





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After having been working for 25 years in industrial research as an Industrial Chemist, Jo decided to retire early and to dedicate his energy to things that are most important to him: sustainability, fighting irreversible climate change and protecting the environment as well as spending as much time as possible with his grandchildren. Among other things, Jo is using his scientific background and his spreadsheet skills to calculate the outcome of investing in renewable energy and in energy saving measures.

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Gary has 15 years' experience as a private consultant and 25 years in local government. In local government, Gary started as a Town Planner and became the first Principal Environmentalist at Gosford City Council. Gary has worked in various management positions from the Manager of Development up to the Director of Environment and Planning.

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1 Background

The aim of this plan is to issue a call for action to the community of New South Wales. We are in the midst of a climate emergency. The scale and magnitude of the threat requires urgent action to cut emissions and prepare for emerging impacts that are getting worse.

Action is needed by governments at local Council, State and Federal level, but the community also needs to act as a whole, and as individuals. Those who feel that they can take action must do so, if we are to meet the challenge in a timely manner.

This plan sets out a pathway for the community for the next 5 to 10 years. A timetable for action is given designed to achieve the aims of the Paris Agreement. That is: to keep the rise in temperature well below 2°C and as close as possible to 1.5°C.

The IPCC Report on *The Physical Science Basis*¹ finds:

“It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.”

“unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach”.

The Earth’s temperature rise depends on the total amount of CO₂ (and other greenhouse gases) that are released over time. This is sometimes referred to as a budget and is a set total in tonnes of all emissions (past and future). This means that each day of delay in reducing emissions pushes up the rate at which we must cut. Every tonne will make a difference.

The climate crisis calls for two types of activity:

- *Emissions reductions* are required to reduce and eventually cease our disruption of the natural climate system (mitigation).
- *Adaptation* is needed to cope with the changes already baked in by past emissions or caused by emissions we must create during the transition to a zero carbon economy.

The targets provided in this plan are consistent with the aims of the Paris Agreement. They provide a means of tracking progress. Actions are then provided with a focus on the individual, while acknowledging wider community efforts and government leadership.

¹ Reference: Intergovernmental Panel on Climate Change, 6th Assessment Report, first part (7 Aug 2021): *The Physical Science Basis* (IPCC AR6 WGI).



2 Why action?

South-Eastern Australia is particularly vulnerable to stronger storms, floods, coastal impacts, heatwaves, drought and bushfire. These events are getting worse because of the warming that has already occurred.

The global 1.2°C rise that has occurred so far is already impacting communities all over the world. Wildfire is particularly noticeable in the news as are extreme heat waves, increasingly intense storms and flooding, melting of ice and damage to species and their habitats. There is direct impact on people from these events.

Without rapid action we are consigning ourselves and our descendants to worse events as the climate system spirals out of control.

2.1 Tipping Points

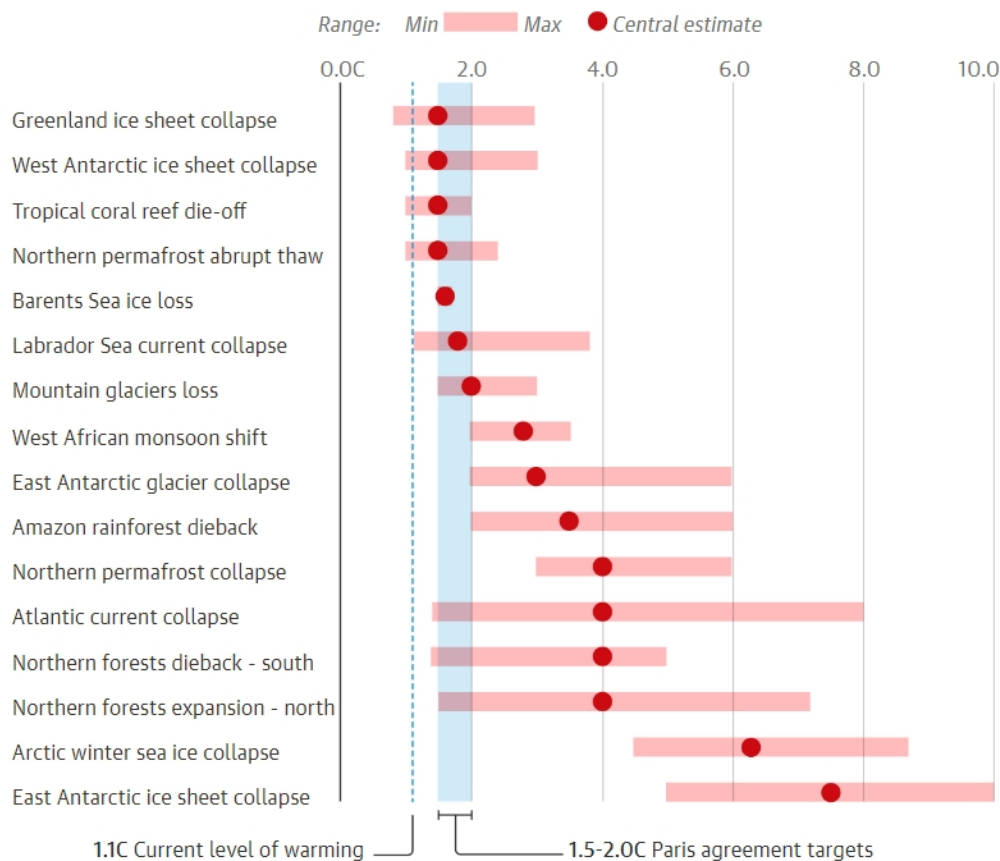
The climate system is at risk of passing tipping points for major influencers of our climate. These include systems that provide us with food and biodiversity and that control physical aspects of human life. A recent review of climate tipping points (CTPs) (Armstrong McKay et al, 2022) finds:

“We show that even the Paris Agreement goal of limiting warming to well below 2°C and preferably 1.5°C is not safe as 1.5°C and above risks crossing multiple tipping points. Crossing these CTPs can generate positive feedbacks that increase the likelihood of crossing other CTPs.”

They identify 15 tipping elements that are already active and 5 that are approaching or may have already passed their tipping points (see Fig 1).

The risk of climate tipping points is rising rapidly as the world heats up

Estimated range of global heating needed to pass tipping point temperature



Guardian graphic. Source: Armstrong McKay et al, Science, 2022. Note: Current global heating temperature rise 1.1°C Paris agreement targets 1.5-2.0°C

Figure 1: Tipping Point trigger temperatures following Armstrong McKay et al, 2022

NOTE: Many of these systems are already actively changing and some scientists believe there is sufficient evidence of passing of tipping points, particularly for loss of coral reefs and collapse of both the Greenland Ice Sheet and the West Antarctic Ice Sheet.

This alone should be enough to require emergency emissions reductions particularly as we may reach 1.5 °C within this decade or soon after. For example, reaching a tipping point for the West Antarctic Ice Sheet would commit us to a sea level rise of up to 7m. If just a 10th of this occurred within this century, the impacts on human habitation and food supply would be dire enough to cause geopolitical chaos. The longer term changes would completely redraw the shape of our continents (the full melting would take several centuries or longer).

Together with the other tipping elements, the climate system is in clear and present danger of sudden change. Such a change would be irreversible and large enough to be considered a chaotic change and cause widespread suffering around the world.

2.2 Local impacts

Australia is particularly vulnerable to hot, dry conditions and to extreme storms, such as cyclones. South-Eastern Australia regularly experiences heat waves, bushfires and droughts. Recent events have reminded us how vulnerable we are to extremes of flood and storm. The Lismore flooding earlier in 2022 was at levels historically identified as well above 1 in 1000 chance in a year of flood.

Impacts on the various regions of the south-east have been described in reports from the Hunter and Central Coast Enabling Regional Adaptation Project (NSW Dept of Planning, Industry and Environment, 2020). However, the approach of tipping points places much of such modelling in doubt due to the unforeseen rapidity at which change may occur.

The lessons of the Black Summer Bushfires and the Lismore Floods are that we cannot predict how serious impacts might be except that they are likely to be worse than expected and potentially, worse than we can envisage.

2.3 Stewardship

We have a duty of stewardship for this planet. Beyond this, we need the environment to remain stable if we are to continue to live where we live, grow food on our farms, fish in our waters and survive the extremes nature throws at us. We have left action so late that survival is what this is now about. Our civilisation and way of life is under threat right across our world.

We also owe our children and their children the right to see the world as we have seen it. Rainforests, coral reefs, the wildlife of the sea and the land must be given a chance to remain viable.

We are all required to take part in the changes needed to cut emissions. We can no longer wait for other nations to act but we must be leaders in the race to zero emissions. Effort is required, but less than many believe. We must have leadership that takes us rapidly to renewable energy and the zero carbon economy. The change must be a just transition and not leave anyone behind. At the same time, individuals must also do what they can to effect change.

Simply avoiding the use of fossil fuels by converting to renewables will remove most of our emissions. There are solutions already implemented across the world that do this, we only need these to be scaled up sufficiently to make the change.

This is the aim of this plan, to lay out a schedule of the best actions we can take to reduce emissions and to prepare for the impacts of the extremes to come. The zero carbon economy awaits us.

Government Targets—Current targets of governments around the world are not sufficient to meet the goals of the Paris Agreement, with an estimate of 2.5 °C to 3 °C or more being the expected outcome. This relies, of course, on all countries sticking to their commitments (which are not compulsory).

Australia's target at the time of publishing is 43% below 2005 levels. This target fails to meet the 1.5 °C limit. The basis for this failure is set out in the accompanying Pathway 2022 document, but it is sufficient to say here that the 43% target will certainly lead to failure to stay within the 1.5 °C limit and is highly likely to take us well above the 2 °C limit.

Given the discussion above regarding the risks of passing tipping points, it is clear that we must impress upon our political leaders that stronger action by our governments is critical to the future of our selves and even more so for our descendants.

Physics does not compromise or wait for time to pass. Warming will continue and extremes become more damaging regardless of any good intentions to deal with the problem later. The situation is such that our society, built through the hard work of past generations, could spiral into chaos and collapse under the pressure of forces too strong for survival.

Leadership must understand that urgent action is required immediately. The target emissions cuts, as of 2022, should be as in this Plan or it will be too late to stop this catastrophe from unfolding.

Further delay will simply mean that future actions will have to be even more immediate and urgent.



3 South-Eastern Australia Plan

3.1 Whole of region emissions reductions

Carbon dioxide is the most important greenhouse gas by quantity and is therefore the one targeted here for the fastest cuts. The burning of coal, oil and gas produces CO₂. For NSW, Victoria, Queensland and South Australia, electricity produces the highest amount by mass followed by transport (petrol/diesel fuels) and gas use.

This report therefore targets the easiest economic sectors for cuts – electricity followed by transport, and then moves on to other areas where cuts can be made to emissions. The focus is on practical solutions.

Electricity Target Profile: That NSW's reliance on fossil fuel electricity be reduced:

- 20% by 2023,
- 50% by 2025, and
- 90% by 2030.

Note: These cuts are below the sector emissions for 2019. See Appendix A for more detail.

For government, the replacement of coal and gas generation with renewables and storage is required.

For the homeowner, the most effective action to reduce emissions is to install solar panels followed by purchasing an electric vehicle (see below).

Estimates of sources of emissions for NSW are available for recent years as Snapshot Climate Reports (by Ironbark Sustainability/ Beyond Zero Emissions, see extract Fig 2). Electricity accounted for 54% of state emissions in 2019. A proportion of these emissions is embedded in the things we buy such as food and drink, clothes, medicines, fridges, washing machines, TVs, computers, phones, etc which is why government action is so necessary. We can, however, tackle our own electricity usage.

New South Wales

2019 state emissions snapshot

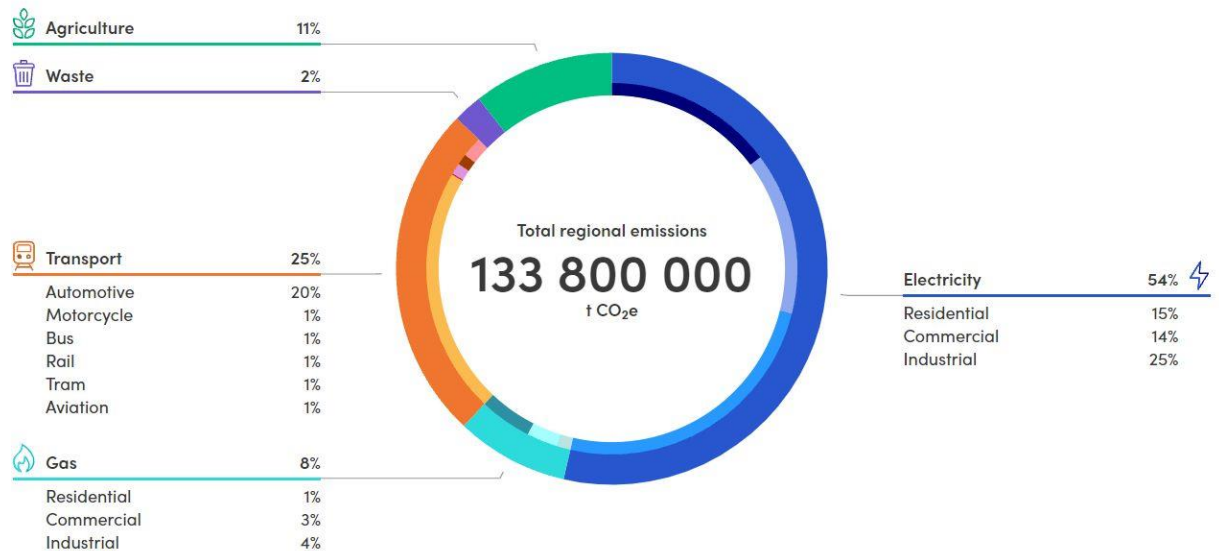


Figure 2: Extract from the Snapshot Climate Report for NSW (Ironbark Sustainability, Beyond Zero Emissions)

Renewable solar and wind energy supported by storage (batteries and pumped hydro) is the path to the largest cuts across all the sectors of our economy (54% of NSW emissions). This technology is readily available and already cheaper than coal or gas, so the above targets are more ambitious than for other sectors. Installation of large-scale energy storage (batteries and pumped hydro) must be part of the solution as it enables more wind and solar to be installed on the grid. Hence the importance of lobbying your politicians (see Section 5).

Transport Target Profile: That NSW's reliance on fossil fuel transport be cut:

- **15% by 2023,**
- **35% by 2025,**
- **80% by 2030.**

For the individual, this calls for investment in an electric vehicle (EV). Government must step in to encourage this transition through incentives and provision of infrastructure. Transport of goods must also be tackled. For the individual, the cost of EVs is falling rapidly, driven by the worldwide changeover that has already been committed to by many countries and manufacturers. New developments in battery technology promise to make batteries far more efficient and much cheaper.

EVs have achieved ranges between 300km and 500km (some even more), suitable for local suburban travel, commuting as well as long distance travel. Charging is carried out at home for most domestic users. Rapid fast charging stations are being installed around Australia for those who are traveling long distances from home (e.g., Alice Springs, Longreach, Nullarbor Plain). Stations at workplaces and commuter car parks would suit many who cannot charge their cars at home. Goods transport is in the wings.

Provided the cuts to electricity emissions are met, those for transport can be at the lower pace of the above targets (due to the electricity sector being the largest proportion of total emissions). Change to our vehicle fleet is also harder to achieve than the switch to renewable electricity. Individuals need the freedom to make their own decision on when to replace their vehicle and with what. Many will not yet be able to afford an EV and will opt for a hybrid engine or smaller vehicle initially or remain with older second-hand vehicles until the prices of full electric vehicles reach lower levels. For this reason, the target profile is less ambitious than that for electricity.

Electric vehicles rely on the electricity supply to charge their batteries. The capacity of the electricity supply would need to be increased by 40% or more in order to provide the additional renewable electricity required for a fully electric vehicle fleet. Note that to replace our energy exports (e.g., coal and gas) with renewable energy, the electricity supply will need to be increased by at least a factor of 7.

In NSW, installation of charging facilities would provide encouragement for the take up of EVs as would concessions on registration and other subsidies. Free charging at public car parks would provide considerable incentive as would reduction of registration fees, or other subsidies.

Gas Target Profile: That the region's use of gas be cut:

- **20% by 2025,**
- **75% by 2030.**

Gas accounts for 8% of the emissions of NSW emissions, mostly for commercial and industrial purposes. Therefore, it is difficult for the community to make significant changes in this sector. Where businesses cannot find economic solutions for this change, we should be calling on Government to take responsibility to work with these users to help them convert to other sources of energy. Renewable electricity would be a suitable replacement as would green hydrogen (from renewable energy).

It is noted that escaped gas (termed fugitive emissions) forms a large part of the impact of fossil gas use on the climate. For example, methane is 100 times stronger than CO₂ as a greenhouse gas in the short term (five years). Therefore, detecting leakage and working with mining and business to eliminate these leaks would be a good first step in preparation for the full elimination of the impact of fossil gas on the climate.

It must be stated that gas is no longer a transition option. This may have been the case 15 years ago, but we have used up too much of our emissions budget to take on new emissions through new use of gas. As with other fossil fuels, no new investment must be made in gas or oil or coal facilities and these resources must be left in the ground.

Green hydrogen (created using renewable energy, not fossil fuels) should be encouraged. It is now expected to be well under way this decade. Expansion of the existing hydrogen market towards production of green hydrogen is projected to be a huge new industry for Australia due to our abundant renewable energy resources of solar and wind and our ability to export this energy as hydrogen and hydrogen derivatives (such as ammonia).



4 Actions

Every tonne of CO₂ saved will make a difference.

This plan focuses on those areas where individuals can take action. The emissions the community has least control over, energy embodied in everyday products and services, must be tackled through political leadership to change the energy mix we use.

The average emissions per person for Australia in 2019 was more than 20 tCO₂e/year. The global average is around 5.8 tCO₂e/y. As a community of individuals, besides lobbying our leaders (see Section 5) the two most obvious ways to cut emissions are to change to renewable electricity and to drive electric vehicles. For those who cannot invest in expensive options there are other measures that individuals can take that reduce emissions in these sectors.

Carried out by enough people in the community, Actions one to 11 below have the ability to make big reductions in emissions. Transport, home and food emissions each contribute approximately 20% of our lifestyle emissions.

Each action is given a star rating with five stars the most effective. 4 or 5 star actions are the first ones to focus on. As you achieve each action, think about moving on to the next one. Some actions are easy to achieve by modifying behaviour, others will cost money.

Besides action by our governments, getting to the zero carbon economy requires us to take all of these actions. A large portion of our individual emissions come from the energy used to produce products and get them to us, that is, the “embodied energy”. Once the zero carbon economy has been established, the climate will no longer be affected by embodied energy (such as “food miles”) because no fossil fuels will be used, no emissions created and the climate impact will have been removed.



Action 1: Reduce use of petrol and diesel vehicles



Plan to buy an electric vehicle (EV) some time in the next few years. By the end of the decade, we should all have got rid of our petrol/diesel vehicles and be charging using renewable electricity. EVs are getting cheaper all the time. If you can afford one now, there are some already available.

In the meantime, using public transport, walking, cycling and generally using the car less frequently can help reduce emissions. Buying a smaller hybrid car will also save you money as well as reduce emissions.

If you find using a bicycle is difficult, e-bikes are now available. These provide energy to the wheels from a battery when you need to accelerate or go up hills. Of course, charging such machines using renewable energy would be preferred.

Avoiding air travel saves significant emissions. For example, an economy return flight for one from Sydney to London and back results in six tonnes of CO₂, more than a whole years emissions for the average citizen of Earth (global 2017 average was 4.8t/y per person).



Action 2: Install rooftop solar or purchase fully renewable energy



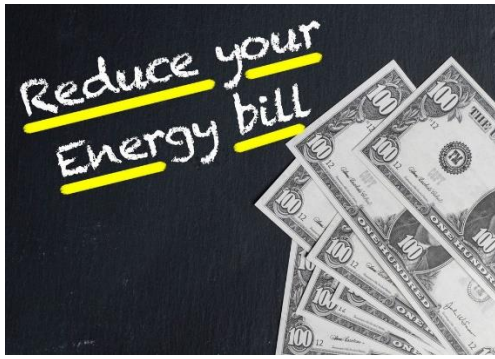
Electricity use is by far the biggest producer of emissions for NSW (54% of NSW in 2019) while Australia has the highest potential for solar energy anywhere in the world. Installing rooftop solar is the fastest way to reduce your emissions. It is simple and will save you thousands once the initial costs are re-paid through savings on your bills.

The total amount of renewable energy from home solar systems across Australia is more than enough to replace a large coal fired power station and yet three quarters of Australian households have no panels.

The simplest system just includes panels and an inverter (no batteries). Even a partially shaded roof (30%-40%) can still capture enough solar energy to be an economical investment. Time your usage to occur when the sun is shining to maximise the solar energy you use and save the most money. Investment in rooftop solar is generally paid off within three to four years in the Sydney area. Renewable electricity reduces your emissions by up to 1.5 tCO₂e per person per year and directly displaces the burning of coal.

For finance, a redraw from your home loan can be very cheap while low-cost loans may be available from your bank. Some companies are considering new proposals where they install the solar panels at no cost on thousands of roofs and harvest the energy like a “virtual power station”. As a last resort, some installers offer finance.

If you already have a system, get your installer to advise you on whether it could be upgraded or expanded.



Action 3: Reduce energy use in the home and workplace



This can be achieved by a raft of measures carried out around the home including insulating the building, using draft blockers, using more efficient heaters/coolers and heavy curtains.

One measure known to be effective is to install a monitor on your electricity supply that shows you how much electricity is being used. People are much less likely to switch appliances on when they can see what the effect is on their energy bill.

Another great measure is to install LED lighting. This lasts up to 10 times as long and uses a 10th of the electricity. Programs are available to replace the lights in your house for free. Otherwise, LEDs can pay for themselves in two years and after that you are saving money on your bill.

Replacing gas use with electricity is also an option. Although this may not save energy, it saves emissions when renewable electricity is used and is a step in the right direction in any case.

Modern induction cooktops are as fast with as fine control as a gas cooktop. For heating, you can change to electric heating or even better to heat pump type heaters (reverse cycle air conditioning). Many of these now avoid using the dangerous HCFCs by replacing them with CO₂.



Action 4: Food source, type and waste

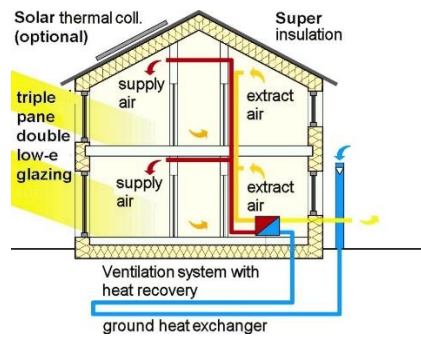


We know that vegetables are good for us. Shifting to low-carbon diets has strong emissions reduction potential. Every tonne of carbon emissions we save will make a difference.

Buy locally produced food. Fruits and vegetables use the least energy and water to produce. Meat production, particularly beef and lamb, creates the most greenhouse gas, generally due to methane produced by the animals.

Based on food being responsible for 20% of our lifestyle emissions, reducing food waste, eating more low carbon footprint foods such as fresh fruit and vegetables (not processed foods) and reducing meats (beef results in the most emissions) can make significant emissions reductions. You will be saving the climate as well as saving money and staying healthy.

We waste a lot of food in Australia. This creates a lot of avoidable emissions because of the energy “embodied” in the food. This comes from the use of machinery on the farm, irrigation, transport and the processing and packaging of the food for sale. Reducing your food waste is easy to do with a bit of care and every little bit helps.



Action 5: Home design and retrofit Action 6: Trees and forests



Careful design of the home can save a lot of energy in heating, cooling and lighting and make the home a more comfortable and convenient place to be.

Shading of windows is critical. For example, the western windows and walls are subject to the scorching summer sun at the hottest part of the day. Protection of windows and walls with shades or plants can greatly reduce the heat in the home, especially when combined with insulation and heavy curtains with pelmets.

Northward facing windows with wide eaves or deciduous plants, can let the sun into the home during winter days, reducing the heating required and providing a well-lit and comfortable space year-round.

Find which windows capture breezes to cool the home (often one at each end of the house will draw the air through). On the hottest days, shut up the house early in the day to keep out the heat.

Roof space ventilators are critical to vent hot air from the roof. Light tubes bring light into a dark room or hallway and remove the need for electric lights during the day.

If you are considering building a house, there are lots of publications that show you how to design more sustainable housing. Facing living space to the north; widths of eaves; window design, location and shading; awnings; verandas; capture of cool afternoon breezes; water tanks; protection from bushfire – all these and more can help reduce energy use and climate impacts. Applying as many as possible of the BASIX options at the design stage is a good starting point. For example, water tanks can save a lot of energy and help extend our precious water supply.

Forests around the world act as natural sinks. Rainforests, wetlands, mangroves and other forest types absorb a large proportion of the additional CO₂ that we put into the air from burning fossil fuels.

This service provided by the natural environment is degrading as the planet warms. As we clear or damage our remaining forests, their ability to absorb CO₂ reduces. This is one of the climate feedbacks that so concern our scientists.

So, protecting our existing trees is an important part of the struggle to stabilize our climate. Trees also help our struggling wildlife to survive. Increasing the number of trees traps additional carbon in the soils and the in trees themselves, which helps to draw down the CO₂ already in the atmosphere and stave off warming.

If you want to plant trees, look for locations where trees are protected from being cut down. Choose trees that will not drop branches or damage your house and are native to your area. Providing appropriate understorey plants can be important for the health of the trees and provides habitat for birds, insects and other wildlife.

Community projects to plant trees on a larger scale for example at a location designed as a wetland, would increase the drawdown of CO₂. Locating such projects in urban areas would provide shading to help keep our suburbs cooler during hot weather.

All levels of government need to protect our remaining trees (forests and wetlands) to keep the natural environmental services they provide.



Action 7: Recycling



Plastics, metals, paper, e-waste, white goods, vehicles, and more, all contain “embodied” energy. This is the energy that has gone into manufacturing the product and bringing it to you. For example, the aluminium smelter in Newcastle is the largest user of electricity in the State. So any aluminium products contain a lot of electrical embodied energy. Plastic products are made using energy intensive chemical processes from refined chemicals and raw materials, so contain a lot of embodied energy.

Every recycled product helps, but reusing and repurposing before recycling is even better.

Electronic waste (e-waste) includes a wide range of materials from plastics, aluminium, copper, silver and small amounts of rare metals: gold, neodymium, indium, terbium, europium, etc. These materials are valuable, rare and have high levels of embodied energy. E-waste also contains a lot of toxic materials such as lead, mercury and cadmium which should not be disposed of in landfill. Batteries are a great example that should be kept out of our tips and recycled for their materials.

Of particular concern for the climate is the recycling of fridges, freezers and air conditioning units. These must be dealt with properly as they contain the extremely dangerous refrigerant greenhouse gases (such as HCFCs). It is the law that the industry must capture these gases for reuse or destruction. They are extremely dangerous in our atmosphere as they can last for thousands of years, continuously trapping extra heat in the climate system.



Action 8: Banking and Super



Money in your super fund and your bank is invested for you in the stock market and in loans to big business. You have the power to change your fund or your bank to one where your money will be invested more wisely.

After all, money invested in a coal company that has no future is at risk of being lost when the coal market collapses. Would it not be better to avoid this risk and invest in renewable energy?

Try to select a super fund that is not invested in fossil fuel companies or projects and ask your bank to stop lending to coal, oil and gas related projects or move to another bank.

Another way to influence the finance system is to lobby your insurance company. Large fossil fuel projects need insurance for their finance. This insurance may be offered by the company you insure your home with. You can exert influence to prevent such fossil fuel projects from being granted insurance, effectively blocking them from going ahead.



Action 9: Consume less



We are increasingly buying more stuff. Many things are used only once. Packaging is a typical side-effect of consuming things. Ask yourself, how can I re-use the things I already have? Is this product going to be used a lot? Do I really need this many clothes? Check your fridge more often for food that is close to its use-by date.

Until we can be sure the products are fossil fuel free, we should be wary of purchasing them. Try to restrict yourself to those things you really need and can get lots of use out of.



Action 10: Buying offsets



As a final option or to cover emissions that you cannot cover in any other way, offsets provide an alternative. You offset your emissions by paying a company that puts your money towards emissions reduction projects such as planting trees, storing carbon in the soil, building small biogas in Africa, micro solar in India or wind energy in the Caribbean.

These projects prevent or re-capture some of the emissions going into our atmosphere, but they can be vulnerable to project failure where the stored carbon is later released again. Failure can occur if the land is re-purposed such as for farmland, cleared for housing, becomes dry or is burned.



Action 11: Greenhouse footprint



You can assess your carbon footprint using a web-based footprint calculator.

This is a good way of working out where you can reduce your emissions most for your particular situation. By varying the inputs into the calculator you can see where best to reduce your emissions.

There are lots of websites.

The ABC's Carbon Counter is a great resource that provides lots of ideas and even calculates the kgs of carbon saved by each action, <https://fightforplaneta.abc.net.au/carboncounter/>.



5 Change the politics!

Action 12: Lobby to reduce emissions

Action 13: Lobby to increase resilience

Tasking our political leaders may be the most effective way the community has of enacting change. We cannot protect ourselves from climate impacts without Government action. This must include:

- Immediate and rapid cuts to emissions based on scientific targets (see Appendix A).
- Increasing community resilience through programs to prepare for and adapt to the worsening impacts of the climate crisis.

If enough people call for cuts to emissions or adaptation planning, politicians will no longer be able to ignore the problem. Call your politicians; write letters; tell them there are votes in acting on the climate crisis. All levels of Government need to be included and change needs to be immediate, real and not half-hearted, and must be based on scientific targets. Hence the need for this plan with its target profile.

Government holds many of the key levers for action on the climate crisis. For example, State and Federal government sets how our electricity is produced. They also mandate the risks that must be considered when making decisions throughout the community. For example, Government subsidies for fossil fuel industries in Australia add up to many billions of dollars per year.

The need for government action is urgent and absolutely necessary. The cuts set out in this Plan cannot be achieved if government approves new fossil fuel assets or gives funding or tax breaks to existing ones.



Action 14: Organising

If what you know influences you to take more action to fight the climate crisis, there are many organisations you can join to become active.

Some are focussed on public actions and civil disobedience, some on direct lobbying of government and leaders and some are designed to raise awareness or harness a political sector of the community. Choose one that suits you or where you think you can have the most influence. Or simply support them all.

Every tonne of emissions saved will make a difference. Every voice raised to call for more action will make a difference.



Action 15: Voting

How you vote is your own decision. However, this crisis demands action now because it is a direct threat to our survival and is already hurting people.

If we are to have any chance of a happy future, those who resist the transition to the low carbon economy must be avoided, those who are already acting must take much stronger action and those who are uncertain must move immediately towards urgent change.

The situation demands action now, starting before Christmas this year. Later this decade will be too late, as the IPCC AR6 WGI report found:

“unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach”.

Action should not be delayed while we wait for a further election but must be taken by the government we now have. We are in this situation because of poor decisions from our leaders since Treasurer Keating in the early 1990’s decided against a carbon emissions target.

The best way to pressure politicians is by telling them that emissions reduction is a critical issue that you and others you know will vote on.

Currently, our governments are not and do not intend to undertake immediate, rapid and large-scale reductions. A weak target is a failure to act. Such leadership is letting us down.

We all live on the same planet and there is no other.



6 Preparation for Impacts

The previous Sections provided actions that reduce emissions. This Section provides actions that help us prepare for the extremes that we already see and which are likely to get worse.

We need to adapt because significant damage has already been done to the climate system that is driving worse events and more frequent extremes than we have seen in the past. Section 7 gives additional advice regarding extremes that are expected.

Climate impacts will continue to get even more extreme for some time because of the lag in the climate system. For example, if strong action was to be taken now to cut global emissions rapidly to half by 2030, we would not see a slow-down in the warming effect for around another 30 years. Unfortunately, if sufficient action is *not* taken, warming into the future will continue to accelerate towards disaster.

Therefore, an important part of the response by the community to the climate crisis is to be prepared for environmental disasters. Heat waves, droughts, bushfire, storms and flooding will be worse than we have seen before. These types of events are listed below with advice on preparing for each (see Section 7). Of course, there are guides and information from various government authorities on preparing for extreme events. This community plan provides a climate change context for reading such official information and goes further to describe the background of the impacts of global warming and what we need to do.



Action 16: Place based planning

Increasing the resilience of the community to extreme events is fundamental to adapting to the climate crisis. Climate related disasters will continue to accelerate and we need to be ready.

Some hazards will affect all areas, such as heatwaves while hazards such as coastal erosion and inundation will be limited to coastal or estuarine locations. Different locations require different solutions (e.g., flood prone areas vs coastal beaches).

Many Councils are working on local plans for zones within their region. Community input is critical as experience of the past helps to inform what needs to be done.

For example, greening of the community would provide cooler places during heat waves and assist in drawdown of atmospheric CO₂.

Contact your local Council to see what is being planned. If they do not have such programs, propose that they start one.



Action 17: Emergency plans

It is important to be prepared and know what to do in an emergency. If there are emergency shelters or a particular pathway to safety, you need to know where to go. Find out what types of extreme event could impact on your area (some guidance on extreme events is given in Section 7) and familiarize yourself with the emergency plans for your location.

Stay in touch with emergency warnings by listening to the radio (ABC local radio). Vulnerable people should have phone numbers handy or have an evacuation plan so that they know what to do, who to call or how to get help. Having a bag packed ready with emergency items would help if evacuation is necessary.

Don't hesitate to evacuate if instructed. Your life is more valuable than your home.

Check your insurance is what you need. All policies are different and companies often have their own definitions for the various types of flooding or other hazards.

Your insurance may even exclude some hazards so that you are not covered when you are in a vulnerable situation.



Action 18: Prepare for extreme events

Being prepared is essential when extreme events threaten. Relevant events include heatwaves, fire, intense rainfall, hail, flooding, storm and coastal erosion. More information is available from authorities.

Having protective clothing and equipment handy is the first requirement for bushfire. Look at protecting your windows and doors.

Check the yard for items that might be a hazard during fire weather (such as flammable material) or when heavy rain threatens (blocked drainage). Clean leaves and debris out of gutters. Keep grass short and trim back hedges and dangerous tree branches. Replace any highly flammable plants with those that are resistant to bushfire. If fire threatens, make sure your hoses are in good condition, will reach all around the property and there is plenty of water available and taps where you need them.

Make sure that if you need to evacuate you have a clear path to safety. Leave early if you can as emergencies can suddenly become critical.



Action 19: Rainwater tanks

Having an extra supply of water can be useful for garden watering but can also double as an emergency supply where fire threatens or during drought.

Rainwater tanks are easy to install and hook up to the guttering. This helps reduce the pressure on our drinking water supply but also provides an emergency supply if the local urban water pressure drops too low, for example, during a bushfire.

For those in areas where bush is near, it may be useful to have a small pump with a hose attached.

Check with your local Council for advice on tank installation, they may have guides you could refer to.



Action 20: Check on vulnerable neighbours

We need to look after our most vulnerable people. Communication is the key to preparation. Talk to your neighbours to find out if they may need help during an emergency. Make a list of contact details. Check on any vulnerable people who may need your assistance. Set up a method where they can contact you in an emergency.

If you get the call to evacuate, make sure to check your neighbours have been informed and have plans in place before you leave.



7 Increasing Risk of Extreme Events

Extra Heat in the Climate System

As additional heat is trapped in our atmosphere from the action of greenhouse gases, the atmosphere warms up. About 93% of this additional energy is stored in our oceans with the result that we have warmer oceans and warmer air.

Much of our weather is driven by the energy in our atmosphere and oceans, by the differences in temperature of oceans and continents and by the rotation of the earth that sets the atmosphere in motion.

So the additional trapped energy results in stronger weather. For example, the amount of moisture that can be contained by the air increases by 7% for each 1°C of increase in temperature. Therefore, when we have rain in a warmer world, there is more moisture in the atmosphere and the rainfall is more intense. This additional energy also drives more intense storms and cyclones. For example, when a cyclone forms over a warmer than usual ocean, it can speed up more rapidly, reach faster wind speeds and stay strong for longer.

Similarly, hot dry weather in a warmer world sucks up more moisture from the land and from plants, leading to more rapid drying out. This means droughts become dryer more quickly and the degree of dryness can be intensified. This threatens our water supply and changes how rapidly bushfire conditions can become dangerous.

A list of hazards with likely changes are given below. This section is for background only and is only intended to guide the reader in understanding the impacts of climate change and how they may be affected.

Heatwaves

Extended hot weather and longer extreme heat waves are expected to worsen in all locations. As the climate heats up, extreme heat waves will increase in frequency and get hotter. We need to be prepared for more heat than we have seen before.

Stay on the lookout for heat stress. Look up the signs and watch others around you to ensure they stay cool. Keeping hydrated is important. Ensure you have a plentiful supply of water. Older or infirm people in particular should be monitored as they may not be aware that they are getting overheated or not drinking enough.

Look for the coolest locations around your house. Find out if there are emergency cool shelters in your area. If not, consult with your Council to have one established.

Bushfire

Australia is extremely vulnerable to bushfire. The increased scale and ferocity of bushfire seen during the recent Black Summer bushfires was a grim warning of worse to come as temperatures increase further. The intensity of the fires meant that areas that had been previously burned off, even just 6 months before, burned again when the fire approached.

Fire weather is what drives these bushfires. The increased heat of the hotter climate dries out fuel faster and makes it burn more rapidly when the fire hits.

Be aware of fire danger levels and monitor the local radio for the latest warnings. If fire may threaten, you must evacuate early. Leaving too late means you could get caught on the road as fire can move very rapidly.

Prepare your property by removing flammable materials around the house, keeping the grass low and having water, buckets and hoses available if you need to take action.

Prepare a fire plan. There are guides available to do this. Usually included is having the correct clothing available for protection from the heat, working out where to go and when to leave, checking your transport and preparing a small evacuation bag with essential items, extra clothes, etc. You may consider taking your precious items such as photo albums and important papers, to a safe location in the days before the fire hazard peaks.

Gardens can be prepared by replacing highly flammable plants with fire resistant ones.

As with all of these emergency events, check on any vulnerable neighbours well before the fire threatens in case they need help to prepare or evacuate.

Drought

Drought is a longer-term hazard which unfolds over time. Due to the increased heat in the climate system, drought conditions can deepen more quickly than before. For example, dam water levels dropped more quickly during the recent drought up to 2020 than they did during the millennium drought. What rain does fall it can be quickly soaked up by the parched landscape so that water flow in creeks and rivers remains low.

Be aware of your water usage during drought periods. Even though water tanks are likely to be dry more often during a drought, they can still catch enough of the rainfall to be useful in preserving the urban water supply.

Desertification

As drought impacts deepen and climate zones move towards the poles, the type of farming applicable to the land will change. Some areas of inland NSW will become arid enough to be classed as desert.

Some land could become uninhabitable as summer temperatures repeatedly rise into the 50's. The animals and plants that can survive in such conditions will change also.

Fire will also be a tool of the climate, destroying what biodiversity was previously present and replacing it with more sparse vegetation types. Invasion of new plant pests and disease would accelerate the process, driving stressed ecologies to collapse.

Flooding

The increasing temperatures in our climate system mean that rainfall intensity is increasing. This means that when it does rain the amount of rain that falls is increased over what has occurred in the past. This leads to more flooding. The behaviour of weather systems also appears to be changing with some systems lingering for longer periods before moving on. The result is that rain can continue to fall for many days in the one area when the storm stops moving. This leads to increased risk of flooding at that location. We have seen the impacts recently in northern NSW.

Flooding can occur quite suddenly and be much more severe than previously expected. Be prepared by checking local Council mapping to see if you are in a flood zone. If you are or are near to one, prepare a flood plan.

Make sure you know how to safely get to higher ground if it becomes necessary to evacuate. Check if there are evacuation centres nearby and how to get there. Be prepared for evacuation or to help others who may be in danger. Flood water can cut roads and make travel impossible for extended periods so if your house is safe you may still need to obtain additional supplies before the flood arrives in case you are cut off.

Never cross through flood waters. There can be dangers hidden under the water that may trap you or your vehicle. A car can float in as little as 20 cm of water (depending on the vehicle and the speed of the water).

If flood waters can enter your property, you may need to move goods and furniture to higher ground well before the flood arrives. Be aware of the danger of water penetrating into the electrical wiring of your house leading to the risk of electrocution.

Heavy rain

For areas where there is low risk of flooding from a nearby body of water, there can still be localised flash flooding. Street drainage is not designed to drain away as much water as can come during very heavy rainfall. Although flash flooding is likely to be short-lived, life threatening situations are still possible and water can sometimes enter into properties or carry away vehicles. Street drains can become blocked with debris that can result in increased water levels. Water can also be moving very fast, making the hazard worse.

Make sure you know how to safely get to higher ground if it becomes necessary to evacuate. Check if your Council has any information on likely flash flooding at your property and make plans accordingly. Be prepared for evacuation or to help others who may be in danger.

Hail appears to be an emerging problem with some very extreme falls reported recently. Be wary of larger hail as heavy hailstones can injure people and pets.

Coastal erosion/ inundation

Coastal property will be most vulnerable when ocean storms occur (see under East Coast Lows below). Occurrence of extreme high tides together with storm conditions will increase the risk of erosion of ocean beaches and foreshore areas around estuaries and coastal lakes.

For locations where wave action is of less issue such as smaller enclosed coastal estuaries and lagoons, inundation may be the more likely hazard. Be aware of the water levels and ensure there is a clear pathway to safety. Check the area around your property to see if water is likely to block your exit to safety. Find out if there is an evacuation centre near you and how to get there if you need to leave suddenly. Be aware of the electrical hazard if water enters your home.

Check if there is an extreme tide predicted for the period of the likely flooding or storm action as this can significantly increase the level of the flood.

East Coast Low Pressure Systems

East Coast Low Pressure Systems (ECLs) impact on the NSW coast from the ocean. They can lead to high winds and heavy rain. They are not expected at this stage to become more frequent but they are likely to become more intense with stronger winds and heavier rain. This is one area where science cannot yet predict exactly what will occur. It is possible that we may get more of these systems or that they may hang around for longer resulting in higher total rainfall, etc. but the trends are not yet showing in the measured data.

However often they occur, the most likely impacts of ECLs include coastal erosion, heavy rain, flooding, localised flash floods, wind damage and the accompanying falling of trees with blocking of roads, damage to buildings and loss of electricity supply.

For most, making sure your roof is in good order and there is no loose debris in the yard will be enough. Those on low-lying land and on the foreshore areas (lakes, lagoons and estuaries) should check local Council mapping for flood areas and plan evacuation if their property is threatened.

Coastal property is likely to be subject to erosion due to increased storm tide levels and wave action. If the storm coincides with an extreme tide such as a spring tide or king tide, the damage will be multiplied. People in these locations will need to monitor any erosion and be ready to evacuate if their house is undermined. Check if your house is on deep piles or shallow footings. If on shallow footings, the house may be undermined and in danger of collapsing. If there is danger of undermining you should evacuate well before this occurs.

Changing impacts on the built environment

As our climate warms, natural events are intensifying. Our built infrastructure has been well designed for historic levels of environmental effects, but the warming climate will bring changes in wind, rain, flood, heat, fire and drought that are difficult to quantify exactly, other than to say they will be worse. How much worse will depend directly on how fast we reduce our emissions.

We will need to both plan and build differently in the future, designing for these changes. We will also have to deal with increasingly vulnerable older buildings, roads and infrastructure.

In the past we have built our cities in locations that have been essentially stable for thousands of years. Now we are in a situation where our cities will be located in the path of floods, fires and droughts never seen before. Sea level rise in particular will impact on coastal cities very significantly towards the end of this century and perhaps earlier. Places we regard as permanent will be lost, with as many as a billion people displaced over time.

We need to change where we locate new development or accept that such locations have a limited life expectancy. The concept of the permanency of land property will need to be re-considered. Why invest the community's capital in new developments on land that we know will be at risk in less than 100 years. We need community debate of this problem to develop new ways of handling the value of property with limited life expectancy.

Appendix A – Emissions Reduction Target Profiles

The targets set in this plan are based on scientific reports from recognized authorities both around the world and in Australia as well as estimations of New South Wales emissions during 2019 and the availability of practical solutions. A detailed background on the derivation of the target profile is given in *Pathway 2022* together with a list of the documents reviewed. The profile for the whole of the State is for cuts below the 2019 levels as follows:-

- By 2025:- 30%
- By 2030:- 65%
- By 2035:- 90%
- By 2040:- 100%
- Beyond 2040:- Negative Emissions are required

Note: These cuts are below the total of all sector emissions for 2019. The best data available can be found in the Snapshot Climate Reports (e.g., <https://snapshotclimate.com.au/region/australia/new-south-wales/>) an extract of which is provided in Fig 1 from the report. 2019 has been selected due to the drop in emissions in 2020 that does not reflect the rebound that has since occurred. Refer to the *Pathway 2022* for more detail.

This profile would provide a reasonable chance of achieving the aims of the Paris Agreement (better than a 2 out of 3 chance). The dates given here are indicative but note that any delay will accelerate climate impacts with serious resulting consequences for all sectors of the community (heatwave, bushfire, flood, storm, etc.). Faster cuts would be preferable as this would greatly reduce the negative emissions burden on future generations.

The targets selected for the electricity, transport and gas sectors are modified from the region's economy wide profile by taking into account the level of difficulty for the community in achieving change in each sector and the relative amount of emissions (see Fig 1).

The sector responsible for the largest portion of current emissions is the electricity sector which is estimated to produce more than half of the total CO₂e emissions. Hence the focus on moving to renewable electricity this decade. The second largest sector is transport which requires the transition to electric vehicles charged using renewable energy. The Community can make the biggest impact on emissions by tackling these two sectors as they represent the majority of the direct emissions from the burning of fossil fuels.

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