

Media Briefing

IPCC Working Group 1 Report

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Media release	Attached separately

Key takeaways from the IPCC report on Physical Science Basis (AR6 WG1)

Climate change is here and it's rapidly getting worse. Unprecedented heatwaves and bushfires, heavy rains and floods, repeated marine heatwaves which are likely to cause mass coral bleaching of the Great Barrier Reef, intense droughts and collapsing ecosystems provide painful reminders of just how much damage fossil fuels have done to our climate and planet.

In the Paris Agreement, governments including Australia agreed to pursue a warming limit of 1.5°C, and to act accordingly, with national targets and plans that are to be strengthened every five years. In 2018, the world's leading scientists provided governments with further clarity on the target, with an [IPCC Special Report](#), and established the global benchmarks for sufficient action: by 2030 global CO₂ emissions would need to be halved and by mid-century, at the latest, brought to net zero, with substantial reductions in other gases in all sectors. For an industrialised country like Australia, this means phasing out coal and decarbonising the electricity sector by 2030, and reaching net zero emissions across the economy by 2035.

Now scientists zoom back to the very big picture on climate change. This report provides an update on what's happening to our warming planet and why. It is the first of three parts that form the IPCC's regular assessment reports and covers the advances in physical climate science since the previous assessment report, AR5 WG1, published 8 years ago. The remaining two parts, on human impacts and ways to limit warming, will be released next year.

The report reinforces what we already knew, with further detail, depth and certainty. Understanding of the climate system's fundamental elements is already robust and well established. The five IPCC assessment cycles since 1990 have comprehensively and consistently laid out the rapidly accumulating evidence of a changing climate system. Overall, observed warming is broadly consistent with projections in the past decades, since systematic scientific assessments began¹.

¹ IPCC AR6, WG1, Chapter 1, Executive Summary, page 5

Below we summarise some of our key takeaways from the latest IPCC report, drawing from its Summary For Policymakers and the underlining chapters. For the exact IPCC wordings and context, see the references in brackets.²

Where we are today, and why

It is unequivocal that human influence has warmed the atmosphere, ocean and land.

Widespread and rapid changes in the atmosphere, ocean, cryosphere (frozen parts of the globe) and biosphere have occurred. (SPM A1)

Multiple lines of evidence indicate the unprecedented nature of recent large-scale climatic changes in the context of all human history.

In 2011-20 global surface temperature was about 1.09°C above pre-industrial levels, and temperatures are now comparable to levels last experienced about 125,000 years ago during the Last Interglacial, when the Greenland ice sheet was smaller and sea-level likely 5-10 meters higher than today. The concentration of atmospheric CO₂ (410 ppm) has not been this high in at least 2 million years. (Ch 1, page 5; SPM A.1.2; SPM A.2.2; TS, p.43, 44; SPM A.2.1)

Since the previous Assessment Report (WG1/AR5) global surface temperatures have warmed strongly, with the past five years (2016-2020) being the hottest in the record since at least 1850. (TS, Cross-Section Box TS.1. WG1/AR5 was released in 2013.)

The rates of sea-level rise and ice loss have accelerated. The rate of sea-level rise has nearly tripled compared to that in 1901-1971, while the average mass-loss rate for the Greenland ice-sheet was about six times faster over the period 2010–2019 compared to the period 1992-1999. The Antarctic Ice Sheet was losing mass on average three times faster in 2010-2019 compared to 1992-1999. (SPM A.1.7; Ch 9, page 7.)

We're witnessing more and worse weather extremes, and we have stronger evidence of their attribution to human influence. Evidence of observed changes and their attribution to human-induced emissions has strengthened for several types of extremes since the previous Assessment Report (AR5), in particular for extreme precipitation, droughts, tropical cyclones and compound extremes (including dry/hot events and fire weather). (SPM, section A.3; Ch11, page 6)

Where we are heading from here

The more greenhouse gases we add to the atmosphere, the worse it will get, with every additional increment of warming, as many changes in the climate system become larger in direct relation to increasing warming. More warming brings more frequent and more intense hot extremes, marine heatwaves, droughts in some regions, heavy rains, flooding events, intense tropical cyclones, and worsening climate impact-drivers such as melting ice and snow, rising sea-levels, changing ocean circulation as well as acidifying, warming and deoxygenation of oceans. (Figure SPM.10; SPM B2; Figure SPM.5; Figure SPM.6; Figure SPM.8; B.5.1; section C2)

² SPM = Summary for Policymakers; TS = Technical Summary; Ch = Chapter

There will be an increasing occurrence of some extreme events unprecedented in the observational record, even at 1.5°C of global warming, but more so with higher levels. For example, hot extremes will increase in frequency and intensity even if warming is stabilized at 1.5°C. But with 2°C warming the changes in the intensity would be at least double, and with 3°C quadruple, compared to changes at 1.5°C. (SPM, B.2.2; Ch 11, p 7) Australia's current Nationally Determined Contribution (our emissions reduction target) under the Paris Agreement, if extrapolated to all global emitters, would lock in up to three degrees of warming.

Some very long-term changes are already locked in, regardless of what we do, including an increase in ocean heat content, sea level rise and deep ocean acidification, which will have profound impacts on the Great Barrier Reef, as well as Pacific peoples and their communities, culture and way of life. The projected scale and speed of these changes varies substantially depending on emissions we release from here on. (SPM section B5; SPM Figure SPM.8)

Melting ice-sheets could leave a legacy of very high sea-level increases. Deep uncertainty remains regarding ice-sheet-related processes and resulting sea-level rise. As a new feature since AR5, the IPCC now extends sea-level rise estimations to 2300, assuming different emission pathways. The likely ranges in 2300 span from less than 0.5 meters to about 7 meters, acknowledging that, assuming a very high emission future, even sea level rise greater than 15m cannot be ruled out, due to ice sheet processes. (Figure SPM.8)

What it takes to limit further impacts and extremes

Warming will continue until carbon emissions reach net zero. Limiting human-induced warming to any specific level requires reaching at least net zero CO₂ emissions and strong reductions in other warming gases. The effects of emission cuts would emerge earlier as slower growth of greenhouse gas concentrations, slower warming rates and improved air quality. (Figure SPM.10, SPM sections D1 and D2; TS, page 28)

Compared to higher levels of warming, meeting the Paris Agreement long-term goal of 1.5°C would lessen sea-level rise, ameliorate weather extremes and deteriorating living conditions in both land and ocean. It would reduce the risks of crossing key tipping points, facing abrupt changes and crippling with compound events. The differences between the current 1.1°C of warming, 1.5°C and 2°C are significant, and specified already in more detail by the IPCC Special Report on 1.5°C in 2018. (SPM Section C.2 Figure SPM.5; Figure SPM.6; Figure SPM.8; B.5.1; SPM C.3.2 and C.3.3)

1.5°C warming limit is still within reach, from a physical perspective, but only with rapid emission cuts that bring carbon emissions to net zero and beyond. The report reaffirms the scenario findings of the IPCC Special Report on 1.5°C. The anticipated time of reaching 1.5°C, and the remaining carbon budget, after methodological improvements, is of the same magnitude as in the IPCC Special Report on 1.5°C. The global emission reduction benchmarks established by that report, of halving global carbon emissions by 2030 and bringing them to zero by 2050 are still valid. (SPM B.1.3; D.1.3, footnote 27)

Failing to cut global emissions from current levels would eat up the remaining carbon budget for 1.5 °C by 2030. To limit global warming to 1.5°C above pre-industrial levels with

either a one-in-two (50%) or two-in-three (67%) chance, the remaining carbon budgets amount to 500 and 400 billion tonnes of CO₂ respectively, from the beginning of 2020. Currently, human activities are emitting around 40 billion tonnes of CO₂ into the atmosphere in a single year. (SPM Table SPM.2)

Strong, rapid and sustained reductions in methane emissions are also needed, and would come with the co-benefit of improved air quality, by reducing global surface ozone. However, methane emissions have grown faster since the AR5. (SPM D1; Ch 6, p 7)

Carbon removal methods could remove residual CO₂ from the atmosphere, but come with many side-effects and are no silver bullet. Human created CO₂ removal methods have the potential to remove some CO₂ from the atmosphere but they come with side effects for biodiversity, water availability and food production. For example, large scale tree planting projects intended for carbon capture can result in loss of biodiversity due to monocultures of trees being planted, and they can impact food availability for local communities. Further, the amount of CO₂ being emitted outweighs the amount that can be sequestered through land and ocean-based methods. Without action to significantly reduce human-caused CO₂ emissions, carbon capture methods will be of little assistance. (SPM, D.1.4-D.1.6. A comprehensive assessment of the ecological and socio-economic dimensions of CDR options is left to the WGII and WGIII reports that will be published next year.)

Greenpeace conclusions for action

The IPCC does not have the mandate to make policy recommendations. Nor does the report discuss ways to mitigate climate risks, as that will be covered in their reports next year. Below we present Greenpeace conclusions for action.

The science is clear, the situation is serious, and we absolutely must act now, starting with the fossil fuel industry. The fossil fuel industry is primarily responsible for the climate crisis, and has been lobbying and blocking action to reduce emissions for decades, [wielding far too much influence](#) on Australian politics. This influence must end, and the Morrison Government must develop a plan to transition Australia to 100% renewable energy by 2030.

The Morrison government must follow, and exceed, the lead of countries like the US and UK by aligning Australia's emissions reduction. Nothing less than an immediate phase out of fossil fuels for electricity and a 75% reduction of emissions economy-wide by 2030, net zero emissions across the economy by 2035 is acceptable from the Morrison Government any more.

The Morrison Government must align its targets and plans with 1.5°C by the COP26 climate conference in Glasgow this year. With current policies we are still [on track](#) to an apocalyptic 2.9°C future, with possible warming as high as 3.9°C. Even if all pledges were backed with sufficient policies, we'd be heading towards roughly 2.4°C warming, with nearly 80% chance of exceeding 2°C. For Australia, this means phasing out coal, oil and gas in our electricity system by 2030, and going to net zero carbon emissions by 2035.

AGL must get out of coal by 2030. As Australia's biggest domestic contributor to climate change, responsible for a whopping 8% of all Australia's domestic emissions, energy giant AGL must commit to closing down its coal-burning power stations and replacing them with renewable energy by 2030.

Australia's biggest energy-using companies must go renewable, following the lead of major energy users Bunnings, Officeworks, Coles and Woolworths, in order to drive down demand for coal and increase demand and funding for large-scale renewable energy projects.

There can't be any new coal, oil or gas investments or projects anywhere, and the phase out of existing fossil fuel infrastructure must commence immediately and align with the 1.5°C carbon budget. Clean and safe renewable energy, backed up with storage is here now, and already powering major parts of our economy.

Australia's clean energy agency ARENA must not be used to fund fossil fuels. Minister for Energy and Emissions Reduction Angus Taylor has repeatedly sought to change ARENA's mandate to include funding fantasy carbon capture and storage (CCS) projects, as well as hydrogen made with the use of fossil fuels. This must not happen.

We must protect and restore ecosystems to build resilience. Healthy ecosystems are more resilient in the face of inevitable climatic changes. We must protect 30% of our land and oceans and reduce all pressures to our ocean ecosystems. We must end deforestation, restore forests and other vital ecosystems, and adopt more sustainable agriculture practises along with more plant-based diets.

Financial institutions - banks, asset managers and insurers, as well as the companies to whom they lend and whose shares they own, must align their business with the objectives of the Paris Agreement, to pursue limiting global average temperature increase to 1.5°C as shifting investment will be key to avoiding high-carbon lock-in. These initiatives must include shifting to 100% renewable electricity, as greenwash with empty net-zero pledges relying on imaginary offsets only add fuel to the problem.

We must deliver in solidarity. Today the true costs of climate change are paid predominantly by those who have caused it the least. Rich governments, including Australia, must deliver on their Paris Agreement climate finance commitments and get serious with addressing loss and damage.

And we can

The challenges are huge, but so are opportunities. Since the IPCC AR5 (published in 2013-2014), the world has already changed a lot. **We now have a truly global climate agreement with a 1.5°C goal, and a lot more.**

- **Solar and wind [have become](#) the cheapest forms of new electricity in most of the world,** and costs continue to decline. This has the potential to change everything, if only we allow it to, by making sure that oil, coal and gas are phased out at the speed required.

- **The International Energy Agency (IEA) now sees a [pathway to 1.5°C](#)**, into an energy system dominated by solar and wind, coming with “huge benefits”. The IEA was created to ensure the security of oil, a fossil fuel responsible for climate change, yet it says there should be no investment in new fossil fuel supply projects, and no further final investment decisions for new unabated coal-burning power stations, and by 2035 no sales of new cars running on oil.
- **The financial sector has finally started to wake up**, with some of the [world's largest](#) bond purchasers and [asset owners](#) now aligning their strategies with the Paris Agreement and 1.5°C limit, and some [top global investors](#) moving away from the massive climate-related risks associated with fossil fuels, into building renewable energy.
- **Businesses are shifting**, with many of Australia's top energy-using companies like Bunnings, Coles and Woolworths ditching coal in favour of powering their operations with 100% renewable energy, car companies announcing combustion engine phase outs, as well as energy utilities announcing early coal phase-outs.
- **People are winning in courts:** Climate court cases are bringing justice to those most impacted, and an increasing number of judges and courts are applying the law to hold climate polluters accountable. In just three years, climate litigation cases have [nearly doubled](#), and only last year, an unprecedented number of key judgments with potentially far-reaching impacts were issued, including on the cases against [Environment Minister Sussan Ley](#), as well as cases [against Shell](#) and against [Germany](#). Now, more than ever, climate litigation has become a real threat for laggard governments and big emitters.
- **Most importantly: People power is forcing justice and action.** In recent years we've witnessed a growing wave of citizen action, from mass demonstrations to climate elections and blooming court cases for justice. And it is creating real impact in the world. New climate targets have been adopted, and a wave of victories in courts is [changing the game](#). (For Greenpeace supported court cases, please see [here](#).)

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