

UN climate report: Scientists release 'survival guide' to avert climate disaster

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Scientists from the Intergovernmental Panel on Climate Change met in Switzerland where glaciers are melting

By Matt McGrath and Georgina Rannard

in Interlaken and Cardiff

UN chief Antonio Guterres says a major new report on climate change is a "survival guide for humanity".

Clean energy and technology can be exploited to avoid the growing climate disaster, the report says.

But at a meeting in Switzerland to agree their findings, climate scientists warned a key global temperature goal will likely be missed.

Their report lays out how rapid cuts to fossil fuels can avert the worst effects of climate change.

- **Five things we've learned from new UN climate report**

In response to the findings, UN secretary general Antonio Guterres says that all countries should bring forward their net zero plans by a decade. These targets are supposed to rapidly cut the greenhouse gas emissions that warm our planet's atmosphere.

"There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all," the report states.

Governments had previously agreed to act to avoid global temperature rise going above 1.5C. But the world has already warmed by 1.1C and now experts say that it is likely to breach 1.5C in the 2030s.

The UK government responded that the report makes it clear that countries must "work towards far more ambitious climate commitments" ahead of the UN climate summit COP28 in November.

"The UK is a world leader in working towards net zero, but we need to go further and faster," a spokesperson said.

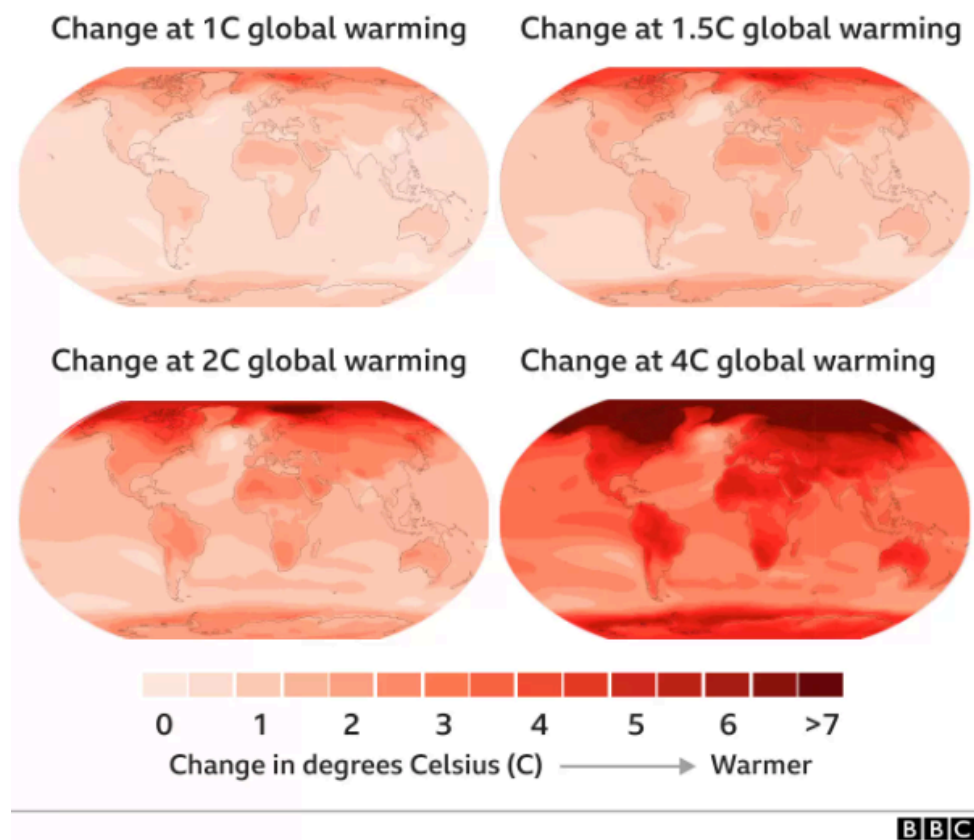
Small islands in the Pacific are some of the countries expected to be worst hit by climate change.

Responding to the report, the chair of the Alliance of Small Island States Fatumanava-o-Upolu III Dr. Pa'olelei Luteru said: "While our people are being displaced from their homes and climate commitments go unmet, the fossil fuel industry is enjoying billions in profits. There can be no excuses for this continued lack of action."

- **A really simple guide to climate change**
- **Four ways climate change is affecting weather**
- **US government approves Alaska Willow oil project**
- **Drought risk to England regions after dry February**

The **report from the Intergovernmental Panel on Climate Change** - the scientific body that advises the UN on rising temperatures - is agreed on by all governments involved.

Their new study aims to boil down to one slim volume several landmark findings on the causes, impacts and solutions to climate change that have been released since 2018. It outlines the significant impacts that climate change is having on the world already, and explains that these will get much worse. By 2100 extreme coastal flooding that used to happen once-a-century is expected to occur at least annually in half of the world's tidal gauge locations - places where sea level recordings are made.



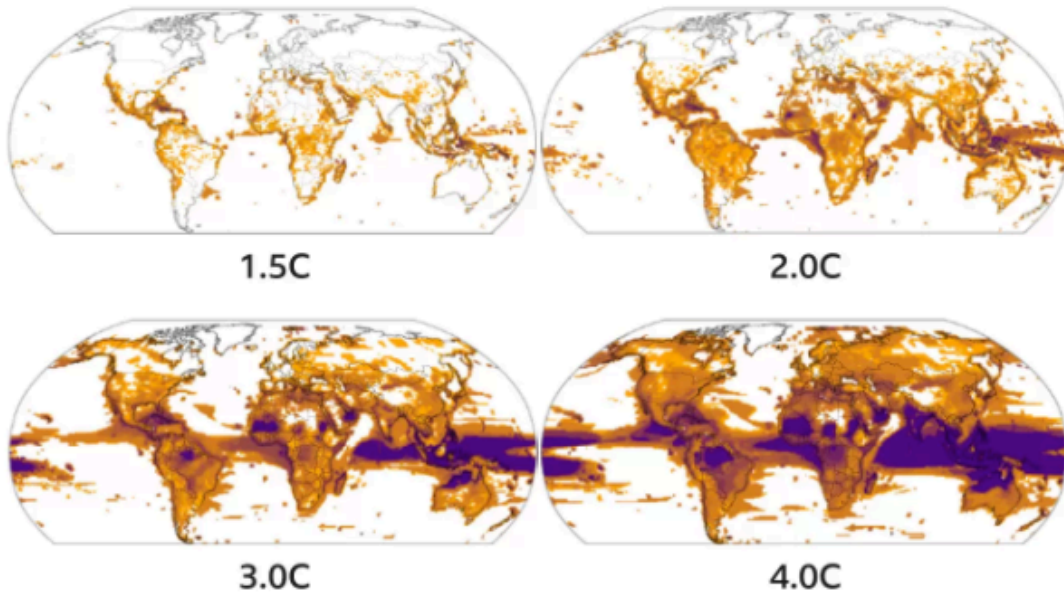
Concentrations of the warming gas CO₂ in the atmosphere are at their highest in 2 million years. The world is now warmer than at any time in the past 125,000 years - and will likely get warmer still over the next decade. "Even in the near term, global warming is more likely than not to reach 1.5C even under the very low greenhouse gas scenario," the report states.

"If we aim for 1.5C and achieve 1.6C, that is still much much better than saying, it's too late, and we are doomed and I'm not even trying," Dr Friederike Otto, from Imperial College, a member of the core writing team for this report, told BBC News.

"And I think what this report shows very, very clearly is there is so much to win by trying."

Risk of species loss depends on how far global temperatures rise

Percentage of species exposed to potentially dangerous temperature conditions



Includes birds, mammals, reptiles, amphibians, fish, invertebrates, corals and seagrasses

Source: IPCC, 2023

BBC

The synthesis shows that projected emissions of CO₂ from existing fossil fuel infrastructure, such as oil wells and gas pipelines, would bust the remaining carbon budget - the amount of CO₂ that can still be emitted - for staying under this key temperature threshold.

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- What is carbon capture - and how can it fight climate change?
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And while not explicitly mentioning new projects like Willow oil in the US or the Cumbria coal mine in the UK, the scientists involved have few doubts about their impact.

"There's not a cut-off day (for fossil fuels), but it's clear that the fossil fuel infrastructure we already have will blow through that carbon budget," Dr Oliver Geden, from the German Institute for International and Security Affairs and a member of the report's core writing team, told BBC News.



World-leading scientists wrote the UN report which must also be agreed on by governments

"The remaining carbon budget in opening new fossil fuel infrastructure is certainly not compatible with the 1.5C target." The document argues strongly that going past 1.5C will not be the end of the world as this may only be a "temporary overshoot".

The authors say that they are optimistic that dramatic changes can be achieved rapidly, pointing to the massive falls in the price of energy made from solar and wind.

They also argue that changes driven by consumers in terms of diet, food waste and switching to low carbon transport can achieve significant cuts in emissions from many sectors.

But the report also acknowledges that in addition to getting to net zero emissions as soon as possible, large scale use of carbon dioxide removal technology will be needed.

Some observers have their doubts. "We know what needs to happen, but the carbon removal part and carbon capture and storage ideas are a massive distraction," said Lili Fuhr, from the Centre for International Environmental Law, who attended the approval session.

Responding to the report's call for more urgent action, the UN secretary general is calling for countries to bring forward their plans for net zero by a decade.

"Leaders of developed countries must commit to reaching net zero as close as possible to 2040, the limit they should all aim to respect," he said in a statement. He also calls on the likes of India and China who have announced net zero plans for beyond 2050 to try and bring them forward by a decade as well.



1.5C above pre-industrial levels is the threshold beyond which our damage to the climate will rapidly become irreversible. Photograph: Janez Volmajer/Alamy

Climate crisis

Scientists deliver ‘final warning’ on climate crisis: act now or it’s too late

IPCC report says only swift and drastic action can avert irrevocable damage to world

- [Analysis: Humanity at the crossroads](#)
- [Timeline: The IPCC’s reports](#)

Fiona Harvey *Environment editor*

Mon 20 Mar 2023 13.00 GMT

Scientists have delivered a “final warning” on the climate crisis, as rising greenhouse gas emissions push the world to the brink of irrevocable damage that only swift and drastic action can avert.

The Intergovernmental Panel on Climate Change (IPCC), made up of the world’s leading climate scientists, set out the **final part of its mammoth sixth assessment report** on Monday.

The comprehensive review of human knowledge of the climate crisis took hundreds of scientists eight years to compile and runs to thousands of pages, but boiled down to one message: act now, or it will be too late.

The UN secretary general, António Guterres, said: “This report is a clarion call to massively fast-track climate efforts by every country and every sector and on every timeframe. Our world needs climate action on all fronts: everything, everywhere, all at once.”

In sober language, the IPCC set out the devastation that has already been inflicted on swathes of the world. Extreme weather caused by climate breakdown has led to increased deaths from intensifying heatwaves in all regions, millions of lives and homes destroyed in droughts and floods, millions of people facing hunger, and “increasingly irreversible losses” in vital ecosystems.

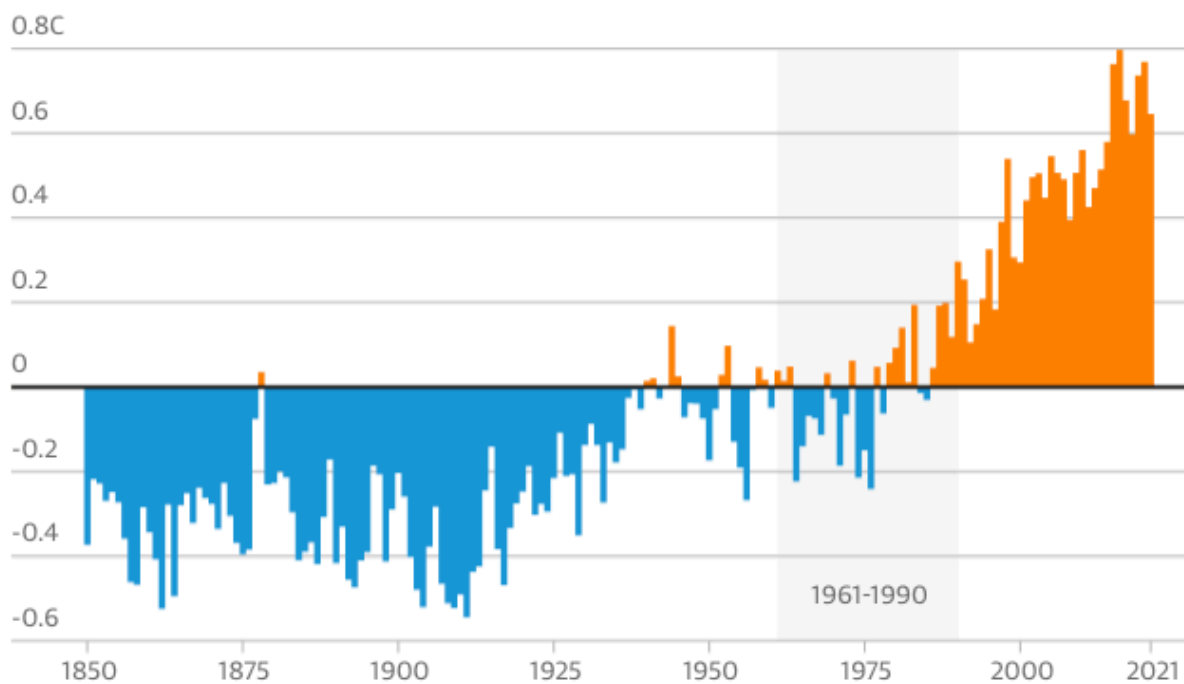
Monday's final instalment, called the **synthesis report**, is almost certain to be the last such assessment while the world still has a chance of limiting global temperature rises to 1.5C above pre-industrial levels, the threshold beyond which **our damage to the climate will rapidly become irreversible**.

Kaisa Kosonen, a climate expert at Greenpeace International, said: "This report is definitely a final warning on 1.5C. If governments just stay on their current policies, the remaining carbon budget will be used up before the next IPCC report [due in 2030]."

More than 3bn people already live in areas that are "highly vulnerable" to climate breakdown, the IPCC found, and half of the global population now experiences severe water scarcity for at least part of the year. In many areas, the report warned, we are already **reaching the limit to which we can adapt** to such severe changes, and weather extremes are "increasingly driving displacement" of people in Africa, Asia, North, Central and South America, and the south Pacific.

Global average temperature

Relative to the 1961-1990 average



Guardian graphic. Source: Met Office

All of those impacts are set to increase rapidly, as we have failed to reverse the 200-year trend of rising greenhouse gas emissions, despite more than 30 years of warnings from the IPCC, which published its first report in 1990.

The world heats up in response to the accumulation of carbon dioxide and other greenhouse gases in the atmosphere, so every year in which emissions continue to rise eats up the available “carbon budget” and means much more drastic cuts will be needed in future years.

Yet there is still hope of staying within 1.5C, according to the report. Hoesung Lee, the chair of the IPCC, said: “This synthesis report underscores the urgency of taking more ambitious action and shows that, if we act now, we can still secure a livable sustainable future for all.”

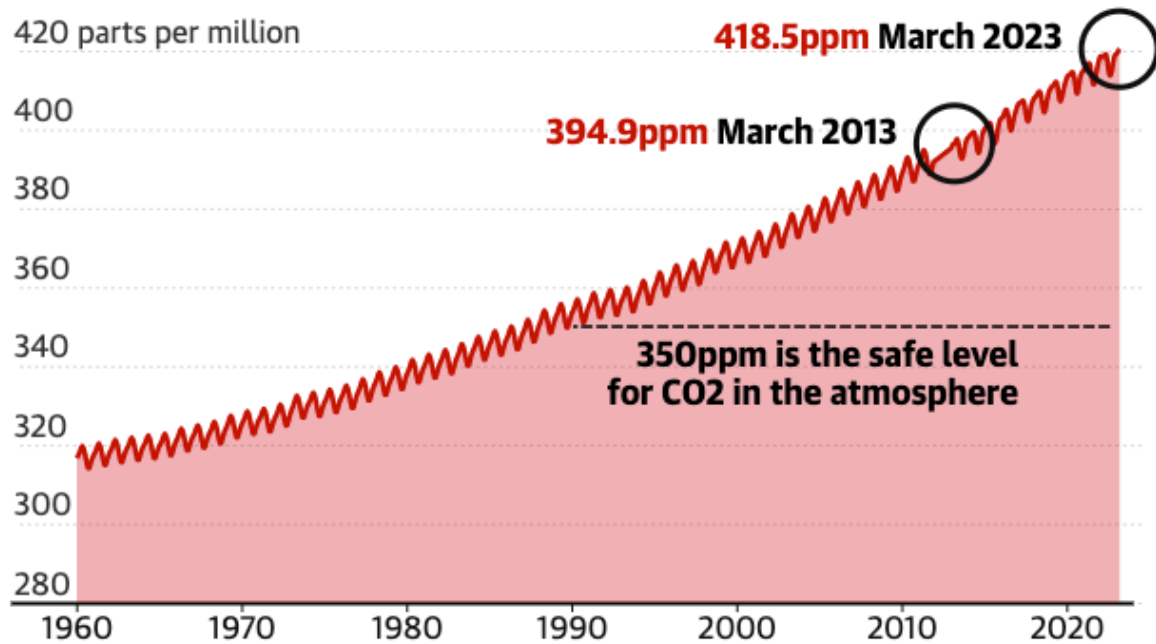
Temperatures are now about 1.1C above pre-industrial levels, the IPCC found. If greenhouse gas emissions can be made to peak as soon as possible, and are reduced rapidly in the following years, it **may still be possible** to avoid the worst ravages that would follow a 1.5C rise.

Richard Allan, a professor of climate science at the University of Reading, said: “Every bit of warming avoided due to the collective actions pulled from our growing, increasingly effective toolkit of options is less worse news for societies and the ecosystems on which we all depend.”

Guterres called on governments to take drastic action to reduce emissions by investing in renewable energy and low-carbon technology. He said rich countries must try to reach net zero greenhouse gas emissions “as close as possible to 2040”, rather than waiting for the 2050 deadline most have signed up to.

He said: “The climate timebomb is ticking. But today’s report is a how-to guide to defuse the climate timebomb. It is a survival guide for humanity. As it shows, the 1.5C limit is achievable.”

Atmospheric CO₂ currently measures **418.5 parts per million**



Guardian graphic. Source: NOAA, global CO₂, updated on 19 March 2023. Chart baseline is 280ppm - the preindustrial average. Label number is the trend, not cycle, value.

John Kerry, the US special presidential envoy for climate, said: “Today’s message from the IPCC is abundantly clear: we are making progress, but not enough. We have the tools to stave off and reduce the risks of the worst impacts of the climate crisis, but we must take advantage of this moment to act now.”



What is the IPCC AR6 synthesis report and why does it matter?

Monday's "synthesis report" is the final part of the sixth assessment report (AR6) by the IPCC, which was set up in 1988 to investigate the climate and provide scientific underpinning to international policy on the crisis. The first three sections of AR6, published between August 2021 and April 2022, covered the physical science behind the climate crisis, and warned **irreversible changes were now almost inevitable**; **section two covered the impacts**, such as the loss of agriculture, rising sea levels, and the devastation of the natural world; and the third covered the **means by which we can cut greenhouse gases**, including renewable energy, restoring nature and technologies that capture and store carbon dioxide.

The "synthesis report" contains no new science, but draws together key messages from all of the preceding work to form a guide for governments. The next IPCC report is not due to be published before 2030, making this report effectively the scientific gold standard for advice to governments in this crucial decade.

The final section of AR6 was the "summary for policymakers", written by IPCC scientists but **scrutinised by representatives of governments around the world**,

who can – and did – push for changes. The Guardian was told that in the final hours of deliberations at the Swiss resort of Interlaken over the weekend, the large Saudi Arabian delegation, of at least 10 representatives, pushed at several points for the weakening of messages on fossil fuels, and the insertion of references to carbon capture and storage, touted by some as a remedy for fossil fuel use but not yet proven to work at scale.

In response to the report, Peter Thorne, the director of the Icarus climate research centre at Maynooth University in Ireland, said next year global temperatures could breach the 1.5C limit, though this did not mean the limit had been breached for the long term. “We will, almost regardless of the emissions scenario given, reach 1.5C in the first half of the next decade,” he said. “The real question is whether our collective choices mean we stabilise around 1.5C or crash through 1.5C, reach 2C and keep going.”

World can still avoid worst of climate collapse with genuine change, IPCC says

Positive framing of otherwise grim report a counterblast to those who dismiss hopes of limiting global heating to 1.5C

Fiona Harvey *Environment editor*

Mon 20 Mar 2023 18.00 GMT



Women wade through floodwaters last year as they take refuge in Shikarpur district of Sindh province, Pakistan. Photograph: Fareed Khan/AP

Avoiding the worst ravages of climate breakdown is still possible, and there are “multiple, feasible and effective options” for doing so, **the Intergovernmental Panel on Climate Change** has said.

Hoesung Lee, chair of the body, which is made up of the world’s leading climate scientists, made clear that – despite the widespread damage already being caused by extreme weather, and the looming threat of potentially catastrophic changes – the future was still humanity’s to shape.

“[The **IPCC reports**] clearly show that humanity has the knowhow and the technology to tackle human-induced climate change. But not only that. They show that we have the capacity to build a much more prosperous, inclusive and equitable society in this process.

“Tackling climate change is a hard, complex and enduring challenge for generations. We, the scientific community, spell out the facts of disheartening reality, but we also point to the prospects of hope through concerted, genuine and global transformational change.”

Finance would be key, he said. The shift to a low-carbon economy would take between three and six times the amounts of funding currently devoted to green investment, according to the final section of the IPCC’s comprehensive sixth assessment report (AR6) of human knowledge of the climate.

Climate justice would also be vital, the IPCC said, because the people being hit hardest by the impacts of the crisis were the poorest and most vulnerable who have done least to cause the problem.

Aditi Mukherji, one of the 93 authors of the “synthesis report”, the final section that draws together the key findings, said: “Almost half the world’s population lives in regions that are highly vulnerable to climate change. In the last decade, deaths from floods, droughts and storms were 15 times higher in highly vulnerable regions.”

This positive framing of a report that **makes mostly very grim reading** was a deliberate counterblast to the many voices that have said the world has little

chance of limiting global heating to 1.5C above preindustrial levels, the threshold beyond which many of the **impacts of the crisis will rapidly become irreversible**.

Chris Jones, of the Met Office Hadley Centre, a member of the report's core writing team, pointed out that emissions fell by 6% in 2020 owing to the Covid-19 lockdowns, and a similar fall would be needed each year for the next decade. "The scale of the challenge is massive," he said. "If we keep emitting at the current rate, the carbon budget for 1.5C will be exhausted by 2030."

Monday's publication may be the last this decade from the IPCC, which was **set up in 1988 to assess global knowledge of the climate** and advise on how human actions have been changing it. The IPCC AR6 report, which was delayed slightly owing to the Covid-19 pandemic, was published in three main sections from August 2021 to April 2022. The first three sections covered the underlying science of the climate system, the **impacts of climate breakdown** and the **ways of tackling or reducing the problem**, followed by Monday's synthesis chapter drawing the previous three together.



A BP refinery and a Uniper coal-fired power plant in Gelsenkirchen, Germany. Photograph: Martin Meissner/AP

IPCC scientists and climate experts emphasised that this decade would be crucial, as decisions made now would affect the future of the planet for hundreds and perhaps thousands of years.

Simon Stiell, the UN's top climate official, said: "We are in a critical decade for climate action. Global emissions need to be reduced by nearly 43% by 2030 for the world to achieve the **Paris agreement's goal** to limit global temperature rise to 2C and pursuing efforts to limit the temperature increase to 1.5C. The synthesis report highlights just how far off-track we are."

But he added: "It's not too late. The IPCC clearly demonstrates that it is possible to limit global warming to 1.5C with rapid and deep emissions reductions across all sectors of the global economy. It has given us many feasible, effective and low-cost mitigation and adaptation options to scale up across sectors and countries."

The message of action, rather than despair, was also taken up by the UN secretary-general, António Guterres. He called for countries to adopt an "acceleration agenda" involving all of the G20, the world's biggest developed and developing countries.

Developed countries must bring forward their commitments on reaching net zero greenhouse gas emissions, from 2050 to "as close as possible to 2040", said Guterres.

Emerging economies, many of which have set net zero targets for the second half of this century, must also bring them forward, to "as close as possible" to 2050, he urged. This would require a major revision by some of the world's biggest emitters: **China currently has a target of before 2060**, and **India of 2070**.

Guterres also called for developed countries to phase out coal by 2030, and all others by 2040. He called for no new licensing or funding of oil and gas projects, based on the findings of the International Energy Agency that **all new oil and gas development must cease** for the world to limit global heating to 1.5C above pre-industrial levels.

Achieving this will be a stretch, and many governments are likely to ignore these pleas, at least in the short term. Many experts were keen to point out that the **price of renewable energy technology has fallen rapidly**, making it a more attractive investment. But **oil and gas companies have also been enjoying a record bonanza**, and many are planning to reinvest the proceeds in more fossil fuels.

Ed Miliband, the shadow secretary for climate change in the UK, said: “António Guterres is right to say that we need to rapidly increase the pace and urgency of the fight against the climate crisis.

“In Britain, we have a Conservative government whose net zero strategy is so bad that it has been declared unlawful. The tragedy is that the Conservatives are holding us back from reaping the benefits of the green transition – lower energy bills, millions of good jobs, and a livable future for our children and grandchildren.

“Labour will make Britain world leader in tackling the climate crisis, with our plan to make Britain a clean energy superpower by 2030, and by leading a clean power alliance across the world to create cleaner, greener energy.”

Humanity at the climate crossroads: highway to hell or a livable future?

Damian Carrington

Environment editor

The choice in the new IPCC report is stark: what we do in the next few years will determine our fate for millennia

- [IPCC climate crisis report delivers ‘final warning’](#)
- [Timeline: The IPCC’s reports](#)

Mon 20 Mar 2023 13.00 GMT

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- A flash flood on the Tule River in Springville, California, earlier this month. Photograph: David McNew/Getty Images

After a 10,000-year journey, human civilisation has reached a climate crossroads: what we do in the next few years will determine our fate for millennia.

That choice is laid bare in the landmark report published on Monday by the **Intergovernmental Panel on Climate Change** (IPCC), assembled by the world's foremost climate experts and approved by all the world's governments. The next update will be around 2030 – by that time the most critical choices will have been made.

The report is clear what is at stake – **everything**: “There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all.”

“The choices and actions implemented in this decade [ie by 2030] will have impacts now and for thousands of years,” it says. The climate crisis is already **taking away lives and livelihoods** across the world, and the report says the future effects will be even worse than was thought: “For any given future

warming level, many climate-related risks are higher than [previously] assessed.”

“Continued emissions will further affect all major climate system components, and many changes will be irreversible on centennial to millennial time scales,” it says. To follow the path of least suffering – limiting global temperature rise to 1.5C – greenhouse gas emissions must peak “at the latest before 2025”, the report says, followed by “deep global reductions”. Yet in 2022, **global emissions rose again** to set a new record.

The 1.5C goal appears virtually out of reach, the IPCC says: “In the near-term, global warming is more likely than not to reach 1.5C even under a very low emission scenario.” A huge ramping up of work to protect people will therefore be needed. For example, “extreme sea level events” expected once a century today will strike at least once a year by 2100 in half of all monitored locations.



[From climate change ‘certainty’ to rapid decline: a timeline of IPCC reports](#)

However, the faster emissions are cut, the better it will be for billions of people: “Adverse impacts and related losses and damages from climate change will escalate with every increment of global warming.” Every tonne of CO₂ emissions prevented also reduces the risk of true catastrophe: “Abrupt

and/or irreversible changes in the climate system, including changes **triggered when tipping points are reached.**”

The report presents the choice humanity faces in stark terms, made all the more chilling by the fact this is the compromise language agreed by all the world nations – many would go further if speaking alone. But it also presents the signposts to the path the world should and could take to secure that liveable future.

Amid the maze of detail set out in the thousands of pages of supporting documents, three of these signposts stand tallest. First is that the climate crisis is fundamentally a crisis of injustice: “The 10% of households with the highest per capita emissions contribute 34-45% of global consumption-based emissions, while the bottom 50% contribute 13-15%.” The climate emergency cannot end without addressing the inequalities of income and gender for the simple reason that “social trust” is required for “transformative change”.

The second signpost is that any new fossil fuel developments are utterly incompatible with the net zero emissions required. “Projected CO₂ emissions from existing fossil fuel infrastructure without additional abatement would exceed the remaining carbon budget for 1.5C,” the report says.

Put plainly, that means the oil, gas and coal projects already in operation will blow our chance of limiting heating to 1.5C, unless some are **shut down early** or fitted with carbon capture technology that is yet to be proven to work at scale.

The third signpost points to the technology and finance that we need: “Feasible, effective, and low-cost options for [emissions cutting] and adaptation are already available.” Solar and wind power, energy efficiency, **cuts in methane emissions** and halting the destruction of forests are the key ones.

The report does not shy away from the daunting scale of the choices we need to make: “The systemic change required to achieve rapid and deep emissions reductions and transformative adaptation to climate change is unprecedented in terms of scale [and] near-term actions involve high up-front investments.”

The money is key but, the report says, “there is sufficient global capital to close the global investment gaps” if barriers to the redirection of financial flows are overcome. Furthermore, it says, the costs of climate action are clearly lower than the damages climate chaos will cause.

But there is also a gaping climate policy gap, between what is in place and what is needed: “Without a strengthening of policies, global warming of 3.2C is projected by 2100.” That is the “**highway to hell**”.

Three decades of IPCC warnings, mostly ignored, have brought us to the climate crossroads. As we stand there, perhaps this is the simplest way to state the choice set out by the IPCC for the world’s political and corporate leaders: what price a “sustainable and liveable future for all”?