

10 Big Findings from the 2023 IPCC Report on Climate Change

March 20 marked the release of the final installment of the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6), an eight-year long undertaking from the world's most authoritative scientific body on climate change. Drawing on the findings of 234 scientists on the physical science of climate change, 270 scientists on impacts, adaptation and vulnerability to climate change, and 278 scientists on climate change mitigation, this IPCC synthesis report provides the most comprehensive, best available scientific assessment of climate change.

It also makes for grim reading. Across nearly 8,000 pages, the AR6 details the devastating consequences of rising greenhouse gas (GHG) emissions around the world — the destruction of homes, the loss of livelihoods and the fragmentation of communities, for example — as well as the increasingly dangerous and irreversible risks should we fail to change course.

But the IPCC also offers hope, highlighting pathways to avoid these intensifying risks. It identifies readily available, and in some cases, highly cost-effective actions that can be undertaken now to reduce GHG emissions, scale up carbon removal and build resilience. While the window to address the climate crisis is rapidly closing, the IPCC affirms that we can still secure a safe, livable future.

Here are 10 key findings you need to know:

1. Human-induced global warming of 1.1 degrees C has spurred changes to the Earth's climate that are unprecedented in recent human history.

Already, with 1.1 degrees C (2 degrees F) of global temperature rise, changes to the climate system that are unparalleled over centuries to millennia are now occurring in every region of the world, from rising sea levels to more extreme weather events to rapidly disappearing sea ice.

An illustration showing evidence of global warming, including glacial retreating and sea level rise.

Additional warming will increase the magnitude of these changes. Every 0.5 degree C (0.9 degrees F) of global temperature rise, for example, will cause clearly discernible increases in the frequency and severity of heat extremes, heavy rainfall events and regional droughts. Similarly, heatwaves that, on average, arose once every 10 years in a climate with little human influence will likely occur 4.1 times more frequently with 1.5 degrees C (2.7 degrees F) of warming, 5.6 times with 2 degrees C (3.6 degrees F) and 9.4 times with 4 degrees C (7.2 degrees F) — and the intensity of these heatwaves will also increase by 1.9 degrees C (3.4 degrees F), 2.6 degrees C (4.7 degrees F) and 5.1 degrees C (9.2 degrees F) respectively.

Rising global temperatures also heighten the probability of reaching dangerous tipping points in the climate system that, once crossed, can trigger self-amplifying feedbacks that further increase global warming, such as thawing permafrost or massive forest dieback. Setting such reinforcing feedbacks in motion can also lead to other substantial, abrupt and irreversible changes to the climate system. Should warming reach between 2 degrees C (3.6 degrees F) and 3 degrees C (5.4 degrees F), for example, the West Antarctic and Greenland ice sheets could melt almost completely and irreversibly over many thousands of years, causing sea levels to rise by several meters.

2. Climate impacts on people and ecosystems are more widespread and severe than expected, and future risks will escalate rapidly with every fraction of a degree of warming.

Described as an “an atlas of human suffering and a damning indictment of failed climate leadership” by United Nations Secretary-General António Guterres, one of AR6’s most alarming conclusions is that adverse climate impacts are already more far-reaching and extreme than anticipated. About half of the global population currently contends with severe water scarcity for at least one month per year, while higher temperatures are enabling the spread of vector-borne diseases, such as malaria, West Nile virus and Lyme disease. Climate change has also slowed improvements in agricultural productivity in middle and low latitudes, with crop productivity growth shrinking by a third in Africa since 1961. And since 2008, extreme floods and storms have forced over 20 million people from their homes every year.

Every fraction of a degree of warming will intensify these threats, and even limiting global temperature rise to 1.5 degree C is not safe for all. At this level of warming, for example, 950 million people across the world’s drylands will experience water stress, heat stress and desertification, while the share of the global population exposed to flooding will rise by 24%.

A chart about comparing risks from rising temperatures.

Similarly, overshooting 1.5 degrees C (2.7 degrees F), even temporarily, will lead to much more severe, oftentimes irreversible impacts, from local species extinctions to the complete drowning of salt marshes to loss of human lives from increased heat stress. Limiting the magnitude and duration of overshooting 1.5 degrees C (2.7 degrees F), then, will prove critical in ensuring a safe, livable future, as will holding warming to as close to 1.5 degrees C (2.7 degrees F) or below as possible. Even if this temperature limit is exceeded by the end of the century, the imperative to rapidly curb GHG emissions to avoid higher levels of warming and associated impacts remains unchanged.

3. Adaptation measures can effectively build resilience, but more finance is needed to scale solutions.

Climate policies in at least 170 countries now consider adaptation, but in many nations, these efforts have yet to progress from planning to implementation. Measures to build resilience are still largely small-scale, reactive and incremental, with most focusing on immediate impacts or near-term risks. This disparity between today’s levels of adaptation and those required persists in large part due to limited finance. According to the IPCC, developing countries alone will need \$127 billion per year by

2030 and \$295 billion per year by 2050 to adapt to climate change. But funds for adaptation reached just \$23 billion to \$46 billion from 2017 to 2018, accounting for only 4% to 8% of tracked climate finance.

The good news is that the IPCC finds that, with sufficient support, proven and readily available adaptation solutions can build resilience to climate risks and, in many cases, simultaneously deliver broader sustainable development benefits.

Ecosystem-based adaptation, for example, can help communities adapt to impacts that are already devastating their lives and livelihoods, while also safeguarding biodiversity, improving health outcomes, bolstering food security, delivering economic benefits and enhancing carbon sequestration. Many ecosystem-based adaptation measures — including the protection, restoration and sustainable management of ecosystems, as well as more sustainable agricultural practices like integrating trees into farmlands and increasing crop diversity — can be implemented at relatively low costs today. Meaningful collaboration with Indigenous Peoples and local communities is critical to the success of this approach, as is ensuring that ecosystem-based adaptation strategies are designed to account for how future global temperature rise will impact ecosystems.

An illustration of how ecosystem-based adaption can protect lives and livelihoods.

4. Some climate impacts are already so severe they cannot be adapted to, leading to losses and damages.

Around the world, highly vulnerable people and ecosystems are already struggling to adapt to climate change impacts. For some, these limits are “soft” — effective adaptation measures exist, but economic, political and social obstacles constrain implementation, such as lack of technical support or inadequate funding that does not reach the communities where it’s needed most. But in other regions, people and ecosystems already face or are fast approaching “hard” limits to adaptation, where climate impacts from 1.1 degrees C (2 degrees F) of global warming are becoming so frequent and severe that no existing adaptation strategies can fully avoid losses and damages. Coastal communities in the tropics, for example, have seen entire coral reef systems that once supported their livelihoods and food security experience widespread mortality, while rising sea levels have forced other low-lying neighborhoods to move to higher ground and abandon cultural sites.

A large bleached coral reef in Indonesia.

Coral has turned into rubble in the shallow waters off the coast of Indonesia. Increased temperatures from climate change means that mortality has increased in coral reef systems in coastal communities. Photo by Velvetfish/iStock.

Whether grappling with soft or hard limits to adaptation, the result for vulnerable communities is oftentimes irreversible and devastating. Such losses and damages will only escalate as the world warms. Beyond 1.5 degrees C (2.7 degrees F) of global temperature rise, for example, regions reliant on snow and glacial melt will likely experience water shortages to which they cannot adapt. At 2 degrees C (3.6 degrees F), the risk of concurrent maize production failures across important growing

regions will rise dramatically. And above 3 degrees C (5.4 degrees F), dangerously high summertime heat will threaten the health of communities in parts of southern Europe.

Urgent action is needed to avert, minimize and address these losses and damages. At COP27, countries took a critical step forward by agreeing to establish funding arrangements for loss and damage, including a dedicated fund. While this represents a historic breakthrough in the climate negotiations, countries must now figure out the details of what these funding arrangements, as well as the new fund, will look like in practice — and it's these details that will ultimately determine the adequacy, accessibility, additionality and predictability of these financial flows to those experiencing loss and damage.

5. Global GHG emissions peak before 2025 in 1.5 degrees C-aligned pathways.

The IPCC finds that there is a more than 50% chance that global temperature rise will reach or surpass 1.5 degrees C (2.7 degrees F) between 2021 and 2040 across studied scenarios, and under a high-emissions pathway, specifically, the world may hit this threshold even sooner — between 2018 and 2037. Global temperature rise in such a carbon-intensive scenario could also increase to 3.3 degrees C to 5.7 degrees C (5.9 degrees F to 10.3 degrees F) by 2100. To put this projected amount of warming into perspective, the last time global temperatures exceeded 2.5 degrees C (4.5 degrees F) above pre-industrial levels was more than 3 million years ago.

Changing course to limit global warming to 1.5 degrees C (2.7 degrees F) — with no or limited overshoot — will instead require deep GHG emissions reductions in the near-term. In modelled pathways that limit global warming to this goal, GHG emissions peak immediately and before 2025 at the latest. They then drop rapidly, declining 43% by 2030 and 60% by 2035, relative to 2019 levels.

A chart shows GHG emission reductions needed to keep 1.5 degrees C within reach.

While there are some bright spots — the annual growth rate of GHG emissions slowed from an average of 2.1% per year between 2000 and 2009 to 1.3% per year between 2010 and 2019, for example — global progress in mitigating climate change remains woefully off track. GHG emissions have climbed steadily over the past decade, reaching 59 gigatonnes of carbon dioxide equivalent (GtCO₂e) in 2019 — approximately 12% higher than in 2010 and 54% greater than in 1990.

Even if countries achieved their climate pledges (also known as nationally determined contributions or NDCs), WRI research finds that they would reduce GHG emissions by just 7% from 2019 levels by 2030, in contrast to the 43% associated with limiting temperature rise to 1.5 degrees C (2.7 degrees F). And while handful of countries have submitted new or enhanced NDCs since the IPCC's cut-off date, more recent analysis that takes these submissions into account finds that these commitments collectively still fall short of closing this emissions gap.

6. The world must rapidly shift away from burning fossil fuels — the number one cause of the climate crisis.

In pathways limiting warming to 1.5 degrees C (2.7 degrees F) with no or limited overshoot just a net 510 GtCO₂ can be emitted before carbon dioxide emissions reach net zero in the early 2050s. Yet future carbon dioxide emissions from existing and planned fossil fuel infrastructure alone could surpass that limit by 340 GtCO₂, reaching 850 GtCO₂.

Carbon dioxide emissions from existing and planned fossil fuels put 1.5 degrees C out of reach

A mix of strategies can help avoid locking in these emissions, including retiring existing fossil fuel infrastructure, canceling new projects, retrofitting fossil-fueled power plants with carbon capture and storage (CCS) technologies and scaling up renewable energy sources like solar and wind (which are now cheaper than fossil fuels in many regions).

In pathways that limit warming to 1.5 degrees C (2.7 degrees F) — with no or limited overshoot — for example, global use of coal falls by 95% by 2050, oil declines by about 60% and gas by about 45%. These figures assume significant use of abatement technologies like CCS, and without them, these same pathways show much steeper declines by mid-century. Global use of coal without CCS, for example, is virtually phased out by 2050.

Although coal-fired power plants are starting to be retired across Europe and the United States, some multilateral development banks continue to invest in new coal capacity. Failure to change course risks stranding assets worth trillions of dollars.

7. We also need urgent, systemwide transformations to secure a net-zero, climate-resilient future.

While fossil fuels are the number one source of GHG emissions, deep emission cuts are necessary across all of society to combat the climate crisis. Power generation, buildings, industry, and transport are responsible for close to 80% of global emissions while agriculture, forestry and other land uses account for the remainder.

A list of 10 key solutions to mitigate climate change including retiring coal plants, decarbonizing aviation and reducing food waste.

Take the transport system, for instance. Drastically cutting emissions will require urban planning that minimizes the need for travel, as well as the build-out of shared, public and nonmotorized transport, such as rapid transit and bicycling in cities. Such a transformation will also entail increasing the supply of electric passenger vehicles, commercial vehicles and buses, coupled with wide-scale installation of rapid-charging infrastructure, investments in zero-carbon fuels for shipping and aviation and more.

Policy measures that make these changes less disruptive can help accelerate needed transitions, such as subsidizing zero-carbon technologies and taxing high-emissions technologies like fossil-fueled cars. Infrastructure design — like reallocating street space for sidewalks or bike lanes — can help people

transition to lower-emissions lifestyles. It is important to note there are many co-benefits that accompany these transformations, too. Minimizing the number of passenger vehicles on the road, in this example, reduces harmful local air pollution and cuts traffic-related crashes and deaths.

Explore Systems Change Lab

Systems Change Lab monitors, learns from and mobilizes action to achieve the far-reaching transformational shifts needed to limit global warming to 1.5 degrees C, halt biodiversity loss and build a just and equitable economy.

Transformative adaptation measures, too, are critical for securing a more prosperous future. The IPCC emphasizes the importance of ensuring that adaptation measures drive systemic change, cut across sectors and are distributed equitably across at-risk regions. The good news is that there are oftentimes strong synergies between transformational mitigation and adaptation. For example, in the global food system, climate-smart agriculture practices like shifting to agroforestry can improve resilience to climate impacts, while simultaneously advancing mitigation.

8. Carbon removal is now essential to limit global temperature rise to 1.5 degrees C.

Deep decarbonization across all systems while building resilience won't be enough to achieve global climate goals, though. The IPCC finds that all pathways that limit warming to 1.5 degrees C (2.7 degrees F) — with no or limited overshoot — depend on some quantity of carbon removal. These approaches encompass both natural solutions, such as sequestering and storing carbon in trees and soil, as well as more nascent technologies that pull carbon dioxide directly from the air.

Hover over each carbon removal approach to learn more:

a long arrow with natural approaches at the top and technological approaches on the bottom

carbon removal approaches on land group of trees to represent afforestation and reforestation outline of seedling plant for soil carbon sequestration icon outline of numerous rocks for biochar icon outline of sun and field for biomass carbon removal and storage icon outline of a large rock, carbon mineralization icon

carbon removal approaches in the ocean wetland grasses coming out of water outline seaweed and rocks icon waves with an arrow facing up Waves with an arrow facing down nitrogen periodic table symbol large rock as alkalinity enhancement battery with a lightning bolt

Note: This figure includes carbon removal approaches mentioned in countries' long-term climate strategies as well as other leading proposed approaches.

Note: The natural vs. technological categorization shown here is illustrative rather than definitive and will vary depending on how approaches are applied, particularly for carbon removal approaches in the ocean.

The amount of carbon removal required depends on how quickly we reduce GHG emissions across other systems and the extent to which climate targets are overshoot, with estimates ranging from between 5 GtCO₂ to 16 GtCO₂ per year needed by mid-century.

All carbon removal approaches have merits and drawbacks. Reforestation, for instance, represents a readily available, relatively low-cost strategy that, when implemented appropriately, can deliver a wide range of benefits to communities. Yet the carbon stored within these ecosystems is also vulnerable to disturbances like wildfires, which may increase in frequency and severity with additional warming. And, while technologies like bioenergy with carbon capture and storage (BECCS) may offer a more permanent solution, such approaches also risk displacing croplands, and in doing so, threatening food security. Responsibly researching, developing and deploying emerging carbon removal technologies, alongside existing natural approaches, will therefore require careful understanding of each solution's unique benefits, costs and risks.

9. Climate finance for both mitigation and adaptation must increase dramatically this decade.

The IPCC finds that public and private finance flows for fossil fuels today far surpass those directed toward climate mitigation and adaptation. Thus, while annual public and private climate finance has risen by upwards of 60% since the IPCC's Fifth Assessment Report, much more is still required to achieve global climate change goals. For instance, climate finance will need to increase between 3 and 6 times by 2030 to achieve mitigation goals, alone.

This gap is widest in developing countries, particularly those already struggling with debt, poor credit ratings and economic burdens from the COVID-19 pandemic. Recent mitigation investments, for example, need to increase by at least sixfold in Southeast Asia and developing countries in the Pacific, fivefold in Africa and fourteenfold in the Middle East by 2030 to hold warming below 2 degrees C (3.6 degrees F). And across sectors, this shortfall is most pronounced for agriculture, forestry and other land use, where recent financial flows are 10 to 31 times below what is required to achieve the Paris Agreement's goals.

Finance for adaptation, as well as loss and damage, will also need to rise dramatically. Developing countries, for example, will need \$127 billion per year by 2030 and \$295 billion per year by 2050. While AR6 does not assess countries' needs for finance to avert, minimize and address losses and damages, recent estimates suggest that they will be substantial in the coming decades. Current funds for both fall well below estimated needs, with the highest estimates of adaptation finance totaling under \$50 billion per year.

Rows of young mangroves.

Young mangroves ready for planting in Watamu, Kenya. Ecosystem-based adaptation measures like restoration can be low-cost ways to help communities adapt and protect biodiversity. Photo by MariusLtu/iStock.

10. Climate change — as well as our collective efforts to adapt to and mitigate it — will exacerbate inequity should we fail to ensure a just transition.

Households with incomes in the top 10%, including a relatively large share in developed countries, emit upwards of 45% of the world's GHGs, while those families earning in the bottom 50% account for 15% at most. Yet the effects of climate change already — and will continue to — hit poorer, historically marginalized communities the hardest.

Today, between 3.3 billion and 3.6 billion people live in countries that are highly vulnerable to climate impacts, with global hotspots concentrated in the Arctic, Central and South America, Small Island Developing states, South Asia and much of sub-Saharan Africa. Across many countries in these regions, conflict, existing inequalities and development challenges (e.g., poverty and limited access to basic services like clean water) not only heighten sensitivity to climate hazards, but also limit communities' capacity to adapt. Mortality from storms, floods and droughts, for instance, was 15 times higher in countries with high vulnerability to climate change than in those with very low vulnerability from 2010 to 2020.

At the same time, efforts to mitigate climate change also risk disruptive changes and exacerbating inequity. Retiring coal-fired power plants, for instance, may displace workers, harm local economies and reconfigure the social fabric of communities, while inappropriately implemented efforts to halt deforestation could heighten poverty and intensify food insecurity. And certain climate policies, such as carbon taxes that raise the cost of emissions-intensive goods like gasoline, can also prove to be regressive, absent of efforts to recycle the revenues raised from these taxes back into programs that benefit low-income communities.

Fortunately, the IPCC identifies a range of measures that can support a just transition and help ensure that no one is left behind as the world moves toward a net-zero-emissions, climate-resilient future. Reconfiguring social protection programs (e.g., cash transfers, public works programs and social safety nets) to include adaptation, for example, can reduce communities' vulnerability to a wide range of future climate impacts, while strengthening justice and equity. Such programs are particularly effective when paired with efforts to expand access to infrastructure and basic services.

Similarly, policymakers can design mitigation strategies to better distribute the costs and benefits of reducing GHG emissions. Governments can pair efforts to phase out coal-fired electricity generation, for instance, with subsidized job retraining programs that support workers in developing the skills needed to secure new, high-quality jobs. Or, in another example, officials can couple policy interventions dedicated to expanding access to public transit with interventions to improve access to nearby, affordable housing.

Across both mitigation and adaptation measures, inclusive, transparent and participatory decision-making processes will play a central role in ensuring a just transition. More specifically, these forums can help cultivate public trust, deepen public support for transformative climate action and avoid unintended consequences.

Looking Ahead

The IPCC's AR6 makes clear that risks of inaction on climate are immense and the way ahead requires change at a scale not seen before. However, this report also serves as a reminder that we have never had more information about the gravity of the climate emergency and its cascading impacts — or about what needs to be done to reduce intensifying risks.

Limiting global temperature rise to 1.5 degrees C (2.7 degrees F) is still possible, but only if we act immediately. As the IPCC makes clear, the world needs to peak GHG emissions before 2025 at the very latest, nearly halve GHG emissions by 2030 and reach net-zero CO₂ emissions around mid-century, while also ensuring a just and equitable transition. We'll also need an all-hands-on-deck approach to guarantee that communities experiencing increasingly harmful impacts of the climate crisis have the resources they need to adapt to this new world. Governments, the private sector, civil society and individuals must all step up to keep the future we desire in sight. A narrow window of opportunity is still open, but there's not one second to waste.

Also go through the following link

<https://www.weforum.org/agenda/2023/03/the-ipcc-just-published-its-summary-of-5-years-of-reports-here-s-what-you-need-to-know/#how-is-this-ipcc-report-different-from-previous-ones?>

The Intergovernmental Panel on Climate Change (IPCC) has just launched its latest report on the climate crisis.

The AR6 Synthesis Report: Climate Change 2023 summarizes five years of reports on global temperature rises, fossil fuel emissions and climate impacts.

Here are the main findings of the IPCC report and what needs to happen to limit global warming to below 1.5°C.

The viability of humanity living within planetary boundaries rests on the actions we take in the next seven years. There's no time to lose to keep to the target of limiting the global average temperature to below 1.5°C.

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

This is the conclusion of the Intergovernmental Panel on Climate Change (IPCC) in its latest report, which sets out to summarize the scientific data on global temperature rises, fossil fuel emissions and the impact of the climate crisis.

The AR6 Synthesis Report: Climate Change 2023 finds that, despite progress in policies and legislation around climate mitigation since the previous such report in 2014, it's "likely that warming will exceed 1.5°C during the 21st century".

This is based on the expected levels of global greenhouse gas (GHG) emissions in the atmosphere by 2030, based on all countries' climate targets – known as nationally determined contributions or "NDCs" – announced as of October 2021.

Limiting warming to "well below 2°C", by 2030, as per the Paris Agreement targets, will be hard to achieve, but avoiding 1.5°C is still possible.

The report also lays out the economic imperative for taking action, finding that the "global economic benefit of limiting global warming to 2°C exceeds the cost of mitigation in most of the assessed literature".

Here's what you need to know about the latest IPCC report, its findings and what needs to happen to ensure we stay on track to meet climate goals.

How is this IPCC report different from previous ones?

The Synthesis Report (SYR) is the culmination of a cycle of reports (the Sixth Assessment) that have been published over the past five years.

Since the Fifth Assessment Report cycle, which ended in 2014, there has been an intensified focus around the globe on the climate crisis and efforts to mitigate its impacts, with the annual Conference of the Parties (COP) meetings driving this progress.

This report is the summary of all reports of the IPCC's 6th Assessment Cycle that were published between 2018 and 2023, which covered, including the landmark Global Warming of 1.5°C, the more recent reports demonstrating how anthropogenic greenhouse gases are causing unprecedented damage, and the report demonstrating that at current levels, many parts of the planet will become unliveable in the next few decades.

Agenda

IPCC report: urgent climate action needed to halve emissions by 2030

This summary report demonstrates an undeniable scientific consensus about the urgency of the climate crisis, its primary causes, its current devastating impacts – especially on most climate vulnerable regions – and the irreversible harm that will occur if warming surpasses 1.5°C, even temporarily.

Its aim is to provide policymakers with a high-level, up-to-date understanding of climate change, its impacts and future risks, and highlight solutions and options for addressing it.

As the next cycle, the Seventh Assessment Report, is not expected before at least 2027, this report provides the foundation for what will be a critical seven-year period to 2030.

We're not going to have this time again, where we know what the situation is so conclusively. This scientific consensus, combined with the fact that the majority of climate solutions to avoid the worst consequences of climate change exist, provides a unique opportunity for us to address the gaps and take action.

What are the main findings of the AR6 report?

The new report, written by 39 scientists, is separated into three sections arranged by timeframes: Current Status and Trends looks back through history to the present day; Long-term Climate and Development Futures projects scenarios to 2100 and beyond; and Near-term Responses in a Changing Climate looks at current international policy timeframes between now and the 2030s.

Here are some of the main findings:

Human-caused climate change is already affecting many weather and climate extremes in every region across the globe – with widespread loss and damage to both nature and people.

GHG emissions will lead to increasing global warming in the near term, and it's likely this will reach 1.5°C between 2030 and 2035.

We are currently at around 1.1°C of warming and current climate policies are projected to increase global warming by 3.2°C by 2100.

The IPCC has "very high confidence" that the risks and adverse impacts from climate change will escalate with increasing global warming.

To keep within the 1.5°C limit, emissions need to be reduced by at least 43% by 2030 compared to 2019 levels, and at least 60% by 2035. This is the decisive decade to make that happen.

Losses and damages will disproportionately affect the poorest and most vulnerable populations, particularly those in Africa and least-developed countries, creating more poverty.

Prioritizing equity, social justice, inclusion and just transition processes would enable ambitious climate mitigation actions and climate-resilient development.

Tracked climate finance for mitigation falls short of the levels needed to limit warming to below 2°C or to 1.5°C across all sectors and regions.

Public and private finance flows for fossil fuels are still greater than those for climate adaptation and mitigation.

Among other measures to ensure energy systems are net-zero CO₂ emitters, we need a "substantial reduction in overall fossil fuel use, minimal use of unabated fossil fuels, and use of carbon capture and storage in the remaining fossil fuel systems; energy conservation and efficiency; and greater integration across the energy system".

Why do we need to listen to the IPCC?

The IPCC is the United Nations' (UN) global organization for assessing the science related to climate change and is made up of 195 member countries.

Thousands of experts from all over the world volunteer to objectively assess the latest scientific research and write reports for the IPCC, which are signed off by the governments of member countries.

Over the course of a week-long session held in Switzerland, the 58th Session of the IPCC, governments have approved the shorter Summary for Policymakers of the Synthesis Report line by line and have adopted the longer report.

This will then shape international climate change negotiations at the future COP meetings – the decision-making body of the UN Framework Convention on Climate Change.

Is it too late to stay within 1.5 °C?

We need to see 1.5°C not as a target but as a ceiling. Overshooting 1.5 °C means we are entering a danger zone, beyond planetary limits in which natural, animal and human life has flourished for millions of years.

As the IPCC report shows, we're not too late to avoid passing 1.5 °C, but the greatest threat is apathy. The impacts of climate change will only get worse.

The cost of inaction is far greater than the cost of action – and the financial implications will impact everyone, from governments to companies and families.

Every fraction of a degree counts. We're already seeing the disproportionate impact the warming of 1.1°C is having globally, particularly on the lives and livelihoods of more vulnerable communities.

The IPCC finds nearly half of the world's population live in this danger zone of climate impacts, where their lives and livelihoods are under threat from more frequent and intense extreme weather events, such as flooding and drought, which impacts on food and water security, as well as loss of vital natural ecosystems.

In reality, the difference between 1.5°C and 2°C degrees is not merely a temperature rise of 0.5°C – but as the chart below shows, it means climate risks will be at least two times worse.

We need to act now to protect climate-vulnerable communities, while also taking action towards a cleaner, healthier and more prosperous future.

Impacts at 1.5°C and 2°C of warming. IPCC AR6 Synthesis Report

Climate impacts at 1.5°C and 2°C of warming. Image: Climate Council

What needs to happen now and what is the World Economic Forum doing?

The solutions are out there to reduce emissions by at least 43% over the next seven years.

The IPCC highlights that to achieve this we need to transition “from fossil fuels without carbon capture and storage (CCS) to very low- or zero-carbon energy sources, such as renewables or fossil fuels with CCS, demand-side measures and improving efficiency”.

Governments, businesses, civil society and communities can work together to transform our energy, food, transport and manufacturing systems. This can be achieved through clear, courageous and concerted policies to further unlock the transformative power of financial markets, industry, and innovators.

Cumulative number of climate laws passed. IPCC AR6 Synthesis Report

Momentum is building to tackle climate change. Image: Alliance of CEO Climate Leaders

The UN Secretary-General António Guterres outlined a major new Acceleration Agenda in his video message to launch the Synthesis Report, which includes:

Ensuring net-zero electricity generation by 2035 for all developed economies and 2040 for the rest of the world.

Ceasing all licensing or funding of new oil and gas – consistent with the findings of the International Energy Agency.

Stopping any expansion of existing oil and gas reserves. Shifting subsidies from fossil fuels to a just energy transition.

Establishing a global phase-down of existing oil and gas production compatible with the 2050 global net-zero target.

Speeding-up efforts to deliver climate justice to those on the frontlines.

We have seen a miraculous breakthrough in renewables, where solar and wind are now the cheapest source of new power in countries representing 90% of electricity generation, and electric vehicles are projected price parity with internal combustion engines in the next 2-3 years.

We need similar breakthroughs across the so-called "hard-to-abate" sectors of heavy industry and long-haul transport – and this is where the World Economic Forum's work with the First Movers Coalition (FMC) is leveraging the power of demand to accelerate the supply of transformational near-zero-emission solutions.

Since it was launched at COP26 in 2021, 74 companies and 12 governments have joined this global, public-private coalition, which aims to decarbonize heavy industry and long-distance transport responsible for 30% of global emissions. To date, FMC represents a strong early market signal of \$12 billion in demand for near-zero-emission solutions.

Discover

How is the World Economic Forum fighting the climate crisis?

The World Economic Forum's Centre for Nature and Climate accelerates action on climate change and environmental sustainability, food systems, the circular economy and value chains, and the future of international development.

Through the Global Plastic Action Partnership, the Forum is bringing together government, business and civil society to shape a more sustainable world by eradicating plastic pollution.

Global companies are collaborating through the Forum's 1t.org initiative to support 1 trillion trees by 2030, with over 30 companies having already committed to conserve, restore and grow more than 3.6 billion trees in over 60 countries.

Through a partnership with the US Special Presidential Envoy for Climate John Kerry and over 50 global businesses, the Forum is encouraging companies to join the First Movers Coalition and invest in innovative green technologies to enable net-zero emissions by 2050.

The Forum is bringing global leaders together to reduce the environmental impact of value chains and make the \$4.5 trillion circular economy opportunity a reality. The African Circular Economy Alliance is funding circular economy entrepreneurs and circular economy activities in Rwanda, Nigeria and South Africa, while the Circular Electronics in China project is helping companies reduce and recycle 50% of e-waste by 2025.

Since launching in 2020, the Forum's open innovation platform UpLink has welcomed over 40,000 users who are working on more than 30 challenges crowdsourcing solutions to the climate crisis.

More than 1000 partners from the private sector, government and civil society are working together through the 2030 Water Resources Group to ensure availability and sustainable management of water and sanitation for all by 2030. The group has facilitated close to \$1 billion of financing for water-related programmes.

And we need to catalyse similar breakthroughs to transform our food systems. There is no way to keep 1.5°C alive without stopping and reversing deforestation, transforming our food and land use systems and protecting ocean ecosystems.

Today, agri-food systems are responsible for up to a third of emissions and are the primary driver of biodiversity loss. Our food and land use systems need to flip from carbon emitters to carbon sinks, and from a contributor to protectors of biodiversity, all while meeting global demand for food.

The green transition has multiple benefits beyond the immediate mitigation of climate change impacts. It could create 24 million new jobs globally by 2030, according to the International Labour Organization. And protect the 1.2 billion workers in farming, fishing, forestry and tourism activities that rely directly on a healthy and stable environment.

In the year from 2020 to 2021, employment in the renewable energy sector grew by 700,000, reaching 12.7 million jobs, according to the International Renewable Energy Agency.

Climate action is now essential to drive sustainable development. Failure to act could shrink global GDP by up to 18% in the next 30 years, according to the Swiss Re Institute.

The net-zero transition will require \$125 trillion by 2050 in climate investment. While this level of investment has yet to be achieved, momentum is building. In 2021, the world spent \$755 billion on low-carbon energy technologies, up 27% from the year prior.

Guterres looked ahead to COP28, which will be held in November 2023 in Dubai, calling for "all G20 leaders to have committed to ambitious new economy-wide nationally determined contributions encompassing all greenhouse gases and indicating their absolute emissions cuts targets for 2035 and 2040. The transition must cover the entire economy. Partial pledges won't cut it".