The Parliamentarians' Global Guide to Climate Change and Climate Solutions

2026-27



University of Exeter

Arizona State University

Inter-Parliamentary Union
For democracy. For everyone.

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Youth Foreword

We do not inherit the Earth from our ancestors; we borrow it from our children.

Opportunities for action:

- Advocate for stronger Nationally Determined Contributions (NDCs).
- Join the Universal NDC Youth Clause Coalition.
- Invest in adaptation, education, and green workforce infrastructure.

In this role, I am focused on delivering real inclusion and amplification of youth voices across COP31, ensuring their perspectives are not only heard but embedded in decision-making processes and outcomes.

Sally Higgins,
COP31 Presidency Youth Climate Champion

Climate impacts once seemed distant – something left for another generation, another time. Yet tomorrow has never felt quite so close, or so unpredictable. This is no longer a distant warning; we are living in the age of consequence.

These consequences have real impacts. Children are missing school, families are losing homes, and communities are nearly out of time. UNICEF reports that at least 242 million children have experienced school disruptions due to climate events. The UN High Commissioner for Refugees has documented some 250 million internal displacements caused by weather-related disasters in the past decade. These challenges will only intensify without action.

Human well-being is contingent upon planetary health. Indigenous wisdoms have long recognised that humanity and the natural world are intimately connected, and that our decisions today will affect not just ourselves, but those who will one day inherit the world. Our futures depend upon combining this ancient wisdom with environmental stewardship and decisive political will, not only to recover, but to build back better.

The imperative to act is not only moral, but legal. The 2025 International Court of Justice ruling affirmed what young people across the globe have been advocating for years: governments have a legal obligation to act on climate change.

We are not short on solutions. Renewable energy is now largely cheaper than fossil fuels. There are best practices for delivering climate education, driving workforce development in the green skills economy, and integrating community solutions into planning processes. Adaptation strategies, from early warning systems to climate-resilient infrastructure, are already protecting lives in communities around the world. Technology, including AI, can help us better understand climate risks, strengthen resilience, and accelerate these solutions if deployed responsibly and equitably. To translate international climate commitments into meaningful action for future generations, parties must strengthen and deliver their updated Nationally Determined Contributions (NDCs).

We require your brave leadership to navigate this age of uncertainty, to chart a sustainable path forward for healthy people and a healthy planet. We call on you to work interculturally and intergenerationally, follow through on the climate goals that you set, and prioritise equity for all. As young people, we often look to our elders for guidance. Do they know that they can look to us, too?

Youth foreword by:

Julie Ann Wrigley Global Futures Laboratory, Arizona State University · Care About Climate · TNU · Villars Institute · ISU Istinye University Istanbul · Purple Mai'a

Elders' Foreword

Ahead of COP31, the Elders urge parliamentarians everywhere to tackle the climate emergency with courage, cooperation and long-term vision.

Geopolitical events this year have spiked public concern over energy security and affordability. At the same time, the growing impacts of extreme weather have made the need for climate action increasingly clear.

This poses a critical challenge for parliamentarians across the globe.

Global surveys show a strong public desire for climate action: 89% of people worldwide want governments to do more. While a vocal minority is opposing climate action, the vast majority of people want to see leaders deal with the problem.

All this should inspire leaders to deliver. Yet, policymakers in many countries are now lagging behind public opinion.

Along with several of my fellow Elders, I started my career in public life in parliament - as a Senator in the Seanad Éireann. I am proud to have used this platform as a way to campaign for greater liberalisation in Irish society and promote women's rights and leadership.

Today, at this critical moment for humanity, parliamentarians have an equally important role to play in finding fair and sustainable solutions to tackle the climate crisis. Citizens are looking to their elected representatives to match the scale of the challenge with ambitious, urgent action.

This is why the Elders are calling for "long-view leadership" to tackle existential threats like the climate and nature crisis. This means showing the determination to resolve intractable problems, not just manage them; the wisdom to make decisions based on scientific evidence and reason; and the humility to listen to all those affected.

Crucially, long-view leadership must also be intergenerational, giving space and respect to the views and needs of young people who will inherit the world we leave behind us and serve as the parliamentarians of tomorrow.

Mary Robinson, on behalf of The Elders – the group of independent global leaders founded by Nelson Mandela who work for peace, justice, human rights and a sustainable planet.







Mary Robinson with Brianna Fruean, an activist and environmental advocate for Samoa.

Fundamentals of climate change

Opportunities for action:

- Encourage your government to join and implement the Global Methane Pledge, and promote legislation that strengthens action in sectors including oil and gas, waste management and agriculture.
- Encourage your government to support the development of the Fossil Fuel Non-Proliferation Treaty.
- Encourage your government to accelerate implementation of the Roadmap on Halting and Reversing Deforestation and Forest Degradation by 2030.

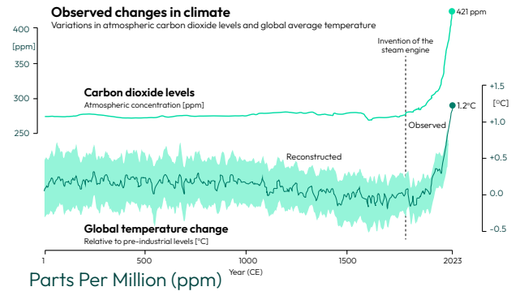
Methane is responsible for roughly a third of the global warming we are experiencing today. Although it is much shorter-lived in the atmosphere than CO_2, it has around 80 times the warming potential of CO_2 over a 20-year period. Scientists estimate that cutting human-caused methane emissions by 45% this decade could avoid nearly 0.3°C of global warming by 2045.

***Honourable Dickson Kyere-Duah,** Member of Parliament for Berekum West Constituency, Parliament of Ghana.*

Unprecedented rate of change

Greenhouse gases such as carbon dioxide (CO_2) and methane occur naturally in the atmosphere, but we have been adding to them – mainly through burning fossil fuels for energy production. Fossil fuels are essentially ancient plant and animal matter that was buried and compressed over millions of years. By burning fossil fuels, we have put a large amount of that carbon back into the atmosphere in just a couple of centuries. We currently release about 38 billion tonnes of fossil CO_2 a year, and a further 4 billion tonnes from land-use change such as deforestation. Atmospheric CO_2 is now at a higher concentration than at any time since humans evolved, warming the planet and threatening Life-supporting systems.

While the climate has always changed, the rate of change produced by this rapid increase in concentration of CO_2 and other greenhouse gases over the historical period is unprecedented compared to natural climate cycles. We should be in a cooling period, but instead the climate is warming rapidly. 2024 and 2025 were the hottest years on record and – for the first time – the world reached 1.5°C above pre-industrial levels in those two years. It is now unavoidable that warming – as measured over the longer term, not just single years – will cross 1.5°C, the central long-term temperature threshold of the Paris Agreement.



Carbon dioxide levels and global temperature over the past 2023 years. Carbon dioxide data from air bubbles enclosed in Antarctic ice. Global temperature data from the PAGES2k project. Credit: Professor Ed Hawkins, National Centre for Atmospheric Science.

Consensus view

The fact that a warming planet is chiefly the result of human activity is well researched and documented. The "greenhouse effect" – the trapping of heat by certain gases in the atmosphere – has been known about since the 19th Century and the first detection of human-caused warming was in the 1930s. Climate models have been able to predict warming with increasing accuracy since around 1970. The 2023 assessment report of the Intergovernmental Panel on Climate Change (IPCC), representing a consensus view among scientists of all nations, states: "Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming."



It is also a fact that further greenhouse gas emissions will lead to more warming of the Earth unless we reach "net-zero" emissions – meaning that any remaining human-caused greenhouse gas emissions have to be balanced by equal human-caused greenhouse gas removals. Even then, while global temperatures would stabilise, some of the impacts of warming – such as sea-level rise – would continue to worsen for a long time.

To meet global goals and reach a safe and sustainable future, we need a rapid and sustained strong decline in global greenhouse gas emissions, reaching net zero around mid-century. Currently, technology-based CO_2 removal (CDR) is less than one millionth of global annual human-caused emissions.

About half of our CO_2 emissions are currently absorbed by the ocean and land ecosystems – highlighting the urgent need to protect and restore the natural world. The rest remains in the atmosphere, driving climate change. Further climate change will reduce the efficiency of both the ocean and land ecosystems to absorb CO_2, reinforcing the need to reach net zero and stop further warming as quickly as possible.

Risks rise

The goal set by the Paris Climate Agreement was to stay well below a warming of 2°C relative to pre-industrial times, and to pursue efforts to limit that even further to 1.5°C. These values were chosen as a combination of achievability and what is believed to be necessary to avoid dangerous irreversible climate change, especially "tipping points" that could cause drastic, irreversible change – with enormous costs for nature, people and economies. The risks rise as the global temperature increases. While we are certain to "overshoot" 1.5°C, every fraction of a degree and every year spent above 1.5°C matters. As the UNEP 2026 Limiting Overshoot report puts it: "Overshoot is not an argument for resignation, but rather for urgency to action."

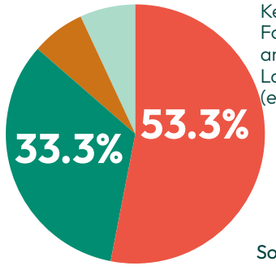
We know that an average warming of 1.5°C produces many more weather and climate extremes. A warmer atmosphere can hold more water, as well as more energy. This means we will see more rainfall as well as temperature extremes. We are already observing increased floods, hurricanes, fires, droughts, heatwaves, biodiversity loss, and movement of plant, human and animal pathogens into new areas.

Predicting societal impacts is more complex, but we are already seeing loss of food, water and energy security, and this could lead to increased global conflict. If we don't act fast to reduce emissions, adverse impacts will continue to intensify. The extent to which current and future generations will experience a hotter and different world depends on choices taken now and in the near-term.

Proportion of global warming since pre-industrial times caused by different greenhouse gases

Nitrous Oxide (NO_2)
Key sources: Agriculture (fertilisers and manure), Fossil fuels and industry.

Carbon dioxide (CO_2)
Key sources: Fossil fuels and industry, Land-use change (e.g. deforestation).



Methane (CH_4)
Key sources: Agriculture, Fossil Fuels, Landfills and waste.

Source: IPCC

	Atmospheric lifespan	Potency compared to CO_2	
CO_2	CENTURIES		
CH_4	12 Years	x80 Over 20 years	x28 Over 100 years
NO_2	109 Years	x273 Over 20 years	x273 Over 100 years

Climate TRACE is a global non-profit coalition that creates data tools to help reduce climate pollution. It operates an open-access database covering more than 745 million emissions sources, provides air pollution modelling to show local impacts, and is launching a tool to help policymakers develop bespoke decarbonisation plans. See **ClimateTRACE.org/reduce**

It also offers free technical support to governments to create and implement emission reduction projects. Contact: **coalition@ClimateTRACE.org climatetrace.org/air-pollution**

Nature and biodiversity loss

Opportunities for action:

- Reform the system of incentives and disincentives (including public subsidies) to support a transition to sustainable and more resilient practices in key economic sectors.
- Develop “nature-repair” legislation and financing in support of climate change mitigation and adaptation.
- Ensure your government has published – and funded – a National Biodiversity Strategy and Action Plan.

For every dollar that flows into nature-based solutions, around 30 flow into activities that degrade nature. Parliaments hold much of the answer to that imbalance, through budgets, subsidies and the rules they set for finance.

Jessica Smith,
Head of Nature, UN Environment Programme Finance Initiative.

Biodiversity: Climate and humanity’s best ally

Climate science is crystal clear: the crisis cannot be addressed without preserving and restoring healthy ecosystems and thriving species populations. In one word: biodiversity.

Biodiversity contributes to the exceptionally stable climate we have experienced for thousands of years. But climate change and biodiversity loss are mutually reinforcing crises. While reducing emissions to net zero is key, it won’t keep us within safe climate scenarios unless we also preserve ecosystems’ ability to sequester and store carbon. Two figures above all speak volumes:

- Over recent decades, land and ocean ecosystems have absorbed over 50% of all human-caused carbon dioxide emissions.
- Ecosystems on land – from forests to grasslands and wetlands – store the equivalent of up to 9,000 gigatons of CO_2 in soil, organic matter and living plants. This is equivalent to over 200 years of human CO_2 emissions at current levels.

The ocean floor stores a staggering additional 8,000 gigatons in the top metre alone. Disturbing these systems, from deforestation to trawling and deep sea mining, ends up releasing huge amounts of CO_2. The 2022 Canadian forest fires released the equivalent of the annual emissions of Japan.

Healthy species populations are also key, as they are the foundation of well-functioning ecosystems and play a direct carbon sequestration role. It is estimated that, on average, a single whale stores over 30 tons of CO_2 equivalent in its body. Moreover, whales dive deep to feed and return to the surface to excrete iron- and nitrogen-rich faeces, fertilising surface waters and triggering blooms of phytoplankton. Phytoplankton capture CO_2 through photosynthesis, functioning as the ocean’s primary carbon scrubber.

Ecosystems also regulate water cycles, reduce flood and drought risks, mitigate extreme weather and buffer coastal communities against storms. IPCC concludes with high confidence that conserving ecosystems and protecting 30-50% of the Earth’s land, freshwater and ocean areas is fundamental to maintaining climate resilience, safeguarding ecosystem services, and supporting sustainable development.

The socio-economic rationale is equally compelling. Declining biodiversity does not only impact climate security but also water and food security, infrastructure, public health and global supply chains. Hence biodiversity loss should not be perceived as an isolated environmental issue, but also a systemic risk affecting society and the economy - a security issue for humanity today and in the future.



Climate change itself has become one of the fastest-growing drivers of biodiversity loss, through causes ranging from forest fires to coral bleaching and decline of fish stocks. The IPCC projects that beginning at 1.5°C of global warming, ecosystems face increasingly severe risks, with natural adaptation reaching hard limits in many regions. At 2°C, the proportion of plant and vertebrate species losing half of their geographic range doubles compared to 1.5°C; insect loss - including pollinators - triples.

Conversely, biodiversity action strengthens climate action. Nature-based solutions – including ecosystem conservation and restoration, marine and terrestrial protected areas, sustainable forest management, and regenerative agriculture – can lock away greenhouse gases and increase resilience. However, these measures must complement, rather than replace, rapid reductions in fossil fuel emissions.

For policymakers, the implication is clear: climate and biodiversity policies should be designed, financed and implemented as part of a coordinated effort on climate. Net-zero emissions and net-positive biodiversity are mutually supporting targets. A nature-positive society and economy is essential to addressing the climate crisis – and many other challenges facing humanity, while supporting all life on the planet.

Convention on Biological Diversity (CBD)

The CBD is the global treaty on nature, signed by 196 Parties, and in force since 1993. Its current mandate is the Kunming-Montreal Global Biodiversity Framework (GBF), agreed in 2022: 23 targets for 2030, including conserving and managing 30% of land, inland water and coastal and marine areas, restoring 30% of degraded ecosystems, mobilising at least $200 billion a year for nature, and identifying and eliminating at least $500 billion a year of subsidies harmful to biodiversity.

Unlike the Paris Agreement, the GBF creates no legally binding targets itself. Its obligations flow indirectly, through the CBD’s existing requirement that parties maintain National Biodiversity Strategies and Action Plans (NBSAPs) – which become real only through domestic legislation, budget lines and departmental mandates.

Progress is currently too slow. The UN’s first review found the world falling short on 22 of the 23 targets, with only 45% of countries having published an NBSAP in time to be considered. On harmful subsidies, only 16% of Parties met the 2025 deadline to report what they had identified. Roughly 18% of land and 10% of the ocean now sit inside protected areas, but only around 3% of the ocean is fully or highly protected. Rapid action is required.

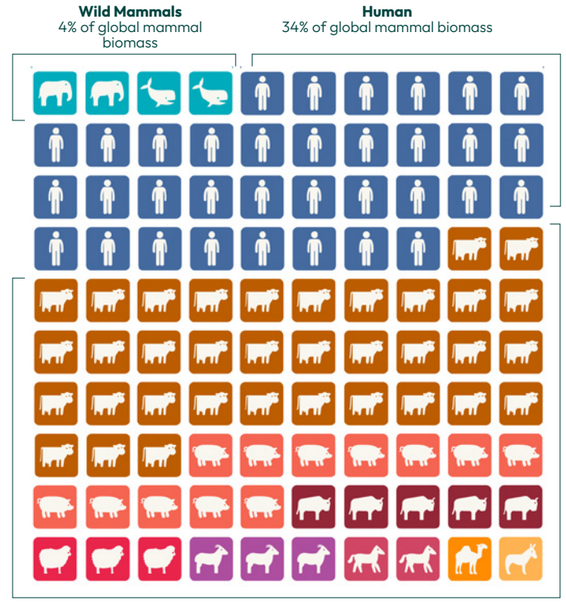
Nature and security

Biodiversity loss is increasingly recognised as a national security risk. Security, resilience and prosperity depend on functioning ecosystems at home and abroad. Degradation of forests, soils, oceans and freshwater systems can undermine food production, disrupt global supply chains and increase competition for scarce resources. This could mean higher food prices, reduced availability of essential commodities, pressure on public finances, and greater exposure to overseas instability.

These risks compound with climate change – extreme weather and ecosystem degradation can amplify economic, health and social shocks. Treating nature as essential infrastructure is therefore critical: restoring wetlands, rivers, soils and woodlands can strengthen resilience to flooding, drought and other climate extremes while supporting biodiversity and communities.

Distribution of mammals on Earth

Mammal biomass is measured in tonnes of carbon, and is shown for the year 2015. Each square corresponds to 1% of global mammal biomass.



Source: Our World in Data. Licensed under CC-BY by the authors Hannah Ritchie and Klara Auerbach.

Ocean and poles

Opportunities for action:

- Join other nations in signing the Deep-Seabed Mining Moratorium.
- Ratify the ITLOS Climate-Ocean Liability legal opinion (states must reduce emissions) into national law as an accountability/ deterrence tool requiring emissions cuts.
- Support national policies to ratify the BBNJ High Seas Treaty, and push to remove the worst subsidies under the WTO Fisheries Subsidies Agreement before 2029.

For the Pacific, the ocean is never just 30% – it is identity, it is livelihood, it is everything.

'Ofa Ma'asi Kaisamy,
Commonwealth Blue Charter Adviser.

The ocean holds the majority of Earth's biodiversity, absorbs vast amounts of carbon, and generates much of the oxygen we breathe. Still, we treat it as invisible, as though it can endlessly absorb our waste and withstand our extraction.

Dr Sylvia Earle,
Oceanographer and Founder of Mission Blue, SEAlliance, and Deep Ocean Exploration and Research.

Protect the poles to preserve global climate

The Arctic and Antarctic are changing rapidly due to global greenhouse gas emissions: the Arctic is warming at nearly four times the global rate; the Antarctic about double. The resulting changes to polar sea ice and glaciers (and the growing threat of abrupt permafrost thaw), have serious knock-on effects for us all.

Sea ice is a major insurance policy against runaway climate change: ice reflects sunlight back into space, cooling the planet, while darker seawater absorbs heat instead. In the last 50 years, we have lost about half of Arctic sea ice by surface area, and about 75% by volume. And in the last 10 years, Antarctic sea ice has remained largely below its long-term average (with successive record summer lows between 2022 and 2025) potentially signalling a fundamental shift in Southern Ocean regulation.

On land, polar ice sheets and glaciers are melting rapidly, and their contribution to sea-level rise is growing fast. Global sea levels have risen by over 20cm since industrialisation (half of that in the last 30 years alone). Historically, this has mostly come from thermal expansion of ocean water and small glaciers, with ice sheets contributing comparatively little. All that is changing: polar ice-sheet melt alone has added over 21mm to sea levels in the last 35 years; a six-fold increase over this time.

Evidence suggests we are approaching several tipping points that could lead to irreversible change, including the dynamic collapse of the West Antarctic ice sheet and the melting of the Greenland ice sheet. When ice sheet losses come to dominate sea-level rise, several metres of change are possible: under strong warming, the IPCC states sea-level rise could exceed 2 metres by 2100, and 5 metres by 2150 – enough to submerge many coastal cities and island nations.We have a duty to current and future generations to reduce global emissions to protect the poles. By doing so, we protect the entire planet.

Blue Planet: Red Alert

The ocean is Earth's most powerful climate regulator, absorbing 90% of the excess heat from greenhouse gas emissions, and sequestering 30% of global CO_2. It is critical to stabilising our climate and planetary systems. Three interconnected threats are destroying this climate lifeline: ocean warming, acidification, and deoxygenation, which amplify one another in a destructive feedback loop.

Warming driven by greenhouse gas emissions triggers coral bleaching, rising sea levels, changing currents, and extreme marine heatwaves that disrupt weather patterns, coastal protections and livelihoods. Acidification, caused by the ocean absorbing excess fossil-fuel generated CO_2, lowers pH and depletes carbonate, harming shell-building species and fish stocks vital to food security. Deoxygenation from warming, greater water stratification, and pollution shrinks habitable zones and alters ecosystems, reducing biodiversity and undermining ocean resilience.

Meanwhile, fossil fuel derived industries pollute the ocean with plastics, toxic waste water, and agricultural run off from chemical fertilisers, while ship noise interferes with marine life's communication and migration. These pollutants intensify climate stress by disrupting carbon-storing species and degrading the ocean's ability to buffer warming.

Precautionary principle
Ocean governance is fragmented – rendering it less effective than it could be. Protecting the ocean means applying the precautionary principle with science-based mandatory standards, independent monitoring, economic sanctions for violations, and criminal liability for environmental destruction (known as Ecocide Law). By reducing fossil fuel emissions, plastic and chemical production, ending destructive subsidies, applying strict pollution controls, and recognising the ocean ecosystem as a rights-bearing entity, we can effect rapid change for a healthy ocean. But these tools cannot succeed without inclusive governance that combines the best available science with diverse knowledge systems, embedding Indigenous peoples' and local communities' expertise in law. Current GDP measures count ocean destruction and overextraction (e.g. deep seabed mining and overfishing) as positive growth, ignoring trillion-dollar ecosystem services.



Fishing

Fishing feeds 3.3 billion people. Small-scale operations deliver over 40% of global catch and fight poverty in low-income nations.

Well-managed fishing is sustainable – but chronic mismanagement, overfishing, and destructive methods have depleted and collapsed at least a third of fish populations and their ecosystems, and probably more. Climate disruption worsens the crisis: warming redistributes fish, causing tropical/polar losses and mid-latitude gains. Overfishing (aided by US$22 billion in harmful subsidies) and unsustainable forms of fish farming contribute to climate breakdown by destroying carbon sinks and accelerating ecosystem collapse. Bottom trawling releases more CO_2 than many countries annually, while deep seabed mining (an unproven, unnecessary industry) threatens ancient carbon stores and irreplaceable ecosystems (formed over millions of years) that regulate ocean chemistry. Warming is reducing primary productivity, while deoxygenation stunts fish growth, shrinks sizes, and hampers reproduction, eroding yields.

These converging threats demand a new, precautionary approach to build resilience for the future. This approach combines reduced exploitation rates with elimination of destructive and unselective fishing methods, and establishing highly or fully protected areas for 30% of the ocean. The World Trade Organisation Agreement on Fisheries Subsidies and BBNJ High Seas Treaty are positive steps.

Three major wins for ocean protection

Win	What it does	What's next?
WTO Fisheries Subsidies Agreement (enacted Sep 2025)	Bans subsidies for illegal & overfished fish populations. Created Fish Fund to support developing nations' implementation.	BUT: Doesn't ban subsidies fuelling overfishing (fuel, fleets, technology). Next stage of negotiations moving too slowly. No deal by Sep 2029 = agreement fails.
BBNJ High Seas Treaty (30×30) (enacted Jan 2026)	Legally binds 78+ nations to protect 61% of the ocean, paving the way to protect 30% of the High Seas by 2030.	BUT: Choosing protection zones is contentious. Only 1.5% of the High Seas have been protected. Designated protected areas must be effectively managed and monitored.
ITLOS Climate-Ocean Liability Opinion (issued 2024)	Confirms greenhouse gases constitute pollution of marine environment under international law. Companies legally accountable for foreseeable damage.	BUT: Requires national implementation to become an effective deterrent.

International shipping carries 90% of global trade, relies on fossil fuels, 40% of its cargo consists of those same fuels. The industry emits over one billion tonnes of CO_2 annually. Urgent action is needed to improve efficiency, switch to cleaner fuels and rethink trade geography via regional supply chains.

Adaptation

Opportunities for action:

- Secure fair and effective funding mechanisms to support adaptation in vulnerable states.
- Advance climate-resilient cities alongside actionable targets to minimise cities' exposure to climate risks including heatwaves, while advancing low-carbon urban systems.
- Develop integrated approaches to food security, resilient farming systems, and water management.

The most climate-exposed nations on Earth should not be the hardest ones to reach with climate finance. For atoll nations like Kiribati, readiness and accreditation must be simplified – because the delays fall hardest on those least able to wait.

Hon Ruth Cross Kwansing,
Minister for Women, Youth, Sport and Social Affairs in Kiribati.

Adaptation for climate-resilient development

Adapting to climate change has emerged in the last decade as a policy priority. With global warming set to overshoot 1.5°C, there is a pressing need to accelerate adaptation to protect people, biodiversity, food production, and economies - while also cutting emissions and recognising the hard limits to adaptation.

Food security and access to water are particular vulnerabilities. For example, UNEP estimates a decline of up to 14% in global food production by 2050 in the absence of effective adaptation, and nearly three quarters of the world's population already live in countries classified as water-insecure or critically water insecure. Small island states and some low-lying coastal communities face a catastrophic "collapse of habitability", and cities face growing risks including heatwaves and flooding.

Intergenerational challenges
Both older people and children are sensitive to intensifying heat and humidity. Children aged 0-9 years are already three times more likely to be exposed to severe heat stress under current global temperatures. As warming exceeds 1.5°C, it is anticipated that children who were aged 10 or younger in the year 2020 will experience a nearly four-fold exposure to extreme events. Considering the needs of children, elderly, disabled, indigenous and other marginalised communities can accelerate adaptation action in dangerous climates.

Adaptation Indicators agreed
At COP30 in Belém, 59 Adaptation Indicators were agreed to help track adaptation efforts including water management, health, ecosystem conservation, food security, poverty alleviation and preservation of cultural heritage. Effective adaptation requires investment in systems, including: grey infrastructure such as transport, energy and early warning systems; blue-green infrastructure such as water and ecological systems; and social infrastructure including social protection, health and education systems.

Finance gap
The lack of adaptation funding available for Least Developed Countries (LDCs) puts achieving the Global Goal on Adaptation (part of the Paris Agreement) at risk. While governments at COP30 agreed to triple adaptation finance by 2035, concerns have been expressed that this revised target will not cover more than a third of estimated adaptation funding needs by 2035 and does not meet the requests of LDCs, small island states, and the African Group at COP who called for "a tripling of grant-based adaptation finance by 2030 to at least US$120 billion". UNEP's 2025 Adaptation Gap Report estimated US$310-365 billion per year will be needed by 2035 to enhance the adaptive capacity and resilience of LDCs, but international public adaptation finance flows from developed to developing countries have been falling.

Food systems and genetic diversity
Effective adaptation also includes resilient food systems. Temperature is one of the most critical environmental factors governing plant growth. Plant genetic diversity is a vital foundation of climate resilience. Conservation and biobanking preserves traits needed for future food production. Biotechnology and genomic tools, including DNA barcoding, sequencing and advanced genotyping, can improve the identification of these resources and accelerate the development of crops resilient to heat, drought, salinity, pests and diseases and is a strategic investment in food security, biodiversity and long-term societal resilience.

Legal obligations
The International Court of Justice (ICJ) landmark ruling of 2025 observed that states must protect the environment and climate system from greenhouse gas emissions and – along with mitigation – the ICJ identified adaptation as a "major area of action". The court also observed that within national contexts, parties have binding obligations to "formulate, implement, publish and regularly update" adequate adaptation efforts, and that developed countries "shall" assist vulnerable developing countries in meeting the costs of adaptation, including funding and transfer of technology.

The ICJ ruling underscores the obligations of states to make best efforts to protect people, economies and biodiversity, and support the most vulnerable nations including small island states, in an increasingly dangerous climate.

Water is where much of the climate crisis becomes tangible in people's everyday lives. Climate change is making the water cycle more variable and extreme - bringing too much water, too little water, or water at the wrong time, while also threatening its quality. Droughts, floods and changing rainfall patterns affect drinking water supplies, sanitation, food and energy production, ecosystems, public health and economic development, with the greatest impacts often falling on communities with the least capacity to adapt. Building climate resilience therefore requires putting water at the centre of climate policy: strengthening monitoring and early-warning systems, protecting watersheds and groundwater, investing in climate-resilient water and sanitation infrastructure, and managing water at basin scale through institutions capable of making transparent and adaptive decisions under uncertainty. For parliamentarians, this means connecting water, climate and development policies.



India's Heat Action Plans
India was an early adopter of Heat Action Plans (HAPs), with cities and states developing early warning, public awareness, health-system preparedness and measures to protect vulnerable populations. The cities of Ahmedabad and Surat show how HAPs have evolved – and what is needed in the future.

Ahmedabad's HAP – launched after a deadly heatwave in 2010 – includes an early warning system linked to temperature thresholds, public communication, community outreach, health-worker preparedness, and inter-agency co-ordination. Later, it incorporated longer-term measures including cool roofs. The HAP demonstrates the value of treating extreme heat as a preventable public-health risk, and of linking temperature warnings with co-ordinated action. Surat's HAP maps urban heat spots and assesses the vulnerability of low-income populations in those areas. It recognises that housing conditions, livelihoods, access to water and cooling, and women's responsibilities for cooking, caregiving and water collection can increase heat vulnerability. Surat demonstrates how HAPs can take account of where the vulnerable populations live, why they face greater heat exposure and what limits their capacity to adapt.

Next-generation HAPs
Warming cities must move beyond seasonal emergency response towards more institutionalised, adequately financed and equitable HAPs. Ultimately, success will depend on who is reached and whether heat-related risks and inequities are reduced.

- The Global Parliamentary Water Network focuses on strengthening lawmaking, budgeting, and accountability to accelerate progress on water and climate change adaptation. **watercaucus.org**

Climate and health

Opportunities for action:

- Recognise climate change as a health emergency and legislate for commensurate national responses.
- Mandate rapid reductions in greenhouse gas emissions as a public health priority, setting legally binding decarbonisation roadmaps and targets that account for and maximise health benefits.
- Invest in resilient, low-carbon health systems, increasing funding for climate-resilient and zero-emission healthcare infrastructure.

> *The climate crisis is a health crisis for individuals, but also for health systems.*
>
> ***Dr Tedros Adhanom Ghebreyesus,*** *WHO Director General.*

The growing health impacts of climate change

By destabilising the environment on which health and wellbeing depend, climate change is already affecting people in every country. Rising temperatures increase exposure to extreme heat, worsen chronic respiratory, cardiovascular and neurological conditions, contribute to adverse birth outcomes and affect mental health. In 2023, heat-related deaths reached a record 710,000 globally, with 72% directly attributable to human-induced climate change.

Climate change is intensifying wildfires, flooding and hurricanes. Persistent drought threatens sanitation, water and food security. Between 2016 and 2025, 13% more global land area experienced extreme droughts, while increased heatwaves and droughts contributed to 127.9 million additional people experiencing food insecurity in 2024 (compared to the average from 1981-2010).

Climate change is altering the distribution and transmission of infectious diseases, exposing new populations and health systems to unfamiliar threats. From 1981-90 and 2016-25, annual average transmission suitability for dengue increased by 24.39% for the *Aedes albopictus* mosquito, and 7.39% for *Aedes aegypti*. Malaria and West Nile virus transmission are also shifting geographically, while the global burden of vibriosis reached an estimated 738,000 cases in 2025.

> Reducing health risks from extreme heat requires increasing adaptive capacity through city-to-person-level adaptation strategies; from increasing heat-resilient infrastructure, shade cover, and new technologies (e.g. passive cooling) to effective personal-level behavioural changes (e.g. adjusting activity, seeking cooling), augmented by improved health status and thus lower heat susceptibility.

Health systems face growing pressures from increased healthcare demand and direct impacts on services and infrastructure. Healthcare workers are experiencing adverse effects on their physical and mental health, with climate-related events increasingly impairing their performance.

These impacts have cascading economic consequences through increased health and social care costs, labour absenteeism, reduced labour capacity and macroeconomic impacts. Heat exposure reduced labour productivity by an estimated 573 billion potential work hours in 2025, resulting in potential global income losses of US$1.07 trillion. Climate change impacts on malaria, dengue, diarrhoea and heat-related mortality in low- and middle-income countries (LMICs) could surpass a total loss of US$21 trillion by 2050. Individuals are increasingly exposed to multiple concurrent hazards that can aggravate one another. These cascading impacts across health, economic, social and environmental systems are difficult to quantify but threaten national resilience, security and sustainable development.



Urgent need for health-centred adaptation

Health systems must strengthen infrastructure, ensure continuity of essential services, and increase capacity to respond to changing climate hazards. Climate-informed disease surveillance, early-warning and rapid-response mechanisms - delivered in collaboration between meteorological, health and emergency response services, and enabled through adequate funding - are essential to anticipate and reduce harm. Climate change education and preparedness of health professionals are equally essential to enable a health-protective response.
Health sector adaptation can deliver stronger health systems and reduced inequities, and offers the highest return on investment of any sector. Protecting health also requires adaptation across buildings, water, food and urban systems. Such measures can deliver wider health benefits: increasing urban greenspaces, for example, can reduce temperatures by 1-7°C while improving air quality and physical and mental health.

Mitigation as a public health imperative

While adaptation is essential, its costs and limitations will grow with every increment of warming. Rapid and sustained climate mitigation is therefore essential to prevent hazards exceeding the capacity to adapt. The actions needed can also deliver major and near-term health benefits.

Replacing fossil fuels with clean energy can prevent the estimated 2.73 million deaths each year from fossil fuel-derived air pollution, alongside around two million deaths from solid-fuel household air pollution. Affordable public transport and active travel can improve air quality and promote physical activity, while healthier, sustainable diets could prevent an estimated 10.5 million deaths attributable to unhealthy diets.

However, mitigation must account for health to avoid unintended harms. Critical-mineral extraction can expose communities to pollution and occupational hazards; unequal access to clean energy can worsen health inequities, and building retrofits that don't account for health risks can increase overheating and poor air quality. Placing health at the centre of climate policy, with health professionals engaged in planning, is essential to maximise benefits and minimise harms. Integrating health into climate legislation, investment and oversight is vital and could deliver transformational health gains.



Climate finance

Opportunities for action:

- Push for simplified access and accelerated approvals to climate finance.
- Support WTO subsidy reform to enhance sustainability.
- Strengthen concessional finance for adaptation and vulnerable countries.

> *Banks play a pivotal role in addressing climate change, providing capital, financial advisory and risk management for building a sustainable future.*
>
> ***Hedwige Nuyens,***
> *International Banking Federation MD*

The climate challenge beyond COP30: finance, debt and delivery

As the world approaches COP31, priorities are well established: scaling up finance, improving access to funding, accelerating technology transfer, strengthening institutional capacity, addressing debt vulnerabilities, and deepening international cooperation.

The world remains off-track on almost every major climate target. While investment in clean energy continues to grow, progress on emissions reduction is still insufficient to meet the goals of the Paris Agreement. According to the International Energy Agency (IEA), global energy investment reached approximately US$3.3 trillion in 2025, including US$2.2 trillion for clean energy – renewables, nuclear, electricity grids, storage, energy efficiency, and electrification – compared with US$1.1 trillion invested in fossil fuels. At the same time, the International Monetary Fund estimates that global fossil fuel subsidies reached US$7.4 trillion in 2024, over 6% of global GDP, highlighting the continued financial support for carbon-intensive development despite international commitments.

Transforming subsidies is a major focus of the Villars Framework for a Sustainable Trade System – a trade reform agenda developed by a network of researchers and policymakers operating under the banner of the Remaking Trade Project. The Villars Framework proposes creating a system of rules that discourages environmentally harmful subsidies while promoting sustainable ones. Such a change would preserve consideration of a proposed subsidy's potential disruption to trade but prioritise evaluation of its environmental impact, shifting the focus of subsidies policies toward sustainability – in keeping with the Marrakesh "mandate" to promote sustainable development found in the 1995 Agreement that launched the World Trade Organization.

While the problem is now well understood, the challenge is implementing solutions at the pace and scale required. Climate finance remains central, and access is critical. Many vulnerable countries continue to face complex accreditation processes, lengthy approval timelines, and fragmented financing mechanisms that delay urgently needed investment. Climate finance should therefore be judged not only by the amount committed but also by how rapidly and effectively it reaches those most exposed to climate risks.

Adaptation remains significantly underfunded despite rising climate impacts. Developing countries require substantially greater concessional finance, stronger integration of adaptation into national development strategies, and simplified access to funding. Likewise, predictable financing for addressing Loss and Damage remains essential, particularly for countries that have contributed least to global emissions yet suffer the greatest consequences.



Technology transfer is another critical pillar. The growing trend toward fragmentation, protectionism, and technological competition risks slowing the global diffusion of renewable energy technologies, energy storage, climate-resilient agriculture, water management systems, and early warning technologies. Expanding access to these technologies should be viewed as a global public good, because faster technology diffusion will accelerate both mitigation and adaptation efforts.

Developing countries also require stronger institutional capacity to design policies, prepare bankable projects, improve climate-related data systems, and implement sustainability reporting frameworks. Without adequate technical assistance and capacity building, many countries risk falling further behind as climate disclosure standards, transition planning, and sustainable finance frameworks become increasingly important.

The Green Climate Fund (GCF) – a key element of the Paris Agreement – is the world's largest climate fund. It is mandated to support developing countries to raise and meet their climate goals – known as Nationally Determined Contributions. With US$20 billion already programmed for funding proposals, GCF operates through a country-driven approach, with each developing country appointing a Nationally Designated Authority or focal point to coordinate relations with GCF. Some GCF funding is used to help mobilise financial flows from the private sector to compelling and profitable climate-smart investment opportunities.

Climate action must also recognise its important social dimensions. Climate change disproportionately affects women and girls, particularly in vulnerable communities where they often face greater exposure to water scarcity, food insecurity, displacement, and reduced access to resources, decision making power and adaptive opportunities. Gender -responsive climate policies are therefore essential to building resilient and inclusive societies. Adopted at COP30 in Brazil, the updated Belém Gender Action Plan for 2026-34 builds upon the enhanced Lima work programme on gender, aiming to drive long-term, concrete impact across both global and local climate initiatives.

A year on from the Fourth International Conference on Financing for Development (FfD4) in Seville, many of the challenges identified – including debt distress, high borrowing costs, limited fiscal space, and unequal access to finance – continue to constrain climate action across much of the developing world.

The work of the UN Expert Group on Debt is highly relevant in this regard, notably the establishment of the Borrowers' Forum to strengthen cooperation among debtor countries. Improving their capacity to engage in sovereign debt discussions can lead to a more balanced and development-oriented international debt architecture.

The broader lesson is increasingly clear: climate finance, development finance, and debt sustainability cannot be treated separately. Countries burdened by high debt servicing costs often lack the fiscal space needed to invest in resilience, adaptation, and low-carbon development, while climate vulnerability itself increasingly contributes to debt risks. Recognising these interconnections represents one of the most significant advances in international policy discussions over the past year.

In an era of interconnected climate, development, debt, and geopolitical challenges, renewed multilateral cooperation remains indispensable.



The economics of climate change

Opportunities for action:

- Consult the World Bank Country Climate and Development Reports (CCDRs) to identify main pathways to reduce emissions and boost resilience. www.worldbank.org/en/publication/country-climate-development-reports
- Implement clear incentives and de-risking policies to unlock finance for investment in green technologies and green jobs.
- Eliminate and repurpose fossil fuel subsidies to invest in renewables, regenerative agriculture and nature-based solutions for mitigation and adaptation.

> *The interests of institutional investors and good-faith policymakers are often well aligned: climate-related damage and disruption risks 16% lower GDP and nearly 40% lower pension fund balances in key markets by 2050.*
>
> ***Stephen Dunne,***
> *Chair, Investor Group on Climate Change*

A path to sustainable and resilient prosperity

It is clearer than ever that the costs of inaction on climate change will be far greater than the investments required to make the transition to a sustainable, inclusive and resilient global economy. Those investments can generate a new form of sustainable and resilient prosperity, far more attractive than the extractive, destructive and polluting paths followed in the past.

The science has grown ever more worrying, with many impacts already occurring with a greater intensity than expected just a few years ago. All around the world, lives and livelihoods are being damaged by extreme weather events of unprecedented severity and frequency. Poor people in every country are proving to be the most vulnerable. Economic development is under increasing threat as tropical storms destroy villages, floods sweep away homes, infrastructure and businesses, wildfires devastate huge areas, and droughts wipe out crops. And scientists warn that far worse awaits us if we do not now radically reduce and soon halt greenhouse gas emissions.

Profound threat
Tipping points in the climate system could lead to unstoppable and irreversible effects, such as the destabilisation of ice sheets in Greenland and West Antarctica. These impacts could trigger the displacement of human populations on a scale not seen before, with risks of conflict and war. Climate change is a profound threat to peace, security and prosperity.

Unfortunately, traditional models used by economists to project the impacts of climate change fail to capture many of the worst consequences, and paint a deceptively mild picture of economic impacts. The Planetary Solvency report of 2025 estimates the global economy could face a 50% loss by 2090. But the risks are broader and deeper than those measured simply by output. For many, development, in all its dimensions, could be put into reverse and lives lost on a massive scale. The right policy action today can mitigate both economic harm and threats to human lives.

While assessments of the risks are now much more severe, we have made much greater technological progress than we expected. For instance, the costs of producing solar panels, wind turbines and other renewables have declined much more rapidly than predicted – they are now the cheapest forms of energy in many parts of the world, given a manageable cost of capital.



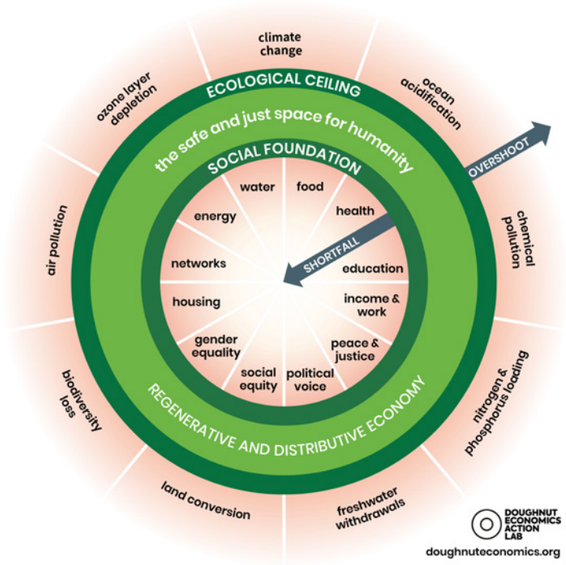
Economic opportunities
The rapid roll-out of electric vehicles has also been faster than anticipated, and across all sectors we are seeing new technologies, including heat pumps, rapidly developed and deployed, at ever lower cost, providing a more affordable alternative to fossil fuels. Models used by some economists have failed to project these rapid cost reductions because they do not take significant account of learning-by-doing and other self-reinforcing processes that accelerate technological progress. And the processes of discovery and diffusion are being strongly augmented by AI.

The case can now also be made that phasing out the use of oil can drastically improve economic performance in oil-dependent countries via reduced expensive imports – money that could be spent on domestically produced technologies and on economic development, with the additional benefit of enhanced energy security. Countries are now increasingly recognising this transition not only reduces the immense risks of climate change but can also generate good jobs and economic prosperity. In 2025, an OECD report found that tackling climate change through enhanced Nationally Determined Contributions (NDCs) could – by 2050 – increase GDP per capita growth by up to 60% in the most advanced economies, and 124% in lower-income countries.

Multiple tools
However, all this requires strong investment in technologies and in domestic production capabilities of countries for those technologies, which can only be achieved if governments provide clear policies that unlock private investment. The returns on these investments will include, for instance, cities where it is possible to breathe, move and be productive, and ecosystems that are healthy, robust and fruitful. Successful examples include: policies for feed-in tariffs for solar energy (Germany), contracts for differences for onshore and offshore wind energy (UK), and mandates for electric vehicles (China, Norway, California). All of these instruments mitigated investment uncertainty. Policymakers need multiple tools that address a whole range of market failures too, including those associated with fossil fuel and farming subsidies, economic uncertainty, research and development, capital markets, insurance, networks, information, and air pollution.

While the economic case for stopping greenhouse gas emissions and moving to a new and cleaner path of growth and development is now overwhelming, we must also invest in adaptation to make ourselves more resilient to those impacts of climate change that cannot be avoided.

Investments in nature are particularly valuable. The economic evidence is clear. The transition to a sustainable, inclusive and resilient global economy is the growth story of the 21st Century.



Credit: Kate Raworth and Christian Guthier. CC-BY-SA 4.0.

The Doughnut of social and planetary boundaries.

The Social Foundation (Inner Ring): 12 basic human necessities such as food, water, health, education, housing, political voice, and social equity. Falling short of this inner boundary means people face critical deprivation.

The Ecological Ceiling (Outer Ring): Based on nine planetary boundaries such as climate change, biodiversity loss, ocean acidification, and freshwater withdrawals. Crossing this outer boundary causes severe environmental degradation and destabilises Earth's systems.

The Safe and Just Space (The Doughnut Ring): The green area between the two rings represents the ideal operating space where everyone's basic needs are met without overshooting the planet's ecological limits.

Energy transition

Opportunities for action:

- Promote consistent policy incentives for renewable power and decarbonised transport, fuels, chemicals and heat.
- Align policies for customer-level clean energy and large-scale infrastructure projects, so they reinforce each other.
- Reduce and repurpose fossil fuel subsidies to the energy transition.

> *Every dollar invested in renewable energy today is an investment in long term security from external shocks and air pollution, driving development and saving money.*
>
> ***Surangel S. Whipps,***
> *President of the Republic of Palau*
> *Chair, Pacific Islands Forum*

Opportunities for people, economies and climate

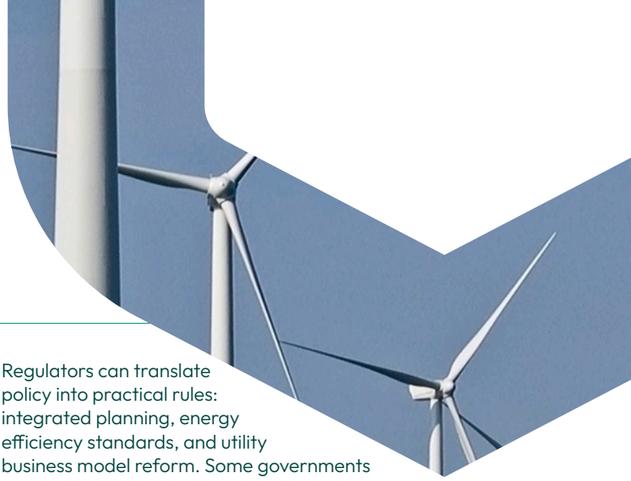
The energy security crisis will accelerate the transition away from imported fossil fuels this decade. The blockage of the Strait of Hormuz has pushed Asia, Europe and the developing world toward domestic and regional supply. Energy efficiency and substitution are also deeply undermining demand for fossil fuels. Energy importers are accelerating renewables, while others, notably Gulf States, the US and Russia, hold to fossil fuels. China's investment in renewables, electric vehicles and grid infrastructure has created an electro-state: clean sources supplied 42% of its electricity in 2025, about half of new cars are electric, and road fuel demand has begun to fall. India reached half its power capacity from non-fossil sources five years early; Uganda, Kenya and Ethiopia already run largely renewable grids. In 2025, for the first time, clean power met all new global electricity demand and fossil generation fell.

Global overcapacity in solar photovoltaics and batteries has reduced the cost of firm (consistently available) solar plus batteries to around US$76/Mwh – for energy importers, this is lower than the bare fuel cost of existing plants that run on imported coal or LNG. New solar farms, distributed solar and mini-grids can arrive in under two years; a new gas turbine takes five or six. Speed to power matters for the AI race, and for development.

For most of the world's parliaments, the transition is also a development strategy. The number without electricity has fallen from 1.2 billion in 2010 to about 655 million; two billion still lack clean cooking. Distributed renewables and mini-grids are the cheapest route to universal access, and pairing them with productive use (agro-processing, irrigation, cold chains) and clean cooking turns electrons into jobs, incomes and healthier homes. Where energy arrives with innovation, it industrialises; where it arrives alone, it under-delivers. Despite this incredible growth, challenges remain. Total energy demand has risen by 40% since 2000, despite energy intensity (MJ/$) dropping 28%, and fossil fuel is still the majority source of primary energy.

Four factors will define the transition. Energy efficiency comes first: computation and energy efficiency could cut AI and data centre energy use tenfold.

Grid architecture is next: local integration of distributed energy, and regional links that move renewable electrons from remote regions to urban centres, are critical to low cost, reliable power at scale. Decentralised, cellular grids are critical to energy security because they are less vulnerable to cyber or military attack and severe weather. Third: the world is not short of capital; capital is badly priced. Conventional wisdom puts the transition at US$1 trillion per year, unaffordable for middle- and low-income countries. But this ignores the US$7.4 trillion per year in fossil fuel subsidies, as estimated by the IMF for 2024. In the Global South, the deeper problem is the cost of capital: risk premiums double or triple the price of the same kilowatt-hour. Consumers are outrunning governments, and governments their lenders: Pakistanis bought 17 gigawatts of solar panels in 2024 for their own rooftops and factories, and Ethiopia financed Africa's largest hydropower plant from its own treasury and its citizens' bonds.



Finally, legislation and regulation unlock the investment needed for a net-zero energy system, and work best when anchored in national development strategy. Uganda's Energy Transition Plan (rooted in its Vision 2040, Tenfold Growth Strategy and a presidential science, technology and innovation agenda) and the African Union's Agenda 2063 treat energy and innovation as twin engines of industrialisation. This is mirrored in national visions across the Global South; island nations have established similar net-zero frameworks. Where legislation, finance and oversight align, the Global South does not wait for the transition. It builds it.

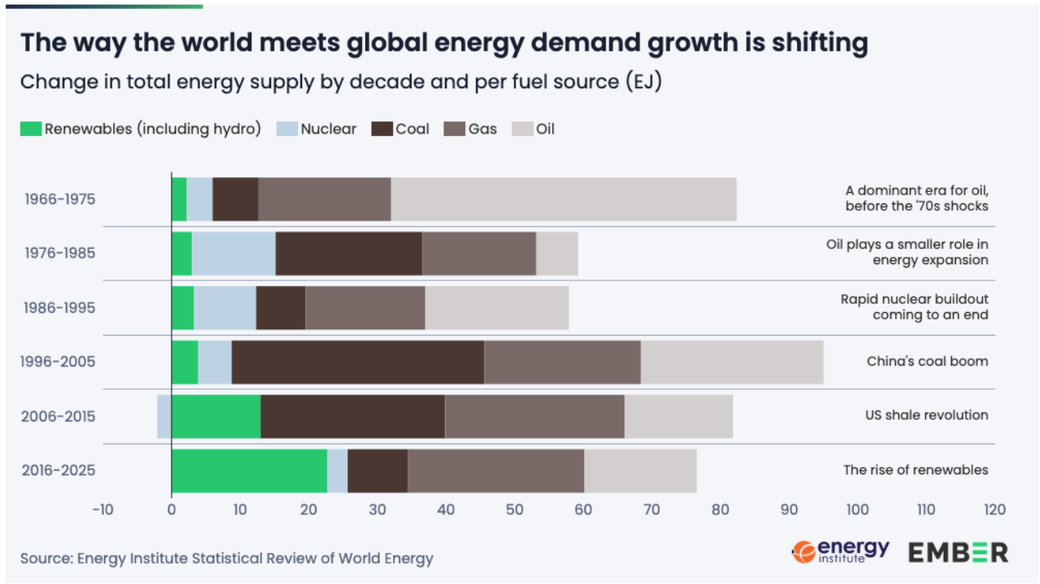
Regulators can translate policy into practical rules: integrated planning, energy efficiency standards, and utility business model reform. Some governments cut tariffs on solar, batteries and EVs to speed adoption; others, India and Morocco among them, use tariffs and incentives to build the industries at home. Both are bets on electrotech. Together, these measures drive electrotech adoption at scale and strengthen energy security and competitiveness.

Summary

As energy and trade weaponisation increases, there is little reason to expect energy crises to wane. Regional integration, diversification, redundancy, storage and resilient grids together provide durable energy security. The clean energy transition offers the most affordable and timely path to reducing exposure to global volatility and, for the Global South, the fastest route to access and industrialisation.

A just transition to a low-carbon economy involves social as well as technological change. There are huge opportunities and a wide range of social benefits that can be delivered through sustained action to reduce demand for energy. To achieve net zero, we need actors from across society to be engaged. Place-based organisations that work at the mid-level (e.g. local businesses, schools, community groups) and operate between scales and sectors are especially important. Engaging citizens in genuine and meaningful debate about change and generating positive visions of a net-zero future will also be essential.

EMBER



Food, forests and fashion

Opportunities for action:

- Redirect harmful agricultural subsidies toward regenerative practices.
- Investing in science and strengthening forest protection rules can turn conservation from an aspiration into reality.
- Make fast-fashion brands pay for the waste they create, and reward on-demand, recyclable or bio-degradable production.

Indigenous Peoples and local communities are widely recognised as some of the world's most effective stewards of forests and biodiversity, yet they continue to receive only a small fraction of the climate and conservation finance intended to protect these ecosystems.

Beto Borges,
Forest Trends

Transforming food for people and planet

We produce enough food for 10 billion people, yet a third is wasted and 2.7 billion cannot afford a healthy diet. Almost half of Earth's habitable land is farmed; 16% of it grows crops for people, supplying 83% of our calories, while 80% raises livestock, supplying 17%.

Agriculture is the largest driver of deforestation and biodiversity loss, and the food system generates about a third of global greenhouse gas emissions. Those emissions return as floods, drought and heat that cut yields, and with El Niño conditions developing, the World Food Programme warns that tens of millions more people could face acute hunger through the 2027 lean seasons. Food price shocks of that scale are followed by unrest and political instability in low-income countries.

Over 90% of agricultural subsidies do damage, and the World Bank attributes 14% of annual forest loss to support for soy, palm oil and beef. Labour conditions compound this: 36% of the world's working women are employed in agrifood systems, and women in agricultural wage employment earn 82 cents for every dollar earned by men.

Immediate priorities
Redirect harmful subsidies toward regenerative practices and healthy soils that store carbon. New Zealand removed agricultural production subsidies outright in 1984, and Switzerland conditions its direct payments on ecological performance.

Support organic farming and cut food loss at source, investing in post-harvest storage and composting what remains rather than sending to landfill. South Korea's mandatory separation and volume-based charging system (paying for waste produced) now recycles most household food waste.

Shift diets toward plants through procurement standards in schools, hospitals and government canteens, alongside research and market support for plant proteins. Denmark's national action plan for plant-based foods, backed by a dedicated fund, is the first of its kind.

Extend labour law to agricultural workers, including heat standards and bargaining rights, and give women equal rights to own and inherit land. FAO estimates that closing the gender gap in farm productivity and wages would add close to $1 trillion to global GDP and lift 45 million people out of food insecurity.



Forests: The frontline of climate and biodiversity protection

Forests cover about 4.14 billion hectares – close to one-third (32%) of the global land area, equivalent to 0.50 hectares per person. Beyond providing timber, food, and medicine, forests anchor the planetary carbon and water cycles.

In a typical year, forests and other vegetation absorb roughly 30% of the carbon humans emit from burning fossil fuels – a climate service delivered at virtually no cost. Between 2001 and 2025, forests removed an average of 14.4 gigatonnes of CO_2 equivalent annually, while deforestation, wood harvest, and wildfires released 9.3 gigatonnes, leaving forests a strong net carbon sink. But that sink is weakening. Deforestation alone drives roughly 10% of global greenhouse gas emissions each year, and fire is an escalating threat: in 2025, fires accounted for 42% of the 25.5 million hectares of tree cover lost worldwide and this figure is expected to go up for 2026 due to extreme heat and forest fires across Europe and North America. Extreme fires in 2023 and 2024 caused forests to absorb only a quarter of the CO_2 they capture in an average year, as hotter, drier conditions fuel more frequent, more severe fires and drought-linked tree mortality. This forest loss carries a double cost: habitat destruction is the leading driver behind the one million species now at risk of extinction, while the resulting loss of ecosystem diversity erodes forests' resilience to climate stress.

Protecting all forest types – not only tropical rainforests – remains one of the most immediate, cost-effective actions available to safeguard climate stability, biodiversity, and the future of life on Earth.

Fire, driven by climate change and accelerated by human behaviour, is now the dominant driver of forest loss globally. In 2024, 44.2 million acres of Brazil's Amazon burned through – an area bigger than the state of California. As the Amazon creates its own weather, fire degrades Amazonian forests so that it is no longer able to return the moisture necessary for sufficient precipitation to maintain the rainforest habitat, potentially causing the Amazon Forest to "tip" into a degraded grassland. The impact of the Amazon tipping would likely have a domino effect, potentially pushing other climate systems past their own tipping points, such as the melting of the Greenland and Antarctic ice sheets. Fire is also threatening other habitats like the Boreal forests, accelerating carbon emissions into the atmosphere.

Fibres and fashion

The global fashion and textiles industry accounts for an estimated 8% of greenhouse gas emissions – more than aviation and maritime shipping combined – yet remains conspicuously absent from most climate policy frameworks. This omission is not merely a political oversight; it is a missed opportunity.

The structural problem
Decades of globalisation have produced textile and apparel supply chains that are long, linear, extractive, and opaque. Synthetic textiles derived from fossil fuels dominate fibre production. Global textile waste reached 120 million tonnes annually in 2024, up from 92 million tonnes in 2019. The industry's upstream inputs – petrochemical dyes, synthetic polymers, toxic finishing agents – impose compounding environmental burdens on agricultural and aquatic ecosystems.

Critically, the feedstock crisis threatening the US$5 trillion bioeconomy (economic activities that use biological resources like plants) is inseparable from the sustainability crisis in fibres and fashion: global demand for sugars and cellulose will soon outstrip supply, while two billion tonnes of agricultural waste are burned or left to rot annually – a $2.6 trillion missed opportunity. The same waste streams rotting in fields or polluting waterways adjacent to fishing communities are the exact inputs a next-generation textile economy needs.

The policy opportunity
Shifting to circular, resource-efficient systems could generate $3.5 trillion in business opportunities and 87 million jobs by 2030.



Carbon capture and carbon markets

Opportunities for action:

- Introduce policies that treat carbon dioxide as a waste management problem that can be addressed the moment fossil fuel companies extract it.
- For your country to generate and sell carbon credits under article 6.4, the relevant authority can contact the UNFCCC's regional collaboration centre, review the 6.4 host party manual, and start a designated national authority (DNA). **https://unfccc.int/RCCcoverage**
- Advocate to fast-track the current letter of authorisation process for carbon credit projects within your country that can be traded internationally. This also enables tapping into potentially lucrative aviation (CORSIA) and voluntary carbon markets for premium credits.

We need to rapidly transition away from fossil fuels and massively scale up carbon dioxide removal.

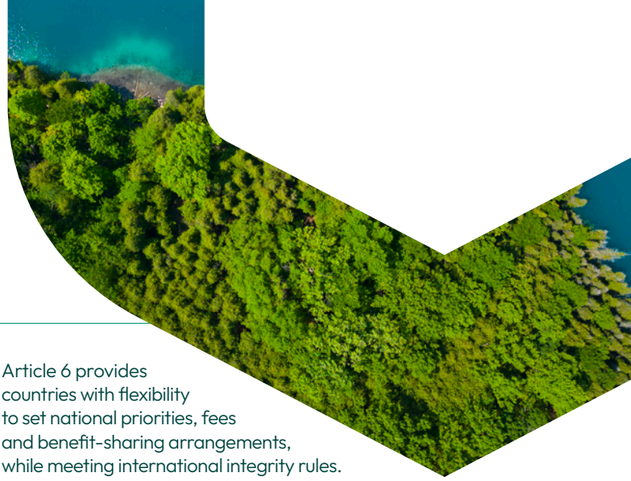
Johan Rockström,
Director, Potsdam Institute for Climate Impact Research.

Carbon capture and storage

Natural processes are moving about half the CO_2 that the burning of fossil fuels adds to the atmosphere into terrestrial and marine ecosystems. Half is not good enough. It will take millennia for nature to remove the remaining half, and furthermore, nature's ability to remove carbon appears to be faltering both on land and sea, raising the question of how far natural sequestration processes can be pushed. While nature-based solutions remain important, tech-based carbon capture is likely to gain increasing importance.

Exploring tech-based carbon capture
Net-zero carbon is a prerequisite for fixing the climate. Either the world stops burning fossil fuels and producing cement, or for every tonne of CO_2 coming out of the ground, another will have to be removed. Since stopping extraction in time to avert severe climate damages is no longer realistic, CO_2 removal technologies must augment the phaseout of fossil fuels. Conceptually, CO_2 removal involves its collection, often referred to as carbon capture, and its safe and permanent disposal, referred to as carbon storage. Sometimes the two steps merge. For example, trees extract carbon dioxide from the atmosphere and sequester it as woody biomass for decades. Direct air capture collects CO_2 from the atmosphere just like a tree but without photosynthesis, and delivers a stream ready for use (bubbles in drinks for example) and/or storage.

Smaller footprint
Direct air capture is currently more expensive than biological capture but also more powerful, resulting in a thousand times smaller footprint. Compensating for the world's current emissions through photosynthesis would take more than the land that is currently used for agriculture. Unfortunately, direct air capture is still nascent and expensive, but its cost will likely drop as it is phased in. Through learning by doing, solar and wind energy costs have dropped about one hundredfold over a few decades. Furthermore, not all CO_2 would have to be removed directly from air. Flue gas scrubbers (which capture pollutants) for power, cement, steel and chemical plants might intercept about half of all the CO_2 before it is emitted. Once collected, CO_2 must be kept out of the environment for climate-relevant time scales, which are measured in millennia. Here, too, technical solutions can excel. Storing CO_2 deep underground in saline aquifers or converting it into solid carbonate (mineral rock) provides sequestration on geological timescales. All options need to be on the table. Low-cost biological storage sequesters carbon for decades and some biochar for millennia, but technical solutions will have to follow to cope with the formidable scale of the necessary carbon removal.



Carbon markets

Since COP30, momentum has focused on implementation of the new Paris Agreement Article 6 Rulebook. "Article 6" might sound technical, but it's a game-changer for how we tackle climate change, setting the rules for international carbon markets.

Governments run their own compliance carbon markets and domestic emissions-trading schemes, while the voluntary market is international with many schemes and projects in operation, varying considerably in credibility. Article 6 is a big deal for both compliance and voluntary markets.

Governments alone can't solve climate change. They require companies to reduce, offset, and embrace policy, and individuals to support those businesses and voluntarily offset. But it's important to ensure voluntary offsetting makes a difference, and wouldn't be double-counted somewhere else.

Unlocking finance
This is where Article 6 comes in. It deals with ITMOs (Internationally Transferable Mitigation Outcomes), which are essentially carbon credits that can be traded between countries. One ITMO equals one ton of CO_2 reduced or removed. The rules around ITMOs allow for centralised accounting at international level, ensuring everyone plays by the same rules. This is a huge step forward. It provides much-needed certainty for investors backing climate projects, and gives countries confidence to use these projects to meet their own climate pledges in their Nationally Determined Contributions. This unlocks a flow of finance into developing nations that are well-placed to generate high-quality carbon credits, helping contribute to the climate finance goal to raise US$1.3 trillion annually by 2035.

Article 6 provides countries with flexibility to set national priorities, fees and benefit-sharing arrangements, while meeting international integrity rules. Activities may include a wide range: from biochar to renewable energy, forests to clean cooking, as well as blue carbon.

While Article 6.4 relies on a centralised UN market, Article 6.2 gives participating governments the flexibility to design their own cooperative agreements. Consider ways to maximise margins by partnering with international organisations like the World Bank, UNDP, and grant issuers to provide helpful resources.

The role of insurance
Carbon markets depend on trust in the delivery, permanence, and integrity of carbon credits. Insurance is emerging as a key tool to manage these risks and unlock investment. By covering risks such as project failure, carbon reversal, and regulatory uncertainty, insurance improves project bankability and enables long-term financing. It is already supporting large-scale carbon removal projects and is increasingly integrated into market standards.

Bottom Line
Article 6 offers countries practical routes to attract finance while advancing development priorities. Establishing core legal authority and processes today will allow governments to benefit as international demand grows.

Blue carbon

Mangroves, seagrasses, and tidal marshes are among the most carbon-rich ecosystems on Earth. Mangroves alone can store up to five times as much carbon per hectare as tropical upland forests, holding most of it in deep, waterlogged soils where it remains locked away for centuries. They also shield coastlines from storms and flooding, sustain fisheries, and support coastal livelihoods. Yet they are being lost faster than almost any other habitat, and this "blue carbon" remains heavily underrepresented in carbon markets.

The barrier is not a shortage of viable projects but a shortage of the early-stage finance and technical support needed to bring them to investment readiness. Parliamentarians can close this gap: clarify who owns coastal land and its carbon value so projects can get off the ground; include coastal wetlands explicitly in Nationally Determined Contributions and national restoration targets; and direct concessional or blended finance toward the pre-feasibility stage, where high-potential projects most often stall.

How is the international community addressing climate change?

Opportunities for action:

- Help ensure your government's Nationally Determined Contribution (NDC) is ambitious.
- Translate commitments into legislation. Consult the Climate Policy Radar to identify and compare climate laws or topics (e.g. deforestation) between countries.
- Consult the NDC Equity Tracker database for reviews of country pledges and recommendations on gender, youth, and civil society inclusion.

> *The choices we make today will determine how high temperatures peak, how long they remain there, and how safely we can return to 1.5°C. COP31 must turn this urgency into concrete action. We need to accelerate global electrification, reduce methane emissions from waste, strengthen the climate resilience of cities, and enhance the resilience of marine and coastal ecosystems.*
>
> ***Murat Kurum***
> *President, COP31*

Significant progress has been made

The Conference of the Parties (COP) is the central decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC), established in 1992 to coordinate international efforts to prevent "dangerous human interference with the climate system". In addition to Environmental Ministers and negotiators, civil society, youth, Indigenous Peoples, local government, and private actors attend COP to advocate and share knowledge. Increasingly, parliamentarians attend to advocate and share expertise.

Science plays a central role
The Intergovernmental Panel on Climate Change (IPCC), formed in 1988, provides scientific assessments of climate change, its impacts, and response strategies. Early climate impacts and UNFCCC efforts led to the Kyoto Protocol, adopted at COP3 in 1997 as the first treaty requiring industrialised nations to cut emissions. Lacking enforcement mechanisms, the Kyoto Protocol had limited success.

Increasing ambition
The Kyoto Protocol laid the foundation for future negotiations by establishing the concept of quantified emissions targets and operationalising the principle of "common but differentiated responsibilities and capabilities". In 2015, the UNFCCC adopted the Paris Agreement at COP15, calling on all countries to set emissions targets and limit global temperature rise to well below 2°C, striving for 1.5°C. Nationally Determined Contributions (NDCs) – climate action plans submitted by countries – are core to the Agreement. Every five years, NDCs are reviewed under the Global Stocktake (GST), which offers an opportunity for course correction on climate action. The first GST, adopted at COP28 in 2023, marked the first time the UNFCCC formally recognised fossil fuels as the main driver of climate change and called for a transition away from them, signalling a major shift in global dialogue. Beyond mitigation, the UNFCCC includes discussions on climate finance, technology transfer, adaptation, gender, capacity-building, action for climate empowerment, loss and damage.

Working in tandem
When the Paris Agreement was adopted, our planet was on track to warm around 5°C. Today, if all commitments are met, it's on track to warm by nearly 3°C. Every fraction of a degree and every ounce of climate action matters. While the UNFCCC offers a framework for cooperation, progress is slow due to the need for consensus among all Parties and lack of enforcement.

Despite the United States' second withdrawal from the Paris Agreement in 2025 – joining Iran, Libya, and Yemen as non-parties – the other 195 parties that signed the agreement remain committed to it. Climate action is not impossible. For example, at COP30, some 80 countries backed a global roadmap away from fossil fuels; it was blocked. The Brazilian Presidency then launched two global roadmaps to present at COP31: Deforestation and Transitioning Away From Fossil Fuels. In April 2026, 57 countries met in Santa Marta for the *First Conference on Transitioning Away from Fossil Fuels* co-hosted by Colombia and the Netherlands.

To meet the urgency of the climate crisis, action must also come from national governments, local communities, businesses, and financial systems working in tandem with UNFCCC processes. Initiatives like the Race to Resilience and Global Methane Pledge exemplify how non-state actors and international coalitions can complement formal negotiations, accelerating efforts to build climate resilience and reduce emissions. Parliamentarians are key, because every commitment a government makes at a COP also eventually needs a law to enact it, a budget line to fund it, or an oversight body to hold it accountable.

Do your constituents care?
A study of nearly 130,000 people across 125 countries (covering 97% of global emissions) found that 89% want more political action to protect the climate. However, many underestimate the willingness of their fellow citizens to act. Therefore, policymakers have an opportunity to foster and raise awareness of this consensus – providing crucial leadership and driving action to deliver a sustainable future for people, nature and the planet.

Education, participation and awareness

Long-lasting climate progress depends on more than policy. It requires an informed, engaged, and empowered public. In 1994, when the UNFCCC became operational, parties committed to mobilise and empower the public to act through education, training, public awareness, public participation, access to information, and international cooperation. Together, these pillars form what the UNFCCC calls Action for Climate Empowerment (ACE), which is being revised at COP31. Over the past decade, these pillars have become increasingly visible as a foundation for broad societal understanding and engagement on climate. National ministries of education have invested in this agenda globally and locally, supported by UN agencies including the UNFCCC Secretariat, UNEP, FAO, UNICEF, UNU, UNITAR and UNESCO.

UNESCO's Greening Education Partnership (GEP) is mobilising international organisations, governments, youth, civil society and the private sector around four priorities: green schools, curricula, teacher training, and communities. While focused on climate, this intersects with biodiversity, pollution, and health.

UNITAR hosts the One UN Climate Change Learning Partnership (UN CC:Learn), offering a single entry point to UN climate knowledge through free online courses. These resources help scale climate literacy, yet education systems worldwide still lag behind the level of action required. Countries in the Global South, in particular, request greater support, recognising the need to also build capacities in climate education within national education and training ecosystems (including universities, research entities and national schools of public administration). Parliamentarians have a key role in championing stronger climate education, public participation, and public awareness.



Climate Policy Radar: Consult the Climate Policy Radar to identify and compare climate laws or topics (e.g. deforestation) between countries. Climate Policy Radar is the world's largest open knowledge base of climate (and increasingly, nature) documents, spanning 35,000+ laws, policies, UN submissions, finance project documents, and more from almost every country in the world.

A growing block of nation-states is calling for a Fossil Fuel Treaty to establish binding commitments to end the expansion of fossil fuels and phase down existing production in a just and equitable manner. The proposal has the support of more than 900 parliamentarians worldwide, along with the European Parliament.

Climate mis- and dis-information

Opportunities for action:

- Close the disinformation gap by legislating for Action for Climate Empowerment (ACE) commitments, like mandating climate education in schools.
- Consult LobbyMap database for information on corporate influence on climate policy. https://lobbymap.org/
- Encourage your government to sign the Declaration on Information Integrity on Climate Change.

Disinformation did not begin with AI, yet today it finds a powerful amplifier in AI.

His Holiness Pope Leo XIV

Accurate information is vital for a better future

For decades, oil, gas and other companies have known the catastrophic risks to the global climate from the continued burning of fossil fuels. Instead of shifting business models, companies strategically undermined public understanding of climate science to delay action for their own profits. These companies continue to misrepresent the overwhelming scientific consensus.

Social media and video networks have recently surpassed news organisations as the predominant means by which global audiences access news. Unfortunately, it can be difficult to determine the source and validity of information. Therefore, it is important to understand misinformation and disinformation and how to identify them. Misinformation is false or misleading information that is spread without the intent to deceive. Disinformation is the malicious spread of false information with the intent to deceive or confuse.

Most climate disinformation repeats decades-old claims rather than reflecting new scientific evidence. Denial, dismissal, doubt, delay, and doomerism are common tactics, along with false advertising campaigns and attacks on the legitimacy of science, scientists, universities and other institutions. Therefore, when consuming news and social media, it is important to look out for these techniques.

Support for mechanisms to identify and reduce misinformation and disinformation is vital. Media literacy is crucial, especially with the rise of AI. Supporting media literacy as a component of formal education is key to ensuring that young people can detect misinformation and disinformation. However, wider media literacy campaigns for the general public are also important.

Parliamentarians can support systemic action to reduce climate misinformation and disinformation through the UN and UNESCO's Global Initiative for Information Integrity on Climate Change. This is a great opportunity to use your voice to advocate for the accurate information we need to plan for a safer, better future for us all.

Six key truths about climate change

- **It's real** (Climate change is happening)
- **It's us** (Human activity is causing climate change)
- **Experts agree** (There is a scientific consensus about human-caused climate change)
- **It's bad** (Climate change harms people)
- **Others care** (Most people are concerned about climate change and support action)
- **There's hope** (Actions can be taken to limit the harm)



Glossary and tools

Adaptation: Measures that reduce vulnerability to current or expected climate change impacts.

Anthropogenic: Caused by human activity.

Bioeconomy: Using renewable, nature-based resources (like plants, animals and microorganisms) to produce products such as energy, food and materials.

Carbon Budget/Methane Budget: The total net amount of these gases that could still be emitted while keeping global temperatures below 1.5°C (above pre-industrial levels) under the Paris Agreement.

Convention on Wetlands (1971). Adopted in Ramsar, Iran, this is the oldest of the modern global environmental treaties, which works towards the wise use of wetlands worldwide and whose data feeds into other relevant global conventions and organisations. www.ramsar.org

CO_2 equivalent (CO_2e): A way of comparing the climate impacts of different greenhouse gas emissions by converting these to the equivalent amount of carbon dioxide.

Mitigation: Actions to reduce or prevent greenhouse gas emissions, including strengthening carbon sinks.

Nationally Determined Contributions (NDCs): National climate action plans that each country must develop under the Paris Agreement, updated every five years with increasing ambition.

Net-zero: The point when humanity removes as many emissions as we produce, halting any further increase of greenhouse gases in the atmosphere.

Ocean Acidification: The process by which the ocean absorbs excess carbon dioxide (CO_2) from the atmosphere, causing a decrease in seawater pH.

Ocean Deoxygenation: The ongoing decline in dissolved oxygen levels in the ocean, driven mainly by warming waters (which hold less oxygen) and increased stratification (which limits mixing).

Parts per million, or ppm, refers to the concentration of a pollutant in air- so at 1 ppm, there is one unit of pollutant for every million units of air.

Precautionary principle: if a new product or practice carries a plausible risk of causing grave harm to people or the environment, protective measures should be taken even without scientific certainty on these risks.

Rio Trio synergies: Continuing the work begun under previous respective Presidencies of Azerbaijan, Colombia and Saudi Arabia to align the three UN conventions on climate change, biological diversity and combating desertification, the COP31 Presidency highlights "Rio Synergies" among the top ten work programme priority themes.

Tools:

- **TransitionZero** is a non-profit that provides free software to reduce the time to build clean energy at scale. Its no-code browser tool, Scenario Builder, lets policymakers, planners and investors working in or alongside governments test the fastest, cheapest and cleanest routes to secure power for their country. builder.transitionzero.org
- **NDC Equity Tracker:** Consult this database for country pledge reviews and recommendations on gender, youth, and civil society inclusion. ndcequitytracker.org
- **Climate Laws Database** provides access to national-level climate change legislation and policies from around the world. https://climate-laws.org
- **World Weather Attribution** is an international collaboration of climate scientists that investigates how climate change influences the intensity and likelihood of extreme weather events. www.worldweatherattribution.org
- **Planetary Communications** is a handbook for communicating sustainability science. www.stockholmresilience.org/research/research-projects/planetary-communications.html
- **Planetary Health Check 2026.** https://app.wedonthavetime.org/posts/99c6ebdc-6807-42a6-bf01-33a1216345df



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CHAPTER SIX Climate finance
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CHAPTER EIGHT Energy transition
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CHAPTER NINE Food, forests and fashion
Food: Based on original text by Sandrine-Dixson-Declève, Honorary President/Global Ambassador, The Club of Rome / Co Founder/Vision Keeper, The System Transformation Hub / Co Author & Executive Chair, Earth4All, and Sage Lenier, Founder, Futureline. Forests: By Dr Oris Sanjur, Deputy Director, Smithsonian Tropical Research Institute, Panama. Fashion: By Lisa Morales-Hellebo, Founder & Managing General Partner, REFASHIOND Ventures: The Industrial Transformation Fund. Box on forest fires by Alex Deagan, CEO Conservation X Prize.

CHAPTER TEN Carbon capture and carbon markets
Carbon capture: *By Professor Klaus Lackner, founder of the Center for Negative Carbon Emissions, Arizona State University Wrigley Global Futures Laboratory, and Honorary Patron of the New Carbon Economy Consortium.* Carbon markets: *By Dave Rouse, CEO and co-founder, CarbonClick and Jennifer McFarlane, Partner, Asterra Partners, Board of Directors, Verra. Breakout box by Diana Denke, Co-Founder & CEO, Fair Carbon.*

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