COP29 · COP30 · COP31 PRESIDENCIES

Belém Mission to 1.5

Enabling ambition and accelerating implementation of NDCs and NAPs

1.5

A report prepared by Azerbaijan, Brazil, Türkiye and Australia in response to the request to the Presidencies of COP29, COP30 and COP31, in the Global Mutirão decision (Decision 1/CMA.7 Global Mutirão: Uniting humanity in a global mobilization against climate change).

November 2026

Foreword by the COP Presidencies

A decade after the adoption of the Paris Agreement, Parties gathered at COP30 in Belém at a turning point in global climate action.

With the architecture of the Agreement largely in place, the task ahead was to deliver on its commitments at the pace and scale that science demands.

In that spirit, Parties resolved to join forces in a Global Mutirão against climate change and to turn decisively to implementation.

As part of this effort, Parties launched the Belém Mission to 1.5 to enable ambition and implementation of nationally determined contributions (NDCs) and national adaptation plans (NAPs), and to reflect on how to accelerate implementation, international cooperation and investment across mitigation and adaptation. They entrusted the Presidencies of COP31, COP30 and COP29 with guiding the Mission and preparing a report summarising its work. Throughout 2026, we – Türkiye and Australia, Brazil and Azerbaijan – have taken this mandate forward together, in a spirit of continuity among Presidencies and shared responsibility for its outcome.

The Mission was conceived as an open and inclusive process. We invited all Parties, as well as Indigenous Peoples and local communities, subnational governments, civil society, academia, businesses, financial institutions and other stakeholders, to share their knowledge and experience through written submissions and dedicated consultations. The breadth of the response is reflected in the pages that follow, and we are grateful to all who took part.

The central message of this report is one of possibility.

We know our collective actions have made a difference – when the Paris Agreement was signed a decade ago we were on a path for around 4 degrees of warming. Since then, we've brought projected warming down to 2.4 degrees with the full implementation of the latest NDCs. But we must redouble our efforts.

Many of the solutions needed are already delivering results, and there is a clearer understanding of what makes transitions just. Scaling them up, making them accessible and adaptable to different national realities, and strengthening the conditions they depend on can help bring positive tipping points closer. This offers a practical route to closing both the implementation and ambition gaps and to strengthening adaptation and resilience.

The latest science points to a temporary overshoot of 1.5 °C. Acknowledging this reality does not weaken the goal; it reinforces its urgency. Keeping 1.5 °C within reach is the very purpose of the Belém Mission to 1.5. The task ahead is to keep any overshoot as small and as short as possible, and to bring temperatures back down over time. Every fraction of a degree avoided will spare lives, livelihoods and ecosystems.

Across energy systems, industry, agriculture, forests, cities, health and more, examples from all regions demonstrate that progress is already underway. They show that climate action can advance resilience, strengthen energy and food security, support sustainable development and create new economic opportunities. They also remind us that no country can succeed alone. International cooperation remains essential to mobilising finance, building capacity and expertise, reducing costs, and enabling solutions to scale.

The knowledge and experience gathered through the Mission show that the means to do so are increasingly at hand. What is needed now is the collective resolve to use them: to translate solutions into stronger NDCs and NAPs, scaled-up investment and deeper international cooperation. We offer this report not as an end point, but as a resource for Parties and all stakeholders as they carry this work forward. From Baku to Belém and on to Antalya, our Presidencies stand united in the conviction that keeping 1.5 °C within reach remains both necessary and possible. Now is the time to renew our commitment to multilateralism and to turn unity into collective action that makes a lasting difference.

Mukhtar Babayev
COP29 President

André Aranha Corrêa do Lago
COP30 President

Murat Kurum
COP31 President

Chris Bowen
COP31 President of Negotiations

Foreword by the Executive Secretary of the UNFCCC

The Belém Mission to 1.5 speaks to a central priority: turning agreed goals and national plans into faster, fairer action in the real economy, at the scale and speed needed.

Every fraction of a degree of temperature rise avoided matters, yet the gap between what the science demands and the progress made remains too wide. Closing it requires practical delivery – finance that reaches people in need, technologies that can be adapted and deployed, stronger institutions and skills, and cooperation that helps proven solutions travel further, faster.

Requested by Parties in the Global Mutirão decision, this report is an important part of the Mission entrusted to the COP29, COP30 and COP31 Presidencies. It brings together the latest science with the experience of governments, businesses, civil society, researchers, Indigenous Peoples, local communities and other implementers. The sheer volume of submissions received reflects the urgency of the moment, the depth of knowledge available, and a strong determination to act across regions and sectors.

As the report shows, solutions already exist across energy, industry, food and agriculture, forests and oceans, health, cities and early warning systems. The main constraint often lies in the conditions needed to deploy them at scale. These include accessible finance, technology development and transfer, sustained capacity-building, inclusive governance and international cooperation grounded in national circumstances and priorities.

I commend the Presidencies for the open and consultative way they have guided this work. The result is a practical, non-prescriptive resource that identifies barriers, highlights transferable approaches, and keeps people's needs and agency at its heart.

At COP31, our responsibility is to turn this knowledge into results. By strengthening the conditions for implementation, we can deliver existing commitments faster, build resilience, limit the magnitude and duration of overshoot, and keep our climate goals within reach.

Simon Stiell

Executive Secretary of the UNFCCC

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Executive Summary

As part of the Global Mutirão decision (Decision 1/CMA.7),[1] adopted at the thirtieth session of the Conference of the Parties (COP30) in 2025, Parties launched the "Belém Mission to 1.5" to be taken forward under the guidance of the Presidencies of COP29, COP30 and COP31. It aims to enable ambition and implementation of nationally determined contributions (NDCs) and national adaptation plans (NAPs), and to reflect on accelerating implementation, international cooperation, and investment. It embodies the shared resolve of Parties coming together at COP30 to reaffirm their enduring commitment to the Paris Agreement's long-term temperature goal, to resolve to pursue efforts to limit the temperature increase to 1.5 °C and limit the magnitude and duration of overshoot, and to transition to a new era focused on implementation.[2]

Drawing on year-round engagement undertaken by Azerbaijan, Brazil, Türkiye and Australia and 148 submissions from Parties and non-Party stakeholders,[3] it examines the scale of the challenge, identifies implementation needs and barriers, and highlights high-impact opportunities already being advanced. These illustrate the growing range of solutions available to accelerate progress towards the objectives of the Paris Agreement. The opportunities and enablers outlined are non-prescriptive and depend on national circumstances and priorities.

Current emissions, warming and impacts

The science

Progress in the decade since the Paris Agreement has been significant. The world has avoided the worst-case outlook of 2015, of warming above 4 °C.[4] However, emissions have not yet begun a rapid, sustained decline, as was needed from 2020 to keep warming below 1.5 °C.[5] Pathways that keep 1.5 °C within reach now involve faster emission reductions, greater resilience and adaptation efforts to manage higher impacts during any temporary overshoot, and a plan for how to bring about net-negative emissions to lower warming again.[6,7]

Current warming has already exceeded 1.5 °C in a single year,[8] and the last 11 years are the 11 warmest on record.[9] Impacts that were projected at the time of the Intergovernmental Panel on Climate Change Sixth Assessment Report (AR6) are now occurring, increasing global heat-related mortality,[10] extreme weather, glacial collapse,[11] and ecosystem impacts.[12] Recent assessments indicate the world will overshoot 1.5 °C and peak at around 1.7–1.8 °C before returning to below 1.5 °C before 2100 in the most ambitious pathways assessed.[4] Global warming will be higher, if action is delayed.[6] This reflects trends in global emissions to 2025 and the feasible pathways for reducing emissions from this point on, including with deployment of carbon dioxide removal (CDR), as evident in newly published climate scenarios.[13] Returning to 1.5 °C requires sustained efforts beyond achieving net-zero emissions and faces significant feasibility constraints.[7] These findings reinforce the urgency of reducing emissions, strengthening resilience and limiting every additional increment of warming.

The impacts of warming temporarily overshooting 1.5 °C are not expected to reverse symmetrically once temperatures come back down.[14,15] Several climate tipping points such as the loss of warm-water coral reefs, the shrinking of the Greenland and West Antarctic ice sheets and abrupt permafrost thaw are now assessed in evidence published since AR6 as possible at or near current warming.[12,16]

The NDCs

NDCs submitted since early 2024 reflect a comprehensive response to climate change and in aggregate affirm the transition path towards existing net-zero targets and long-term low-emission development strategies, with variation in the strength of near-term ambition across countries.[17] The best estimate of 2100 warming is now between 1.7 and 2.3 °C, across major recent studies[18] if all current NDCs and long-term targets are met. Without strengthening current policies to deliver the targets now set, the best estimates of projected warming are between 2.6 and 2.9 °C.[18]

The Belém Mission to 1.5 focuses on enabling ambition and implementation of NDCs and NAPs seeks to address both ambition and implementation gaps. The ambition gap is the difference between outcomes under current targets and what is needed to limit warming to 1.5 °C. Closing the ambition gap means further strengthening or overachieving targets to minimise the magnitude and duration of overshoot. The implementation gap is the difference between outcomes under current policies and under targets. It quantifies the gains possible from accelerating action to deliver current NDCs and providing the finance and international support on which conditional NDCs depend.

The NAPs

National adaptation planning is now close to universal in principle but uneven in depth. Of 198 Parties to the United Nations Framework Convention on Climate Change (UNFCCC), almost 90 per cent have a national adaptation plan (NAP), or national adaptation strategy or policy,[19] and 93 Parties, including 81 developing countries, have submitted a NAP to the UNFCCC.[20] Many of those also include references to loss and damage. Coverage of the United Arab Emirates (UAE) Framework for Global Climate Resilience targets is strongest for food and agriculture, water and health.[20] The key limiting factor is increasingly shifting from plans to delivery.

NAP delivery is supported by a range of efforts, costed investment strategies; secured finance; capacity building; monitoring systems; effective institutional arrangements; inclusive participation in risk identification, planning and implementation; prioritisation of locally led action, integration of diverse knowledge systems and strong political leadership. The United Nations Environment Programme (UNEP) estimates developing countries' annual adaptation finance needs at USD 310–365 billion by 2035.[19] Meeting these needs will require a combination of international public adaptation finance flows, domestic resource mobilisation and mobilised private finance. International public adaptation finance flows are estimated to be about USD 26 billion in 2023.[19]

Acceleration opportunities: Insights from the Belém Mission to 1.5

Submissions highlight that accelerating implementation is generally not constrained by a lack of technical solutions, but by the broader barriers and enabling conditions needed to

deploy them at scale, and in some cases to commercialise and de-risk. Acceleration depends on sectoral and outcome-specific initiatives, supported by core enablers in the form of finance, technology, capacity building and partnerships.

Submissions identify specific barriers and solutions in high-impact implementation areas critical to returning warming to below 1.5 °C by the end of the century, limiting the magnitude and duration of overshoot, and enabling adaptation and resilience. These barriers, opportunities, and potentially scalable initiatives, explored in Part 2 of this report, are grouped as:

- **Cross-cutting enablers including means of implementation**
  - **Finance and investment, technology and capacity-building**: Enabling implementation at the pace and scale required to meet climate goals.
  - **International cooperation:** Facilitating countries to move faster, learn from one another and unlock sustainable supply chains and trade.
  - **Inclusive governance:** Ensuring climate action is informed by just transitions, diverse perspectives, reflects local circumstances and delivers benefits that are broadly shared.
- **Adaptation and mitigation**
  - **Forests, the ocean and nature-based solutions:** Delivering healthy and resilient ecosystems with mitigation, adaptation, biodiversity and social benefits.
  - **Strengthening food security and agricultural resilience:** Supporting resilient communities, sustainable development and long-term adaptation outcomes in a changing climate.
- **Mitigation**
  - **Accelerating the clean energy transition and electrification:** Offering significant opportunity to reduce emissions, while strengthening energy security, affordability and economic prosperity.
  - **Reducing methane and advancing the green industrial transition:** Delivering near-term climate benefits while laying the foundations for long-term industrial competitiveness and economic transformation.
- **Adaptation**
  - **Towards universal early warning systems:** Protecting lives and livelihoods by helping people and communities anticipate, prepare for and respond to climate hazards.
  - **Developing climate-resilient health systems:** Embedding health as a consideration during national climate action design and implementation, and not only considered as a co-benefit, to improve preparedness, planning and public health outcomes.
  - **Building climate-resilient cities and infrastructure**: Investing in resilient cities, buildings and infrastructure to reduce climate risks while improving liveability, sustainability and economic resilience.

The initiatives brought together under the Belém Mission to 1.5 have relevance beyond COP31. Together with strengthening the enabling conditions on which they depend, they offer practical routes to enabling ambition and accelerating the implementation of NDCs and NAPs. The Global Climate Action Agenda and the Global Implementation Accelerator also provide opportunities for mobilising actors and resources to support the practical implementation of NDCs and NAPs.

1 Introduction

1.1 Purpose and mandate

In the Global Mutirão decision (Decision 1/CMA.7),[1] adopted at COP30 in 2025, Parties reiterated their resolve to pursue efforts to limit the temperature increase to 1.5 °C, to limit both the magnitude and the duration of any temperature overshoot, and to close adaptation gaps (paragraph 7). In paragraph 15 of the same decision, Parties resolved to decisively transition to a focus on implementation of the Paris Agreement and previous CMA decisions.

As part of this effort, the Global Mutirão decision launched the Belém Mission to 1.5 (paragraph 42) to be taken forward under the guidance of the Presidencies of COP29, COP30, and COP31. The Belém Mission to 1.5 aims to enable ambition and implementation of nationally determined contributions (NDCs) and national adaptation plans (NAPs), and to reflect on accelerating implementation, international cooperation and investment in NDCs and NAPs across mitigation and adaptation. Parties requested the Presidencies to produce a report summarising this work by COP31. This report is submitted in response to that request.

1.2 Process

The Presidencies have sought input throughout 2026 via a call for submissions,[3] in events at climate meetings including in Berlin (April 2026), Copenhagen (May 2026), Bonn (June 2026), London (June 2026), Shamakhi (July 2026), Baku (September 2026), New York (September 2026), Sydney (September 2026) and at the Pre-COP31 meeting in Fiji (October 2026), and in other meetings and engagements with stakeholders.

Written submissions were received from 148 entities in response to the call: 24 from Parties and 124 from non-Party stakeholders. Of the 24 Party submissions, 16 were made by individual countries, spanning developed and developing countries across regions, and 8 were made on behalf of negotiating groups or coalitions: the African Group of Negotiators (AGN), the Independent Association of Latin America and the Caribbean (AILAC), the Alliance of Small Island States (AOSIS), the Arab Group, the Environmental Integrity Group (EIG), the Least Developed Countries (LDC) Group and the group of Like-Minded Developing Countries (LMDC), and Bangladesh, Bhutan and Nepal.

1.3 Scope and structure

This report is structured in two parts.

Part 1, ‘Context and challenges’, is a review of current emissions and warming and pathways towards long-term goals of the Paris Agreement, climate impacts and adaptation needs. This report is not a new scientific assessment; it provides an overview of the latest-available science in this regard.

Part 2, ‘Accelerating implementation: Insights from the Belém Mission to 1.5’, presents the cross-cutting enablers and high-impact implementation initiatives for specific sectors or

outcomes to accelerate implementation of NDCs and NAPs. These initiatives and the insights distil what has emerged from the written submissions and Presidencies' consultations during the course of this year. This report brings together the Presidencies' reflections and summary of their work, informed by submissions, consultations and the best available science. Its approach is non-prescriptive, facilitative and cooperative: the relevance and application of the opportunities identified depend on national circumstances, development priorities and nationally determined pathways.

The analysis and proposals set out in this report build on goals, solutions and initiatives being pursued through complementary processes in the wider climate implementation ecosystem. The Belém Mission to 1.5 is one of several processes launched at COP30 as part of the Global Mutirão, including the Global Implementation Accelerator. While the Belém Mission to 1.5 identifies strategic opportunities, barriers and enabling conditions for ambition and implementation, the Global Implementation Accelerator, also launched by the Global Mutirão decision, concentrates partner support on selected high-impact solutions drawn from the Global Climate Action Agenda. Together, they help give practical expression to this new focus on implementation, of which the Action Agenda is already a living example. Throughout the year, the COP31 Presidency has been advancing an ambitious Action Agenda, developing implementation-focused initiatives and partnerships to help translate climate commitments into practical action and investment at scale. Those broader efforts depend on actors within and beyond the UNFCCC working together to deliver the objectives agreed over successive COPs, including in Baku and Belém, and to accelerate the collective response needed to achieve the Paris Agreement's goals.

1

2 The science: state of play and implications for action

3 The NDCs and NAPs: progress and gaps

PART 1

Context and challenges

PART 1

Context and challenges

The world is already living with the impacts of climate change. Recent months have seen significant climate impacts such as major glacial collapse, extreme heat across many regions causing tens of thousands of fatalities, wildfire, drought, flooding, and damage to ecosystems. As the international community grapples with the impacts of climate change that are already evident, this part sets out the scale and pace of response that pathways indicate, as context for the opportunities set out in Part 2.

2 The science: state of play and implications for action

In the Global Mutirão decision adopted at COP30 in 2025, Parties reaffirmed their resolve to pursue efforts to limit warming to 1.5 °C above pre-industrial levels.[2]

The progress achieved since the Paris Agreement means that the worst-case scenarios projected 10 years ago have been avoided. Today's business-as-usual emissions are substantially lower than those from that time. The latest scientific assessments indicate that given emissions to date, the world now has to navigate how to limit the magnitude and duration of overshoot through peak-and-decline pathways that will bring the world back to below 1.5 °C. The pace of this response matters: each additional five years at today's high emission levels is estimated to add approximately 0.1 °C to peak global warming.[4]

2.1 Observed emissions, warming, and impacts

Observed emissions

Material progress has been made since the Paris Agreement, but global emissions have not begun the sustained decline required to put the world on track for no or limited overshoot of 1.5 °C (Figures 2, 4 and 5). Atmospheric CO_2 concentration reached 424 ppm in 2024, some 52 per cent above the pre-industrial level.[21]

Global greenhouse gas (GHG) emissions reached an all-time high in 2024, at around 56.8 ± 5.5 Gt CO_2 eq, and are estimated to remain at record levels in 2025. Growth rates have slowed, though.[5] A flat or declining trend over several years would be needed to confirm that global GHG emissions have peaked.[22] Achieving the Paris Agreement temperature goal depends on a sustained decline in emissions.

The energy sector continues to be the largest source of emissions, within which CO_2 emissions from the combustion of fossil fuels remain the largest contributor. Methane is the second largest contributor to global warming. GHG sources associated with extraction, production and combustion of fossil fuels account for around 73 per cent of global GHG emissions. Of the total, CO_2 from fossil fuel energy and industrial sources is about 68 per cent, CO_2 from land use, land-use change and forestry (LULUCF) about 8 per cent, methane about 16 per cent, nitrous oxide about 5 per cent and fluorinated gases about 3 per cent (Figure 1).[23] This underscores the importance of measures to address CO_2, as well as the potential for rapid reductions in methane to play a significant role.

Observed warming

Current global warming has already exceeded 1.5 °C in a single year (2024).[8] The last 11 years (2015–2025) have been the 11 warmest on record.[9] World Meteorological Organization (WMO) projections indicate a tendency toward strong warming El Niño conditions, particularly in 2026–2027, which may increase the likelihood of exceptionally warm years.[24] It is likely (75 per cent chance) that the 2026–2030 five-year mean will exceed 1.5 °C above the 1850–1900 average.[9]

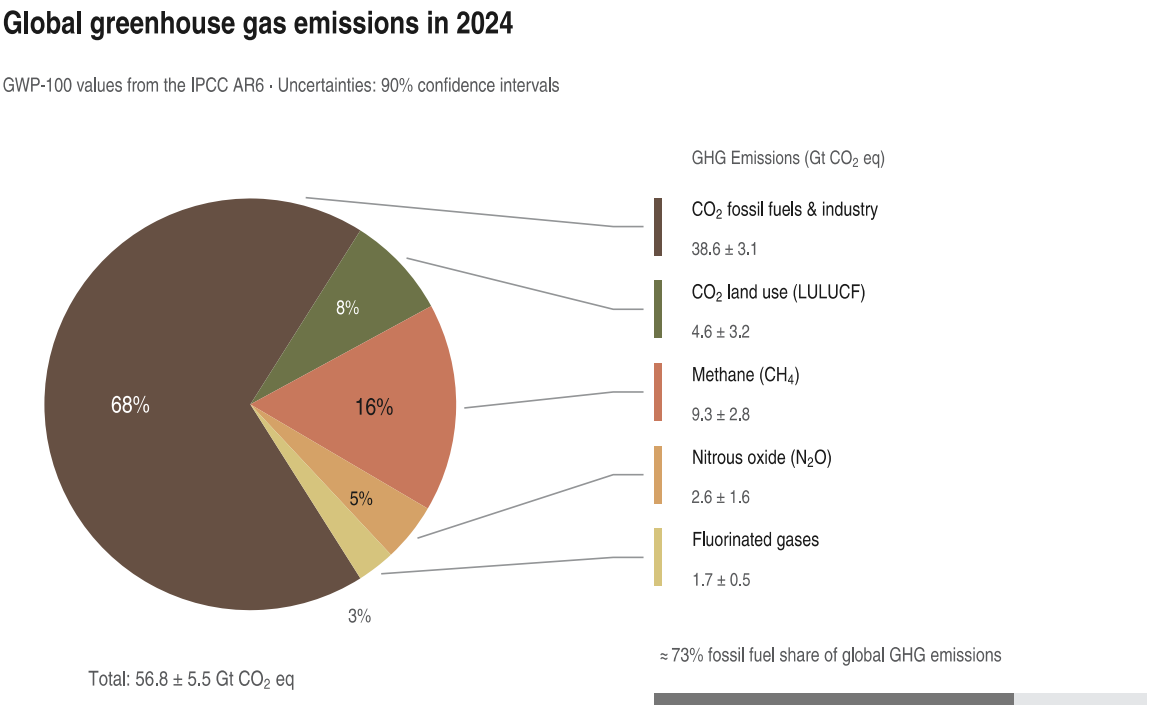


Figure 1 Global greenhouse gas emissions shares by gas for the year 2024. The share of emissions from production, extraction and combustion of fossil fuels is provided for all GHGs.[25]

Observed impacts

Many of the impacts that were projected at the time of the AR6 are now occurring. Exceeding 1.5 °C will bring greater challenges, with more extreme weather events, climate hazards and impacts on people and ecosystems, increasing needs for resilience and adaptation and the risk of loss and damage.

Global heat-related mortality reached an estimated average of 546,000 annually in 2012–2021, up from 335,000 in 1990–1999, a 23 per cent increase on a population-adjusted basis.[10]

Global mean sea level is now about 11 cm higher than in 1993, a rise the Intergovernmental Panel on Climate Change (IPCC) assesses as irreversible for centuries regardless of future mitigation. This rise is now resulting in observed present-day harms such as coastal groundwater salinisation and ecosystem loss.[26] Glacier mass loss in the 2024/2025 hydrological year was among the five worst on record.[11] The AR6 found, with high confidence, that glacier retreat, slope instabilities and heavy precipitation affect landslide and flood activity.[27] Ocean heat reached a new record high in 2025.[28]

Coral reefs are often considered a bellwether of challenges faced by many ecosystems. The fourth global coral bleaching event (January 2023–mid-2025) affected roughly 84 per cent of reef area,[12] the largest and most extensive on record, and warm-water coral reefs are assessed as having already passed their central tipping-point estimate.

2.2 The 1.5 °C warming level with overshoot and return

Warming above 1.5 °C in individual years or even over a five-year period does not mean the 1.5 °C goal is out of reach. However, it now seems that the remaining feasible pathways to limit warming to 1.5 °C by the end of the century involve overshooting this threshold and then returning.

It is still possible to return warming in global temperature to below 1.5 °C by 2100, depending on the pace and scale of global emissions reductions.

The latest science indicates that feasible and cost-effective pathways remain to return warming to 1.5 °C after a peak of around 1.7 °C or even 1.8 °C, but the available set of pathways is shrinking. Every five years of continued high GHG emissions implies a roughly 0.1 °C higher peak warming.[4] The Global Mutirão decision from COP30 reiterates Parties' resolve to pursue efforts to limit the temperature increase to 1.5 °C, to limit both the magnitude and the duration of any temperature overshoot, and to close adaptation gaps.

~130 Gt CO_2

remaining 1.5 °C carbon budget from the start of 2026 — about three years of current emissions

The total carbon budget for 1.5 °C has been almost entirely consumed

Almost all of the total carbon budget for staying below 1.5 °C has now been depleted, as the latest available science shows. Historical cumulative net carbon dioxide emissions already account for about 95 per cent of the total carbon budget for a 50 per cent probability of limiting global warming to 1.5 °C. The remaining carbon budget for holding warming to 1.5 °C with at least a 50 per cent chance is around 130 Gt CO_2 from the start of 2026, which is about three years of current emissions.[29]

To return to below 1.5 °C warming, every tonne of CO_2 emitted in excess of the carbon budget would have to be balanced by removals in subsequent decades, requiring net negative anthropogenic CO_2 emissions.

+0.1 °C

added to peak warming for every five more years at today's emission levels

Pathways that limit warming to 1.5 °C

The pathways in this section are drawn from the pathways assessed by AR6. New peer-reviewed modelling efforts are also emerging. Key characteristics of these new pathways support the conclusions drawn below and will be further assessed in the context of the IPCC Seventh Assessment Report (AR7). The options for limiting warming to 1.5 °C by 2100 are narrowing.[4,13] The pathways assessed in AR6 that limit warming to 1.5 °C with no or limited overshoot assume steep emissions reductions from 2020. Instead, global emissions have continued to rise since 2020. Nevertheless, limiting global warming to 1.5 °C with no or limited overshoot requires deep, rapid and sustained reductions in global greenhouse gas emissions of 60 per cent by 2035 relative to 2019 levels, as recognised in the outcome of the first global stocktake (GST-1) and the Global Mutirão.

Delaying the onset of decisive emissions reductions beyond 2020 has three implications for pathways that aim to return warming to below 1.5 °C by 2100. First, higher peak warming increases climate impacts, adaptation needs and risks. Every additional five years at current global emissions levels before decisive reductions begin is estimated to raise best-estimate peak warming by about 0.1 °C[6] (Figure 6).

Second, the required annual rate of emissions reductions increases, making the transition more demanding. In these pathways, delayed reductions do not materially shift the timing of global net-zero CO_2 emissions around 2050 or global net-zero GHG emissions in the 2070s. Reaching the same milestones from a later start requires faster reductions over a

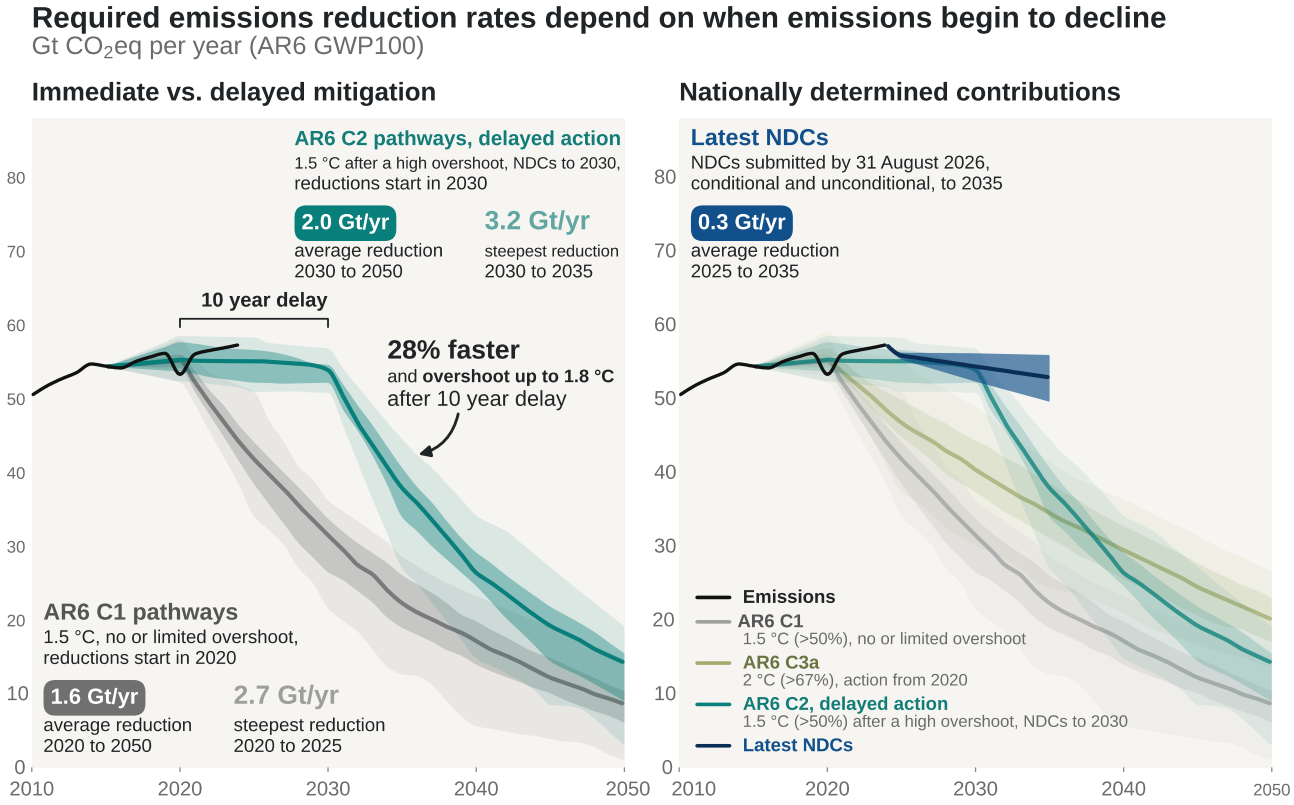


Figure 2 Global greenhouse gas emissions in 1.5 °C pathways (left) and the NDCs (right), in Gt CO_2 eq per year (AR6 100-year global warming potential, GWP100). Left: AR6 C1 pathways (1.5 °C with no or limited overshoot, reductions from 2020, grey) and the C2 delayed action (P3b) pathways (1.5 °C by 2100 with overshoot up to around 1.8 °C, reductions from 2030, teal); the ten-year delay requires reductions about 28 per cent faster and implies a higher peak warming. Right: aggregate emissions implied by the NDCs submitted by 31 August 2026, conditional and unconditional, to 2035 (blue), against the same pathways and AR6 C3a pathways that keep warming likely below 2 °C (green). Lines show medians; for AR6 pathways, darker bands show the interquartile range and lighter bands the 5th to 95th percentiles. The NDC band shows the full range across ambition and conditionality cases; the black line shows historical emissions.[30]

shorter transition period (Figure 2, left) and may lead to different near-term climate outcomes.

Third, a higher peak in warming requires greater cumulative net-negative CO_2 emissions to bring warming back below 1.5 °C by 2100.[7] More CO_2 would need to be removed from the atmosphere over time. The larger removal requirement increases costs and dependence on carbon dioxide removal at scales whose feasibility remains uncertain.

In 1.5 °C pathways where decisive global emissions reductions begin in 2025 and warming returns to below 1.5 °C by 2100, emissions in both 2030 and 2035 are lower than the aggregate levels implied by current NDCs. Pathways with decisive reductions beginning in 2030 also require substantially lower emissions by 2035 than current NDCs imply for that year.[17] If global emissions instead remain approximately constant until 2035, best-estimate peak warming could reach 1.9 °C or more, calling into question whether global warming could return to 1.5 °C this century.[31]

The aggregate effect of current NDCs as at 31 August 2026 is estimated to lead to 3 (0 to 7) per cent reductions of GHG emissions below 2019 levels by 2030 and 6 (0 to 12) per cent reductions by 2035 (Figure 2, right, Figure 6).[17] Taking into account potential overachievement of targets implies lower 2030 and 2035 emission levels, but a large gap will remain towards the 1.5 °C scenarios starting in 2020 or 2025.

At the same time, many Party submissions stress that finance and technology support needs to be ramped up decisively to deal with increasing adaptation pressures, loss and damage and a swifter energy transition towards net-zero emissions globally.

2.3 Climate impacts at 1.5 °C versus 2 °C and implications of 1.5 °C overshoot

Observed impacts since AR6 are consistent with, and in several respects running ahead of, what was projected for today's warming of about 1.4 °C. AR6 found that risks, adverse impacts and losses and damages associated with climate change increase with every increment of warming. Interactions between climatic and non-climatic risks create increasingly complex compound and cascading risks. The 2025 Global Tipping Points assessment finds warm-water coral is no longer a future risk but a tipping element already being crossed, while the assessed uncertainty ranges for the Greenland and West Antarctic ice-sheet thresholds extend down to about 1 °C (Figure 3).[12,16] Crossing these thresholds matters because the consequences are largely irreversible on human timescales: warm-

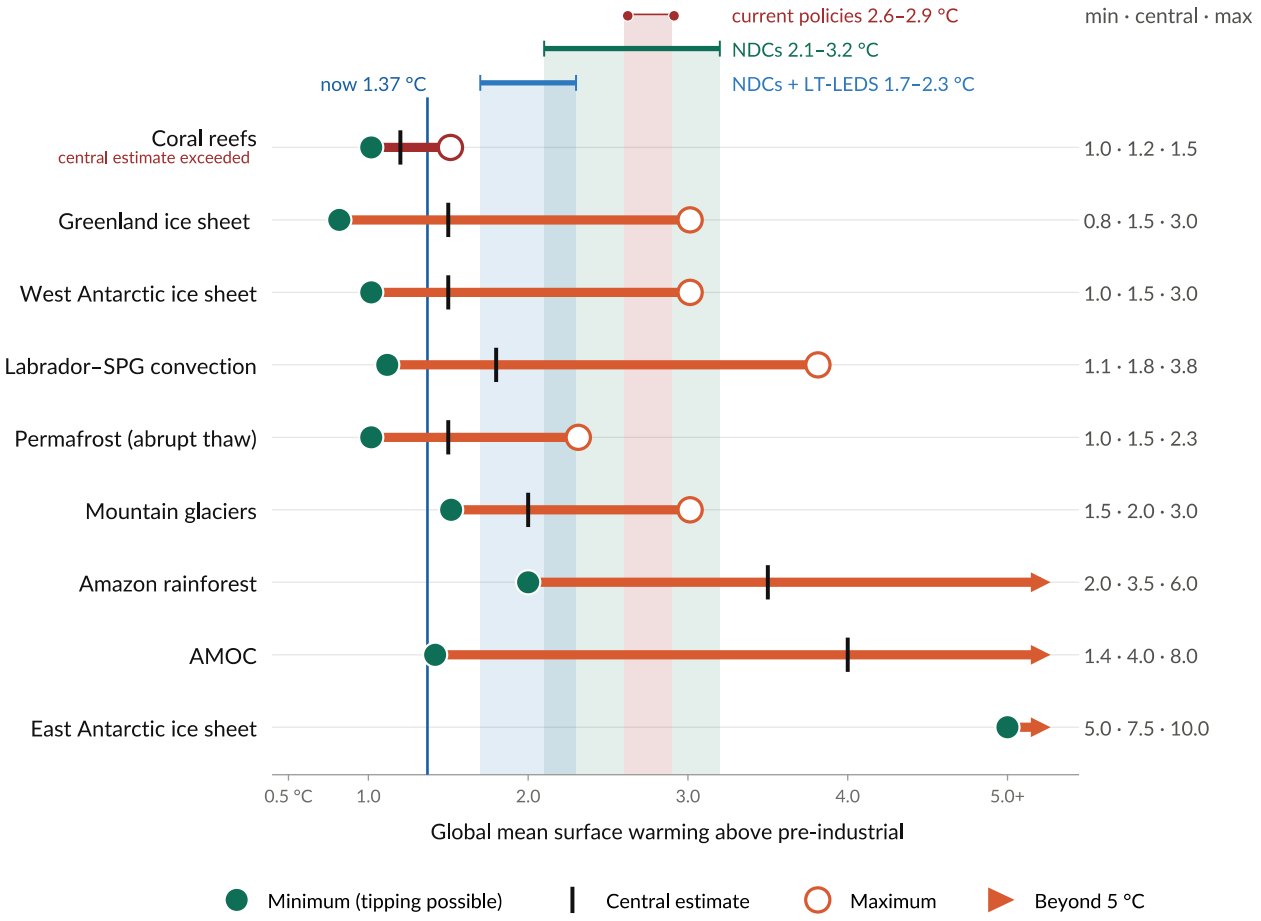


Figure 3 Estimated global-warming thresholds for nine climate tipping elements, in °C above pre-industrial levels. Each bar spans the assessed range: the green marker is the minimum (tipping becomes possible), the black notch the central estimate and the open circle the maximum; arrows indicate maximum values above 5 °C. The blue line marks human-induced warming of about 1.37 °C. Shaded bands show projected warming in 2100; the range of central estimates under current policies across recent studies (red shading, see Section 3.1), and the best-estimate ranges for NDCs only (green) and for NDCs together with long-term targets (blue), in line with the NDC Synthesis Report 2026. Five elements (warm-water coral reefs, the Greenland and West Antarctic ice sheets, Labrador–subpolar gyre (SPG) convection and abrupt permafrost thaw) have minimum thresholds at or below present-day warming. This means tipping is possible, not that it has occurred. The exception is warm-water coral reefs, whose central estimate has been exceeded and which the Global Tipping Points Report 2025 assesses as having passed its tipping point. AMOC: Atlantic Meridional Overturning Circulation. Sources: warm-water coral reef values (dark red) from the Global Tipping Points Report 2025, which revises the central estimate downward; all other values from Armstrong McKay et al. (2022), The Global Tipping Points Report 2025 gives lower indicative thresholds for SPG convection (around 1.5 °C), the AMOC (around 2 °C) and the Amazon with deforestation (below 2 °C).

water coral reefs support nearly a billion people and a quarter of all marine life, and ice-sheet loss commits the world to several metres of sea-level rise over centuries to millennia.[12] The assessed Amazon dieback threshold from warming alone remains in the range of about 2–6 °C, but recent work stresses that compounding drought, fire and deforestation disturbances can drive critical transitions in the forest system well below that level. On this basis, a precautionary 'safe boundary' of about 1.5 °C of global warming to keep the forest resilient is discussed.[32] This risk had already received political recognition in the Belém Declaration, adopted by Amazon Cooperation Treaty countries in August 2023. The Declaration called for integrated cooperation and collective action to prevent the Amazon from reaching a point of no return, linking forest protection with the region's environmental, social and economic challenges.

Impacts are set by peak warming; a pathway that peaks higher locks in more risk even if temperatures later return to the same level. Overshoot is best understood as a process unfolding over decades (exceedance, peak, decline and stabilisation), and it is highly unlikely that all risks reverse proportionately as temperatures fall. Some impacts are broadly reversible, others only partially, and others effectively irreversible, like sea-level rise, deep-ocean warming, marine biogeochemistry, ice-sheet and permafrost loss, and species extinction.[14] A world that returns to 1.5 °C after decades above it is therefore not equivalent to stabilisation at that level.[15]

Every increment of warming between a 1.5 °C and a 2 °C world widens the difference in subsequent impacts that will be felt. Compared with 2 °C, limiting warming to 1.5 °C would leave around 420 million fewer people frequently exposed to extreme heat and about 0.1 m less global mean sea-level rise by 2100 (relative to 1986–2005), with up to 10 million fewer people exposed to related risks.[33,34] Bringing temperatures back down after the peak would reduce sea-level rise in 2300 by about 40 cm compared with stabilising at peak warming, but would not reverse the rise already committed.[35] An ice-free Arctic summer shifts from about once a century at 1.5 °C to at least once a decade at 2 °C.[36]

These risks also carry economic costs that grow with each increment of warming. The IPCC's Sixth Assessment finds that projected global aggregate economic damages generally increase non-linearly with warming, and that some recent estimates are higher than those previously assessed (low confidence). Damages vary widely between regions and are often higher, as a share of income, in developing countries, and vulnerable communities who have historically contributed the least to climate change are disproportionately affected.[37] Reinsurance-sector modelling from 2021 illustrates the potential scale. Compared with a world without climate change, global gross domestic product (GDP) by mid-century could be around 11 per cent lower with 2 °C of warming, 14 per cent lower with 2.6 °C and 18 per cent lower with 3.2 °C, against about 4 per cent if the Paris Agreement goal of holding warming well below 2 °C were met.[38] The choice between 1.5 °C and 2 °C is therefore economic as well as physical. One study finds that limiting warming to 1.5 °C rather than 2 °C has a more than 60 per cent chance of avoiding over USD 20 trillion in cumulative global damages by 2100, and that 71 per cent of countries, home to 90 per cent of the world's population, are likely to be economically better off under the lower limit, with poorer countries benefiting most.[39] Because risks grow with both the peak and the duration of overshoot, delay is also costly in its own right: the later deep reductions begin, the higher warming peaks, the larger the cumulative damages and residual loss and damage, and the greater the reliance on net-negative emissions, which face feasibility and sustainability concerns, to bring temperatures back down.[40,15]

Ecological risks rise sharply and non-linearly between 1.5 °C and 2 °C. The share of species losing more than half their range roughly doubles to triples (insects 6 to 18 per cent, plants 8 to 16 per cent, vertebrates 4 to 8 per cent), and the land area shifting from one ecosystem type to another roughly triples between 1 °C and 2 °C.[41] Warm-water coral reefs decline by 70–90 per cent at 1.5 °C against near-total loss above 2 °C.[36]

The human consequences fall hardest on those that have historically contributed least to climate change. The annual risk of simultaneous multi-region crop failure is estimated to rise by about a third for maize between 1.5 °C and 2 °C, while rising CO_2 lowers the protein, zinc and iron content of staple cereals.[42] Heat-related deaths averaged about 546,000 a year in 2012–2021, and the range of vector-borne disease is expanding, with 2024 the worst year on record for dengue.[43] Across six regions, up to 216 million people could migrate within their own countries by 2050 on a high-emissions path, falling by up to 80 per cent with rapid mitigation and inclusive development.[44] Pacific and Indian Ocean small island states face inundation, a threat described first-hand in some Party submissions. The sea-level rise to around 2050 is largely committed under the assessed emissions pathways.[15]

2.4 Adaptation needs, limits and the cost of delay

The depth and speed of mitigation, and the size of any overshoot, determine both the scale of the adaptation challenge and the loss and damage that adaptation cannot prevent, a link drawn in submissions. Deep, early mitigation reduces climate hazards and lessens the adaptation burden; weak, slow mitigation increases hazards, exposure and vulnerability and drives the greatest irreversible loss and damage. The half-degree between 1.5 °C and 2 °C, and the magnitude and duration of any overshoot, are therefore central to defining the extent to which adaptation remains feasible.[45]

Overshooting 1.5 °C brings more systems up against soft limits to adaptation — where options exist but are not deployed due to the lack of finance, implementation capacity, governance or technology — and hard limits, where no adaptation can avoid major impacts and losses. Some are already close: small-island communities dependent on coral reefs may exceed adaptation limits well before 2100 even under low emissions, some atolls face annual wave-driven flooding of their entire land surface from the 2060s–2090s under a high-emissions scenario, and glaciers are committed to melting for decades or centuries.[45] Warm-water coral reefs are already crossing their thermal tipping point, a limit reached in real time rather than in projection. Because the temperature trajectory shapes how much adaptation is needed and which options remain effective, the temperature goal and the global goal on adaptation are inseparable, as is argued in some submissions.

Adaptation action to date remains fragmented and under-implemented.[46] Issues such as limited political commitment and investment, weak mainstreaming of adaptation across sectors, limited resources and skills at local level, and challenges in accessing and using climate information and data also contribute to this fragmentation. Adaptation finance needs and flows are set out in Section 4.1.

Where resources and state capacity are limited, adaptation tends to respond to current impacts rather than reduce future risk.[46] Large upfront costs and limited fiscal space can hold back investment in prevention, and governments often meet disaster costs by reallocating existing budgets, which can cut planned spending on other development priorities. This is despite each dollar invested in more resilient infrastructure in low- and middle-income countries yielding about four dollars in benefits.[47] Nature-based solutions

and ecosystem-based approaches can be highly cost-effective and deliver multiple co-benefits, and are emphasised in submissions (see Section 5.1). But because the ecosystems that provide protection degrade at higher temperatures, their effectiveness declines with warming, and some, such as warm-water coral reefs and some coastal wetlands, are already reaching hard adaptation limits.[48]

2.5 Emerging context

Submissions highlight the role of recent events and trends shaping options and priorities, including energy security, changes in the relative cost competitiveness of clean energy technologies and the evolution of the energy supply mix, and the emergence of artificial intelligence.

Conflicts, the responses and the broader geopolitical context are reconfiguring the energy security landscape, with price volatility of fossil fuels, and geopolitical exposure of supply chains both in focus. Countries, businesses and consumers are responding. There is a growing focus on demand-side measures, domestically available energy sources, and electrification in many countries.[49]

Submissions note that these energy security risks create both transition challenges and a case for the transition. Energy-security considerations are relevant both to the transition to low emissions-intensive energy systems and to the reliability, affordability, resilience and diversification of energy systems during the transition. More than 100 countries reduced fossil-fuel import reliance and 38 of them cut their reliance on electricity from imported coal and gas by more than 10 percentage points,[50] reducing their exposure to the volatility and risk of shortages.

The focus on energy security, affordability, and diversification has also heightened attention to supply-chain concentration in clean energy technology manufacturing, which has increased in the last five years for many products and components.[51]

Digital technologies including artificial intelligence have emerged as new developments bringing structural changes to economies and societies, while posing both challenges and opportunities to the climate transition. They could offer speed and scale towards systemic change alongside potential implications for the environment and energy demand, among other things.

The economics of the energy transition have shifted over the ten years since the Paris Agreement, and are reshaping the global primary-energy mix. The global average cost of newly commissioned solar and onshore wind has fallen substantially and, in many markets, is below the cost of new fossil-fuel generation as is outlined in Part 2. Relative costs vary by technology, system conditions, financing costs and location. In 2025, more than 90 per cent of newly commissioned, utility-scale renewable capacity delivered power at a lower cost than the cheapest, newly installed fossil-fuel-based alternative.[52]

3 The NDCs and NAPs: progress and gaps

As of 31 August 2026,[53] 154 Parties have come forward with new NDC targets since early 2024, covering approximately 71 per cent of global emissions. Further NDCs continue to be submitted. Around 113 Parties have now put forward targets and ambitions beyond 2035 to the UNFCCC in NDCs and long-term low-emission development strategies (LT-LEDS), including mid-century net-zero targets, many of which were in place before late 2024.

National adaptation planning is now close to universal in principle, but uneven in depth. As of August 2025,[19] 172 of 198 Parties to the UNFCCC had a national adaptation plan, strategy or policy in place, and by October 2026, 81 developing-country Parties had submitted a National Adaptation Plan or a sectoral adaptation plan to the UNFCCC.

Some Parties submit their adaptation plans and needs as part of their NDCs instead of NAPs. It is anticipated that Parties may continue to do so, particularly in light of capacity constraints on developing additional plans, and because many policy areas require a combined mitigation and adaptation lens.

3.1 Mitigation goals: NDCs and LT-LEDS

Progress since the Paris Agreement has bent the emissions curve (Figure 4), as is evident in the NDC Synthesis Report 2026[17]. However, it is also clear that progress is not sufficient to achieve emission reductions to limit warming to below 1.5 °C with no or limited overshoot, even with full implementation of all NDCs.

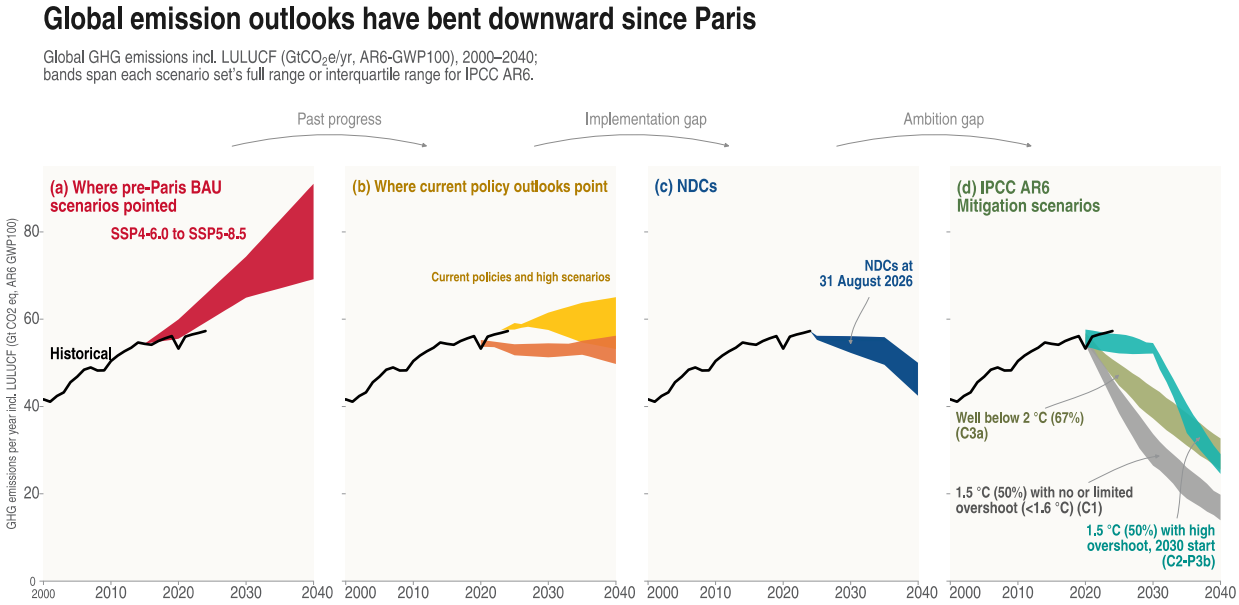


Figure 4 Progress in 'business-as-usual' emission outlooks from before the Paris Agreement (panel a), currently (b) and NDCs (c) and strong mitigation scenarios (d). Projected emissions under current policies have bent downward since Paris (panels a and b).[30,54] Projected emissions if Parties deliver their NDCs (panel c) (and move towards their long-term visions after 2035) are still well above the AR6 1.5 °C pathways with no or limited overshoot (grey), high overshoot after delay of global reductions (teal) and scenarios below 2 °C warming (green-grey) (panel d).

Following the NDC Synthesis Report 2026, global GHG emissions with LULUCF are projected to be around 49.6–52.6 Gt CO_2 eq, in 2035 when considering the full implementation of all elements of the NDCs, including conditional elements. Considering only the unconditional elements results in a range that is on average 3.5 Gt CO_2 eq higher, at 53.1–55.9 Gt CO_2 eq. This total projected 2035 emissions range, including LULUCF, of 49.6–55.9 Gt CO_2 eq lies slightly below the estimated 2025 emission levels, indicating that global emissions might have peaked by 2030 at the latest, if the final aggregate emissions fall within the lower part of this illustrative range, mainly due to achieving the conditional elements of NDCs, or when NDCs are overachieved or following illustrative current-policy business-as-usual emissions instead.

As the emissions curve has bent, projected warming under current policies has also declined since the Paris Agreement, when policies and technology costs implied global warming of between 3 °C and 5 °C. These worst-case scenarios have been avoided, largely due to climate action, cooperation and falling costs of clean energy technologies.

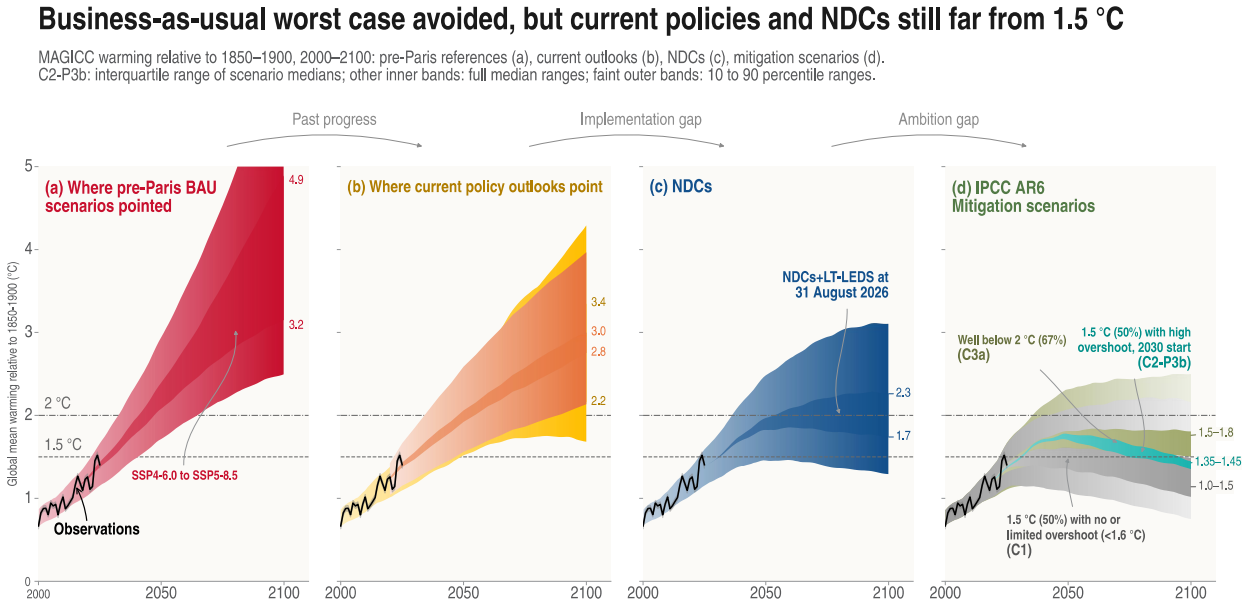


Figure 5 Progress in emission outlooks in terms of their warming implications, illustrating the progress and remaining gaps. At the time of the Paris Agreement, 'business-as-usual' warming projections ranged between 3 and 5 °C (panel a). Updated current-policy projections show warming at around 3 °C (panel b) with a substantial range. Implementation of NDCs and long-term targets would bring the world closer to 1.7–2.3 °C, while climate system uncertainties still cannot exclude warming above 3 °C by 2100 (upper end of the blue NDC bands). Ambition in NDCs and LT-LEDS as submitted does not yet return warming to below 1.5 °C by 2100 (teal range of lower scenarios) (panel c). AR6 1.5 °C mitigation scenario sets are shown in panel d for a 2020 onset of global reductions or after a 10-year delay to 2030 with high overshoot, as well as AR6 2 °C scenarios (panel d).[54]

Major recent studies[18] since late 2025 give broadly consistent best estimates of projected 2100 warming for the four main cases, even though uncertainties are relatively large. Differences between the studies are mainly due to the type of scenarios being considered. In summary, the illustrative central values of median estimates of warming at the end of the 21st century are as follows. Note that the ranges of medians, reflecting various emission projection uncertainties are much wider:[55]

– Approximately 2.6 to 2.9 °C, if emissions continue as projected under current policies, instead of declining to meet the targets now set (current policies).

- Approximately 2.5 to 2.6 °C, taking into account only unconditional NDCs, but not long-term targets. A range of approaches is used to extrapolate emissions after NDCs across the studies (unconditional NDCs only). If uncapped NDCs are considered, then warming projections can be substantially higher than 2.6 °C.
- Approximately 2.4 °C, taking into account full achievement of NDCs including all commitments conditional on international finance and support, but not long-term targets. A range of approaches is used to extrapolate emissions after NDCs across the studies (full implementation of NDCs, including all conditional targets). Again, if uncapped NDCs are considered, then warming projections can be substantially higher than 2.4 °C.
- Approximately 1.9 °C, taking into account NDCs and long-term targets (NDCs and long-term targets). Depending on conditionality and long-term assumptions, the range can be 1.7–2.3 °C.

The ambition gap

The ambition gap is the difference between current targets within Parties' NDCs in aggregate and what is needed to limit global warming to 1.5 °C. The 1.5 °C-consistent pathways require deep global cuts in emissions. The aggregate impact of targets reflected in Parties' NDCs and LT-LEDS remains well above the levels in these pathways. Every five years that global emissions remain at current levels will imply an approximately 0.1 °C higher peak warming.[4] Achieving a limited overshoot to a best-estimate warming below 1.6 °C would have required global emission reductions from 2020 onwards.

The AR6 Synthesis Report indicates that global emission reductions will have to be further enhanced for 2035 and beyond to be in line with pathways to limiting warming to 1.5 °C (with over 50 per cent likelihood in 2100) with no or limited overshoot over the course of the century. In those scenarios, GHG emissions are reduced by 60 (49–77) per cent by 2035 relative to the 2019 level. In scenarios of keeping global warming likely below 2 °C (with over 67 per cent likelihood), emissions in 2035 are 37 (25–56) per cent below the 2019 level. For 2040 and 2050, further emission reductions are indicated to be needed in order to limit warming to below 1.5 °C with no or limited overshoot, including net-zero CO_2 emissions by 2050 (99 per cent CO_2 emission reduction relative to the 2019 level).

The outcome of the global stocktake informs Parties in updating and enhancing, in a nationally determined manner, their actions and support, and each successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances.

As of 31 August 2026, the new NDCs imply changes in global GHG emissions relative to 2019 of about −3 (range −7 to 0) per cent by 2030 and about −6 (range −12 to 0) per cent by 2035, based on the 2026 NDC Synthesis Report,[56] highlighting the ambition gap, both to pathways to limiting warming to 1.5 °C and 2 °C (Figures 5 and 6). There is significant variation across Parties: some are not expected to see peak emissions by 2035.

The implementation gap

The implementation gap is the difference between outcomes under current policies and under targets. It quantifies the gains possible from accelerating action to deliver current targets and providing the finance and international support on which conditional targets depend.

The best estimate of 2100 warming provided by the NDC Synthesis Report is now 1.7 to 2.3 °C if all current NDCs and long-term targets are met. Without strengthening current policies to deliver the targets now set, the best estimates of projected warming are between 2.6 and 2.9 °C. The difference reflects the impact if all Parties' emissions follow current-policy trajectories, rather than trending towards existing long-term targets.

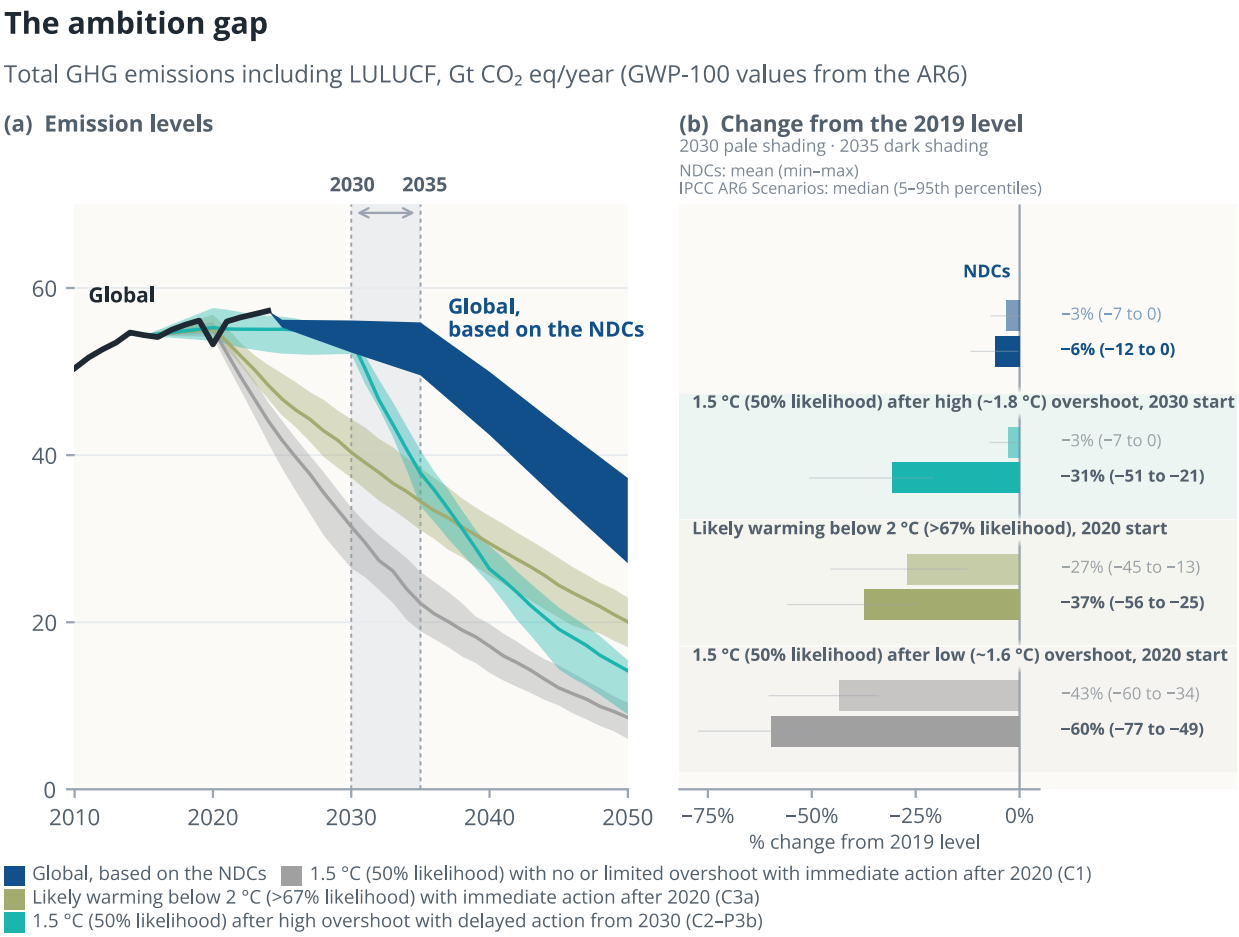


Figure 6 The ambition gap between aggregate global emissions in line with NDCs and AR6 scenarios that reach 1.5 °C (>50 per cent) at the end of the century with limited (<1.6 °C) or high (<1.8 °C) overshoot with starting years of when global emissions start to fall in 2020 and 2030, respectively. Also shown are scenarios that limit warming to well below 2 °C from the AR6 report. Emission levels shown for 2035 under the conditional and unconditional NDCs are estimated in the NDC Synthesis Report. Illustrative reduction levels by 2035 when accounting for potential overachievement of NDCs could be 14–19 per cent below 2019 levels.

NDC targets for 2035 that are stronger than current policy projections signal a commitment to stronger delivery, but they only narrow the gap towards 1.5 °C if the policies to achieve them are put in place.[57] In the global aggregate, current policies fall short of current NDCs in 2035, as not all countries have policies in place yet to achieve their unconditional 2035 NDCs. Currently, this implementation gap is estimated to be 3 to 6 Gt CO_2 eq with respect to implementing unconditional and conditional NDCs, respectively.[57] Likewise, there is a gap in enabling the conditions so that conditional NDCs can be implemented, a gap raised in Party submissions.

3.2 Adaptation goals: the global goal on adaptation, NAPs and NDCs

Since December 2023, the number of developing-country Parties that have submitted a National Adaptation Plan has risen from 52 to 81, and 93 Parties in total, including developed countries, had done so by 5 October 2026. As at September 2025, 144 developing countries had initiated the NAP process.[20]

The UAE Framework for Global Climate Resilience set seven thematic targets: water, food and agriculture, health, ecosystems and biodiversity, infrastructure and settlements, poverty and livelihoods, and cultural heritage. The Framework also set out four dimensional targets spanning the adaptation policy cycle: assessment, planning, implementation, and monitoring, evaluation and learning.[58]

At COP30, Parties decided to advance the activities under the Baku Adaptation Roadmap and adopted the Belém Adaptation Indicators as the tracking tool for this framework. The decision adopts 59 voluntary indicators across the eleven targets, developed through an expert-led process under the UAE–Belém work programme, and launches a two-year Belém–Addis vision on adaptation to put them into practice, with a review in 2029.[58] The indicators cover each of the thematic and dimensional targets, together with indicators on the means of implementation (finance, technology transfer and capacity-building).

Implementing this framework requires connecting adaptation planning with investment, sectoral policies and local delivery. A number of existing institutions and programmes offer complementary channels for mobilising partners and support around countries' adaptation priorities, including the NAP Implementation Alliance.

Read against the eleven targets, the submitted plans show varying coverage (Figure 7). Food and agriculture, water and health are almost universally addressed, and ecosystems and biodiversity in most (97 per cent of NAPs in the UNFCCC assessment; a priority in 80 per cent in the NAP Global Network review), while infrastructure and settlements are covered by a smaller majority and poverty and livelihoods and cultural heritage least of all. Coverage also tapers through the policy cycle, with around half of the 144 developing countries in the Least Developed Countries Expert Group (LEG) assessment reaching the implementation and monitoring stages.

3.3 Needs, gaps and barriers in NDC and NAP implementation

Many submissions observe that the key limiting factor for adaptation is increasingly shifting from the absence of plans to the challenges around implementation. Gaps include a lack of costed investment strategies, secured finance, capacity and quantified monitoring, as well as effective institutional arrangements for mainstreaming adaptation across government, inclusive participation in risk assessment and planning, and the use of diverse knowledge systems. UNEP's 2024 assessment found that around half of the adaptation

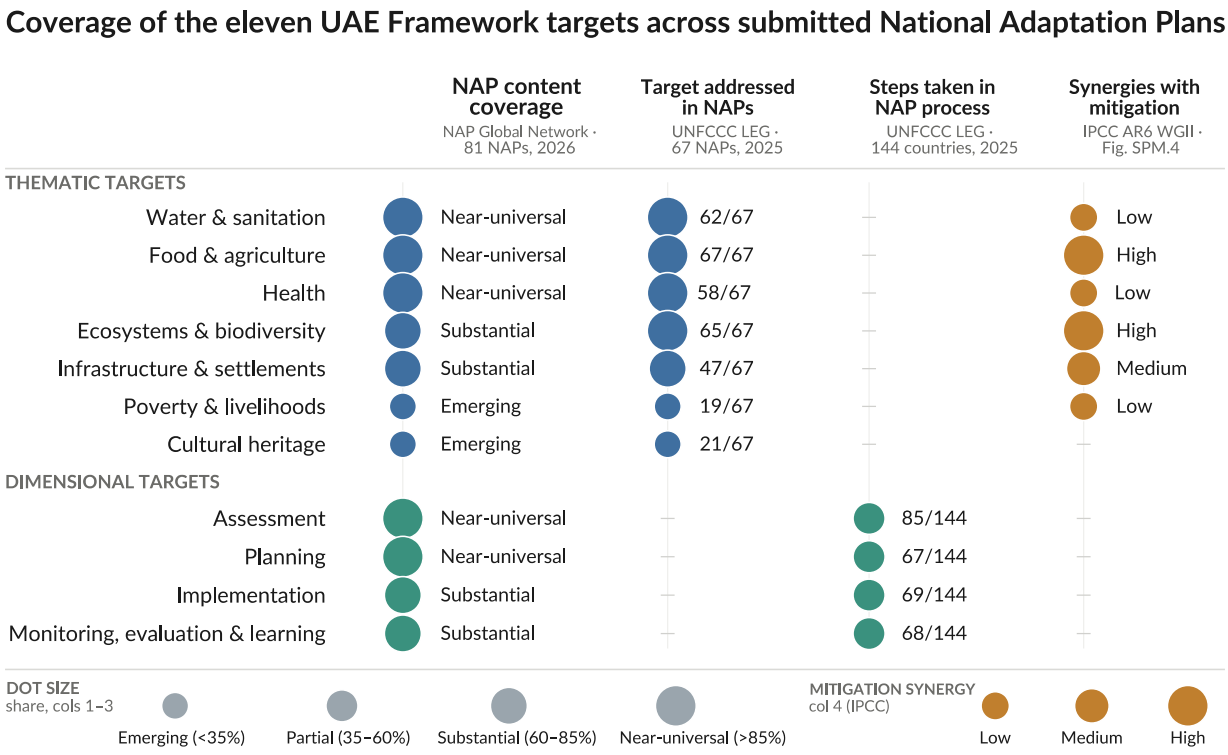


Figure 7 Coverage of the eleven UAE Framework targets across submitted NAPs, as assessed by the NAP Global Network (81 NAPs submitted by 5 October 2026: share that identify each sector as a priority or include each element) and the Least Developed Countries Expert Group (as at 30 September 2025: number of the 67 NAPs addressing each thematic target, and of the 144 countries in the NAP process that have taken each step, counted separately), with potential synergies with mitigation from AR6 Working Group II (WGII) Figure SPM.4. Sources: NAP Global Network (2026); UNFCCC Least Developed Countries Expert Group (2025); IPCC (2022b).

actions funded through the financial mechanisms of the UNFCCC and the Paris Agreement faced challenges in delivering results or sustaining them once project funding ends, underlining the importance of local capacity and finance for operation and maintenance.[59]

Progress on monitoring, evaluation and learning, one of the dimensional targets of the UAE Framework for Global Climate Resilience, to be tracked through the Belém Adaptation Indicators, has historically been slow. Most NAPs now include monitoring, evaluation and learning indicators (56 of the 81 reviewed by the NAP Global Network — Figure 7), but many countries still lack the institutional arrangements to put them into practice.[20] Reporting under the enhanced transparency framework is raised as both a burden and an opportunity. Biennial Transparency Reports (BTRs) are a key way for countries to show where progress has been made and where more action and support are needed. Second BTRs are due by the end of this year, and 138 BTRs had been submitted as of 31 August 2026, providing an unprecedented understanding of national climate action. Developing countries, however, continue to face constraints of institutional capacity, technical expertise, data systems and resourcing, making availability of adaptation data across NAPs and NDCs uneven.

These gaps sit against the physical limits described in Section 2.4. Limits imposed by finance, governance and capacity persist, particularly in least developed countries and small island developing States (SIDS), and drive residual loss and damage. Because the feasibility of adaptation itself declines as warming rises, the size of the adaptation gap has a strong dependence on mitigation ambition and the magnitude and duration of any overshoot.

As set out in Section 3.1, current NDCs leave a large ambition gap. The UNEP Emissions Gap Report 2026 estimates that even fully implemented, current NDCs leave 2035 emissions around 16–19 Gt CO_2 eq above the lowest 1.5 °C overshoot pathway.[57] Realising the ambition in current NDCs depends on policies, institutions and capacity as well as finance. Many submissions observe that the means of implementation, rather than the targets themselves, are increasingly the key limiting factor.

For many developing countries, a substantial part of their NDC mitigation is explicitly conditional on international finance, technology development and transfer and capacity-building. Full delivery of conditional commitments lowers the lower end of the projected warming range by 0.1 to 0.2 °C. Several developing-country submissions frame their ambition in these terms, identifying finance and support as a principal factor in implementing their commitments. Section 4.1 sets out current financial flows and the barriers and solutions identified in submissions, together with other means of implementation, and Section 4.2 the international cooperation to support and accelerate delivery of NDCs and NAPs.

2

PART 2

Accelerating implementation: Insights from the Belém Mission to 1.5

4 Cross-cutting enablers including means of implementation
5 Adaptation and mitigation
6 Mitigation
7 Adaptation

PART 2

Accelerating implementation: Insights from the Belém Mission to 1.5

Keeping 1.5 °C within reach demands faster implementation, stronger international cooperation, and increased investment in NDCs and NAPs over the short, medium, and long term.

Countries are increasingly pursuing climate, economic growth, and development priorities together, with climate action driving growth and development. Parties' right to promote sustainable development is a principle of the UNFCCC and is a key context for global efforts under the Paris Agreement.

Low-carbon, climate-resilient solutions strengthen energy and food security, reduce hunger, poverty, and inequality, and shape trade, investment, and industrial policies. Many of these solutions are emerging in developing countries and local communities where climate impacts are felt the hardest.

Achieving the long-term goals of the Paris Agreement requires a rapid acceleration of climate action and deployment of climate solutions during this critical decade. To help drive this transformation, Parties agreed at COP30 to focus on implementation of the Paris Agreement, through stronger action, solidarity, and international cooperation.[1]

Since the Paris Agreement, the Global Climate Action Agenda has mobilised governments, businesses, investors, cities, regions, civil society and other non-Party stakeholders to accelerate action and implementation. The five-year vision presented at COP30 aligns its framework to support the implementation of what has already been agreed at GST-1, translating its findings into six thematic Axes and 30 key objectives spanning mitigation, adaptation and means of implementation.

The Global Implementation Accelerator, launched under the joint guidance of the COP30 and COP31 Presidencies, is being designed to work on this ground. Through its own process, it will take forward a small number of such solutions where cooperation among partners could help trigger a positive tipping point, to accelerate implementation across all actors to keep 1.5 °C within reach and supporting countries' in implementing their NDCs and NAPs.

Submissions indicate that implementation is generally not constrained by a lack of technical solutions, but by the broader barriers and enabling conditions needed to deploy them at scale. Submissions point to sectoral and outcome specific initiatives, supported by the cross-cutting finance, technology development and transfer, capacity building and partnerships needed, as the means of accelerating implementation of NDCs and NAPs.

Many of the solutions identified are already gaining momentum. The Global Tipping Points Report 2025 highlights that "positive tipping points" can accelerate and scale up system transformation by generating self-amplifying change in societies, economies and technologies.[12] It finds that such positive tipping points have been crossed in the uptake of clean technologies including solar photovoltaics (PV) and wind power globally, and in the adoption of electric vehicles, battery storage and heat pumps in leading markets, and that lowering the cost of capital can help trigger such tipping points in developing economies, with benefits that can cascade through economies. The report identifies key policy priorities for triggering other positive tipping points across energy, finance, and nature. These include phasing in clean technologies and transitioning away from fossil fuels in a just, orderly and equitable manner; improving access to affordable climate finance, particularly in the Global South; ensuring that climate action advances social development

and reduces inequality; and scaling up nature regeneration. The report also emphasises the potential of international cooperation, civil society engagement and decisive policy action to catalyse positive change across sectors.

The solutions described below are non-prescriptive in nature. The context of each Party may be different in terms of national circumstances, development objectives, energy security concerns, nationally determined contributions and availability of finance, technology and capacity-building support.

Cross-cutting enablers including means of implementation are set out first, followed by high-impact implementation opportunities across adaptation and mitigation.

A recurring point is that treating adaptation and mitigation as separate tracks (institutionally, financially, or in planning) undercuts both. Submissions point to integration itself as a high-impact lever. Both adaptation and mitigation are central to implementation as the world navigates overshoot and return pathways, while their relative emphasis and sequencing will differ according to national circumstances and development priorities. Submissions, particularly from research and environmental groups, argue that integrated solutions are more durable, financeable and politically feasible than siloed ones. Barriers and initiatives to accelerate NDC and NAP implementation are grouped in this report into those in which adaptation and mitigation are intertwined, which focus on the land sector and the ocean, those that are predominantly mitigation focused, and those that are predominantly adaptation focused. For each, the co-benefits and risks across adaptation and mitigation are highlighted showing areas in which integrated responses can address both.

4 Cross-cutting enablers including means of implementation

Ensuring core enablers are in place is critical, with emphasis on:

- Accelerating climate finance and investment, including through adequate, predictable and accessible climate finance, climate-aligned global finance flows and investment, and with technology deployment and transfer, sustained capacity building and stronger national institutions.
- International cooperation focused on delivery, including South-South, regional and plurilateral cooperation, technology development and transfer, capacity building and trade.
- Ensuring inclusive, just transition principles are embedded in the design of solutions.

4.1 Finance and investment, technology and capacity building

Submissions identify means of implementation including finance, technology development and transfer, and capacity building, as well as investment and domestic mobilisation, as essential to implementing NDCs and NAPs, reaffirming findings from AR6.[40] Both climate finance and development finance that deliver the broader Sustainable Development Goals, if well designed and delivered, can also support adaptation and mitigation, delivering NDCs and NAPs as co-benefits of broader development initiatives.[60] The focus on means of implementation reflects the importance of finance, technology development and transfer and capacity building as important enablers of climate action and as a result are reflected under the Paris Agreement with finance in Article 2 paragraph 1c and Article 9; realising technology development and transfer in Article 10; and capacity-building to enhance the capacity and ability of developing country Parties to take effective climate action in Article 11.[61]

Finance and investment

The Climate Policy Initiative, following its own methodology, estimates that global climate finance continues to grow, surpassing USD 2 trillion for the first time in 2024, with approximately 9 per cent of global climate finance comprising cross-border flows to developing countries. This total includes domestic investment by governments, companies and households in developed and developing economies alike. Around 60 per cent of it was private finance, and around 85 per cent was raised and spent within the same country. Around 95 per cent was directed to mitigation, with the remainder split between dedicated adaptation and dual-benefit activities.[62]

Climate finance is growing, but not fast enough. There is sufficient global capital to close the global investment gap, but both adaptation and mitigation financing would need to increase many-fold to meet climate goals.[63] Closing the gap will require a step change: stronger domestic resource mobilisation, deeper capital markets, policy reforms, and more

strategic use of scarce public capital to crowd in private investment where it is needed most.

International Energy Agency (IEA) analysis indicates that on a 1.5 °C pathway, clean-energy investment in emerging and developing economies (outside China) would need to rise more than sixfold, from about USD 270 billion to some USD 1.6 trillion a year, by the early 2030s, with a tripling of concessional finance for their energy transitions.[64]

Finance was the most frequently cited barrier to accelerating the implementation of NDCs and NAPs in submissions. Two kinds of constraints are holding back flows to developing countries. Structural, macro-level constraints include limited fiscal space, debt distress and a high cost of capital, which together limit developing countries' ability to fund national climate action in full. More specific constraints cited across submissions include climate finance provision and mobilisation that has not kept pace with growing needs, particularly for adaptation, insufficient concessionality levels and persistent barriers to access. Currently, the volume of international finance flows is insufficient.

Following their own methodology, the Organisation for Economic Co-operation and Development's (OECD's) eighth assessment of progress towards the UNFCCC USD 100 billion climate finance goal, found that climate finance provided and mobilised by developed countries reached USD 136.7 billion in 2024.[65] However, estimates of the climate finance moving from developed to developing countries are debated, including in relation to the comprehensiveness of data. The recent report of the Standing Committee on Finance provides further information in this regard.[66]

In terms of the quality of finance, submissions emphasise access that is simple, predictable and concessional, available for programmes as well as projects, and that does not add to debt burdens. The OECD reported that grants from developed countries comprised around 30 per cent of public climate finance in 2024, and loans around two-thirds. Submissions highlight the high cost of capital in developing countries, which is often two to three times that in developed countries. Submissions also emphasise the shortage of investable project pipelines and the fragmentation of the climate finance landscape. Other submissions stress mobilising finance from all sources, including domestic resources and private investment, and using public finance strategically to crowd in private capital, while recognising that much adaptation finance will remain public. Calls for improved access and simplification are a recurring theme, including direct access, harmonised accreditation across funds, multi-year programmatic windows, as well as more timely and better-resourced readiness support.

In the case of adaptation, tracked finance from all sources, including domestic finance, reached about USD 64 billion in 2024.[62] Adaptation finance remains far below estimated needs, both globally and in developing countries. UNEP's Adaptation Gap Report 2025 puts developing-country adaptation-finance needs at USD 310–365 billion a year by 2035.[19] According to the OECD, adaptation finance provided and mobilised by developed countries reached about USD 35 billion in 2024.[65] Private finance remains a small share. Many adaptation projects do not generate a direct financial return. Submissions highlight the importance of public finance for adaptation, alongside efforts to use it strategically to attract additional investment, including from the private sector.

COP29 and COP30 have given new momentum to the finance agenda. The new collective quantified goal on climate finance (NCQG), adopted at COP29, sets a goal of at least USD 300 billion a year by 2035 for developing country Parties for climate action, from a wide variety

of sources, with developed country Parties taking the lead, counting all climate-related outflows from and climate-related finance mobilised by multilateral development banks towards achievement of the goal, and encouraging developing country Parties to make contributions, including through South–South cooperation, on a voluntary basis alongside qualitative elements that guide its implementation. It also calls on all actors to work together to enable the scaling up of financing to developing country Parties for climate action from all public and private sources to at least USD 1.3 trillion a year by 2035.[67]

The Baku to Belém Roadmap to 1.3T translates the headline figure into a structured framework of pathways. The Roadmap sets out suggested measures across five action fronts: Replenishing, Rebalancing, Rechanneling, Revamping and Reshaping (the "5Rs"). Together, these point to a system that must be reformed across its full range, from scaling up grants and concessional finance and expanding private investment to addressing structural constraints related to debt and the wider international financial architecture.

At COP30, Parties decided "to urgently advance actions" towards the at-least 1.3T goal, elevating the call agreed in Baku to a decision and lending it a sense of urgency. The Global Mutirão decision also calls for efforts to at least triple adaptation finance by 2035, in the context of the new collective quantified goal on climate finance.[68] Together, these decisions point in one direction: more finance, better finance and more of it for adaptation.

Technology development and transfer

Submissions call for affordable, accessible and locally relevant technology that builds long-term national capability, rather than reliance on imported solutions. They also call for support to deploy the technology priorities that developing countries have already identified, including through technology needs assessments. Submissions ask for the five key themes of the Technology Framework (innovation; implementation; enabling environment and capacity-building; collaboration and stakeholder engagement; and support) to guide delivery, with attention to national systems of innovation and to emerging digital technologies, including artificial intelligence and its energy footprint.[60]

Technology development and transfer are essential to accelerating mitigation and adaptation and enabling low-carbon, climate-resilient development. Yet significant disparities persist in countries' capacities to develop, access, absorb, adapt and deploy climate technologies. While technological advances have expanded the range of solutions available, their diffusion remains uneven, particularly in developing countries with limited financial, institutional and technological capabilities. Addressing these barriers requires moving beyond the provision of equipment and technical assistance towards strengthening national systems of innovation, including research and development capacities, enabling policy environments, skills and institutional frameworks. Submissions note this is critical to fostering endogenous technological capabilities and ensuring that technology deployment generates lasting economic and developmental benefits.

Established in 2010, the Technology Mechanism, comprising the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), supports developing countries through policy guidance, technical assistance, capacity-building and knowledge exchange. Technology Needs Assessments (TNAs) and Technology Action Plans (TAPs) help countries identify climate technology priorities and pathways for implementation. Building on this work, the Belém Technology Implementation Programme (BTIP), launched at COP30, aims to scale up the implementation of developing countries' climate priorities. It seeks to address barriers across different stages of the technology

cycle, strengthen national innovation systems, including Indigenous and endogenous technologies, integrate technology priorities into national policies and programmes, and enhance project preparation, matchmaking and access to finance.

There is growing recognition of the potential of artificial intelligence (AI), digital public infrastructure (DPI) and other digital technologies to accelerate climate action across sectors.[69]

Capacity-building

Submissions frame capacity-building as a durable institutional investment rather than a series of projects. It supports coordination across government, the mainstreaming of mitigation and adaptation in policy design and delivery, and the ability to prepare investable projects and access finance.[70] The mandate of the Paris Committee on Capacity-building has been extended,[71] but submissions note that demand for support is rising faster than the means to meet it.[72]

Submissions note that closing the gap between climate ambition and implementation requires strengthening the institutional capabilities of governments to translate commitments into sustained action. Recent research increasingly highlights the importance of state capacities for effective climate policymaking, including long-term planning, regulatory enforcement, strategic investment, policy coordination and institutional learning. This is particularly important for developing countries, where limited administrative and fiscal resources can constrain implementation.[73]

Effective climate action also depends on coordination across government institutions and levels of governance. Mitigation and adaptation involve multiple sectors and require coherent action among ministries, public agencies and national and subnational authorities. Capacity-building efforts should therefore support whole-of-government approaches, strengthen coordination between national and subnational authorities, and enable meaningful participation by civil society, local communities and other stakeholders.[74]

Beyond their regulatory functions, public institutions can actively shape markets and mobilise resources for low-carbon and climate-resilient development.[75] Strengthening state capacities can enable governments to deploy strategic policy instruments, including sustainable public procurement, public investment, development finance and the management of state-owned enterprises and public assets, to advance climate objectives.[76,77] International cooperation and capacity-building support can help countries adapt and scale such approaches according to their national circumstances and development priorities.

BARRIERS	Barriers to finance, technology development and transfer and capacity-building could include:
B1 Scale and predictability	Finance flows, including international flows, remain well below assessed needs, and much support is short-term, project-based and hard to predict.
B2 Access	Fragmented funds, complex procedures and long approval times can limit access, particularly for least developed countries, small island developing States and subnational actors.
B3 Cost of capital and debt	High risk premiums in some developing countries, currency risk and debt-service pressures raise the cost of clean investment and constrain fiscal space.
B4 Capacity and project preparation	Institutional and technical capacity to turn NDC and NAP priorities into investment plans and bankable projects is often constrained, and reporting obligations stretch limited resources.
B5 Technology access	Costs, intellectual property, and import costs can impact the deployment of prioritised technologies.
B6 Limited domestic technological and innovation capabilities	Weak national innovation systems, limited research and development (R&D) capacities and insufficient linkages between research institutions and industry constrain countries' ability to absorb, adapt and develop climate technologies, perpetuating technological dependence.
B7 Difficult enabling environments for investment	Lack of stable, strong policy to support alignment of private capital and domestic finance flows with NDC and NAP implementation

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Delivering the NCQG and applying where appropriate the Baku to Belém Roadmap to 1.3T and the Circle of Finance Ministers recommendations, including on the capacity of multilateral development banks and reform of the international financial architecture.	B1 B3
2	Simplifying and harmonising access to climate funds, including direct access, programmatic approaches and common procedures across funds.	B2
3	Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.	B1 B3
4	Using country platforms, matchmaking and Just Energy Transition Partnerships that link NDC and NAP investment plans and sector roadmaps with public, private and multilateral finance and delivery partners.	B2 B4
5	Lowering the cost of capital, including through guarantees, currency-risk instruments, blended finance.	B3
6	Creating fiscal space through debt-for-climate and debt-for-nature swaps, climate-resilient debt clauses and domestic resource mobilisation.	B3
7	Strengthening project-preparation facilities to turn NDC and NAP priorities into investment plans and bankable projects.	B4

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
8	Providing long-term, institution-focused capacity-building, including regional hubs and support for transparency reporting.	B1 B4
9	Making use of implementation initiatives such as the Belém Technology Implementation Programme and the Technology Framework, linking technology needs assessments to NDCs and NAPs and supporting national systems of innovation.	B5 B6

BOX 1

Examples of means of implementation initiatives: finance, technology development and transfer, and capacity building

Egypt	The Nexus of Water, Food and Energy (NWFE) country platform, launched in 2022 ahead of COP27, links a portfolio of national priority projects to concessional, multilateral and private finance through a single platform.[78]
Barbados	A 2024 debt-for-climate-resilience operation, backed by USD 300 million in guarantees from the Inter-American Development Bank and the European Investment Bank, refinanced commercial debt on better terms and redirected about USD 125 million of fiscal savings to climate-resilient water and sewerage infrastructure.[79]
India	The Skill Council for Green Jobs, established in 2015, has developed 56 qualifications and set a goal of 10 million skills trainings and job placements by 2047, including a partnership with Australia to train 2,000 solar technicians.[80]
SIDS	The International Renewable Energy Agency (IRENA) SIDS Lighthouses Initiative reported that renewable capacity across participating small island developing States almost doubled between 2014 and 2021, meeting earlier targets three years early.[81]
Global	The AI Climate Institute, announced at COP30 as a collaboration among the Brazilian National Telecommunications Agency (Anatel), the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), aims at providing in-presence training in developing regions to policy makers and technical personnel on AI for climate and sustainable AI systems.
Global	The Climate Technology Centre and Network (CTCN), the implementation arm of the UNFCCC Technology Mechanism, provides technical assistance on request to developing countries, connecting them with a network of technology institutions.[60]

4.2 International cooperation

International cooperation is a critical enabler of ambitious climate action. GST-1 recognised its importance for accelerating delivery, including through cross-border cooperation, support for countries with significant capacity constraints, and inclusive, multilevel action by Parties and non-Party stakeholders.[82] In responding to urgency, the Global Mutirão decision places international cooperation at the centre of progress towards the goals of the Paris Agreement.[83]

International cooperation is among the themes most frequently raised in submissions: pivoting cooperation to focus on delivery, alignment of the cooperation architecture and addressing fragmentation, the need for transboundary cooperation, peer-to-peer learning including across South–South exchanges, and trade.

Consensus-based decision-making under the UNFCCC remains essential to provide collective direction, legitimacy and a common framework for action. A complementary implementation track can enable governments and other actors to organise cooperation, mobilise resources and deploy solutions more rapidly in support of decisions already adopted. Improved coherence between these two dimensions can help the climate regime respond to urgency while preserving its universal and Party-driven character.

Under the leadership of the Climate High-Level Champions, the Marrakech Partnership for Global Climate Action (MPGCA) supports the implementation of the Paris Agreement by enabling collaboration between governments and non-Party stakeholders such as cities, regions, businesses, investors, and civil society including youth, Indigenous Peoples and local communities, to act on climate change.

Submissions highlight a strong commitment to international cooperation as essential for accelerating the delivery of NDCs and NAPs. Within this, there is a call for cooperation to move towards practical implementation. Submissions emphasise that delivery-focused cooperation is most effective when it is country-driven, demand-based and responsive to national needs and priorities. Support that builds long-term national institutions and enabling environments, supported by effective multilateral and plurilateral processes, is seen as more durable than short-term, supply-driven programmes. In this context, submissions noted the important role and opportunities through international carbon markets, including under Article 6.

The fragmentation of international implementation support is identified as a risk. Separate pipelines, approval processes and data standards across multilateral financial institutions and climate funds raise transaction costs for governments and project developers, particularly in developing economies. They make it harder to aggregate smaller projects into portfolios that can attract finance. Submissions lean towards strengthening the international cooperation architecture through closer alignment and stronger delivery capacity within and across existing initiatives, rather than proposing new institutions.

Submissions note that adaptation planning treats risk largely at the national level, meaning shared risks may not be fully addressed, while national mitigation planning in isolation can leave cross-border cooperation opportunities unrealised. Regional organisations and platforms offer a route to address both, through shared monitoring, joint programmes and regional finance.

Peer-to-peer, South–South and triangular learning, partnerships and coalitions

Many submissions call for scaling and replicating proven delivery models and support South–South, triangular and peer-to-peer exchange. These allow sharing of regional experience and implementation solutions suited to local contexts. Submissions call for regional hubs that sustain this exchange over time, building on the GST-1 inclusion of initiatives that share information, good practices, lessons learned and solutions, including engagement with civil society, business, financial institutions, cities and subnational authorities. Submissions also support peer exchange workshops to share knowledge and

good practice on NDCs, including at climate weeks, as was also emphasised in the Global Mutirão decision.

Submissions champion public–private partnerships, voluntary implementation coalitions and matchmaking platforms that link NDC and NAP priority projects with finance and technical assistance. They note that, alongside the formal negotiations, roadmaps and the Global Climate Action Agenda drive cooperation on agreed priorities and can accelerate delivery. Without long-term coordination and structured follow-up, however, such initiatives risk losing momentum and delivery capacity.

Trade

Trade is raised in submissions as an enabler and a means of accelerating technology diffusion and lowering the cost of the transition. Some submissions propose green trade frameworks and initiatives, particularly related to industrial decarbonisation (discussed below). Conversely, some submissions also raise unilateral climate-related trade measures as a barrier, raising concerns that trade-related climate measures could shift costs onto developing countries.

Article 3.5 of the UNFCCC, restated in the Global Mutirão decision, provides that measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.[84] The Global Mutirão decision also established dialogues on opportunities, challenges and barriers for international cooperation on trade and climate, held in 2026, 2027 and 2028 with the participation of the International Trade Centre, the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization, and concluding with a high-level event in 2028.[85]

Supply chains and standards

Submissions identify sustainable supply chains as a critical area for cooperation. Bilateral and plurilateral arrangements between major trading partners are proposed to align supply chains, investment and demand for low-emissions commodities such as steel, aluminium and critical minerals. Such arrangements could sit alongside trade agreements and include support for just and equitable industrial transitions in emerging and developing economies. Submissions also call for greater value addition in developing countries, so that more processing of commodities and critical minerals takes place where they are produced.

Concentration in supply chains is a related concern. The average market share of the top three refining countries for key energy minerals rose from 82 to 86 per cent between 2020 and 2024, and 11 of the minerals analysed by the IEA are now subject to some form of export control.[86]

International standards and certification are highlighted as a means to reduce trade friction and increase investment predictability. Submissions call for interoperable carbon accounting, consistent biofuel criteria and methane measurement, building on existing standards rather than creating parallel systems, with capacity-building for developing economies.

BARRIERS	Barriers to delivery-focused international cooperation and trade could include:
B1 Fragmented cooperation landscape	Separate pipelines, approval processes, data standards and coordination structures raise transaction costs, particularly for Parties with the fewest resources, and make it hard to aggregate small projects.
B2 Supply-driven, short-term support	Support is often project-based and provider-led, which can limit the build-up of lasting institutional capacity to turn targets into bankable plans.
B3 Limited exchange of practical experience	Lessons from implementation are not systematically shared between countries facing similar challenges, and South–South and peer-to-peer exchange is under-resourced.
B4 Trade measures and costs	Tariffs on climate goods, non-tariff measures and some trade-related climate measures, including unilateral ones, that may impact costs and market access.
B5 Supply chain challenges and different standards	Challenges with supply chains, export policies, and fragmentation of carbon accounting and certification standards raise risks and compliance costs and create challenges for cross-border investment and trade.[86]
B6 Cross-border risks and opportunities	Shared risks are sometimes not addressed during national planning and cross-border cooperation opportunities not realised.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Pivoting cooperation to country-driven implementation. Demand-based, multi-year support that builds national institutions and delivers investment-ready NDC and NAP pipelines.	B2 B1
2	Aligning the cooperation architecture. Strengthening and resourcing existing coordination mechanisms rather than creating parallel ones, with common pipelines, procedures, and data standards and interoperability across funds and portfolio approaches for smaller projects.	B2
3	Using country platforms and matchmaking. Expanding country platforms, including through the Country Platform Hub, and matchmaking platforms that link NDC and NAP priorities with finance and technical assistance.	B2 B3
4	Scaling South–South, triangular and broader peer-to-peer exchange. Regional hubs, peer exchange workshops under the Global Mutirão decision and solution platforms such as the Granary of Solutions.[83]	B3
5	Leveraging Action Agenda coalitions and public–private partnerships to help implement negotiated outcomes, with long-term coordination and follow-up through voluntary plans to accelerate solutions.	B1 B5 B6
6	Sharing experience of trade that supports implementation of supportive trade practices, including through UNFCCC mandated trade and climate dialogues and non-mandated initiatives such as the Integrated Forum on Trade and Climate Change.[83]	B3 B4 B6

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
7	Developing decarbonisation deals and supply-chain partnerships, including bilateral and plurilateral arrangements that align supply chains, investment and demand for low-emissions commodities.	B4 B5 B6

4.3 Inclusive governance

Many submissions frame the transition as one delivered with and for people, as well as for the climate and ecosystems. Embedding inclusive, just-transition principles in the design of solutions is identified as central to durable delivery. This strengthens public support, reduces vulnerability and helps prevent unintended social and environmental harm, while ensuring that the community and economy-wide transformation required is fair. Inclusive governance that prioritises equity and justice in adaptation planning and implementation leads to more effective and sustainable adaptation outcomes.[87] This cross-cutting dimension runs through every opportunity set out in this Part.

Issues and priorities emerging from submissions can be grouped into:

Just transition and equitable development

Just transitions should seek to advance sustainable development, eradicate poverty and reduce inequalities within and among countries. They encompass mitigation, adaptation and resilience across the economy, reflecting national circumstances and development priorities. Decent work, social protection, economic diversification, access to affordable energy and meaningful participation are integral to this approach. Many submissions emphasise the need for targeted support for workers and communities, particularly in fossil-fuel-dependent regions and hard-to-abate sectors, including through reskilling and redeployment, to support affected workers and regions and enhance access to employment opportunities in new sectors, drawing on the International Labour Organization (ILO) Just Transition Guidelines.[88]

Submissions also reflected on the importance of just transition pathways that respect, promote and fulfil all human rights and labour rights, the right to a clean, healthy and sustainable environment, the right to health, the rights of Indigenous Peoples, people of African descent, local communities, migrants, children, persons with disabilities and people in vulnerable situations, and the right to development, as well as gender equality, empowerment of women and intergenerational equity. International cooperation, finance, technology development and transfer and capacity-building are essential to support developing countries to pursue just transition pathways. The decision at COP30 to develop a just transition mechanism provides an important basis for strengthening cooperation and support for these efforts.[89]

Inclusion, participation and rights

Submissions note that NDCs and NAPs tend to be more effective when designed and delivered with those most affected. Submissions emphasise the meaningful participation of women, youth, Indigenous Peoples, local communities, people of African descent, and persons with disabilities, and rights-based approaches that protect land tenure, respect

free, prior and informed consent, and apply social and environmental safeguards, as applicable. Established UNFCCC initiatives such as the Enhanced Lima Work Programme on Gender and its Gender Action Plan,[90] the Local Communities and Indigenous Peoples Platform,[91] and Action for Climate Empowerment,[92] provide guidance and support that countries can draw on in national planning and implementation.

Locally led implementation

Much of the adaptation and nature agenda is delivered locally, yet finance and decision-making remain concentrated nationally. Submissions call for devolving resources and agency to local governments, communities and Indigenous Peoples, echoing the Principles for Locally Led Adaptation[93] and the direct-access and tenure provisions highlighted under nature-based solutions, ecosystem-based approaches and cities. This allows for priorities to be set by those who live with the risks and hold much of the relevant knowledge.

Public awareness and access to information

Public awareness, public participation and public access to reliable, science-based climate information, as recognised in Article 12 of the Paris Agreement, can promote equity, strengthen trust and help sustain implementation. The COP30 Global Mutirão decision referred to restoring trust and hope in the fight against climate change by bringing science, equity and political determination together, promoting information integrity as well as by strengthening multilateralism.

Distributional impacts and social protection

The costs and benefits of the transition fall unevenly. Submissions stress attention to energy access and affordability, food security, and the distributional effects of measures such as coal phase-out, carbon pricing and land-use change, paired with social-protection systems and targeted support to limit the burden on low-income households.

BARRIERS	Barriers to a just transition could include:
B1 Late engagement	Communities are consulted late in the design process, or informed after decisions are taken.
B2 Under-resourced participation	Participation mechanisms may lack resourcing, a defined role in decision-making and disaggregated data (for example by gender, age and disability).
B3 Disconnected transition measures	Just-transition and social-protection measures are disconnected from climate plans and finance, leaving affected workers and communities without clear pathways to be part of a just transition.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Consider integrating just-transition principles in NDCs and NAPs from the outset, with inclusive design, social dialogue and distributional analysis as part of planning and budgeting, drawing on the ILO guidelines and the UAE Just Transition Work Programme.	B1 B3
2	Resourcing and empowering participation, including funding the meaningful engagement of women, youth, Indigenous Peoples, local communities, and persons with disabilities through the LCIPP, the Gender Action Plan and Action for Climate Empowerment, as appropriate, backed by defined decision-making roles and disaggregated data.	B2
3	Devolving finance and agency to the local level, scaling direct access and locally led approaches so that communities and local governments control priorities and benefit-sharing, consistent with the Principles for Locally Led Adaptation.	B2
4	Pairing transition measures with social protection, combining measures such as coal phase-out, carbon pricing and land-use change with reskilling, redeployment, social protection and attention to energy access and affordability.	B3
5	Investing in people as delivery capacity, with green skills and reskilling mainstreamed into national climate plans, to support job creation in the transition, with particular attention to youth and the informal workforce.	B3

BOX 2

Examples of just-transition initiatives

South Africa	The Just Energy Transition Partnership and Just Energy Transition Investment Plan place workers and coal-region communities at the centre of the shift away from coal in Mpumalanga. It builds on principles of procedural, distributive and restorative justice, with reskilling, community-driven development and social dialogue. This is backed by an international pledge that has grown from USD 8.5 billion to about USD 12.8 billion.[94]
Kenya	The Financing Locally-Led Climate Action (FLLoCA) programme and County Climate Change Funds channel national and international climate finance directly to all 47 counties and to communities, who set priorities and deliver adaptation. This aims to establish a model of devolved, locally led implementation.[95]
India	Barefoot College's 'Solar Mamas' trains rural women, including many from least developed countries and small island States, as solar engineers who electrify their own villages, with the aim of establishing a women-led, community-owned approach to clean-energy access.[96]
Canada	Indigenous Guardians programmes and Indigenous Protected and Conserved Areas support Indigenous-led stewardship and conservation, recognising rights, knowledge and jobs on the land.[97]
Fiji	National Planned Relocation Guidelines and a Climate Relocation and Displaced Peoples Trust Fund enable consent-based, community-led relocation of at-risk coastal villages.[98]
Brazil	The Bolsa Verde (Green Grant) programme pairs social protection with environmental stewardship, providing income support to low-income families who conserve forests and other ecosystems.[99]

5 Adaptation and mitigation

High-impact implementation opportunities for which adaptation and mitigation goals are both central, and which submissions highlight, include forests, from halting and reversing deforestation and forest degradation to their conservation, sustainable management and restoration; nature-based solutions in other ecosystems and the ocean; and agriculture and food security.

5.1 Forests, the ocean and nature-based solutions

Forests

Forests are central to both mitigation and adaptation. The outcome of GST-1 emphasises the importance of conserving, protecting and restoring nature and ecosystems, including through enhanced efforts towards halting and reversing deforestation and forest degradation by 2030. It notes the need for enhanced support and investment for these efforts, in accordance with Article 5 of the Paris Agreement, including through results-based payments for reducing emissions from deforestation and forest degradation and for the conservation, sustainable management and enhancement of forest carbon stocks in developing countries, and through alternative policy approaches such as joint mitigation and adaptation approaches.[100]

Submissions to the Belém Mission to 1.5 echo the GST-1 call to halt and reverse deforestation and forest degradation by 2030, often alongside calls to scale up restoration. They point to addressing the drivers of deforestation and forest degradation which have many causes, with actions suited to national circumstances, capacities and capabilities, and to securing land tenure and territorial rights, including of Indigenous Peoples and local communities, where relevant, as a precondition for durable protection. Protecting, improving the management of and restoring forests and other ecosystems make up the largest share of the land sector's mitigation potential available at under USD 100 per tonne of CO_2 eq,[101] and forest restoration also removes carbon (see Carbon dioxide removal in Section 6.2).

BARRIERS	Barriers to halting and reversing deforestation and forest degradation could include:
B1 Finance at scale and predictability	Forest finance falls short of need and is often short-term and unpredictable.
B2 Tenure, rights and governance	Insecure tenure and weak legal recognition of land rights, where relevant, together with weak enforcement of existing regulation, leave forests exposed to clearing.
B3 Monitoring and tracking	Monitoring of forest degradation and wildfire lags behind monitoring of deforestation, national monitoring capacity varies, and there is not yet a consistent way to track progress towards the 2030 goal.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Mobilising predictable, long-term forest finance, including results-based payments and long-horizon instruments such as the Tropical Forest Forever Facility (TFFF), launched at COP30 to reward tropical-forest countries for keeping forests standing,[102] and promote forest-positive production practices.	B1
2	Securing the land tenure and territorial rights of Indigenous Peoples, and of local communities, where relevant, such as through the Forest and Land Tenure Pledge, renewed at COP30 with USD 1.8 billion for 2026–2030,[103] and direct access to finance for Indigenous-led territorial protection, and strengthening forest governance and enforcement.	B2
3	Strengthening national forest monitoring, including of degradation and fire, making monitoring systems more interoperable, and tracking progress towards 2030 through the global stocktake, REDD+ reporting and FAO's Global Forest Resources Assessment.	B3
4	Integrating approaches for halting and reversing deforestation by 2030 into existing national plans and strategies, including NDCs and NAPs, setting out priorities, financing needs and partnerships and, where appropriate, drawing on voluntary international initiatives.	B1 B2

BOX 3

Examples of forest and land initiatives

Pakistan	The Billion Tree Tsunami (2014–2017) restored around 350,000 hectares in Khyber Pakhtunkhwa, some 60 per cent of it through protected natural regeneration, and was scaled up nationally as the Ten Billion Tree Tsunami (2019–2023), one of the world's largest restoration drives, with a major coastal mangrove-restoration component.[104]
China	The Grain-for-Green Programme has converted tens of millions of hectares of sloping cropland to forest and grassland, with payments to participating farmers, complemented by the Three-North Shelterbelt ('Great Green Wall') programme against desertification.[105]
Brazil	Satellite-based monitoring by Brazil's National Institute for Space Research (INPE) and MapBiomas, combined with enforcement, has sharply reduced Amazon deforestation. The Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) combines interministerial coordination, satellite monitoring, enforcement, land-use governance and support for sustainable production. Brazil has also developed dedicated plans for the Cerrado, Atlantic Forest, Caatinga, Pantanal and Pampa. The country also proposed the Tropical Forest Forever Facility, launched at COP30, which had secured USD 7.3 billion in pledges by September 2026 and is designed to pay eligible countries for each hectare of standing tropical forest, with at least 20 per cent going directly to Indigenous Peoples and local communities.[106]
Africa (Great Green Wall / AFR100)	An African-led effort to restore degraded land across the Sahel and, through the African Forest Landscape Restoration Initiative (AFR100), to bring 100 million hectares into restoration by 2030.[107]

The ocean

The ocean and the sustainable blue economy are raised across submissions as high-impact but underused opportunities for implementing NDCs and NAPs. These opportunities include marine-ecosystem protection, aquaculture, and coastal resilience.[108]

The ocean regulates the climate, absorbing roughly a quarter of CO_2 emissions and over 90 per cent of the excess heat in the system, yet ocean-based solutions attract less than 1 per cent of global climate finance.[109,110] Finance is not the only constraint. Submissions also point to gaps in planning, data and capacity. To address the shortfall, submissions suggest structuring commitments in line with national priorities, around existing voluntary platforms such as the Blue NDC Challenge and the Ocean Breakthroughs, rather than creating new architecture.[111]

Ocean and coastal-based adaptation are increasingly recognised in UNFCCC processes. The annual Ocean and Climate Change Dialogue has built a substantial body of practice on coastal-ecosystem restoration, blue carbon, and fisheries and food security, among other ocean-based climate solutions, and the Global Goal on Adaptation's 'ecosystems and ecosystem services' target provides an entry point for integrating ocean and coastal adaptation into NAPs and NDCs.[112]

Blue carbon ecosystems such as mangroves, seagrasses and saltmarshes provide adaptation services, including coastal protection, fisheries and water quality, alongside carbon storage. The IPCC's Special Report on the Ocean and Cryosphere assessed the potential global mitigation contribution of these ecosystems at around 0.5 per cent of annual emissions, with much larger values in countries rich in these natural resources.[113]

Some submissions caution against over-reliance on uncertain marine carbon dioxide removal. Marine carbon dioxide removal (CDR) remains surrounded by many uncertainties, with risks to ecosystems and of mitigation deterrence (see Section 6.2). Some submissions recognise a possible future role for marine CDR, including in the context of overshoot, but contingent on further research, robust monitoring, reporting and verification, and governance.

BARRIERS	Barriers to ocean-based action could include:
B1 Under-representation in national planning	Progress has been made in reflecting the ocean in NDCs and NAPs, but there is scope for greater breadth and depth; more than 60 per cent of ocean NDC commitments are conditional on further technical or financial support;[114] responsibilities are often split across ministries.
B2 Ocean observation and data gaps	Critical gaps persist in monitoring ocean acidification, deoxygenation, blue carbon stocks and marine hazards, especially for small island developing States and least developed countries.
B3 Finance	Blue financial architecture is fragmented and often poorly understood. Small coastal projects, particularly adaptation-focused ones, rarely have the scale or returns to attract investment, and few instruments are matched to their scale and risk profile.
B4 Scientific uncertainty on marine CDR	Marine carbon dioxide-removal approaches are yet to be scientifically developed and practically proven at scale and may carry ecological and mitigation-deterrence risks.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Considering ocean and coastal-based adaptation in national plans, including NDCs and NAPs; aligning with the GGA ecosystems target and the Belém Adaptation Indicators, where relevant, and leveraging existing platforms.	B1
2	Scaling restoration and protection of blue carbon ecosystems and expanding marine protected areas toward the 30×30 target under the Kunming-Montreal Global Biodiversity Framework, where nationally appropriate.	B1
3	Strengthening ocean observation and early warning for marine hazards, with data-sharing prioritising small island developing States and least developed countries.	B2
4	Developing ocean finance instruments such as blue bonds, blended finance and debt-for-nature or debt-for-climate swaps.	B3
5	Assessing marine CDR options, focusing research and any deployment on low-risk approaches.	B4
6	Advancing technology innovation and international cooperation to address emissions related to maritime activities while avoiding detrimental impacts to trade and sustainable development.	–
7	Strengthening offshore renewable energy alongside the sustainable management of marine and coastal ecosystems.	B1

BOX 4

Examples of ocean and blue-economy initiatives

Seychelles	Pioneered the world's first sovereign blue bond and a debt-for-nature swap, financing a Marine Spatial Plan that placed about 30 per cent of its ocean under protection.[115]
Belize	A 2021 debt-for-nature conversion of around USD 364 million protects 30 per cent of its ocean and funds marine conservation while reducing sovereign debt.[116]
Saudi Arabia	Under the Saudi Green Initiative, it plans to plant 100 million mangrove trees along its Red Sea and Arabian Gulf coastlines.[117]
Fiji and the Pacific	'Blue Pacific' leadership embeds the ocean in NDCs and expands locally managed marine areas, alongside the Marshall Islands' push to decarbonise international shipping.[118]
Norway	Science-based fisheries management and sustainable aquaculture support blue-food production within ecological limits.[119]

Nature-based solutions

Nature-based solutions (NbS) are actions to protect, conserve, restore, sustainably use and manage ecosystems that address social, economic, and environmental challenges while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits.[120] Ecosystem-based adaptation (EbA) is a form of NbS that uses biodiversity and ecosystem services to help people adapt to the impacts of climate change.

NbS are among the most cost-effective and co-benefit-rich adaptation options available. UNEP's Adaptation Gap Report 2025 finds that every USD 1 invested in coastal protection avoids about USD 14 in damages, and that urban nature-based solutions lower ambient temperatures by more than 1 °C on average.[19] Mangroves, reefs, wetlands, urban greening and agroforestry reduce flood, storm, heat and drought risk while supporting fisheries, water quality and carbon storage. These benefits also skew towards vulnerable low-income and coastal communities.[121]

The effectiveness of NbS is itself warming-dependent. Because the ecosystems that provide protection degrade at higher temperatures, NbS show more evidence of hard adaptation limits than most other response types, with protection provided by reefs and mangroves declining sharply beyond 1.5 °C.[122] NbS are therefore best understood as high-value but time-limited opportunities, which links their effectiveness to the level of peak warming and the duration of overshoot.

BARRIERS

Barriers to scaling NbS for adaptation and mitigation could include:

B1 **Finance for NbS remains small relative to their potential**	Much of what exists is short-term or grant-dependent, and individual projects are often too small to attract institutional capital.
B2 **Measurement and standards**	Metrics for adaptation outcomes are still developing and yet to be standardised. For mitigation, carbon methods exist, but work continues to develop baselines, address permanence and develop national inventory accounting. Local data can be limited for both.
B3 **Tenure, rights and governance**	Secure land and resource tenure for Indigenous Peoples and local communities, where relevant, supports durable NbS. Tenure remains insecure in many contexts, and conservation and carbon-market projects can displace communities where safeguards are weak.
B4 **Permanence and warming limits**	Rising temperatures, drought and fire can reduce the protective function of NbS, and release stored carbon.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Considering NbS and ecosystem-based adaptation in national plans, including NAPs and NDCs, and aligning with the UAE Framework for Global Climate Resilience target on ecosystems and biodiversity (paragraph 9(d)), where relevant, tracked through the Belém Adaptation Indicators.[58]	B2
2	Considering the benefits of better alignment between NDCs, NAPs, national biodiversity strategies, the Sustainable Development Goals, and other national planning instruments.[123]	B2
3	Scaling predictable, long-horizon finance, including aggregation vehicles, and blue and green bonds for smaller coastal and urban projects, and applying high-integrity standards where carbon finance is used.	B1
4	Directing finance to locally led adaptation and securing the tenure of Indigenous Peoples, and local communities, where relevant, so that communities share in setting priorities and the benefits.	B1 B3
5	Protecting intact, high-integrity ecosystems (halting loss of existing ecosystems), alongside restoration.	B4
6	Combining engineered and nature-based (hybrid green–grey) approaches, such as mangrove-plus-berm coastal defence, which can be a more resilient and lower cost approach than engineering solutions alone.[123]	B4
7	Investing in monitoring, standards and replicable case studies so NbS outcomes can be quantified, replicated and financed.	B2

BOX 5

Examples of nature-based solutions

Caribbean and Pacific small island developing States	Reef restoration and community-managed marine areas help maintain natural coastal defences for reef- and atoll-dependent islands.[124]
Medellín, Colombia	A network of 30 ‘green corridors’ along roads and waterways, created from 2017, has reduced the city’s urban heat island effect by around 2 °C, according to the city administration.[125]
Niger	Farmer-managed natural regeneration, in which farmers protect and manage trees that regrow from stumps and roots, covers an estimated 5 million hectares of southern Niger, reducing wind erosion and increasing the production of crops, fodder and firewood.[126]

5.2 Strengthening food security and agricultural resilience

Transforming agriculture and food systems is raised across submissions as a particularly high-impact priority, touching mitigation, adaptation, biodiversity and food security simultaneously. Submissions present food-system transformation as a headline opportunity for NDCs and NAPs. Some tend to lean towards technology, sustainable intensification and innovation-led solutions. Others instead tend to lean towards

agroecological and regenerative practices. A distinct cluster highlights reducing food loss and waste as a cheap, fast lever that receives less attention than either agroecology or agri-tech.[127]

Considering emissions throughout the entire food value chain, including fertiliser production, agricultural activities, industrial processing, transportation, commercialisation, and water-related services, food systems account for roughly one-third of global greenhouse-gas emissions (around 18 Gt CO_2 eq a year). Agriculture, forestry, and other land use (AFOLU) accounted for about 13–21 per cent of total global anthropogenic greenhouse gas emissions in 2010–2019, depending on how land-use CO_2 is counted.[101] Agrifood systems received about 7.2 per cent of tracked global climate finance.[128] Noting recent increases are largely due to a sharp rise in domestic public investment in a small number of regions rather than the broader systemic shift that is needed globally. Agriculture is also highly susceptible to climate extremes, which has exposed millions of people to acute food insecurity.[129] In 2025 they were the primary driver of acute food insecurity in 16 of the 47 food-crisis countries analysed by the Global Report on Food Crises, where 87.5 million people faced crisis-level hunger, and a secondary or tertiary driver in a further 27 countries.[129]

Agricultural methane is addressed here rather than in the Methane section because its sources and options differ from those for fossil and waste methane. Around 42 per cent of global anthropogenic methane emissions in 2020 were from agriculture.[130] In many countries agricultural methane is closely tied to staple food production, livelihoods and food security, and submissions emphasise reduction approaches that safeguard them. Mitigation opportunities include improved feed, genetic improvement and productivity gains that lower emissions intensity, manure management, alternate wetting-and-drying and other rice systems with irrigation control, and reducing food loss and waste. Several of these can also raise incomes and resilience, although key sources such as enteric fermentation remain technically challenging to address.

The same transformation is central to adaptation. Climate-resilient and agroecological practices such as promoting drought and heat-tolerant cropping varieties, diversifying cropping, soil and water management, and restoring on-farm vegetation reduce exposure and stabilise yields while storing carbon and supporting biodiversity.[131] Submissions from developed and developing countries emphasise different approaches (productivity and innovation gains, and agroecological resilience), which are complementary when tailored to national circumstances.

Food has increased in profile on the climate agenda. At COP28, 134 countries, producing some 70 per cent of the world's food, signed the Emirates Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action, committing to integrate food and agriculture into their national climate plans.[132] The number of signatories has since risen to around 160. At COP27, the FAO-hosted Food and Agriculture for Sustainable Transformation (FAST) initiative was launched to improve the quality of, and access to, agrifood climate finance. The implementation of NDCs and NAPs offers an opportunity to convert commitments into costed and measurable actions.

BARRIERS	Barriers to food-system transformation could include:
B1 Finance	Agrifood systems attract a small fraction of climate finance relative to their mitigation potential and adaptation needs, and smallholders in particular struggle to access it.
B2 Hard-to-abate emissions	Enteric methane and nitrous oxide from fertiliser use have fewer mature, low-cost abatement options available than in the fossil and waste sectors, and some promising solutions are still emerging.
B3 Measurement, reporting and verification (MRV)	Agricultural emissions and soil-carbon changes are difficult and costly to measure in some jurisdictions, weakening the basis for finance, crediting and monitoring.
B4 Smallholder capacity and just transition	Hundreds of millions of smallholders and pastoralists need support, secure tenure and a just transition to change practices without threatening food security or livelihoods.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Considering agriculture and food systems in national plans, including NDCs and NAPs, and considering cooperation through initiatives such as the Emirates Declaration with costed, measurable actions spanning mitigation, adaptation and food security.	B1 B3
2	Scaling climate-resilient practices, including agroecological approaches and technology innovation, alongside productivity gains, tailored to national circumstances, to deliver adaptation, mitigation and biodiversity co-benefits together.	B4
3	Where appropriate, exploring options to reduce agricultural methane, such as improved feed and livestock productivity, manure management, and alternate wetting-and-drying in rice, as well as by scaling up emerging solutions such as feed additives and genetic improvement.	B2
4	Reducing food loss and waste, including by considering opportunities to advance action across NDCs, national policies, finance, data and transparency, and innovative partnerships, as promoted by the COP29 Declaration on Reducing Methane from Organic Waste.	B2
5	Aligning food and agriculture measures with the Kunming-Montreal Global Biodiversity Framework to capture co-benefits and avoid trade-offs.	B4
6	Mobilising direct finance and a broader range of instruments for smallholders through concessional finance and grants with support for access to finance.	B1 B4

BOX 6

Examples of climate-resilient agriculture and food-systems initiatives

Brazil	The ABC+ Plan (Brazil's Sectoral Plan for Adaptation to Climate Change and Low Carbon Emission in Agriculture, 2020–2030) scales low-carbon agriculture actions such as integrated crop–livestock–forestry systems, no-till farming, degraded-pasture restoration and biological nitrogen fixation, across tens of millions of hectares.[133]
Viet Nam	The One Million Hectares of High-Quality, Low-Emission Rice programme (Mekong Delta, to 2030) uses alternate wetting-and-drying and straw management to cut methane and water use while raising farmer incomes. Early phases have exceeded their targets.[134]
India	The National Mission on Natural Farming and a national push on climate-resilient millets (building on the 2023 International Year of Millets) reduce input dependence and diversify diets for resilience.[135]
Kenya and African partners	Climate-resilient agriculture and drought-tolerant seed programmes reach millions of smallholders, prioritising adaptation and food security.[136]
Pacific small island developing States	The revival of traditional climate-ready root crops and locally led food systems strengthens food security and builds resilience to extreme events.[137]

6 Mitigation

High-impact implementation opportunities highlighted in submissions include accelerating the clean energy transition and electrification, addressing opportunities in the industrial transition towards a low-carbon economy, including reducing methane and consideration of carbon dioxide removal (CDR), carbon capture and storage (CCS) and carbon capture utilisation and storage (CCUS). In addition to mitigation, these can support:

- Adaptation and resilience. Electricity generation and distribution systems are increasingly exposed to extreme events and climate hazards affecting supply and demand. Electricity infrastructure is increasingly part of adaptation infrastructure.[138]
- Health outcomes. Health benefits from the clean energy transition, including clean cooking, and industrial decarbonisation, are substantial. Fossil fuel-derived outdoor air pollution resulted in 2.5 million deaths in 2022.[10]
- Development. Access to electricity and the associated development outcomes depend on solutions underpinned by low-cost renewables.[139] The breadth and depth of the changes implied across the economy and to communities is recognised in the decision at COP30 to develop a just transition mechanism. Submissions point to translating these principles into policies and actions.

6.1 Accelerating the clean energy transition and electrification

Many submissions identify accelerating the clean energy transition and energy-system decarbonisation as the highest-impact mitigation opportunity. Energy production and use account for more than three-quarters of global greenhouse gas emissions,[140] making accelerating clean energy production and deployment one of the most significant opportunities to close the emissions gap and implement NDCs and NAPs.

The rapidly falling price of clean energy and related technologies has fundamentally changed the global energy landscape. The global average cost of newly commissioned solar and onshore wind has fallen substantially and, in many markets, is below the cost of new fossil-fuel generation.[52] Global average costs of solar PV have fallen by around 90 per cent, and onshore wind by around 70 per cent since 2010.[52] Battery storage costs have fallen by more than 90 per cent from 2010 to 2025.[141] Grid costs have not seen the same decline (Figure 8).

Annual growth in global electricity demand has been absorbed increasingly by solar, wind and other low-emissions generation since 2023. In 2025, wind and solar met 99 per cent of the growth in electricity demand (Figure 9).

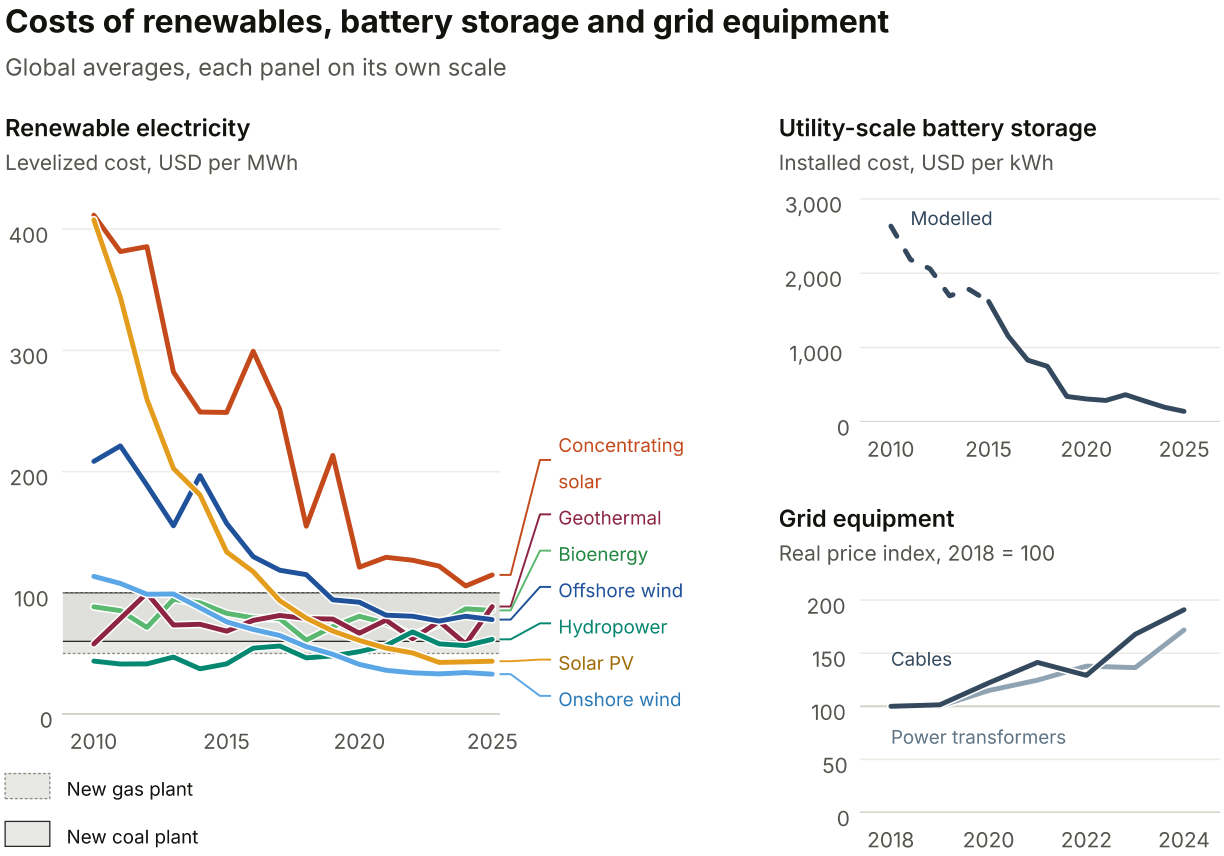


Figure 8 Renewable generation costs compared with fossil-fuel benchmarks, battery storage costs and grid equipment prices, 2010–2025 (grid equipment prices to 2024). Left: global average levelised cost of electricity of newly commissioned renewable projects, by technology, with recent cost ranges for new gas and coal plants shown as grey bands. Right, top: global average installed cost of utility-scale battery storage. Right, bottom: price index for transmission cables and power transformers. Each panel has its own scale.[142]

In GST-1, Parties called for the tripling of installed renewable energy capacity and doubling the rate of energy efficiency improvement by 2030. Deployment of renewables at rates consistent with tripling renewable energy by 2030 could meet a substantial share of forecast growth in electricity demand to 2030, and more than the IEA's current forecast to 2030 (Figure 9).[143]

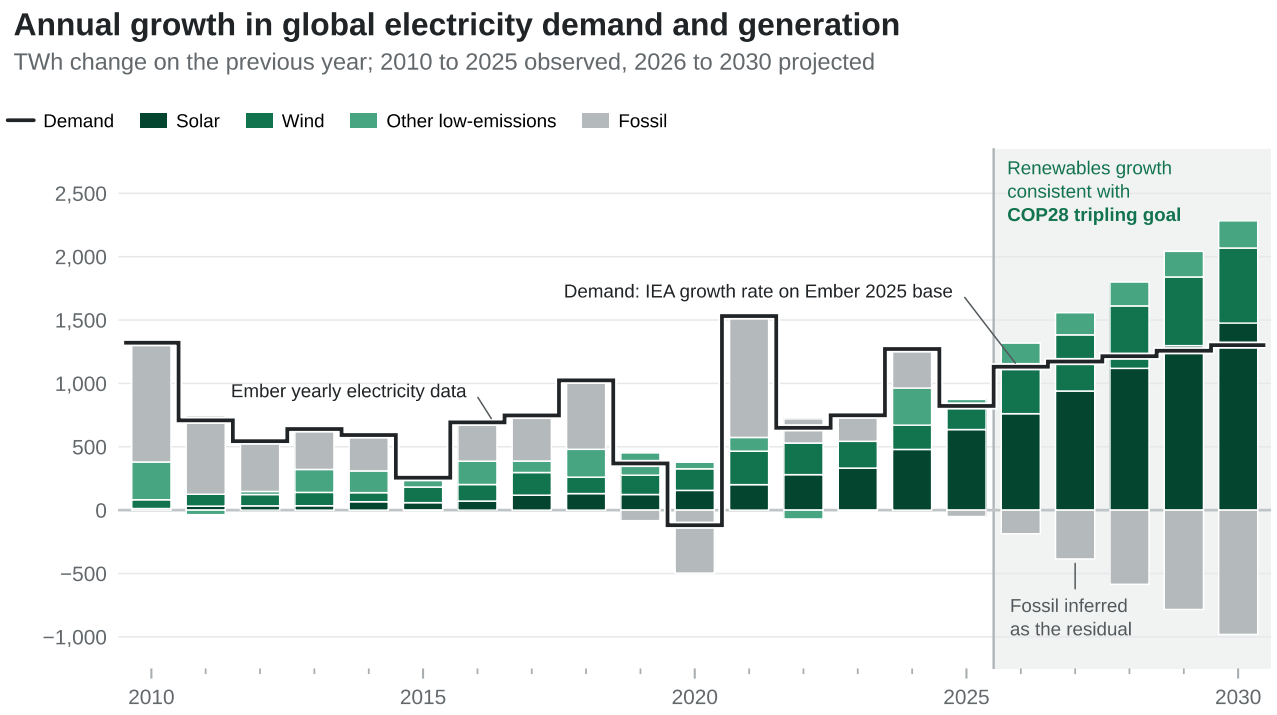


Figure 9 Annual changes in global electricity demand and generation, 2010–2030, illustrating and contextualising points in several Party submissions. Stacked bars show generation changes by source; the black line shows demand growth. The shaded 2026–2030 illustration assumes 11 TW of renewable capacity by 2030, and the capacity-addition mix of nine 1.5 °C pathways with medium overshoot.[143]

Total global clean-energy investment is expected to reach about USD 2.2 trillion in 2025, roughly twice the investment in fossil fuels. The IEA estimates it would need to rise to around USD 4.5 trillion a year by the early 2030s to align with a 1.5 °C pathway.[144,145]

Submissions raise connected outcomes and actions to increase the pace of the clean energy transition and deliver NDCs, including accelerating deployment of renewable generation capacity, energy efficiency, electrification and sustainable fuels. These together contribute to the transition away from fossil fuels, if implementation delivers existing and proposed global pledges, and full implementation of NDCs. Submissions also spoke to reducing dependence on fossil fuels in energy systems, diversifying public revenues and economic structures for actors reliant on fossil fuels and planning for changes in employment structures, promoting new jobs generated by the transition and supporting workers that may be affected by it. Consistent with the GST-1 call on Parties to contribute to transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, submissions highlight that national pathways remain determined by national circumstances, development priorities and energy-security considerations.

Scaling renewables and modernising grids

Accelerating renewable energy deployment is the most frequently discussed opportunity in the submissions, many of which anchor it to the target of tripling renewable energy

capacity by 2030. Also raised are specific sources (wind, solar, hydro, ocean energy), decentralised and community-owned models, and the finance needs of developing countries and SIDS. The goal of tripling renewable energy remains within reach after three consecutive years of record renewable additions, but faces bottlenecks in finance, grids, supply chains and skills.[146]

Energy efficiency

Energy efficiency is a source of cost-effective, near-term mitigation. Global energy intensity improved about 1 per cent in 2024 and an estimated 1.8 per cent in 2025. The landscape of policy and regulatory measures now implemented is wide, with transferable solutions and insights, creating means to scale towards the 4 per cent a year required to meet the GST-1 goal of doubling the rate of improvement in energy efficiency by 2030.[147]

Electrification

The COP31 Presidency's Global Climate Action Agenda goal of electrifying 35 per cent of final energy by 2035 is aligned with pathways to 1.5 °C that limit the duration and magnitude of overshoot. The IEA considers 33 per cent of final energy could be electrified cost-effectively using technologies that are commercially available and higher potential can be unlocked with additional investment.[148] Some barriers and enabling conditions are common, with a breadth of examples of policies and actions to accelerate implementation globally. The best solutions for electrification of end uses vary between countries and sectors, particularly for electrification of industrial energy use.[149] The electrification goal, together with the existing pledges to triple renewable energy capacity and double the rate of improvement in energy efficiency by 2030, if met, become primary structural drivers of the energy transition and fossil fuel decline across end-use sectors.

Sustainable fuels

Expanding the production and use of sustainable fuels, such as biogases and biofuels, renewable, clean/zero emission and low-carbon hydrogen and its derivatives, including e-fuels and e-methane, provides opportunities to rapidly and significantly reduce emissions from hard-to-abate sectors, such as the industrial, aviation, maritime and road transport sectors. Efforts in this direction will make existing systems cleaner, more productive and more sustainable, complement electrification, and reinforce global climate ambition. This was the focus of the Belém 4x Pledge on Sustainable Fuels launched at COP30.[150]

Submissions also emphasise that the set of solutions and timelines for the clean energy transition in each country are shaped by national circumstances and priorities, as well as emerging regional initiatives and opportunities. Accordingly, the range of solutions may include clean electricity generation technologies such as renewable energy, sustainable fuels, nuclear and geothermal energy; demand-side measures such as energy efficiency and electrification; and emissions management technologies including carbon capture and storage and carbon dioxide removal.

BARRIERS	Barriers to the clean energy transition could include:
B1 Grid and infrastructure bottlenecks	Physical, regulatory, and permitting constraints in energy infrastructure limit the integration of renewable energy and slow grid interconnectivity, including between regions.
B2 High cost of capital and limited access to climate finance	Limited access to affordable, predictable, and concessional climate finance, and high costs of capital in some locations. Need to strengthen market confidence to further accelerate investment decision-making, including by reinforcing long-term directions of travel.
B3 Inefficient fossil fuel subsidies and market impacts	Inefficient fossil fuel subsidies that do not address energy poverty or just transitions.
B4 Institutional capacity gaps and lack of investment-ready projects	Subnational and national agencies in some countries may have limited technical capacity to prepare complex project proposals, conduct feasibility studies, and manage multi-stakeholder procurement processes required by international capital providers.
B5 Technology development and transfer barriers, workforce and supply chain bottlenecks	Intellectual property barriers, import costs, supply-chain concentration for equipment, and in some locations a lack of sufficient local technical expertise to increase installation rates, operate and maintain advanced clean energy infrastructure. Lack of commercially available solutions for hard-to-electrify processes for some high-temperature industrial heat processes.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Modernising and strengthening grids and addressing permitting, planning and regulatory barriers to interconnection, and storage and system-flexibility bottlenecks that constrain renewable deployment, to support high levels of distributed and variable energy resources and avoid high curtailment.[151]	B1 B2
2	Deploying fit-for-purpose systems including grids, micro-grids, and distributed energy sources most appropriate to national and local circumstances, supported by strengthening local institutions and building lasting capacity to maintain and expand their systems.[139]	B1 B4
3	Providing finance, including predictable, simplified access to grant and blended finance solutions where required in developing countries to address the high cost of capital for renewable energy projects, and related grids and storage in these markets.	B2
4	Sending political signals that boost global confidence for the private sector, such as the collective objective to electrify 35 per cent of final energy demand by 2035 launched under the COP31 Action Agenda, recognising different circumstances and pathways.[149]	B2
5	Implementing demand-side measures to support electrification and accelerate reliable, affordable, investable solutions and build consumer awareness, applicable to transport, buildings and industry, and consistent with national circumstances and priorities.	B1 B2

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
6	Integrating goals into existing national plans and strategies, including NDCs and NAPs, or reflected in voluntary national plans or roadmaps, backed by broader international and regional cooperation that supports a rapid, just and equitable transition to clean energy, sustainable fuels, and electrification, consistent with national circumstances and priorities.	B3 B5
7	Forming bi- and pluri-lateral energy and industrial transition partnerships, including regional alliances and trade platforms to facilitate the transition to electrification, clean energy sources, and alternative energy and processes for hard-to-electrify and hard-to-abate sectors.	B1 B4 B5

BOX 7

Examples of clean energy transition initiatives

Southeast Asia	The Association of Southeast Asian Nations (ASEAN) Power Grid aims to establish interconnected regional grids across Southeast Asia, which will unlock renewable energy resources in the region and reduce the costs. It has evolved since 1997, resulting in bilateral interconnections linking ASEAN nations.[152] The roadmap aimed for most priority transmission lines operating by 2035.[153] This would support 400 GW of additional generation and storage capacity by 2040, 90 per cent of which could be accounted for by clean energy.[154] Barriers to accelerating progress include fragmented regulatory and market rules and technical standards, which impact bankability and finance.
Africa	Mission 300 (AfDB / World Bank) was launched in 2024 and taken forward at the Dar es Salaam Africa Energy Summit in January 2025, attended by 48 national delegations. The aim is to connect 300 million Africans to electricity by 2030 via National Energy Compacts and blended finance, including AfDB's Sustainable Energy Fund for Africa (SEFA).[155] More than 50 million people had been connected by June 2026, up from about 32 million reported in late 2025, although reaching the target would require a substantially faster rate of connection.[156]

RENEWABLE ENERGY

Australia	The Federal Government's Capacity Investment Scheme (CIS) uses a reverse auction tender process to select new wind, solar and battery projects, underwriting revenue to accelerate deployment and help deliver the target of 82 per cent renewable electricity by 2030. Each contract sets a revenue floor, with the government paying any shortfall, and a ceiling above which earnings are shared. Expanded in 2025, the scheme targets 26 GW of renewable generation and 14 GW of clean dispatchable capacity by 2030.[157] By June 2026, tenders had contracted more than 100 projects across the national and Western Australian markets, with new tests proposed to enforce delivery milestones.[158]
India	Since June 2023, India's Ministry of Power's bidding guidelines set standard rules for buying 'firm and dispatchable renewable energy' (FDRE). This procurement framework promotes, for example, wind and solar paired with batteries or pumped hydro, contracted to follow a set demand profile, with penalties for shortfalls.[159] More than 14 GW has been tendered, about 10 GW is under construction, and the first project began supplying power in 2026. In an August 2026 round-the-clock auction, developers committed to meet at least 90 per cent of peak-hour demand at prices below recent estimates of new coal.[160]

BOX 7

Examples of clean energy transition initiatives

ENERGY EFFICIENCY

Europe	The recast European Union (EU) Energy Efficiency Directive (2023) commits the EU to reducing final energy consumption by at least 11.7 per cent by 2030 relative to the 2020 Reference Scenario projection, while the revised Energy Performance of Buildings Directive requires national building renovation plans for a sector that uses about 40 per cent of EU energy. The Commission set out an energy efficiency roadmap in June 2025, with priority actions for 2025–2026 including an Electrification Strategy and a revised Heating and Cooling Strategy.[147]
Southeast Asia	Under the ASEAN Plan of Action for Energy Cooperation (APAEC) 2026–2030, endorsed by ASEAN energy ministers in October 2025, the region set ambitious targets to reduce energy intensity by 40 per cent by 2030 relative to 2005.[147]

ELECTRIFICATION

Global, China, and emerging markets (transport)	Global electric car sales grew by 20 per cent from 2024 to 2025, and are now about a quarter of new cars sold. In China, electric cars made up nearly 55 per cent of car sales. Uptake is spreading to emerging markets. Sales in Southeast Asia more than doubled to a share of nearly 20 per cent, and sales in Latin America grew by 75 per cent.[161] Nepal stands out: nearly three-quarters of new cars sold in 2025 were electric.[162]

SUSTAINABLE FUELS

Brazil	Brazil introduced the world's first ethanol blending mandate in 1931 and has since built one of the longest-running sustainable fuel markets: in 2024 ethanol supplied nearly half of all petrol-type fuel used in road transport. Tax incentives since the early 2000s mean flex-fuel vehicles now make up nearly 80 per cent of the light vehicle fleet, while the RenovaBio programme (2017) rewards fuel producers with tradable credits for cutting lifecycle emissions. The Fuel of the Future law raises blending targets and extends support to renewable diesel, aviation fuel and biomethane.

6.2 Reducing methane and advancing the green industrial transition

Submissions raise several additional dimensions of the green industrial transition including methane reductions, industrial decarbonisation, and CDR and CCS.

Reducing methane

Reducing methane emissions is a significant abatement opportunity. Methane accounts for around 16 per cent of current global GHG emissions. Submissions identified reducing methane as a priority near-term lever, noting rapid cuts to methane are among the fastest ways to slow near-term warming, and among the lowest-cost emission reduction opportunities. The waste and fugitives sector provides particularly prospective opportunities for addressing methane emissions.

Fossil fuels account for about 35 to 40 per cent of global anthropogenic methane emissions.[163] These are predominately fugitive emissions associated with coal, oil and gas extraction, production, and processing including venting and flaring, leaks from transmission and distribution infrastructure, and incomplete combustion. Around 70 per cent of these emissions can be abated with existing technology, and around 30 per cent of

fossil fuel-related methane could be reduced at no net cost when the value of gas recovered is taken into account.[164] The no-net-cost characterisation reflects conditions in large integrated oil companies operating in advanced economies; for national oil companies in developing countries, methane abatement in oil and gas operations often requires significant upfront capital investment in older infrastructure that is not readily available and may not be economically feasible. Rising energy demand and associated price volatility may constrain the pace of methane reduction efforts in the fossil fuel sector in the short term.

Waste accounts for about 20 per cent of global anthropogenic methane emissions, mainly from organic waste, landfills and wastewater. Around 15 to 20 per cent of waste methane could be abated by 2030 using existing technology and result in a net saving, when taking into account the value of gas recovered.[165] Global waste volumes may double to 2050 with increasing urbanisation, strengthening the case for accelerating action, given waste can continue to emit methane for decades unless well managed.[166] Agricultural methane emissions are addressed in Section 5.2.

The Global Methane Pledge (GMP) was launched at COP26 in 2021, targeting a 30 per cent reduction in methane emissions by 2030 relative to 2020. The GMP has been joined by 159 countries, and others have adopted national plans.[167] Despite this momentum, global methane emissions have risen since 2015.

Historically, methane emissions have often been said to be under-reported. Recent advances in ground-based and satellite monitoring and remote sensing technologies are transforming data availability and have significant capacity to improve reporting and accountability. Methane emissions can now be detected in near real time, and in some parts of the world attributed to a specific source within a 50-metre radius.[168]

In the waste sector, methane mitigation can be advanced through measures across the waste hierarchy, including waste prevention, separate collection, recycling and organic-waste diversion, composting, anaerobic digestion, improved landfill management and methane recovery.

BARRIERS	Barriers to fugitives and waste methane reductions could include:
B1 Regulatory gaps and finance for fugitive abatement	Gaps in regulation, and finance. Most fugitive abatement measures are mature and often profitable, while deployment depends on regulatory frameworks, infrastructure conditions, access to finance and national circumstances.
B2 Uneven incentives to invest in alternatives	Capital constraints and ageing infrastructure limit uptake, as owners may not finance the replacement of high-emitting equipment or invest in new technology without external support or obligations. Abandoned facilities continue to emit.
B3 Under-deployment of waste-methane solutions	Waste methane policies, infrastructure and technologies, including organic-waste separation, treatment and landfill-gas management, remain unevenly deployed.[169] Many countries have largely unmanaged landfill, or open dumps.
B4 Municipal capacity and investment needs	Municipal governments often lack the creditworthiness and technical capacity to invest in landfill gas capture and constraints in accessing finance, challenges in developing investment-ready projects, and gaps in data and monitoring needed to scale waste-methane solutions.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Addressing routine flaring and cold venting, and strengthening leak detection and repair, including measures to lift the MARS alert response rate.[170]	B1
2	Moving towards direct, asset-level measurement and independently verified reporting aligned with industry standards and evolving best practice for facilities and infrastructure likely to exceed a stated emissions threshold.[171]	B1
3	Considering methane in national plans, including in NDCs, or LT-LEDS.[171]	B1 B2
4	Addressing coal-mine methane, supported by regulation and market instruments.	B1 B2
5	Adopting policies and incentives to accelerate efforts to phase out open dumping, burning of waste, and uncontrolled landfills, alongside organic-waste separation, supported where necessary with funding for procurement of new facilities or infrastructure.[172]	B3 B4
6	Scaling landfill-gas capture, anaerobic digestion, biogas and biomethane production, and wastewater methane recovery, encouraged through grants, concessional finance or tax incentives, investment mechanisms and technical assistance.[173]	B3 B4
7	Building circular, low-methane urban waste systems through public–private partnerships and concessional finance, embedding methane targets into concession contracts and tenders.[173]	B3 B4

BOX 8

Regulating fugitive methane emissions – four country approaches

Norway	Banned routine flaring as early as 1971 and has taxed CO_2 and methane emissions from petroleum production and transport since 1991, with the tax raised again in 2017. The country now has the world's lowest methane intensity in upstream oil and gas production – if every producer matched it, global oil and gas methane emissions could fall by around 90 per cent.[174]
Colombia	Became the first South American country to regulate fugitive methane from oil and gas, through a 2022 resolution (updated in 2023) that set equipment standards, leak detection and repair requirements, and combined limits on flaring, venting and fugitive emissions in a single framework.[175]
Nigeria	Issued 2022 guidelines targeting the elimination of routine flaring by 2030 and a 60 per cent cut in fugitive emissions from production, processing, transmission and distribution by 2030–31, with asset-level reporting overseen by its upstream regulator. Prompt operator response to satellite alerts has already fixed major leaks, in one case within two weeks.[176]
Türkiye	The Zero Waste Initiative globally promotes waste prevention, source separation, recycling and resource efficiency as part of an integrated approach to waste management. Building on this experience, the COP31 Presidency is advancing implementation-focused cooperation on waste-sector methane through its Global High-Level Dialogue on Methane Emissions from the Waste Sector.

Industrial decarbonisation

Industry accounts for a substantial share of global emissions and parts are among the most challenging to decarbonise. Emissions arise from the combustion of fuels to generate heat and energy, and the industrial processes themselves, such as the chemical reactions involved in producing steel, cement and chemicals. While low-emissions alternatives are becoming available for some applications, commercially proven technologies to eliminate many process emissions are not yet deployed at scale. For example, of around 1.8 billion tonnes of annual global steel production, only a few hundred thousand tonnes currently come from near-zero-emissions iron and steel production facilities.[177,178]

Submissions highlight the role for supply-side support for pilot plants and demand-side measures that create durable markets for near-zero processes and materials.

Submissions also highlighted the role for:

- Country-level sectoral roadmaps and strategies to align industrial transition strategies with NDCs and NAPs. Submissions, including from investor groups, identified the development of credible, long-term strategic plans to support industrial decarbonisation as an effective way to help inform private investment decisions.
- A set of policies, government support and investment mechanisms that deliver multi-year industrial transition plans.
- Plurilateral and bilateral arrangements focused on hard-to-abate sectors, and industrial decarbonisation, and support matching of potential suppliers with demand, including via trade initiatives.

Many of these issues are reflected in the Belém Declaration on Global Green Industrialisation. Proposed solutions include platforms launched at COP30, existing initiatives such as the Climate Club's Global Matchmaking Platform, the Leadership Group for Industry Transition (LeadIT) and the Industrial Transition Accelerator, and a proposed "decarbonisation deals" platform linking NDCs with trade and economic cooperation. Submissions also emphasise the importance of avoiding carbon lock-in from long-lived industrial assets, particularly in the steel, cement and chemicals sectors.[179,180]

BARRIERS	Barriers to industrial decarbonisation could include:
B1 Innovation and commercialisation hurdles	High capital costs and a "green premium" can discourage investment in the absence of supply and demand-side support, or regulatory-driven demand for low-emissions alternatives.[181,182]
B2 Uneven technology readiness across sectors	Hard-to-abate processes (e.g. cement clinker, and some chemical processes) still lack commercially proven, at-scale low-emissions alternatives, particularly for non-energy process emissions.[177]
B3 Workforce, skills, and stakeholder-alignment gaps slow project delivery	These barriers may persist without coordination between industry, financiers, technology providers, and government on transition planning.[183]

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Deploying targeted public finance and de-risking instruments (such as concessional finance, innovation funds, and blended finance, or contracts for difference) to support first-of-a-kind commercial plants and shared infrastructure.[181]	B1 B2
2	Advancing green and sustainable procurement, including standards that support a growing market share for low-emissions materials. Expanding and deepening existing initiatives and tracking outcomes.[184]	B1
3	Using voluntary demand-aggregation mechanisms, including advance market commitments, to help create predictable demand for low-emissions steel, aluminium, cement and chemicals. Supported, where appropriate, by public and private finance, these mechanisms could facilitate investment in industrial decarbonisation through approaches that take into account national circumstances.[185]	B1
4	Developing sector-level roadmaps, interoperable emissions accounting, workforce transition and skills programmes.[186]	B3

BOX 9

Examples of global, regional, and national industrial decarbonisation and hydrogen market-maker and co-finance initiatives

Global	First Movers Coalition is a buyers' club through which member companies commit to purchasing minimum shares of near-zero emissions steel, aluminium, cement, and other hard-to-abate materials by 2030. It launched in 2021 at COP26. It aggregates corporate purchasing power to send an early demand signal to producers. Membership has grown to represent more than USD 19 billion in demand for low-carbon products by 2030.[187]
EU, with global reach	H2Global is a double-auction mechanism that conducted its first pilot auction in July 2024. It is a market-maker mechanism in which the intermediary, Hintco, signs 10-year purchase agreements with global green hydrogen producers and sells to buyers through shorter-term demand-side auctions. Public funding bridges the gap between purchase and sale prices. Originally funded by Germany, it has since been joined by the Netherlands and Canada. A second, larger auction of around EUR 2.5 billion launched in 2025.[188]
Chile	The H2V (green hydrogen) Chile Facility launched a USD 1 billion financing facility, announced in 2023, under the Green Hydrogen Action Plan 2023–2030. It is backed by the Corporación de Fomento de la Producción (CORFO), Chile's economic development agency, with support from the Inter-American Development Bank, the World Bank and the EU, which have subsequently committed additional funding. Competitive tenders allocate public co-financing to green hydrogen projects explicitly targeting hard-to-abate industrial uses such as mining explosives, iron and steel, and industrial heat. It is an advanced green hydrogen market mechanism, but deployment remains early-stage. An update to the strategy in March 2026 revises targets for hydrogen production and cost to reflect market conditions.[189]

Carbon dioxide removal (CDR), carbon capture and storage (CCS), and carbon capture, utilisation and storage (CCUS)

Submissions expressed a range of views on the role of CDR, CCS and CCUS. CDR plays a significant role in many 1.5 °C overshoot pathways and is identified as contributing to the

balancing of residual emissions and, where relevant, the reversal of overshoot. At the same time, some submissions noted that CDR, CCS and CCUS do not substitute for deep emissions reductions.

Some submissions called for increased ambition, transparency and deployment of CDR, CCS, and CCUS portfolios to support net-negative emissions in the second half of the century and strengthen the credibility of climate targets. Others emphasised risks, uncertainties and implementation challenges, including potential ecosystem impacts associated with some approaches, such as in marine CDR.

Literature assessed by the IPCC AR6 indicates some level of CDR is required in pathways that limit warming to 1.5 °C with no or limited overshoot, and that larger deployment is generally associated with pathways involving greater overshoot.[190]

Residual emissions are projected to remain in some hard-to-abate sectors, including chemicals, steel, some transport fuels and agriculture. More broadly, pathways that reverse an overshoot, rather than stabilising temperatures at their peak, require sustained net-negative CO_2 emissions, amounting to several hundred gigatonnes of cumulative CO_2 removal by 2100.[191]

Total CDR today is about 2.2 Gt CO_2 a year, of which 99.9 per cent is conventional CDR and only about 0.002 Gt CO_2 a year is novel CDR.[192] Novel CDR that enables permanent storage of captured CO_2 is needed to balance emissions, although shorter term storage can have value in balancing biological CO_2 or methane emissions.[193] Achieving net-negative emissions in the second half of the century requires a rapid scale-up of novel CDR with durable, long-term storage. Conventional CDR also provides a range of benefits to resilience, biodiversity, broader ecosystem services and livelihoods.

CCS and CCUS capture emissions at a point source and avoid those emissions entering the atmosphere. It is a potentially important technology for reducing or avoiding residual emissions from hard-to-abate sectors. It is distinct from CDR technologies that capture atmospheric CO_2. Investment in CCS and CCUS is larger and more geographically diverse, with private capital flowing into the more than 30 final investment decisions that have been reached in the past two years.[194]

The IPCC is due to publish a methodology report in 2027 on CDR and CCUS to provide guidance for national greenhouse gas inventories, and address gaps in existing guidelines.[195]

BARRIERS	Barriers to novel CDR, CCS and CCUS could include:
B1 Early-stage cost and technology risk for novel CDR	Most durable pathways are pre-commercial. Large-scale projects remain rare, and uncertainty in the funding landscape for CDR demonstration projects is emerging as a barrier in some jurisdictions. Submissions note that further support would help drive novel CDR and CCS down the cost curve.[196]
B2 Resource constraints may limit conventional CDR, while transport and storage constraints may limit novel CDR	Land, water, and biomass limits may be material for individual methods such as bioenergy with carbon capture and storage (BECCS). Novel CDR deployment at scale and CCS may depend on shared CO_2 transport and storage infrastructure that does not yet exist at scale in most regions.[197]
B3 A lack of compliance demand for novel CDR	Nearly all demand for novel CDR is voluntary and rests on a very small number of buyers and suppliers. Only a handful of domestic carbon markets currently recognise CDR.[198]
B4 Governance and legal frameworks are complex and still evolving in particular for novel CDR	The evolving legal frameworks are both a barrier due to uncertainty and steps towards clarification.[199] Cross-border governance arrangements are underdeveloped, including for transport and storage.[200]

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Building long-term demand signals for approaches that do not have high scientific uncertainty or environmental risks, such as integrating novel CDR methods into compliance carbon markets where they have credible certification frameworks that set minimum criteria for additionality and permanence.[201]	B3 B4
2	Lowering cost through economies of scale and de-risking first-of-a-kind projects, including by co-investing in shared CO_2 transport and storage infrastructure.[202]	B2 B1
3	Applying public procurement, reverse auctions and advance market commitments to support commercialisation of low-risk durable CDR.[203]	B1 B3
4	Co-investing in CCS/CCUS to support technology development and commercialisation.	B1 B3
5	Establishing robust MRV, certification and durability/quality standards for removals that distinguish between avoidance and negative emissions technologies.	B1 B4

BOX 10

Examples of global, regional, and national novel CDR and CCS initiatives

Global	The Frontier advance market commitment (launched 2022) aggregates corporate buyer demand and negotiates multi-year purchase agreements for permanent CDR, using pre-purchases to support earlier-stage suppliers. Commitments had grown to USD 1.8 billion by June 2026, though purchases remain concentrated among a handful of founding members.[204]
Global	Mission Innovation launched its CDR Mission in 2021, with the goal of enabling CDR technologies to deliver a net reduction of 100 Mt CO_2 a year by 2030, including using direct air capture, biomass with carbon removal and storage, and enhanced mineralisation. Its CDR launchpad is a coalition of governments working together to accelerate the pace of CDR, including through information sharing.[205]
Japan	Japan's Green Transformation Emissions Trading System (GX-ETS) became mandatory in April 2026 for several hundred large emitters. It allows external credits to meet up to 10 per cent of compliance obligations. The mandatory phase is new, so the durable-removals share taken up by obligated companies remains to be seen.[206]
Saudi Arabia	The Jizan CO_2 mineralisation pilot project is a CCS project developed under a joint technical collaboration with Saudi Aramco.[207] It captures CO_2 from the Jizan refinery complex, and injects it underground, using a closed loop system to reduce the water requirements. Under development since 2023, it has proved its core technical concept and is now being scaled up. Approximately 70 per cent of CO_2 injected into Jizan basalts was converted into carbonate minerals within ten months using recirculated subsurface water.[208]
Canada	Canada's Alberta Carbon Trunk Line (ACTL), operating since June 2020, is a 240-kilometre open-access CO_2 pipeline. A dedicated storage facility with an initial capacity of 1.5 million tonnes a year is due to start commercial operation in January 2027, providing a shared transport-and-storage infrastructure for refineries, petrochemicals, cement, power and, potentially, future carbon removal projects.

7 Adaptation

As climate impacts increase, adaptation needs continue to grow. Submissions identify challenges to global climate resilience, including a widening finance gap, institutional fragmentation, challenges in mainstreaming and assigning institutional responsibilities, and in some jurisdictions, the need to consider further devolution of authority and resources to local level. Non-Party actor submissions emphasised the importance of good quality climate risk information, data and transparency for adaptation planning, investment, and appropriate capital allocation by businesses and financial groups.

High-impact implementation opportunities that are primarily adaptation focused and highlighted in submissions include early warning systems, health, and climate-resilient cities and infrastructure.

7.1 Towards universal early warning systems

Submissions highlight early warning systems (EWS) as one of the most effective adaptation tools to avert and reduce the impacts of climate hazards. Systems may be either cross-cutting or sector or hazard-specific. Multi-hazard early warning systems (MHEWS) are among the most cost-effective adaptation investments available.[209] Disaster mortality is nearly six times lower in countries with more comprehensive MHEWS than in those with limited capabilities.[210]

Submissions emphasised that keeping 1.5 °C is a matter of survival, noting that 2 °C rather than 1.5 °C of warming could lead to 30 to 50 per cent more glacial outburst floods, and called for multi-hazard early warning systems and timely information-sharing for regional resilience.

Submissions note deployment could be accelerated by building on international initiatives, partnerships and coordination mechanisms to scale to universal coverage that leads to early action with locally led delivery models, sectoral applications, and underlying data/modelling capacity.

Progress has been significant over the last 10 years since the launch of the Climate Risk and Early Warning Systems (CREWS) initiative in 2015, the emergence of anticipatory action and in recent years since the launch of the UN Secretary-General's Early Warnings for All (EW4All) initiative in 2022. This aims for all inhabited regions to be protected by EWS by the end of 2027, through a network of global, regional, national and local initiatives. The Global Status of MHEWS 2025 report launched at COP30 recorded 119 countries (60 per cent of all countries) with a MHEWS, a 113 per cent increase over the past ten years. Significant gaps remain. Coverage remains uneven geographically and in terms of the comprehensiveness of the systems in place. Only 43 per cent of small island developing States report having a MHEWS, the lowest coverage among countries in special situations, and least developed countries (LDCs) still have the least comprehensive coverage, despite having doubled installed systems since 2015.[210]

Technological innovation and adoption are supporting the scaling of MHEWS capacity, but a persistent digital divide limits their reach, and gaps remain in ensuring delivery of actionable warnings to communities at risk, even in large cities.[211] Gaps also remain in the

use of climate and early warning information in decision-making that enables early action at household, community, local and national levels. For example, WMO's 2023 assessment reported that only 23 per cent of health ministries use meteorological information to monitor climate-sensitive health risks, and heat warning services reached health decision makers in only around half of affected countries.[212] While many climate vulnerable countries have progressed in the development of disaster risk financing strategies to respond to disasters, the lack of national financial mechanisms to trigger early actions based on warnings remains a major gap.[213]

At the same time as scientific and technological capacity is increasing, climate change is also increasing the intensity and complexity of hazards and with them the demands on warning systems and responses.

BARRIERS	Barriers to universal and effective EWS could include:
B1 Inclusion gaps	Lack of inclusive locally led approaches for delivery and communication that ensure warnings are received by at-risk groups, understood, and acted upon. Warnings frequently fail to reach, or be actionable by, remote, informal, low-income, displaced, or linguistically diverse populations.
B2 Insufficient preparedness relative to risks	Lack of well-developed and resourced preparedness, early action and response plans that keep pace with the increasing complexity of risks.
B3 Funding and capacity constraints	Limited funding and capacity for ongoing operational effectiveness of infrastructure and systems being developed.
B4 Decision-making and early action triggers	Gaps in ensuring climate and early warning information triggers decision-making and the release of resources to enable early action.
B5 Need for observation, risk and data sharing	Gaps in observations, risk knowledge and data-sharing, including for transboundary hazards, which undermine the accuracy, lead time and reach of warnings.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Linking early warnings to forecast-based action through pre-agreed access to finance and resources at Government level, including shock-responsive or adaptive social protection, blended finance and insurance-linked instruments, with existing examples such as the Global Shield against Climate Risks, the anticipatory pillar of the IFRC Disaster Response Emergency Fund, the Start Network Fund for Non-Governmental Organizations and the anticipatory action frameworks of the UN Central Emergency Response Fund (see Box 11).	B4 B5
2	Closing the foundational observation and data gap and delivering end-to-end EWS, including in SIDS and LDCs, for example through building on the efforts of CREWS, and supporting SIDS and LDCs to achieve Global Basic Observing Network compliance through the Systematic Observations Financing Facility.[214]	B3 B5
3	Building on the Belém Adaptation Indicators to harmonise definitions to support MHEWS coverage and effectiveness across countries and agencies.[58]	B5

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
4	Shifting from capital grants to predictable operations and maintenance finance to fund the recurring costs of running EWS addressing a major cause of systems degradation over time.[214]	B2 B3
5	Integrating delivery across sectors through multi-agency partnership models. Approaches could build on existing structures such as the GCF-supported, UNDP-led Advancing Early Warnings for All project and the WHO–WMO Joint Office for Climate and Health, which link meteorological, health, disaster-risk and agriculture authorities.[215]	B2 B4
6	Strengthening last-mile, inclusive dissemination and community preparedness. Increasing local capacity and collaboration between state and non-state actors to develop clear triggers and decision-making plans and early action protocols. Improving data-sharing and regional cooperation for transboundary hazards, and inter-agency coordination for the different pillars of a MHEWS for example building on initiatives such as the UN Early Warnings for All, the Risk-informed Early Action Partnership.	B1 B2 B5

BOX 11

Examples of early warning, anticipatory action and social protection initiatives

GLOBAL INITIATIVES

UN Early Warnings for All (EW4All)	Launched by the UN Secretary-General in 2022, EW4All aims for everyone on Earth to be protected by early warning systems by the end of 2027. It is co-led by WMO and the United Nations Office for Disaster Risk Reduction (UNDRR), with UNDRR, WMO, ITU and IFRC leading its four pillars (risk knowledge; observation and forecasting; warning dissemination and communication; and preparedness and response), and is being rolled out through national roadmaps in priority countries.[216]
Climate Risk and Early Warning Systems (CREWS)	Launched at COP21 in 2015, CREWS finances risk-informed early warning systems in LDCs and SIDS. Originally implemented by WMO, UNDRR and the World Bank's Global Facility for Disaster Reduction and Recovery, recent projects have supported EW4All. A GCF–CREWS scale-up framework provides fast-tracked access to Green Climate Fund resources to replicate successful projects.[217]
Global Shield against Climate Risks	Launched at COP27 by the V20 and G7, the Global Shield supports pre-arranged financial protection, such as insurance, contingent finance and shock-responsive social protection, so that money is available quickly when disasters strike.[218]
Systematic Observations Financing Facility (SOFF)	A UN fund established by WMO, UNDP and UNEP that provides long-term grant finance and technical assistance to help LDCs and SIDS meet Global Basic Observing Network requirements, through readiness, investment and compliance phases. Less than 10 per cent of the required basic weather and climate data is currently available from these countries. Readiness funding has been approved for 61 countries.[219]
Risk-informed Early Action Partnership (REAP).	Launched at the UN Climate Action Summit in 2019, REAP brings together an unprecedented range of Governments and stakeholders across the climate, development, humanitarian, hydrometeorological, private and academic communities, with the aim of getting ahead of disasters.[220]

BOX 11

Examples of early warning, anticipatory action and social protection initiatives

REGIONAL INITIATIVES

Weather Ready Pacific	A Pacific-led, ten-year programme designed by the Pacific Meteorological Council and endorsed by Pacific Islands Forum Leaders in 2021, to strengthen the region's ability to anticipate, plan for and respond to high-impact weather, water and ocean events. Australia pledged AUD 30 million in 2023 to kick-start implementation.[221]
AMHEWAS (Africa Multi-Hazard Early Warning and Early Action System)	AMHEWAS is a continental programme, launched in 2022, led by the African Union Commission (AUC) to improve disaster preparedness, early warning, and anticipatory action across Africa.[222]

FORECAST-BASED FINANCING, ANTICIPATORY ACTION AND SOCIAL PROTECTION

Bangladesh	In July 2020, the UN Central Emergency Response Fund released anticipatory funding when forecasts showed severe monsoon flooding, so cash transfers and other support reached vulnerable households before the flood peak. Through the forecast-based action window of the IFRC Disaster Response Emergency Fund, the Bangladesh Red Crescent Society also evacuated families and livestock by boat and provided cash grants ahead of the floods.[223]
Sahel	The World Bank-administered Sahel Adaptive Social Protection Program supports Burkina Faso, Chad, Mali, Mauritania, Niger and Senegal in building social protection systems that can scale up quickly in response to drought and other climate shocks.[224]

7.2 Developing climate-resilient health systems

Climate change is placing increasing pressure on health systems, affecting disease patterns, health infrastructure, workforces and the continuity of essential services. Many countries have raised health as a key consideration in NDC and NAP design, rather than only as a co-benefit of climate action. Submissions call for embedding 'health in all policies' approaches into national climate plans, for climate-sensitive disease preparedness, for health-tailored early warning systems, and, from youth constituencies, for attention to the mental-health dimensions of climate change. Submissions highlight the impacts of urban heat and call for health to be built into climate-resilient urban planning.

While climate and health has received growing attention, implementation remains uneven. Challenges include integrating climate-health priorities into national planning and resource allocation, strengthening institutional and workforce capacity, mobilising accessible finance, improving the resilience of health infrastructure, and translating climate information into operational health-system preparedness and response.

Integrating health into climate action is both a public-health and an implementation opportunity. Climate change is already affecting health, driving heat mortality, the spread of vector-, food- and water-borne disease, malnutrition and pressure on health systems, with the burden falling hardest on the poorest communities.[225] Submissions note that building health into climate plans can broaden domestic support, unlock health-sector finance, and turn near-term benefits such as cleaner air and cooler cities into drivers of ambition. Household air pollution from cooking with polluting fuels contributes to around 2.5 million premature deaths a year, making clean cooking both an energy-access and a health priority.[226]

BARRIERS	Barriers to developing climate-resilient health systems could include:
B1 Governance and capacity	Limited capacity and weak integration of health into climate governance, with health ministries often absent from NDC and NAP processes and few dedicated climate and health staff.
B2 Health data and early warning	Limited health-tailored data and early warning, including underuse of climate information by health systems and limited systems to connect data on exposure to climate hazards with observed health outcomes.
B3 Finance	Insufficient and hard-to-access finance for climate-resilient health systems, particularly in low-income and climate-vulnerable countries.
B4 Preparedness and emissions	Health systems that are themselves under-prepared for climate shocks and a source of pollution and emissions.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Consider integrating health priorities and actions in NDCs and NAPs, including 'health in all policies' approaches and health national adaptation plans, and aligned with the UAE Framework for Global Climate Resilience target on health and the Belém Adaptation Indicators.	B1
2	Scaling heat-health action: heat action plans, chief heat officers and heat-health early warning systems.	B2 B4
3	Strengthening climate information services for health systems, including climate-sensitive disease surveillance and preparedness, connecting national meteorological services operationally to health systems and ministries, and improving the integration and use of climate and health data for decision-making.	B2
4	Building climate-resilient and low-carbon health systems, drawing on Alliance for Transformative Action on Climate and Health (ATACH) commitments, with dedicated and accessible finance, strengthened institutional and workforce capacity, and more resilient health infrastructure.	B3 B4
5	Capturing the health co-benefits of mitigation, such as improvements in air quality from reducing emissions in energy, transport, industry and households.	B1

BOX 12

Examples of climate-resilient health systems initiatives

Global	Through the WHO-led ATACH, more than 100 countries have committed at ministerial level to build climate-resilient and low-carbon health systems, including health vulnerability assessments and health national adaptation plans.[227]
India	Heat action plans, pioneered by the Ahmedabad Heat Action Plan in 2013 and since adopted across more than twenty states and dozens of cities, combine heat-health early warning, public awareness and preparedness measures, and have been associated with substantial reductions in heat-related mortality.[228]
Sierra Leone	Freetown appointed one of Africa's first Chief Heat Officers and adopted a citywide Heat Action Plan focused on informal settlements, which can run up to 6 °C hotter than surrounding areas. This includes a heat-health early warning system and dedicated seed funding to scale cooling solutions.[229]
France	Following the 2003 heatwave, France established a national heat-health plan and warning system linking meteorological alerts to graduated public-health responses, and many other European countries have since introduced similar systems.[230]
Pacific	Ministries of Health from across the Pacific region have established a Pacific Network for Health and Climate Change, to improve regional collaboration and knowledge exchange across sectors, build more climate-resilient health systems, and improve access to finance for climate resilience solutions that benefit health.

7.3 Building climate-resilient cities and infrastructure

Cities and infrastructure are raised across submissions as a high-impact arena for adaptation, given the concentration of people, assets and emissions in urban areas. Submissions emphasise climate-resilient urban planning, the management of urban heat and stormwater, resilient and low-carbon buildings, and the green skills needed to deliver them. A recurring theme is that engineered 'grey' and nature-based 'green' approaches work best together rather than as alternatives.

Improving building energy efficiency and resilience can reduce energy demand and costs, improve thermal comfort and health, and support the efficient electrification of heating, cooling, cooking and other energy services, according to national circumstances and priorities.

Cities are now home to 45 per cent of the world's 8.2 billion people, and smaller and mid-sized cities, particularly in Africa and Asia, are growing fastest, so decisions taken now on urban form and infrastructure lock in exposure or resilience for decades.[231] Urban heat, flooding and infrastructure failure hit informal settlements and low-income residents hardest. The same investments that build resilience also cut emissions and improve health and liveability, including green space, efficient buildings, and resilient water and energy systems. Cities are also where local governments can act quickly, and submissions point to city-level initiatives as proof of concept ready to be scaled and financed.

Climate change is already damaging cities and the infrastructure they depend on. The IPCC finds that extreme and slow-onset events have compromised transport, water, sanitation and energy systems, causing economic losses and disruptions to services.[232] Climate-related disasters are estimated to cost infrastructure and buildings USD 512–592 billion a year on

average.[233] In low- and middle-income countries, infrastructure disruptions from natural hazards and poor maintenance cost households and firms at least USD 390 billion a year, while each dollar invested in more resilient infrastructure yields about four dollars in benefits.[234] Many of the most effective measures are well established: risk-informed land-use planning that steers new development away from the highest-risk areas; building codes and design standards that account for future climate; maintaining and climate-proofing critical energy, water and transport networks; early warning and contingency plans for essential services; and urban green space, wetlands and other nature-based solutions that cool cities and absorb flood water.

BARRIERS	Barriers to building climate-resilient cities and infrastructure could include:
B1 Governance and coordination	Fragmented mandates and weak coordination between national and local governments and across urban sectors.
B2 Municipal finance	Limited municipal access to finance, with few instruments suited to small, distributed or nature-based projects.
B3 Data, standards and skills	Gaps in local data, building standards, implementation capacity and skills, alongside limited capacity to finance and deliver energy-efficient and climate-resilient buildings and renovations.
B4 Unplanned urban growth	Rapid, often informal, urban growth that outpaces resilient planning, often exposing lower socio-economic groups.

POSSIBLE ENABLERS AND OPPORTUNITIES		BARRIERS ADDRESSED
1	Consider integrating urban resilience into NDCs and NAPs and empowering local governments, aligning with the Global Goal on Adaptation infrastructure and settlements target and the Belém Adaptation Indicators.	B1
2	Combining green and grey infrastructure — sponge-city drainage, green corridors, and resilient water and energy systems — tailored to local hazards.	B4
3	Scaling resilient, energy-efficient, low-carbon buildings and the green-construction workforce, including through stronger building energy-performance standards, renovation of existing buildings, passive design and efficient electrification.	B3
4	Developing municipal and blended finance, including pooled and city-level instruments, public and concessional finance and technical assistance to mobilise investment in resilient infrastructure and energy-efficient buildings, prioritising informal settlements and low-income residents.	B2 B4
5	Advancing low-carbon, accessible urban mobility and public and active transport.	B1 B4

BOX 13

Examples of climate-resilient cities and infrastructure initiatives

Global	The Buildings Breakthrough, launched at COP28 and co-led by France and Morocco, unites more than twenty-five countries around making near-zero-emission and climate-resilient buildings the norm by 2030.[235]
China	The Sponge City Programme, launched after deadly urban floods, combines blue–green and conventional 'grey' drainage across dozens of pilot cities, with a target that 80 per cent of urban built-up areas absorb and reuse the majority of rainfall by 2030, reducing flood risk while creating public green space.[236]
Netherlands	The Room for the River programme gave rivers more space to flood safely at 34 locations across the Netherlands, shifting from purely raising dikes to hybrid, nature-based flood management.[237]

Endnotes

1 (UNFCCC, 2025a).

2 (UNFCCC, 2025a, paragraphs 6–7).

3 The call for submissions asked which action areas and solutions offer the greatest potential to strengthen ambition and enable implementation of NDCs and NAPs, what are the most significant barriers, and how international cooperation can be strengthened to support delivery. Written submissions were received from 148 entities in response to the call: 24 from Parties and 124 from non-Party stakeholders. Of the 24 Party submissions, 16 were made by individual countries, spanning developed and developing countries across regions, and 8 were made on behalf of negotiating groups or coalitions: the African Group of Negotiators (AGN), AILAC, AOSIS, the Arab Group, the Environmental Integrity Group (EIG), the LDC Group, the group of Like-Minded Developing Countries (LMDC), and Bangladesh, Bhutan and Nepal. Non-Party submissions came from intergovernmental organisations, coalitions and networks, research institutions, civil society organisations, businesses and financial institutions. The negotiating-group submissions are listed under African Group of Negotiators (2026), AILAC (2026), AOSIS (2026), Arab Group (2026), Environmental Integrity Group (2026), Least Developed Countries Group (Timor-Leste) (2026), Like-Minded Developing Countries (2026), and Bangladesh, Bhutan and Nepal (2026). See also UNFCCC (2026a) for the call.

4 (UNEP, 2026a). (Reisinger et al., 2025).

5 (Forster et al., 2026, table 1). (UNEP, 2026b).

6 (IPCC, 2022a). (Riahi and van Vuuren, 2026). (van Vuuren et al., 2026). (Sun et al., 2021). (UNEP, 2026a).

7 (Riahi et al., 2022).

8 (Berkeley Earth, 2026). (NASA GISS, 2026). (Morice et al., 2021). (WMO, 2026a). (Forster et al., 2026).

9 (WMO, 2026a). (WMO, 2026b).

10 (Romanello et al., 2025).

11 (WMO, 2026b). (WMO, 2026d).

12 (ICRI and NOAA, 2025). (Global Tipping Points, 2025).

13 (van Vuuren et al., 2026).

14 (Schleussner et al., 2024). (UNEP, 2025b).

15 (Schleussner et al., 2024). (IPCC, 2021, Summary for Policymakers, statement B.5.3).

16 (Armstrong McKay et al., 2022).

17 (UNFCCC, 2026b).

18 (UNEP, 2026a). (UNEP, 2026b). (IEA, 2025e). (UNFCCC, 2026b).

19 (UNEP, 2025a).

20 (UNFCCC Least Developed Countries Expert Group, 2025). For the BTR submission register, see UNFCCC (n.d.-c). For NAPs submitted and shared, see UNFCCC (n.d.-e).

21 (WMO, 2025a). (Friedlingstein et al., 2026).

22 (UNEP, 2026a). (UNEP, 2026b, Executive Summary, section 1). (WMO, 2026b). (WMO, 2025b).

23 (Forster et al., 2026).

24 (WMO, 2026c).

25 (Forster et al., 2026, table 1). (UNEP, 2025b).

26 (WMO, 2026b). (IPCC, 2021).

27 (Adler et al., 2022).

28 (WMO, 2026b).

29 That updated remaining carbon budget is now substantially lower than at the time of the IPCC AR6 when it was around 500 Gt CO_2 from the start of 2020 onwards. Over half of that downward revision is due to emissions in the six years since 2020 and the remainder due to methodological changes. See Forster et al. (2026). There is some variation in the estimates of the remaining carbon budget for 1.5 °C across studies, but all concur that the budget will be consumed in the next few years given current levels of emissions.

30 (IPCC, 2022a). (Riahi and van Vuuren, 2026). (van Vuuren et al., 2026). (UNFCCC, 2026b). (Gütschow and Pflüger, 2026).

31 This is based on the insight that the highest peaking overshoot scenarios that return to below 1.5 °C by the end of the century are peaking around 1.8 °C (C2 class of scenarios assessed in IPCC AR6) and that every five years of emissions at current levels translate into an approximately 0.1 °C higher peak warming (UNEP, 2026a).

32 (Flores et al., 2024).

33 (IPCC, 2018, Summary for Policymakers, statement B.2.1, and chapter 3, section 3.3.2).

34 (Dosio et al., 2018).

35 (IPCC, 2018). (Schleussner et al., 2024).

36 (IPCC, 2018).

37 (IPCC, 2022b, Summary for Policymakers, statement B.4.6). (IPCC, 2023, Summary for Policymakers, statement A.2).

38 (Swiss Re Institute, 2021).

39 (Burke et al., 2018). The estimated global benefit of limiting warming to 1.5 °C rather than 2 °C is expressed in 2010 USD, discounted at 3 per cent. The probability of exceeding USD 20 trillion is over 60 per cent.

40 (IPCC, 2023, Summary for Policymakers, statements A.4.5 and C.7).

41 (IPCC, 2018). (Warren et al., 2018).

42 (IPCC, 2022b). (Gaupp et al., 2019). (Myers et al., 2014).

43 (Romanello et al., 2025). (WHO, 2025a).

44 (World Bank, 2021).

45 (IPCC, 2022b).

46 (IPCC, 2022b, Summary for Policymakers, statements C.1.2 and C.2).

47 (International Monetary Fund, 2019). (Skoufias et al., 2018). (Hallegatte et al., 2019).

48 (IPCC, 2022b, Summary for Policymakers, statement C.3.3, and chapter 16).

49 (IEA, 2026a).

50 (IEA, 2025d). (Gabbatiss, 2025).

51 (IEA, 2026b).

52 (IRENA, 2026).

53 Allowing for a few NDC submissions received by the UNFCCC shortly after 31 August 2026. (UNFCCC, 2026b).

54 Current policies and high scenarios are represented by a range of scenarios, including CMIP7 medium to high scenarios and NGFS Phase 5 Current Policy scenarios. Sources: (Riahi and van Vuuren, 2026). (van Vuuren et al., 2026). (NGFS, 2024).

55 The illustrative central values are only illustrative and to be seen within the context of a wider range of median warming projections across emissions pathways. The central estimate is followed in parentheses by the full minimum–maximum range of scenario medians: (1) Current policies: UNEP (2026b) gives 2.6 °C (2.0–3.5 °C); IEA (2025e) gives 2.9 °C in its Current Policies Scenario (CPS) (UNEP, 2026b; IEA, 2025e). (2) Unconditional NDCs only, without long-term targets: UNEP (2026b) gives 2.5 °C (1.8–3.2 °C); analysis of the NDC Synthesis Report 2026 data gives 2.6 °C (2.1–3.2 °C). IEA's Stated Policies Scenario (STEPS) gives 2.5 °C. STEPS is a source-specific comparator based on stated policies, rather than an exact unconditional-NDC implementation scenario (UNEP, 2026b; IEA, 2025e; UNFCCC, 2026b). (3) Conditional NDCs, without long-term targets: UNEP (2026b) gives 2.4 °C (1.8–3.1 °C); analysis of the NDC Synthesis Report 2026 data gives 2.4 °C (2.1–2.9 °C) (UNEP, 2026b; UNFCCC, 2026b). (4) NDCs and long-term targets: pooling unconditional and conditional cases, analysis of the NDC Synthesis Report 2026 data gives 1.9 °C (1.7–2.3 °C). For the conditional cases alone, the corresponding result is 1.9 °C (1.7–2.0 °C). UNEP's closest counterpart, conditional NDCs combined with long-term strategies without the United States' long-term pledge, gives 1.9 °C (1.7–2.2 °C) (UNEP, 2026b; UNFCCC, 2026b). These ranges reflect differences in projected emissions, interpretation of pledges and assumptions for extending emissions beyond target years; they are not climate-response uncertainty intervals around a single pathway. IEA and the UNFCCC-labelled results describe warming in 2100. UNEP's values describe peak warming over the twenty-first century: warming continues to rise through 2100 in its first three cases, whereas its conditional-NDC-plus-long-term-strategy case stabilises before 2100. UNEP's separate headline values at 66 per cent likelihood are distinct from the medians reported here (UNEP, 2026b). Sources: UNEP (2026a, 2026b), IEA (2025e), UNFCCC (2026b), UNFCCC and UNEP (2026).

56 These ranges reflect the span of outcomes across conditional and unconditional NDCs, and high and low assessments of ambition for Parties. (UNFCCC, 2026b).

57 (UNEP, 2026b).

58 (UNFCCC, 2025b). (UNFCCC, 2023c, paragraphs 9–10).

59 (UNEP, 2024a).

60 (UNFCCC, 2018). (Climate Technology Centre and Network, n.d.).

61 (UNFCCC, 2015, Articles 9–11).

62 (Climate Policy Initiative, 2026).

63 (IPCC, 2023, Summary for Policymakers, statements C.7, C.7.1 and C.7.3). (Climate Policy Initiative, 2026).

64 (IEA, 2024b).

65 (OECD, 2026).

66 (UNFCCC Standing Committee on Finance, 2026a). (UNFCCC Standing Committee on Finance, 2026b).

67 (UNFCCC, 2024a, paragraphs 7–9).

68 (UNFCCC, 2025a, paragraphs 47–48 and 53). (UNFCCC, 2021, paragraph 18).

69 The ISA Global Mission on AI for Energy was launched at the India AI Impact Summit (February 2026) and builds on India's Energy Stack as digital public infrastructure integrating data, markets, payments and consumers. According to the ISA Director-General, nearly 40 per cent of the approximately 1,000 GW of solar added globally in the last two years was decentralised (pv magazine India, 2026).

70 (UNDP, 2026).

71 (UNFCCC, 2024b, paragraph 11). (UNFCCC, 2025c).

72 The Climate Technology Centre and Network received 29 technical assistance requests in 2024–2025, more than double the previous period, bringing cumulative requests to 439 from 115 developing countries, of which only 38 per cent are completed; it reports that limited and earmarked funding constrains its ability to respond, with only USD 1.86 million of unearmarked project funding expected to be available by 2027. (Climate Technology Centre and Network, 2025).

73 Effective institutions "require adequate institutional capacity" (IPCC, 2023, Summary for Policymakers, statement C.6.2). Capacity is needed at individual, institutional and systemic levels, including "institutional capacity for governance and coordination" (UNFCCC, 2023a, paragraphs 112 and 114). (UNDP, 2009).

74 Multi-stakeholder engagement, country ownership and meaningful engagement (UNFCCC, 2023a, paragraphs 113 and 116). "Inclusive decision processes that prioritise equity and justice" (IPCC, 2023, Summary for Policymakers, statement C.6.3). Submissions to the call for inputs (UNFCCC, 2026a): UNDP/UNDCO (whole-of-government coordination); GAIA (vertical integration from national planning to local implementation); Osservatorio Parigi and SHCF (structured participation of subnational actors, civil society, youth, Indigenous Peoples).

75 On the market-shaping, mission-oriented public sector: (Kattel and Mazzucato, 2018). (OECD, 2023).

76 (OECD, 2024). (UNDP, 2025). Submissions to the call for inputs (UNFCCC, 2026a): OECD (dedicated data-governance programmes); Mexico (interoperable information systems for NDC/NAP tracking); UK (electrification data standards). Brazil example: DataClima+ (MCTI national climate transparency system, presented at COP30).

77 The Belém Declaration on Sustainable Public Procurement was launched at COP30 in November 2025 by Brazil's Ministry of Management and Innovation with Norway, the Netherlands, Mexico, UNEP, UNIDO and the University of Oxford (Smith School of Enterprise and the Environment, 2025).

78 (Ministry of International Cooperation, Egypt, n.d.).

79 (Inter-American Development Bank, 2024). (Green Climate Fund, 2024).

80 (Careers360, 2025). (IEA, 2023b). (ReNew, 2026).

81 (IRENA, 2023).

82 (UNFCCC, 2023a, paragraphs 153–163).

83 (UNFCCC, 2025a, paragraphs 12, 38, 39, 41, 56 and 57).

84 (United Nations, 1992, Article 3, paragraph 5). (UNFCCC, 2025a, paragraph 56).

85 (UNFCCC, 2025a, paragraph 57).

86 (IEA, 2025g).

87 (IPCC, 2022b, Summary for Policymakers, statement C.5.6).

88 (ILO, 2015). (ILO, 2018). (UNEP, ILO and IUCN, 2022).

89 (UNFCCC, 2023b). (UNFCCC, 2025e, paragraphs 12(h) and 25).

90 (UNFCCC, 2019).

91 (UNFCCC, n.d.-b).

92 (UNFCCC, n.d.-a).

93 (World Resources Institute and partners, 2021). (Endorsed by more than 100 organisations as of September 2022.)

94 (Presidential Climate Commission, South Africa, 2022). International pledges have grown from USD 8.5 billion to around USD 12.8 billion: (International Partners Group, 2025).

95 (Government of Kenya, n.d.).

96 (Barefoot College International, n.d.).

97 (Government of Canada, n.d.).

98 (Government of Fiji, 2018).

99 (Ministry of the Environment and Climate Change, Brazil, n.d.).

100 (UNFCCC, 2023a, paragraphs 33–34).

101 (Nabuurs et al., 2022, Executive Summary).

102 (Tropical Forest Forever Facility, n.d.). (Barber et al., 2025).

103 (Forest Tenure Funders Group, n.d.).

104 (IUCN, 2017). (UNEP, 2021).

105 (Bryan et al., 2018).

106 (INPE, 2026). (Tropical Forest Forever Facility, n.d.).

107 (African Union and UNCCD, n.d.). (AFR100, n.d.).

108 (AOSIS, 2026). (Republic of the Marshall Islands, 2026). (Ocean Risk and Resilience Action Alliance, 2026).

109 (IPCC, 2021). (IPCC, 2019). (Ocean uptake of CO_2 and excess heat.)

110 (High Level Panel for a Sustainable Ocean Economy, 2025).

111 (Ocean Risk and Resilience Action Alliance, 2026). (Ocean & Climate Platform, 2026). (Ocean-based solutions attract less than 1 per cent of global climate finance; Blue NDC Challenge; Ocean Breakthroughs.)

112 (UNFCCC, n.d.-d).

113 (IPCC, 2019). (Coastal blue carbon ecosystems: potential mitigation of the order of 0.5 per cent of annual global emissions, with much larger local value.)

114 (Blue NDC Challenge, n.d.).

115 (World Bank and Global Environment Facility, 2018). (Government of Seychelles, 2020).

116 (The Nature Conservancy, 2021). (USD 364 million; 30 per cent of ocean protected by 2026; debt reduced by about 12 per cent of GDP.)

117 (Arab News, 2023).

118 (Pacific Islands Forum, 2022). (Locally managed marine areas.)

119 (Institute of Marine Research, Norway, n.d.).

120 (UNEP, 2022).

121 (IPCC, 2022b, Summary for Policymakers, statements C.2.5–C.2.6 and Figure SPM.4b). (Nature-based solutions and ecosystem-based adaptation.)

122 (IPCC, 2022b). Chapters 15 and 16 (hard and soft limits to adaptation); see also Section 2.4.

123 (Indonesia, 2026). (Philippines, 2026). (European Union, 2026). (Republic of the Marshall Islands, 2026). On the alignment with biodiversity strategies: (CBD, 2024, paragraph 3(d)). On hybrid green-grey approaches: (Browder et al., 2019).

124 (Global Fund for Coral Reefs, 2026).

125 (Moloney, 2021).

126 (Moloney, 2021). (Reij et al., 2009).

127 (Environmental Integrity Group, 2026). (Mexico, 2026). (United Kingdom, 2026). (Sweden, 2026). (Republic of the Marshall Islands, 2026). Also non-Party submissions to the Belém Mission to 1.5.

128 (Climate Policy Initiative and ClimateShot Investor Coalition, 2025). (Climate Policy Initiative, 2023).

129 (FAO, WFP and GNAFC, 2026). (In 2025, weather extremes were the main driver of acute food insecurity for 87.5 million people in 16 countries; conflict for 147.4 million in 19 countries.)

130 (IEA, 2026c). (UNEP, 2025c). (Agricultural methane about 42 per cent of global methane emissions in 2020: enteric fermentation, rice cultivation and manure.)

131 (IPCC, 2022b). (Food, fibre and other ecosystem products; climate-resilient agriculture.)

132 (COP28 UAE, 2023). (134 signatories at launch, rising to 159.) (FAO, n.d.).

133 (Ministry of Agriculture and Livestock, Brazil, 2021).

134 (Government of Viet Nam, 2023). (Ministry of Agriculture and Environment, Viet Nam, 2026).

135 (Government of India, 2024). (FAO, 2023).

136 (AGRA, 2025).

137 (Pacific Community, n.d.).

138 (IEA, 2024a).

139 (IEA, IRENA, UNSD, World Bank and WHO, 2026).

140 (IEA, 2026j).

141 (IEA, 2026e).

142 Left panel: capacity-weighted global averages for projects commissioned in each year, in 2025 USD per MWh. The grey bands are fixed recent benchmarks for new plants, repeated across all years rather than historical cost series: new gas 50 to 100 USD/MWh in 2025 dollars (IRENA) and new coal 60 to 100 USD/MWh in 2024 dollars (IEA estimates for the United States, China and India; the EU estimate is excluded). Generation costs are plant-level and exclude storage and grid-integration costs. Right, top: total installed cost per kWh of usable capacity, in 2025 USD; the values for 2010 to 2015 (dashed) were modelled by IRENA from an experience curve rather than surveyed. This is an installed cost, not a levelised cost of storage. Right, bottom: IEA price index in real terms, 2018 = 100; it covers equipment prices only, not total grid investment. Sources: left panel, IRENA (2026) and IEA (2025e), Table B.4b; right, top, IRENA (2026); right, bottom, IEA (2025a), p. 26; author calculations.

143 Methodological note for the illustration: IEA demand growth is applied to Ember's 2025 base. Renewable capacity reaches 11,000 GW in 2030, consistent with the IEA and IRENA quantification of the COP28 tripling goal. The 2026-2030 technology mix is the median share of solar, wind, hydro and bioenergy in 2025-2030 renewable capacity additions across the nine ScenarioMIP-CMIP7 pathways that limit median peak warming to 1.7 °C or below, return to 1.5 °C or below by 2100 and report installed electricity capacity (Riahi and van Vuuren, 2026; van Vuuren et al., 2026). Annual nuclear growth is assumed to be 2.8 per cent (IEA, 2026g), and fossil generation is the residual. The shaded projection is an author calculation, not an IEA forecast. Sources: Ember (2026b, 2026c), IEA (2026g), Riahi and van Vuuren (2026), and van Vuuren et al. (2026). The renewable-capacity benchmark is from UNFCCC (2023a). (Ember, 2026b).

144 (IEA, 2025f).

145 (IEA, 2023c).

146 (IRENA, COP30 and Global Renewables Alliance, 2025).

147 (IEA, 2025h). Regional policy sources: European Commission (n.d.-a, n.d.-b, n.d.-c) for the EU efficiency target, buildings policy and June 2025 roadmap. ASEAN Centre for Energy (2025a) for the 40 per cent energy-intensity target relative to 2005.

148 (IEA, 2026i).

149 (COP31 Presidency, 2026). (UNFCCC, 2026b).

150 (Ministry of Foreign Affairs, Brazil, 2025). (UNFCCC, 2025d).

151 (IEA, 2025a).

152 (ASEAN Centre for Energy, n.d.). (ASEAN, 1997). (ASEAN Centre for Energy, 2024).

153 (ASEAN Centre for Energy, 2026). (ASEAN, 1997). (ASEAN Centre for Energy, 2025b).

154 (Ember, 2026a).

155 (African Development Bank Group, n.d.).

156 (African Development Bank Group, 2026).

157 (Department of Climate Change, Energy, the Environment and Water, Australia, n.d.-a).

158 (Australian Energy Regulator, 2026). (Department of Climate Change, Energy, the Environment and Water, Australia, n.d.-b).

159 (Ministry of Power, India, 2023).

160 (Paliwal et al., 2026). (Gupta, 2026).

161 (IEA, 2026h).

162 (IEA, 2026h). (IEA, 2026k).

163 (Gütschow and Pflüger, 2026). (IEA, 2026c). (United Nations, 2026).

164 (IEA, 2026c).

165 (Gütschow and Pflüger, 2026). (United Nations, 2026).

166 (United Nations, 2026). (IEA, 2026c).

167 As at mid-2026, the GMP has been joined by 159 countries. Several signatories to the GMP have implemented policies that are driving changes, supporting earlier examples of effective regulation reducing emissions. China is not part of the GMP but in 2023 adopted the Methane Emissions Control Action Plan for reducing methane from across the economy: (Ministry of Ecology and Environment, 2023). English translation provided by the IGSD for reference only: (Institute for Governance and Sustainable Development, 2023).

168 (United Nations, 2026).

169 (United Nations, 2026, section 5.3 and Box 5).

170 (United Nations, 2026, Actions 1 and 2).

171 (IEA, 2026c). (Policy trends.) (United Nations, 2026).

172 Timelines and mechanisms can draw on examples from relevant countries including Cameroon, the United Arab Emirates and Chile. (United Nations, 2026). Actions 7–9.

173 (United Nations, 2026, Actions 7–9).

174 (United Nations, 2026, section 5.1). (IEA, 2025c).

175 (IEA, 2023a). (World Bank, n.d.-a).

176 (Climate and Clean Air Coalition, 2023, 2024). (UNEP, 2024b).

177 (IEA, 2026b). (Gailani et al., 2024).

178 (Leadership Group for Industry Transition, n.d.). (Institute of Materials, Minerals and Mining, 2026). (Stockholm Environment Institute, 2026).

179 (UNIDO, 2025). (TeraMed Initiative, 2025). (On the Declaration's links to the Glasgow Breakthrough Agenda and the Dubai Industrial Transition Framework.)

180 (Climate Change Authority, 2026).

181 (ACEEE, 2025).

182 (Ricardo, 2024).

183 (IChemE, 2024).

184 (Carbon Management Europe, 2025).

185 (United Nations Inter-agency Task Force on Financing for Development, 2026).

186 (G7, 2022).

187 (World Economic Forum, n.d.).

188 (H2Global, n.d.). (Hintco, n.d.). (Federal Ministry for Economic Affairs and Energy, Germany, 2025).

189 (Ministerio de Energía, Chile, 2023). (Ministerio de Energía, Chile, 2026).

190 (IPCC, 2022c, Summary for Policymakers, statement C.11).

191 (Gidden et al., 2025). (IPCC, 2022c, Summary for Policymakers, statement C.11 and Table SPM.2).

192 (Edwards et al., 2026). Conventional CDR includes land-based removals largely from afforestation and reforestation. Durable CDR includes biochar, bioenergy with carbon capture and storage (BECCS), direct air carbon capture and storage (DACCS), enhanced weathering and other novel methods.

193 (Allen et al., 2025).

194 (IEA, 2026d).

195 The Panel agreed on the outline of the 2027 IPCC Methodology Report on Carbon Dioxide Removal Technologies, Carbon Capture, Utilization, and Storage for National Greenhouse Gas Inventories in October 2025 (Decision IPCC-LXIII-6). Topics to be addressed are listed on the IPCC website (IPCC, n.d.).

196 (IEA, 2025b).

197 (IPCC, 2022c, Summary for Policymakers, statement C.11). (Edwards et al., 2026).

198 (Edwards et al., 2026, pp. 89 and 114). (Carbon Gap, 2026). States that one company purchased 82 per cent of total novel (durable) CDR credits sold in 2024 and 2025, and that four companies account for 72 per cent of all CDR investment.

199 Some recent developments are summarised in documentation from the 11th Mission Innovation Ministerial Meeting in October 2026 (Clean Energy Ministerial and Mission Innovation, 2026).

200 (Edwards et al., 2026). (IEA, 2023d). (Integrity Council for the Voluntary Carbon Market, 2025). (European Commission, 2026).

201 (Edwards et al., 2026).

202 (World Economic Forum, 2025). The Norwegian government committed roughly NOK 16.8 billion to the Longship project including the Northern Lights CO_2 transport and storage project, the first cross-border, open-access CO_2 storage service, and pairs this with a rising domestic carbon tax, projected to reach about NOK 2,000 (USD 220) per tonne by 2030, to build long-term demand.

203 (Danish Energy Agency, n.d.). Denmark's NECCS Fund, established under the 2022 Finance Act, allocates roughly USD 360 million towards negative emissions from carbon capture, and the government has run the largest single government procurement of durable CDR to date, alongside separate funding for biochar projects.

204 (Frontier, 2026). (USD 915 million Growth AMC; total commitments USD 1.8 billion.)

205 (Mission Innovation, n.d.). The document released at the 11th Mission Innovation Ministerial Meeting in October 2026 notes developments with CCUS and CDR programmes (Clean Energy Ministerial and Mission Innovation, 2026).

206 (International Carbon Action Partnership, 2026).

207 (KAUST, 2026).

208 (Oelkers et al., 2026).

209 (UNEP, n.d.).

210 (UNDRR and WMO, 2025).

211 (Sheehan et al., 2025).

212 (WMO, 2023).

213 REAP partners developed this for the Coalition of Finance Ministers for Climate Action, as part of making the fiscal case for domestic financing for EWS and anticipatory action (Risk-informed Early Action Partnership, 2026).

214 (UNEP, 2025a). (WMO, 2025c). (UNDRR and WMO, 2024). (SOFF, n.d.-a).

215 (UNDP, n.d.).

216 (WMO, 2024a). (CREWS, 2024).

217 (UNDRR, 2015). (WMO, n.d.). (CREWS, n.d.). (WMO, 2026e).

218 (Global Shield against Climate Risks, n.d.). (Choy, 2022).

219 (SOFF, n.d.-a). (SOFF, n.d.-b). (WMO, 2026e).

220 (Risk-informed Early Action Partnership, n.d.).

221 (SPREP, n.d.). (WMO, 2024b). (Department of Foreign Affairs and Trade, Australia, n.d.). (PreventionWeb, 2023).

222 (African Union, 2022). (African Union, 2026).

223 (OCHA, 2020). (Centre for Humanitarian Data, 2020). (IFRC, 2020).

224 (World Bank, n.d.-b).

225 (WHO, 2023).

226 (IEA, 2026f).

227 (WHO, n.d.). (WHO, 2025b). (Over 100 countries committed at ministerial level to climate-resilient and low-carbon health systems.)

228 (Natural Resources Defense Council and Amdavad Municipal Corporation, 2019). Heat action plans in India, pioneered by the Ahmedabad Heat Action Plan (2013) and since adopted across more than 20 states and dozens of cities, are associated with reduced heat-related mortality.

229 (Freetown City Council and HERA, 2025).

230 (Government of France, 2023). (Ministère des Solidarités et de la Santé, France, 2017). (Casanueva et al., 2019). Established after the 2003 heatwave, linking meteorological alerts to graduated public-health responses.

231 (United Nations Department of Economic and Social Affairs, 2025).

232 (IPCC, 2022b, Summary for Policymakers, statement B.1.5).

233 (Coalition for Disaster Resilient Infrastructure, 2023). About 70 per cent of the estimated USD 732–845 billion average annual loss across all hazards is associated with climatic hazards.

234 (Hallegatte et al., 2019).

235 (UNEP, 2023).

236 (State Council of the People's Republic of China, 2015). Launched 2014–2015 with 30 pilot cities, targeting 80 per cent of urban built-up areas absorbing and reusing the majority of rainfall by 2030.

237 (Rijkswaterstaat, n.d.).

Abbreviations

ABC+	Plano ABC+, Brazil's Sectoral Plan for Adaptation to Climate Change and Low Carbon Emission in Agriculture
ACTL	Alberta Carbon Trunk Line
AfDB	African Development Bank
AFOLU	agriculture, forestry and other land use
AFR100	African Forest Landscape Restoration Initiative
AGN	African Group of Negotiators
AI	artificial intelligence
AILAC	Independent Association of Latin America and the Caribbean
AMHEWAS	Africa Multi-Hazard Early Warning and Early Action System
AMOC	Atlantic Meridional Overturning Circulation
AOSIS	Alliance of Small Island States
APAEC	ASEAN Plan of Action for Energy Cooperation
AR6	Sixth Assessment Report of the Intergovernmental Panel on Climate Change
AR7	Seventh Assessment Report of the Intergovernmental Panel on Climate Change
ASEAN	Association of Southeast Asian Nations
ATACH	Alliance for Transformative Action on Climate and Health
AUC	African Union Commission
AUD	Australian dollars
BECCS	bioenergy with carbon capture and storage
BTIP	Belém Technology Implementation Programme
BTR	biennial transparency report
CCS	carbon capture and storage
CCUS	carbon capture, utilisation and storage
CDR	carbon dioxide removal
CIS	Capacity Investment Scheme (Australia)
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMIP7	seventh phase of the Coupled Model Intercomparison Project
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
CORFO	Chilean Economic Development Agency (Corporación de Fomento de la Producción)
CREWS	Climate Risk and Early Warning Systems initiative
CTCN	Climate Technology Centre and Network
DACCS	direct air carbon capture and storage
DPI	digital public infrastructure
EIG	Environmental Integrity Group
EU	European Union
EW4All	Early Warnings for All initiative
EWS	early warning system
FAO	Food and Agriculture Organization of the United Nations
FAST	Food and Agriculture for Sustainable Transformation partnership
FDRE	firm and dispatchable renewable energy
FLLoCA	Financing Locally-Led Climate Action programme (Kenya)
G7	Group of Seven
GCF	Green Climate Fund
GDP	gross domestic product
GGA	global goal on adaptation

GHG	greenhouse gas
GMP	Global Methane Pledge
GNAFC	Global Network Against Food Crises
GST-1	first global stocktake under the Paris Agreement
Gt	gigatonne
GW	gigawatt
GWP100	100-year global warming potential
GX-ETS	Green Transformation Emissions Trading System (Japan)
H2V	green hydrogen (hidrógeno verde), Chile
IEA	International Energy Agency
IFRC	International Federation of Red Cross and Red Crescent Societies
ILO	International Labour Organization
INPE	National Institute for Space Research (Brazil)
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
ITU	International Telecommunication Union
IUCN	International Union for Conservation of Nature
kWh	kilowatt-hour
LCIPP	Local Communities and Indigenous Peoples Platform
LDC	least developed country
LeadIT	Leadership Group for Industry Transition
LEG	Least Developed Countries Expert Group
LMDC	Like-Minded Developing Countries
LT-LEDS	long-term low-emission development strategy
LULUCF	land use, land-use change and forestry
MARS	Methane Alert and Response System
MHEWS	multi-hazard early warning system
MPGCA	Marrakech Partnership for Global Climate Action
MRV	measurement, reporting and verification
Mt	megatonne
MWh	megawatt-hour
NAP	national adaptation plan
NbS	nature-based solutions
NCQG	new collective quantified goal on climate finance
NDC	nationally determined contribution
NGFS	Network for Greening the Financial System
NOK	Norwegian kroner
NWFE	Nexus of Water, Food and Energy platform (Egypt)
OECD	Organisation for Economic Co-operation and Development
ppm	parts per million
PV	photovoltaic
R&D	research and development
REAP	Risk-informed Early Action Partnership
REDD+	reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks
SEFA	Sustainable Energy Fund for Africa
SIDS	small island developing States
SOFF	Systematic Observations Financing Facility
SPG	subpolar gyre
SPM	Summary for Policymakers
TEC	Technology Executive Committee

TFFF	Tropical Forests Forever Facility
TW	terawatt
TWh	terawatt-hour
UAE	United Arab Emirates
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollars
V20	Vulnerable Twenty Group
WGII	Working Group II of the Intergovernmental Panel on Climate Change
WHO	World Health Organization
WMO	World Meteorological Organization

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