

Climate action and support trends

Based on national reports submitted to the UNFCCC secretariat
under the current reporting framework

2019



United Nations
Climate Change

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Foreword



**By Patricia Espinosa,
Executive Secretary of
UN Climate Change**

Once a distant concern, climate change is now an existential threat and the greatest challenge facing this generation. It is abundantly clear that business as usual is no longer good enough. Rapid, deep and transformative change is needed throughout society—not only to reduce emissions and stabilize global temperatures, but to build a safer, healthier and more prosperous future for all.

Our goals are clear and the science is non-negotiable. We must limit global temperature rise to 1.5 degrees and, on the road to doing so, achieve climate neutrality by 2050. This must be done urgently and cooperatively; a global project requiring the best efforts from all nations, all businesses and all people.

The 2019 UN Climate Summit represents a significant opportunity to speed up that process. It brings together government and business leaders from around the world to do more than talk: to clearly state how they will contribute to eliminating CO2 emissions and safely keep the world from warming above 1.5 °C.

To know where nations are collectively going however, they must have a deep understanding of where they collectively stand. This report, requested by the Special Envoy of the 2019 UN Climate Summit, and prepared by the UNFCCC, provides an overview of the action taken by governments to address climate change in response to UNFCCC mandates. It also details the status of climate action and relevant support provided and received.

The international community has worked tirelessly for more than 25 years to build a strong foundation for the climate regime; one with clear goals based on science. The adoption of the UNFCCC in 1992 triggered a positive global response to climate change that has since been under constant evolution and expanding cooperation. Subsequently, the Paris Agreement, our global framework for action, has been agreed and its guidelines are now in place. Now is the time for action and implementation. Many nations have already begun this work and we have extraordinary examples, yet the world remains far behind climate change. We are not currently on track to achieve our 1.5°C goal. Instead, we are on track to more than double that—a scenario that is extremely worrying for humanity's future on this planet.

The next two years offer a crucial window of opportunity for all nations—as well as non-State actors—to capitalize on our current framework, build on our existing momentum and make the changes we desperately need to avoid a climate catastrophe. The 2019 UN Climate Summit represents a key milestone. The information contained within this report intends to not only inform and contribute to the necessary groundwork for the success of the Summit, but also provide critical input for our future work.

Abbreviations and acronyms

AF	Adaptation Fund
AR5	Fifth Assessment Report of the Intergovernmental Panel on Climate Change
BA	Biennial Assessment and Overview of Climate Finance Flows
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CTCN	Climate Technology Centre and Network
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	greenhouse gas
INDC	intended nationally determined contribution
IPCC	Intergovernmental Panel on Climate Change
LDC	least developed country
LDCF	Least Developed Countries Fund
LULUCF	land use, land-use change and forestry
MDB	multilateral development bank
NAP	national adaptation plan
NAPA	national adaptation programme of action
NDC	nationally determined contribution
PCCB	Paris Committee on Capacity-building
PSP	Poznan strategic programme on technology transfer
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SCF	Standing Committee on Finance
SCCF	Special Climate Change Fund
TAP	technology action plan
TEC	Technology Executive Committee
TNA	technology needs assessment

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1

Overview and key messages

GHG emission levels are increasing. Parties may be able to fulfil their Cancun pledges and achieve their NDCs but current efforts are not in line with keeping global warming well below 2 or 1.5 °C.

In 2016, global GHG emissions reached 31.2 per cent above the 1990 level, with an average annual increase of 0.9 per cent since 2010. The sectors contributing the largest shares of the emissions are energy supply (34 per cent), industry (22 per cent) and transport (14 per cent), which have also contributed the most to the emission increase since 2010.

In aggregate, Parties are on track to fulfilling the Cancun pledges and can achieve their NDCs with some extra effort. However, current emission trajectories and planned efforts are not in line with meeting the 2 and 1.5 °C goals, which would require the peaking of global emissions well before 2030, followed by a global annual emission reduction of between at least 1.3 and 2.8 per cent. Moreover, between one sixth and one third of the carbon budget consistent with these goals has already been consumed.

Parties' reporting provides a clear picture of climate-related impacts and hazards across the globe.

Observed atmospheric GHG concentrations reached record highs in 2017, well above the levels observed in nature over the last 800,000 years, and the global mean temperature in 2018 was estimated to be 0.99 ± 0.13 °C above the pre-industrial baseline. At the same time, Parties are reporting significant changes in temperature, rainfall, sea level rise and other indicators, accompanied by increasing (in number and intensity)

climate risks and hazards, such as floods, drought, extreme weather events, changing seasonal patterns, changes in the distribution of species and diseases, and glacier and permafrost melting. Such hazards, together with other factors, create a pattern of vulnerability expected to affect all economic sectors, in particular water resources, agriculture, ecosystems, health and forestry.

Parties are transitioning towards low-emission, climate-resilient societies and economies, including through enhanced participatory processes. Progress is visible, but the pace remains slow.

With the submission of, among others, 183 NDCs, 12 low-emission development strategies, 13 NAPs and 51 NAPAs, Parties have outlined their vision for low-emission and climate-resilient development. The relevant international processes benefited from increased stakeholder engagement representing all sectors of society, including the private sector, civil society and academia.

Low-emission development requires deep structural changes to energy, transport and food production, with the challenge of addressing immediate counteracting factors resulting from the increase in energy demand in certain regions. As regards climate change adaptation, more than 90 countries have launched their process to formulate and implement a NAP; however, significant scientific, political, technological, investment and public support related challenges need to be overcome before countries can be considered to be fully prepared for the expected global temperature increase.

The increasing establishment of institutional arrangements for planning,

funding, implementing, monitoring and evaluating climate action reflects the growing awareness of the need to address climate change.

Climate change adaptation and mitigation are becoming more deeply embedded in governmental structures in line with the increasing profile of climate action in national political agendas. Countries are establishing inter-ministerial committees to oversee climate action and comprehensive national systems to monitor, evaluate and report on progress.

The transparency framework established under the Convention and enhanced under the Paris Agreement has led countries to enhance their institutional arrangements and improve the quality of their reporting.

However, there are still gaps in individual and institutional capacity in government ministries and agencies in many developing countries. Reliance on external assistance and lack of permanent institutional arrangements for and integrated approaches to capacity-building at the national level are barriers to building and retaining capacity in these countries.

The portfolio of actions to reduce emissions and adapt to climate change is expanding as new instruments are adopted, actions proven effective are replicated, existing policies are reformulated and less effective policies are discontinued.

The portfolio of measures to address climate change is growing and diversifying from discrete stand-alone projects to comprehensive integrated national programmes. Countries' portfolios are becoming more comprehensive in terms of sectors addressed and also more impactful with respect to climate action.

The measures most commonly used to reduce GHG emissions in developed countries are regulatory economic, fiscal and informational instruments. A mixture of regulatory and economic instruments are used in most developing countries, with innovative policy approaches such as renewable energy auctions being introduced in recent years. Countries are also adopting carbon pricing mechanisms such as trading schemes and taxation. Most measures target the energy sector, followed by the transport sector in developed countries and the forestry sector in developing countries. Adaptation measures include formulating and implementing NAPs; sector-specific pre-emptive interventions; integrating adaptation into strategies, policies, plans and investments; enhancing the information basis; strengthening national institutions and building institutional capacity; and identifying contingency measures to facilitate recovery from unavoidable impacts.

Support for and cooperation on climate action are central to achieving mitigation and adaptation objectives and increasing ambition as countries face more and more political, technical, socioeconomic and other barriers.

- » Improving the availability, volume and coverage of and access to international financial sources could facilitate the implementation of climate action at the scale and speed necessary to meet the global climate goals.

According to the Standing Committee on Finance, global total climate finance flows increased by 17 per cent between 2013–2014 and 2015–2016, reaching USD 681 billion in 2016. Parties have identified finance needs related to capacity and technology, and needs by



Photo: Dan Meyers

economic sector, with a few identifying finance needs by activity, including information on preferred financial instrument and priority level. To leverage climate finance and meet the goal of raising USD 100 billion per year by 2020, secure adequate finance for action, effective financial mechanisms for implementation, and enhanced capacity and coordination among stakeholders are necessary.

- » **More effective technology development and transfer is key to increasing ambition.**

Countries require support for implementing and diffusing prioritized technologies, mostly in the energy, agriculture, forestry and other land use, and water sectors. More effective

technology development and transfer is contingent upon simultaneously tackling financial, technical, policy, legal and regulatory challenges.

- » **For developing countries to mitigate and adapt to climate change, they need to build and retain capacity.**

Gaps in individual and institutional capacity in government ministries and agencies remain. Stable institutional arrangements for and integrated approaches to capacity-building at the international and national level can help to increase developing countries' ownership and retention of capacity gains.

2

Introduction

The UNFCCC has been the main avenue for action and cooperation to address climate change since 1992.

The United Nations Framework Convention on Climate Change was adopted in 1992 with the objective of stabilizing GHG concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system. It has been the main avenue for action and cooperation to address climate change since then.

The Kyoto Protocol, which sets out internationally binding emission reduction commitments for industrialized countries, was adopted in 1997 and entered into force in 2005. In 2012, the Doha Amendment was adopted, which sets out new commitments for a second commitment period to 2020.

With the adoption of the Paris Agreement in 2015, governments worldwide agreed to limit global warming to well below 2 °C and to pursue efforts to limit it to 1.5 °C; to increase adaptation to the adverse impacts of climate change and build climate resilience; and to foster and make climate finance flows consistent with a pathway towards low-emission and climate-resilient development. Global GHG emissions must peak and be subsequently reduced by the middle of this century in order to deliver on those goals.

The adoption of the Convention and its instruments has not only triggered an unprecedented response in terms of policies, projects and programmes, but also helped to raise awareness of the importance of addressing climate change and to elevate consideration of climate action to the highest political level.

This report, prepared by the secretariat as input to the United Nations 2019 Climate Action Summit, provides an overview of the action taken by governments to address

climate change in response to UNFCCC mandates and presents the status of climate action and relevant support provided and received. The latest trends in GHG emissions and concentrations compared with emission objectives are detailed in chapter 3. Climate risks, vulnerability and impacts identified by Parties are outlined in chapter 4. With respect to mitigation and adaptation, the long-term vision and goals, trends in national policies and institutional frameworks, stakeholder involvement and Parties' reporting on progress are discussed in chapter 5. Chapter 6 provides an overview of finance, technology and capacity-building by outlining arrangements, mechanisms, needs and trends in relation to support provided. Finally, the outlook for enabling countries to rise to the climate challenge and address their needs is considered in chapter 7.

The information contained in this report was aggregated from national reports submitted to the secretariat by the 197 Parties to the Convention up until April 2019.¹ Statistical statements are made relative to the total number of reports analysed rather than to the total number of Parties. Secondary sources of information, such as compilations, syntheses and assessments, were also drawn upon.

1. Including from 183 NDCs, 44 annual GHG inventory reports, 13 NAPs, 51 NAPAs, the biennial update reports of 46 Parties and the latest biennial reports and national communications.

3

Global greenhouse gas emissions



Photo: Tom Barrett

GHG emission levels are increasing. Parties may be able to fulfil their Cancun pledges and achieve their NDCs but current efforts are not in line with keeping global warming well below 2 or 1.5 °C.

3.1.

Trends in greenhouse gas emissions and concentrations

This report presents estimates of global aggregate GHG emissions based, primarily, on the information contained in the national GHG inventories submitted to the secretariat by Parties in their national inventory reports, national communications and biennial update reports as part of their reporting obligations under the UNFCCC.²

The data submitted by Parties indicate that global aggregate GHG emissions in 2016 totalled 49.05 Gt CO₂ eq without emissions and removals from forests and other land use and 50.81 Gt CO₂ eq with emissions and removals from forests and land use, putting global aggregate GHG emissions with and without forests and other land use in 2016 at 31.2 and 46.7 per cent, respectively, above the 1990 level.

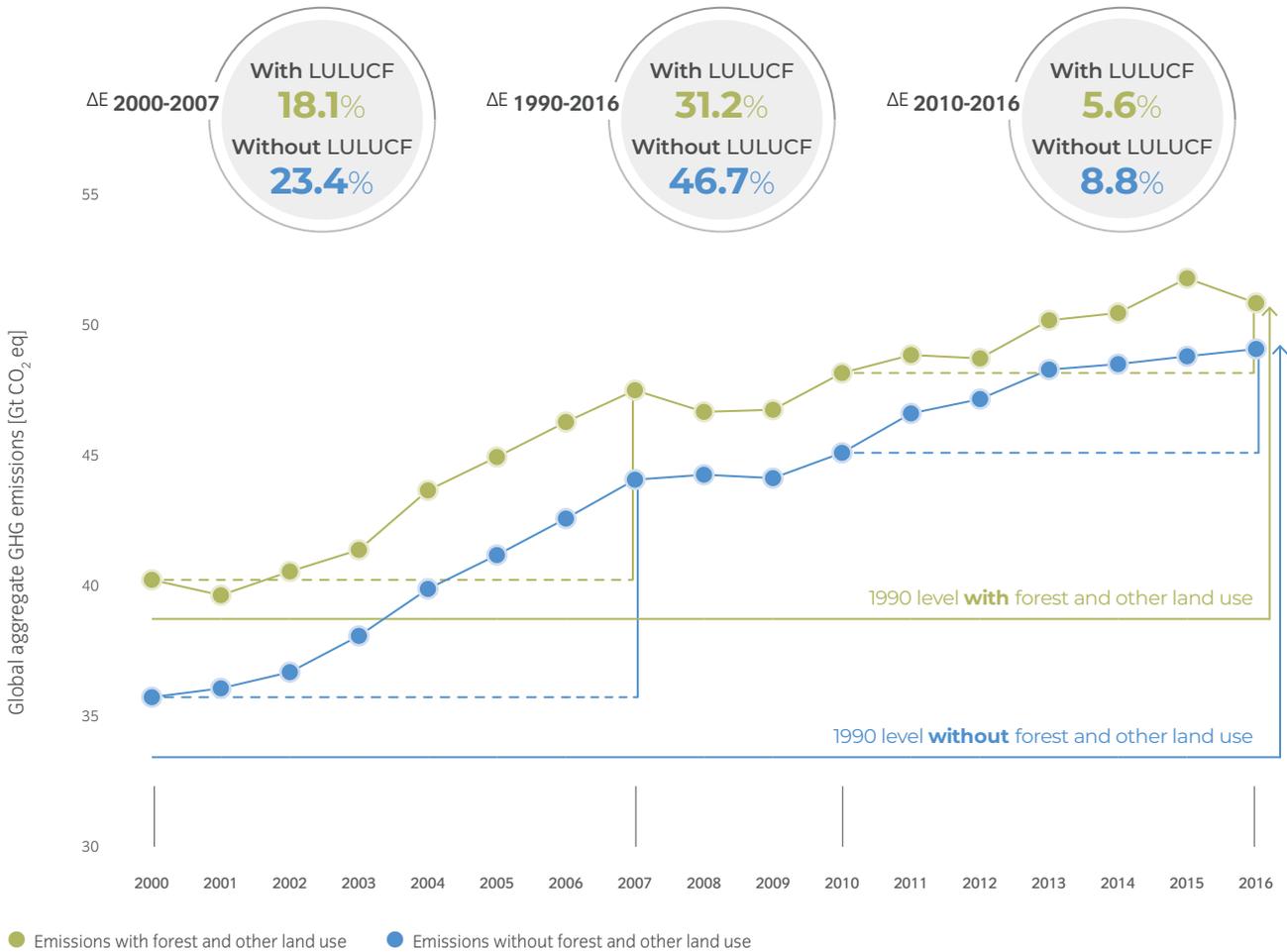
Figure 1 shows the evolution of aggregate annual GHG emissions from 2000 to 2016 against the 1990 emission level. The increasing emission trend can be divided into three distinct periods in which the rate of emission growth was markedly different:

- » 2000–2007: rapid emission growth, averaging 2.4 and 3.1 per cent per year with and without forests and other land use, respectively;
- » 2008–2009: stabilization of emissions, with close to zero growth;

2. This report quotes the 'best guess' value of the global aggregate GHG emissions in 2016. Different estimates lie in the range of +4 and –2 per cent of the best guess value. Data gaps in the time series of Party inventories were filled using data from other sources (such as the International Energy Agency CO₂ emissions from fuel combustion, and FAOSTAT for emissions from land use) or inter- or extrapolation.

Figure 1

Global aggregate greenhouse gas emissions with and without forests and other land use



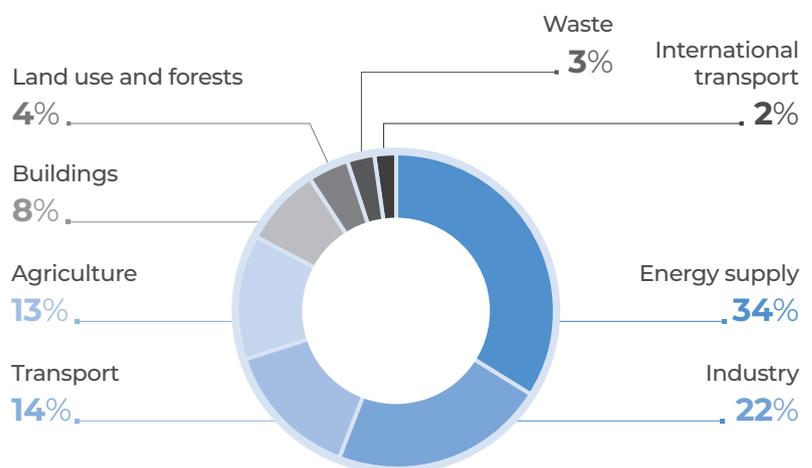
Source: UNFCCC

Figure 2

Global greenhouse gas emissions by sector in 2016

» 2010–2016: resumed emission growth, but at a slower rate than prior to 2007, with a gradual slowdown in the increase since 2010 (on average, emissions grew by 0.9 and 1.4 per cent per year in 2010–2016, with and without forests and other land use, respectively, but in 2014–2016 this slowed to 0.5 per cent per year).

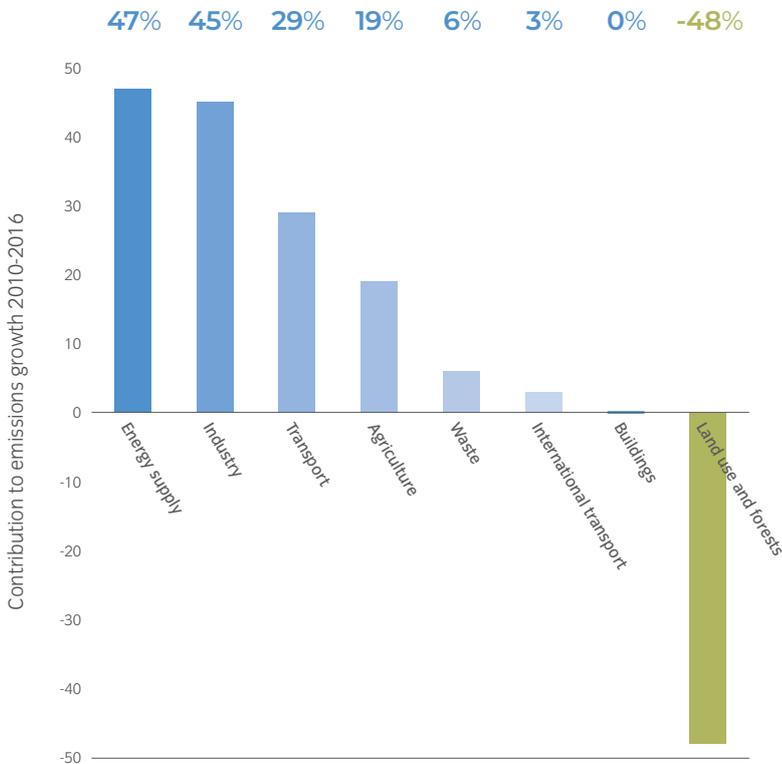
Currently, the energy supply, industry, transport and agriculture sectors are the dominant sectoral emissions sources (see figure 2). Of the 50.8 Gt CO₂ eq emissions in 2016, 17.3 Gt came from the energy supply sector, 11.4 Gt from combustion and processes in industry (including use of fluorinated gases) and 7.0 Gt from transport (excluding international transport).



Source: UNFCCC

Figure 3

Contribution to global emission growth in 2010–2016 by sector



Source: UNFCCC



Photo: Jue Huang

Energy supply and industry accounted for the largest share of the emission increase between 2010 and 2016. GHG emissions grew in all sectors except forests and other land use, where emissions decreased and compensated for some of the increase in other sectors (see figure 3). While most sectors made similar percentage contributions to the GHG emission growth in 2010 and 2016, global transport emissions experienced disproportionate growth, meaning that the sector had a larger share in global emissions in 2016 than in 2010.

3.2.

Emission reduction objectives

Emission objectives refer to levels of emissions at different points in the future expected as an aggregate result of the realization of countries' emission pledges.

3.2.1.

Cancun pledges

In 2010, in the lead-up to COP 16, many countries prepared and submitted plans, referred to as the Cancun pledges, for controlling GHG emissions up until 2020. Developed countries presented economy-wide emission reduction targets, while developing countries proposed ways of limiting growth in their emissions in the shape of plans of action, known as nationally appropriate mitigation actions.

Box 1

Atmospheric greenhouse gas concentrations

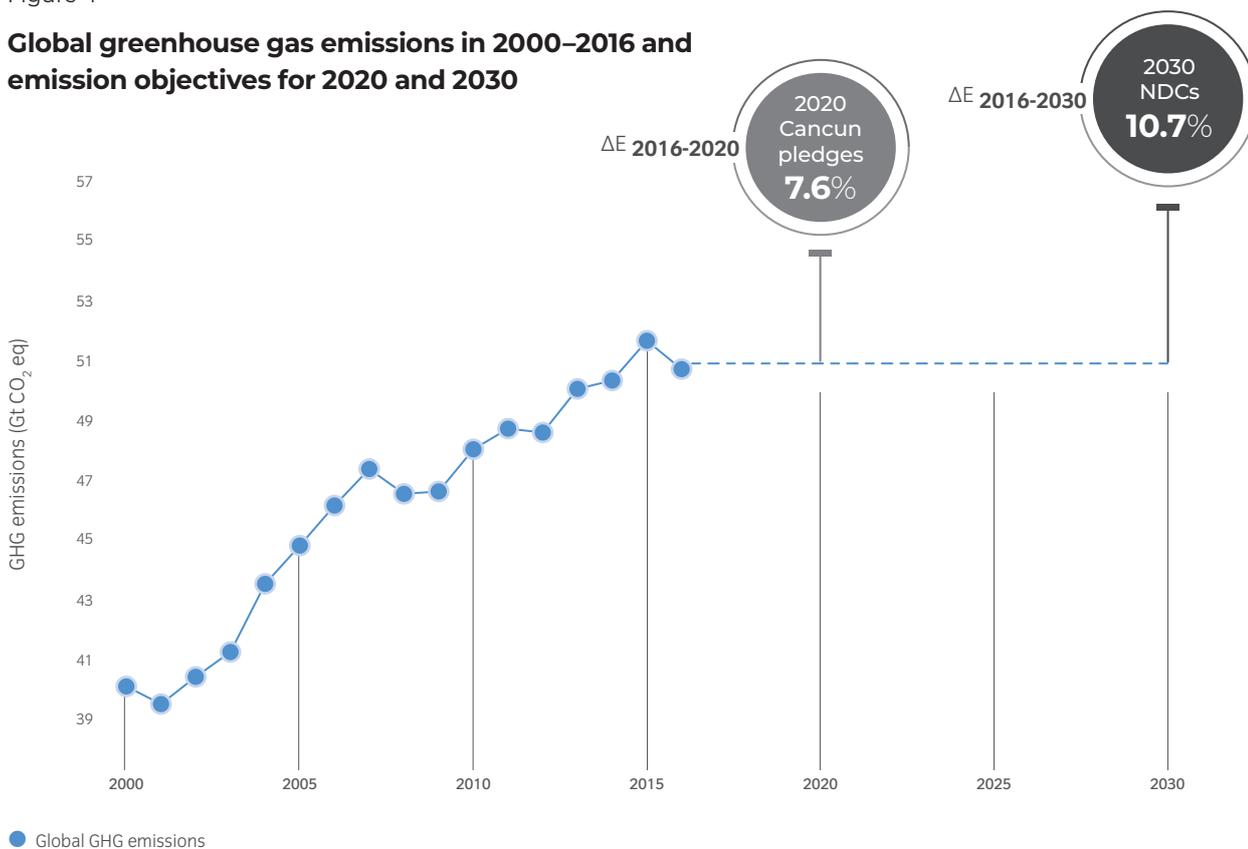
Greenhouse gases like carbon dioxide or methane absorb infrared radiation in the atmosphere and prevent heat from the earth escaping into space, causing the greenhouse effect. Their increasing concentration in the atmosphere is the primary cause of the observed increase in global average temperatures. According to the World Meteorological Organization, the estimated global mean temperature in 2018 was 0.99 ± 0.13 °C above the pre-industrial baseline. The atmospheric concentrations of three key GHGs reached record highs in 2017: 405.5 ± 0.1 ppm for CO₂, $1,859.0 \pm 2$ ppb for methane and 329.9 ± 0.1 ppb for nitrous oxide, bringing the concentrations of those three GHGs alone to about 460 ppm and currently well above the levels observed in nature over the last 800,000 years. Current atmospheric CO₂ concentration specifically is almost twice as high as the historical naturally occurring range (180–280 ppm).

In the AR5 it is argued that staying on course towards the 2 °C target is contingent upon stabilizing GHG concentrations in the range of 430–480 ppm by 2100, but current GHG concentrations are already close to the upper limit of that range.

Sources: World Meteorological Organization. *WMO Statement on the State of the Global Climate 2017 and 2018*; Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Figure 4

Global greenhouse gas emissions in 2000–2016 and emission objectives for 2020 and 2030



Source: UNFCCC

In reference case scenarios from the AR5 scenario database that captures the Cancun pledges,³ global aggregate GHG emissions in 2020 are projected at 54.69 Gt CO₂ eq,⁴ 7.6 per cent (3.88 Gt CO₂ eq) above the 2016 global GHG emission level presented in this report.

In 2010–2016, global aggregate emissions grew at an average rate of 0.9 per cent per year. If sustained throughout the 2016–2020 period, this trend would be consistent with fulfilling the Cancun pledges for global aggregate emissions in 2020 to be no more than 3.88 Gt CO₂ eq above the 2016 global emission level (see figure 4).

However, if the 2020 emission level consistent with the Cancun pledges is taken as a milestone en route to achieving the

NDCs in 2030, there will be limited room for emission growth between 2020 and 2030 (see figure 4).

3.2.2.

Nationally determined contributions

In 2015, in the lead-up to COP 21, many countries prepared and submitted new plans for addressing climate change, known as INDCs, with the majority of countries setting national emission reduction targets. Since then, as they ratify the Paris Agreement, Parties' intended plans are being formalized as NDCs.

The full implementation of the conditional and unconditional components of INDCs

submitted by Parties by 4 April 2016 has been estimated to result in aggregate global GHG emissions of 56.24 Gt CO₂ eq in 2030,⁵ 6 10.7 per cent (5.43 Gt CO₂ eq)⁷ above the 2016 level presented in this report. The NDCs communicated to the secretariat since 4 April 2016 do not significantly alter that result, so this estimate can be taken to capture the effect of the full implementation of all NDCs communicated up to April 2019 (see figure 4).

Current global emissions would be in line with the achievement of the NDCs in 2030 if a linear path starting in 2016 implies average growth in global emissions of no more than 0.7 per cent year on year. This is close to the growth rate observed in 2014–2016, but the latest estimates of the International Energy Agency⁸ suggest that

3. 22 reference scenarios that are categorized as P3 scenarios in the AR5 scenario database and belong to the group of HST scenarios designed under the European Union AMPERE project (see https://secure.iiasa.ac.at/web-apps/ene/AMPEREDB/static/download/WP2_study_protocol.pdf); they assume the implementation of the Cancun pledges at the higher-emission end.

4. Uncertainty range: 53.84–55.71 Gt CO₂ eq.

5. Uncertainty range: 51.99–59.33 Gt CO₂ eq.

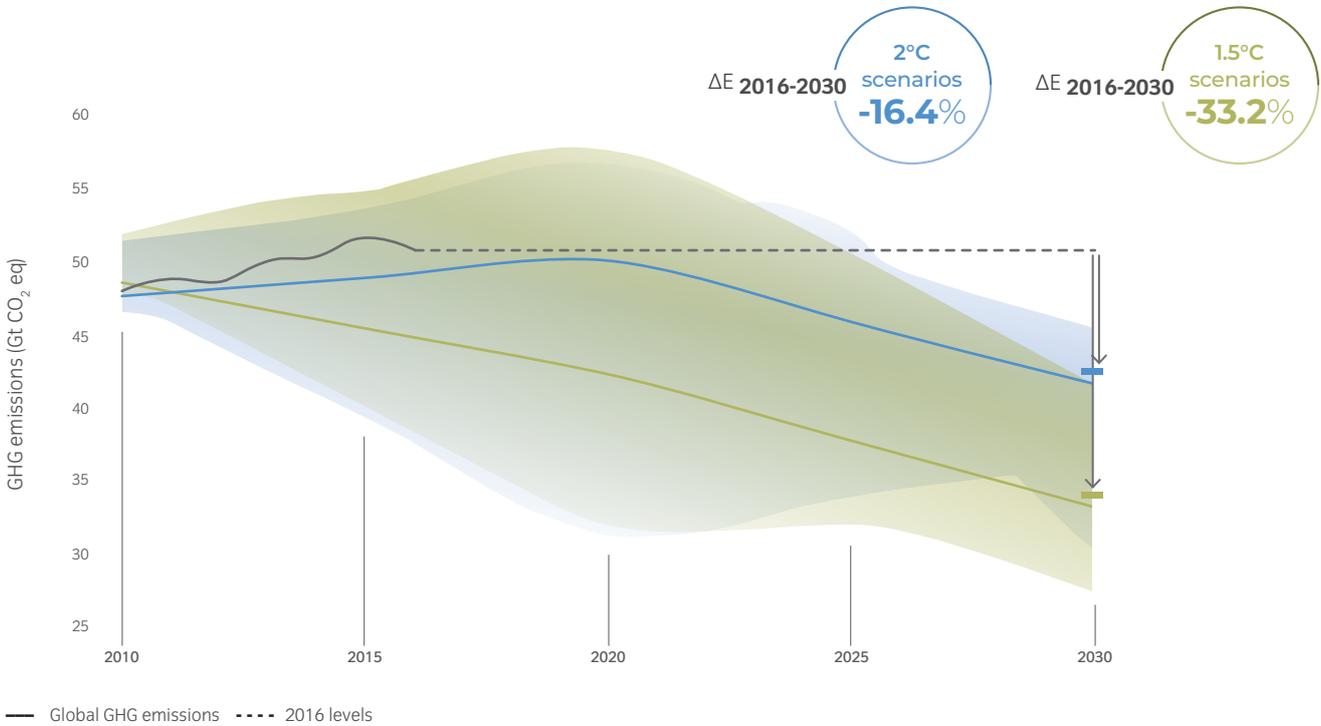
6. See document FCCC/CP/2016/2.

7. Uncertainty range: 2.3–16.8 per cent or 1.18–8.52 Gt CO₂ eq.

8. The latest figures published by the International Energy Agency in its global energy and CO₂ status reports in 2018 and 2019 indicate that global energy-related CO₂ emissions, a major part of global GHG emissions, grew by 1.4 per cent in 2017 and by another 1.7 per cent in 2018.

Figure 5

Global greenhouse gas emissions in 2010–2016 and scenarios for staying below a temperature increase of 2 or 1.5 °C relative to pre-industrial levels



Source: UNFCCC

global emissions have grown at a faster rate since 2016. Therefore, additional measures may be required to deliver an aggregate global emission level in 2030 in line with the NDCs.

3.3. Long-term temperature goals

3.3.1. Emission trajectories

Emission objectives for 2030 consistent with the long-term temperature goals are derived from pathways compatible with limiting global warming to 2 or 1.5 °C above pre-industrial levels.⁹

Emission pathways consistent with the 2 °C goal require global annual emissions to be

below 42.51 Gt CO₂ eq¹⁰ in 2030, while 1.5 °C pathways require them to be about three quarters of that at 33.94 Gt CO₂ eq.¹¹

Keeping emission levels compatible with the 2 and 1.5 °C pathways requires a reversal of current emission trends. Global emissions must peak as soon as possible, followed by rapid and sustained reduction:

- » For limiting global warming to below 2 °C, by 16.4 per cent (8.31 Gt CO₂ eq) below the 2016 level by 2030;¹²
- » For limiting global warming to 1.5 °C, by 33.2 per cent (16.87 Gt CO₂ eq) by 2030 relative to the 2016 level.¹³

The corresponding annual reduction rate depends on when emissions reach their peak: assuming emissions started to decrease immediately after 2016, they

would have to decrease by 1.3 and 2.8 per cent per year, respectively, to be on the 2 and 1.5 °C pathways by 2030. A later peak (as implied by the latest International Energy Agency figures) would necessitate more substantial average annual emission reductions thereafter.

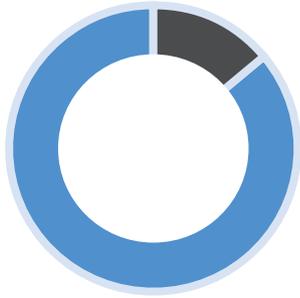
Figure 5 presents the relationship between aggregate annual GHG emissions reported by Parties in their inventories (black line) and emission levels in 2030 compatible with least-cost 2 °C scenarios (blue) and 1.5 °C scenarios (green) and shows that actual emissions since 2010 are increasingly diverging from most pathways towards the 2 and 1.5 °C goals.

Whether efforts to reduce emissions will be sufficient to limit global average temperature rise to less than 2 or 1.5 °C above pre-industrial levels depends

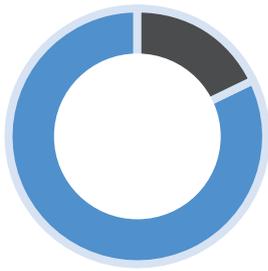
9. See document FCCC/CP/2016/2. 2 °C pathways were derived from AR5 emission pathways; 1.5 °C pathways were constructed drawing on original literature.
 10. Uncertainty range: 36.28–43.63 Gt CO₂ eq.
 11. Uncertainty range: 29.64–37.32 Gt CO₂ eq.
 12. Uncertainty range: 14.1–28.6 per cent or 7.19–14.54 Gt CO₂ eq.
 13. Uncertainty range: 26.6–41.7 per cent or 13.49–21.17 Gt CO₂ eq.

Figure 6

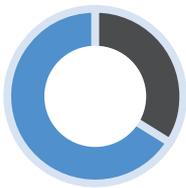
CO₂ budget remaining for limiting warming to 2°/1.5°C with different probabilities



CO₂ budget to keep temperature increase below 2 °C with a **50%** probability.



CO₂ budget to keep temperature increase below 2 °C with a **66%** probability.



CO₂ budget to keep temperature increase below 1.5 °C with a **50%** probability.

■ Remainder ■ Emissions 2012-2016

Source: UNFCCC

on socioeconomic drivers, technology development, and action taken between now and 2030. Parties can draw on the valuable experience of those that have already sustained consistent emission reductions over longer periods of time (10 years), which could indicate that their national emissions have already peaked.

3.3.2.

Carbon dioxide budget

Another way of setting emission reduction objectives relative to today is through the notion of a CO₂ budget, that is the maximum cumulative CO₂ emissions that can be released into the atmosphere while maintaining a reasonable chance of averting a particular level of global warming. In this report, estimates of the CO₂ budget that remained as at 2011 under different scenarios from the AR5 are presented:

- » For 50 per cent probability of achieving the 2 °C target at least cost, 1,300 Gt CO₂ eq;
- » For 66 per cent probability of achieving the 2 °C target at least cost, 1,000 Gt CO₂ eq;
- » For 50 per cent probability of achieving the 1.5 °C target at least cost, 550 Gt CO₂ eq.

Analysis of Parties' inventories puts cumulative CO₂ emissions in 2012–2016 at 184 Gt CO₂ eq, which means that between 2012 and 2016 the world consumed a sixth, a fifth and a third of the CO₂ budget available as at 2011 for having a 50 per cent chance of meeting the 2 °C target, a 66 per cent chance of meeting the 2 °C target, and a 50 per cent chance of meeting the 1.5 °C target, respectively.

Figure 6 illustrates the CO₂ budget that remained according to the IPCC as at 2011 for the three scenarios and how GHG emissions released to the atmosphere in the period 2012–2016 compare with the CO₂ budget under each scenario. The size of the pie chart is relative to size of the CO₂ budget

– the less ambitious the temperature target and the lower the probability of achieving it, the bigger the CO₂ budget.

Figure 6 clearly shows that at the current level of emissions the remaining CO₂ budget is being rapidly consumed. The situation is more extreme under the higher-probability scenarios and/or those of limiting warming to lower levels.¹⁴

Once the budget for a scenario is exhausted, meeting the temperature goal becomes less likely, more expensive or both. To manage a CO₂ budget wisely is to lower emissions in such a way that global carbon neutrality is achieved before the budget is exhausted. According to the data presented in this report, emissions have not yet peaked. The later emissions peak and decline, the more CO₂ will have accumulated in the atmosphere, which underpins the provision in Article 4, paragraph 1, of the Paris Agreement for global GHG emissions to peak as soon as possible and be followed by rapid reduction towards carbon neutrality.

14. The 2018 IPCC Special Report on Global Warming of 1.5 °C identifies remaining CO₂ budgets from 2018 that are larger than those estimated for the AR5, but have high associated uncertainties. Figure 6 should therefore be taken to illustrate the magnitude of emissions in 2012–2016 relative to the overall remaining CO₂ budget.

4

Climate risk, vulnerability and impacts



Photo: Jeremy Goldberg

Parties' reporting provides a clear picture of climate-related impacts and hazards across the globe.

In the light of the increase in GHG emissions and the resulting changes in the climate system, most Parties reflected on key impacts and vulnerabilities in their submissions. They provided information on observed and projected changes in climate parameters; climate risks and hazards; and key vulnerabilities, including drivers of vulnerability and vulnerable sectors, areas and population segments, accompanied by information on socioeconomic consequences and costs of impacts. They also presented the various methods, approaches and scenarios applied in their vulnerability analysis, and relevant uncertainties and challenges.

4.1.

Observed and projected changes in climate parameters

Parties reported the changes observed or anticipated in climate parameters, mainly in terms of temperature, rainfall or sea level rise, but also more specific indicators such as ocean acidification level, status of glaciers, incidence of extreme weather and the relationship between national, regional and global climate conditions. This included information on climate conditions applied as a baseline for estimating impacts, climate change experienced to date, projections and scenarios, as well as regional variations in climate trends. Most Parties reported on observed gradual changes, highlighting, for instance, increases in temperature in the past 50–60 years, changes in precipitation in the past 50–60 years and sea level rise in the past 50–100 years. In terms of projected changes, Parties reported, in particular, scenarios of temperature increase in the medium term (2050) and long term (2100), quantitative and qualitative estimates of rainfall change, including regional variations, and long-term projections of sea level rise.

4.2.

Climate risks and hazards

Parties reported on a wide range of climate risks that they consider most prevalent, including sudden events, mainly floods, drought, extreme weather (including hurricanes and cyclones, torrential rains, storm surges, sand and dust storms, heatwaves, wild fire and cold spells), landslides and glacial lake outburst floods. They also mentioned slow onset impacts, such as higher temperatures, sea level rise, rainfall variability, reduced river flows, changing seasonal patterns, changes in species distribution, invasive species, changes in disease distribution, soil and coastal degradation, erosion, desertification, ocean acidification, coral bleaching, salt water intrusion, changes in ocean circulation patterns, and glacier or permafrost melting.

Quantitative analysis of the adaptation components of (I)NDCs indicates the climate risks and hazards most frequently identified by Parties, which are presented in figure 7.

4.3.

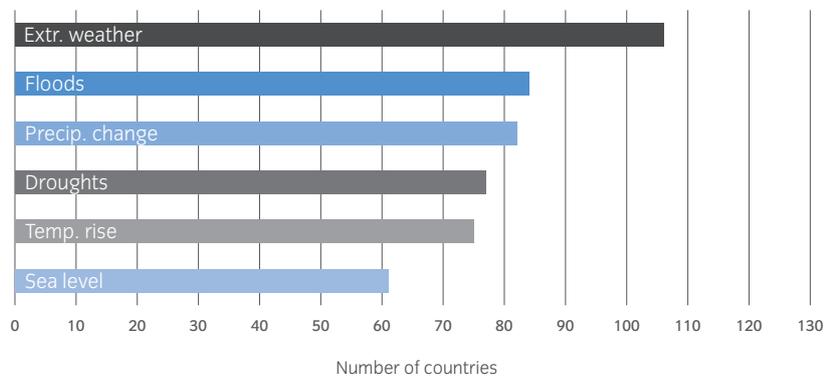
Key vulnerabilities

Parties identified drivers and socioeconomic conditions that make them vulnerable to the climate hazards outlined above. Vulnerability is generally due to a combination of climate impacts and socioeconomic or geographical circumstances. Drivers of vulnerability include, in particular, status as a small island developing State or LDC, isolation, lack of land, high-risk location, nature and land degradation, population growth, poverty, poor infrastructure, concentration of activities or populations in high-risk areas, dependence on natural resources (e.g. rainfall) or economic sectors (e.g. fossil fuels) or processes (e.g. desalination for water), low capacity, food shortages, and health sector challenges.

Vulnerability is often described in terms of the sectors most threatened by climate impacts. Parties referred to a wide range of vulnerable sectors, particularly water, agriculture, ecosystems, health and forestry. The sectors of concern to most

Figure 7

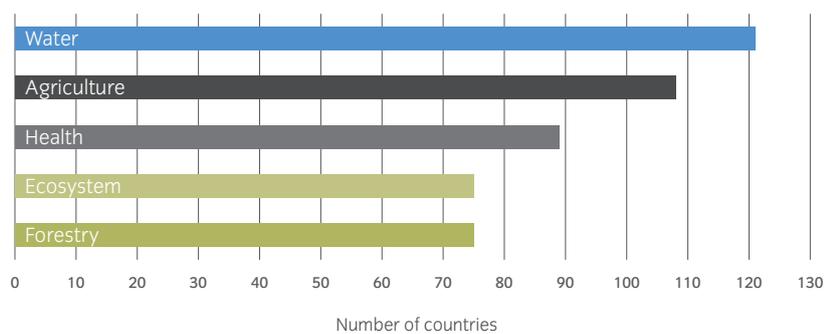
Climate hazards identified by Parties in the adaptation components of their intended nationally determined contributions



Source: UNFCCC

Figure 8

Vulnerable sectors identified by Parties in the adaptation components of their intended nationally determined contributions



Source: UNFCCC

Table 1

Impacts in key vulnerable sectors identified in Parties' intended nationally determined contributions

Sector	Observed and projected impacts
Agriculture	<ul style="list-style-type: none"> › Increased frequency and severity of crop disease › Increased soil erosion › Losses in agricultural production and crop yield due to extreme weather
Water	<ul style="list-style-type: none"> › Changes in water distribution › Reduced water availability and quality
Health	<ul style="list-style-type: none"> › Hunger and malnutrition due to increased food insecurity › Increase in water-borne diseases such as diarrhea due to water scarcity › Increase in vector-borne diseases such as malaria due to higher temperatures › Mortality and morbidity due to extreme events
Forestry	<ul style="list-style-type: none"> › Increase or projected increase in forest fires › Changes in the distribution of forest species
Biodiversity	<ul style="list-style-type: none"> › Changes in the timing and duration of growing seasons › Changes in the distribution of species › Species endangerment and extinction
Coastal zones	<ul style="list-style-type: none"> › Increased risk of flooding and inundation due to extreme weather › Increased coastal erosion › Changes to coastal ecosystems › Alterations in sediment deposition patterns
Fisheries	<ul style="list-style-type: none"> › Changing population numbers and distribution because of ocean acidification and ocean circulation patterns › Habitat loss and degradation for marine animals
Tourism	<ul style="list-style-type: none"> › Reduced winter tourist traffic due to reduced snow cover › Archaeological sites and ancient buildings threatened by extreme weather › Endangered tourist areas due to coastal erosion and sea level rise
Energy	<ul style="list-style-type: none"> › Challenges for thermal generation › Higher demand for cooling › Economic losses due to interruptions caused by extreme weather

Parties are highlighted in figure 8. Parties emphasized the interconnected nature of the sectors; for example, water resources have implications for agriculture, health and ecosystems.

For each vulnerable sector, Parties identified specific impacts experienced or anticipated. Table 1 provides examples of impacts identified for the highest priority sectors. In addition to sector-specific impacts, Parties identified impacts affecting the entire country, such as loss of life, livelihoods, buildings, infrastructure, trade, culture, tradition and heritage; increasing inequality, instability and conflict; and migration.

In addition to the vulnerable economic sectors described above, Parties drew attention to the most vulnerable geographical areas and regions and segments of the population. Regional trends within countries can render certain regions more vulnerable than others. In this regard, Parties highlighted the special vulnerabilities of river deltas, low-lying territories, mountain ranges, drought-prone regions, cities, municipalities and informal settlements.

Parties recognized that certain segments of the population are particularly vulnerable, highlighting children, youth, women (in particular during pregnancy), the elderly, the poor, people with disabilities or specific illnesses, indigenous peoples and ethnic minorities. People working in certain sectors, for example farmers, smallholders and artisanal fisherfolk, were also identified as particularly vulnerable.

In the context of their vulnerability analysis, Parties provided information on the measured or projected damage caused by the impacts, expressed in terms of lost lives, from a sectoral perspective (e.g. in terms of lost crops or production or of impacts on specific resource prices) and as quantified financial impacts (e.g. in terms of the financial damage caused by an extreme event in absolute terms or as a proportion of gross domestic product or the national budget).

5

Climate action



Photo: Zachary Staines

Parties are transitioning towards low-emission, climate-resilient societies and economies, including through enhanced participatory processes. Progress is visible, but the pace remains slow. The increasing establishment of institutional arrangements for planning, funding, implementing, monitoring and evaluating climate action reflects the growing awareness of the need to address climate change.

5.1.

Objectives and goals

Since the adoption of the Convention in 1992, Parties have reached important milestones in enhancing climate action and addressing climate change and its adverse impacts.

The Kyoto Protocol, which sets out internationally binding emission reduction targets for industrialized countries, was adopted in 1997 (at COP 3) and entered into force in 2005. The first commitment period ended in 2012, when all developed countries met their targets. In 2012 (at COP 18) the Doha Amendment was adopted, which sets out new commitments for a second commitment period to 2020. Under the Kyoto Protocol, developing countries engage in projects to reduce emissions under the clean development mechanism, which can be used in the accounting by developed countries towards their targets. By 31 May 2019, there were 8,125 registered clean development mechanism projects and programmes and 1.99 Gt CO₂ eq in certified emission reductions had been issued.

Under the Cancun Agreements (established at COP 16), which set out a shared vision for long-term cooperative action encompassing

mitigation, adaptation and means of implementation, developed country Parties submitted quantified economy-wide emission reduction targets, and 55 developing country Parties communicated nationally appropriate mitigation actions.

The international arrangements on adaptation have moved gradually towards scaling up adaptation and more comprehensive coverage and longer-term orientation: from vulnerability and adaptation assessment, starting in 1994, to full-scale implementation. The NAPA process was established early this century to address the urgent and immediate needs of the LDCs and to provide access to funding to support small-scale pilot projects. At the same time, the Nairobi work programme on impacts, vulnerability and adaptation to climate change was launched to build an adaptation knowledge base. It soon became clear that adaptation needs to be enhanced considerably. Consequently, in 2010 the process to formulate and implement NAPs was established to reduce vulnerability and facilitate the integration of adaptation into relevant policies, programmes and activities. In 2013, the Warsaw International Mechanism on Loss and Damage associated with Climate Change Impacts was set up to address the impacts experienced despite planned adaptation.

In 2015, the Paris Agreement solidified these developments with the establishment of a global goal on adaptation in the context of sustainable development, linking NAPs to post-2020 funding through the GCF and setting up a comprehensive structure for reporting on adaptation, which Parties can do in adaptation communications, national communications, biennial transparency reports and documents related to the NAP process.

Upon ratification of the Paris Agreement, 183 Parties submitted their national climate plans in their first NDCs under the Paris Agreement, of which 177 contain a vision for low-emission development and 129 set out an overall vision for adaptation and climate-resilient development.

5.2.

National policies and institutional frameworks

5.2.1.

National climate strategies and plans

Many Parties see the transition to low-emission and climate-resilient development as an essential means to provide and secure jobs, growth, and investment opportunities for present and future generations. Consequently, governments have taken steps towards adopting national climate policies and aligning and integrating sectoral strategic goals and action into a coherent framework with a view to reducing GHG emissions and enhancing the resilience of their societies and economies.

Many Parties address all major sources and sinks of national GHG emissions and include quantified emission reduction targets, which take different forms (e.g. economy wide or (sub)sectoral; relative or absolute) and relate to different time-horizons (mostly until 2025 or 2030). Some NDCs include strategies, plans and actions for low-emission development.¹⁵

The process to formulate and implement NAPs, the main national-level adaptation planning instrument globally, is gearing up. More than 90 countries have started the process of formulating, and in some cases implementing, a NAP, aiming to reduce vulnerability by building adaptive capacity and resilience and to facilitate the integration of adaptation into policies, programmes and activities. To support this work, the GCF was requested to expedite support for the LDCs and other developing country Parties for the formulation of NAPs and subsequent implementation of policies, projects and programmes identified therein.¹⁶

In the Paris Agreement, Parties are urged to formulate their vision beyond 2030 in long-term low-emission development strategies. As at June 2019, 12 Parties had communicated to the secretariat such strategies, and others had indicated

that they were developing theirs. The aim of the strategies is to reduce emissions through substantial changes to countries' economies; in this context, some Parties have set a vision of reducing emissions to net zero by 2050. On adaptation, they address reducing the vulnerability of populations and the productive sectors, preserving and protecting ecosystems and environmental services, and increasing the resilience of strategic infrastructure.

Many Parties have enacted legislation to enforce provisions on climate change mitigation and adaptation in their national and sectoral policies. All of them are intertwined with development objectives, such as poverty alleviation, economic growth, energy access and improvement of living standards, security, human rights, environmental sustainability, disaster risk reduction and other environmental challenges, which are crucial to safeguarding the health and quality of life of their people (e.g. via sustainable water supply, soil protection, air quality and biodiversity).

5.2.2.

National institutional arrangements

Most Parties have established institutional arrangements for planning, implementing and monitoring climate action. The specific legal, administrative and procedural arrangements and features vary depending on national circumstances and the importance of climate change considerations relative to other national policies and priorities. For example, some start with a national strategy and follow up with more detailed national and sectoral plans. Many Parties have identified dedicated ministries for climate action; others have established interministerial commissions or other inter-institutional coordination mechanisms at the highest political level, underpinned by a legal mandate.

Setting up appropriate institutional arrangements can be challenging and depends on short- to medium-term political and economic priorities, circumstances

15. See document FCCC/CP/2016/2.

16. Decision 1/CP.21, para. 46.

and human and financial capacities within the country. However, climate change adaptation and mitigation are becoming more deeply embedded in governmental structures responsible for environment, energy, transport, agriculture, forestry, emergency management, urban planning or economy, though not necessarily in the same place. This demonstrates the increasing profile of climate change in national political agendas. For adaptation, institutions such as disaster management agencies, meteorological institutions and research institutes involved in the study of climate risk, impacts and options for adaptation have also been playing an important role.

National arrangements for climate action often have an earmarked budget and dedicated staff to enable their smooth functioning. Other aspects also tend to be well defined: roles and responsibilities of each institution involved, mechanisms for information and data exchange, quality

assurance and quality control procedures, provisions for stakeholder engagement and a legal framework to work towards defined objectives and goals and ensure compliance and evaluation of progress. Institutional arrangements often originate from key legal instruments, such as the overall national climate change policy framework.

In most cases, the institutional framework involves ministries and agencies responsible for a range of sectors (environment, energy, transport, industry, agriculture and forestry) as well as the ministries for foreign affairs and finance. The interministerial work allows governments to realize climate action by establishing aligned objectives in different institutions or ministries and to incorporate climate considerations into other major national policies (e.g. energy planning, transportation planning, disaster management). Responsibilities and procedural arrangements are typically set out in national law. In certain cases, organizational structures may be more

flexible, such as cross-sectoral, permanent or ad hoc steering or coordination bodies comprising representatives of government and key stakeholders (e.g. research, technology, non-governmental organizations and the private sector).

Institutional arrangements often include the necessary legal, administrative and procedural arrangements to report on the progress of climate action, to ensure transparency and accountability, to evaluate performance and to identify areas for improvement. The need for systems to track progress is increasing as national governments seek greater involvement of and contributions from a broader base of government organizations at all jurisdictional levels and the private sector.

Sometimes mitigation and adaptation action and support are monitored under a single integrated system, but most Parties have developed or are in the process of developing monitoring and evaluation systems for adaptation that are distinct from those used for mitigation.

National measuring, reporting and verification systems cover one or more of following interrelated components:

- » For mitigation: GHG emissions and trends; quantified targets, if applicable; policies, measures and actions, and their effects; and projections;
- » For adaptation: adaptation goals, targets and baselines; tracking progress of implementation to inform the adaptation process by sharing lessons learned and to update NAPs; determining the degree to which the adaptive capacity of individuals, communities and systems has been increased and vulnerability has decreased, including through the use of quantified indicators where available and appropriate; tracking support provided for adaptation.

Many developed country Parties monitor and evaluate their provision of support to developing Parties with respect to: amount of climate funding provided; allocation channels; types of activity supported, such as mitigation, adaptation, cross-cutting or other; and capacity-building and transfer of technology.



Photo: Jason Blackeye

5.2.3.

Action to address climate change

Mitigation

Thanks to strong political commitment, the mitigation portfolio (of policies, measures, plans and action) continues to expand, strengthen and diversify towards achieving the 2020 targets, and is now also being shaped by the increased ambition of the midterm targets communicated in NDCs under the Paris Agreement. An effective national or regional mitigation portfolio has several fundamental elements: top-level political commitment and strong policy capacity; targets and midterm and long-term strategies; a rigorous and comprehensive system of monitoring and evaluation of emissions and performance; and a comprehensive set of actions.

Mitigation portfolios vary greatly in terms of their profiles—gases affected, sectors targeted and types of instrument – and scale of impacts across countries. They also vary in their governance jurisdictions – from regional (e.g. European Union or multiprovince) to national, to provincial or state and, increasingly, to city level.

In some cases, the higher levels of government initiate the efforts and devolve responsibilities to lower levels of government. In other cases, provincial or state governments act independently, on their own initiative, which may or may not encourage change at higher levels of government.

Some Parties reported having joined international cooperatives and partnerships together with other Parties and non-State actors to benefit from sharing experience of designing and using certain policies and to help inform successful policy development. For example, some have joined the Carbon Pricing Leadership Coalition, a voluntary partnership of national and subnational governments, businesses and civil society organizations that have agreed to advance a carbon pricing agenda by working with each other towards the long-term objective of a carbon price applied throughout the global economy by strengthening carbon pricing policies and enhancing cooperation.

Developed country Parties reported primarily on mitigation action undertaken to meet their 2020 climate targets, but considerable attention was also given to strategies and action for meeting their goals

for 2030 and beyond. Parties' portfolios of implemented and adopted policy approaches for reducing emissions are dynamic, constantly growing, diversifying and strengthening. Policies range from national GHG emission targets and more traditional sectoral policies to innovative cross-sectoral policies that provide the underlying incentives, requirements and technical capacity for mitigation across sectors.

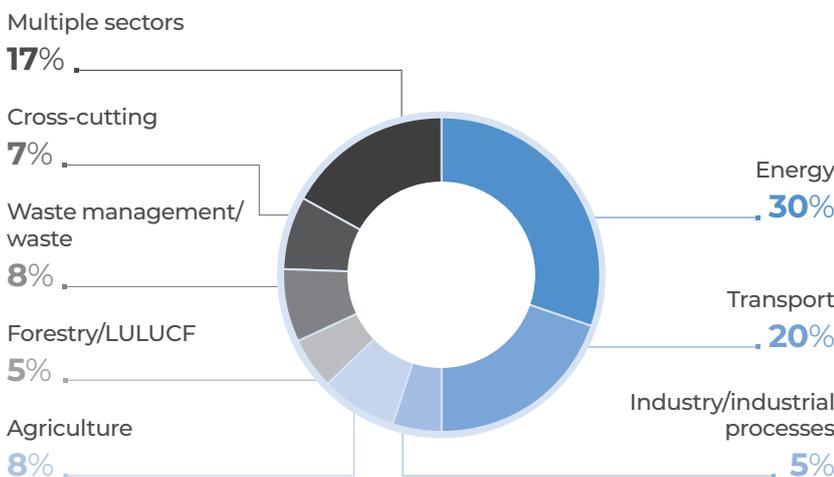
Developing country Parties reported on their mitigation actions and their effects, providing information on the nature of the actions, quantitative goals and estimated outcomes. They implement their mitigation actions in the context of their broader national programmes and strategies, sectoral plans, voluntary market mechanisms and nationally appropriate mitigation actions. Criteria used to prioritize implementation include mitigation potential, abatement cost, socioeconomic and environmental co-benefits and contribution to economic growth.

Choice of mitigation action has been influenced by key national circumstances (e.g. demographics, natural resources, political and economic structures, finance) and national priorities (e.g. poverty alleviation, facilitating access to basic infrastructure, preference for certain technologies). Most Parties make use of sector-specific mitigation actions, which, especially those based on regulation, have been used the longest and have proven effective in many sectors, including energy, LULUCF and waste. The sectoral distribution of mitigation action in developed countries is presented in figure 9.

As countries progress and expand their mitigation portfolios, they become more comprehensive in terms of sectors addressed and also more impactful with respect to climate action. Portfolios include, for example, comprehensive national legally binding climate change and energy legislation; national climate change strategies; carbon taxes, renewable energy certificates or levies on CO₂ emissions; emissions trading systems; and control of GHG emissions in urbanized zones and cities.

Figure 9

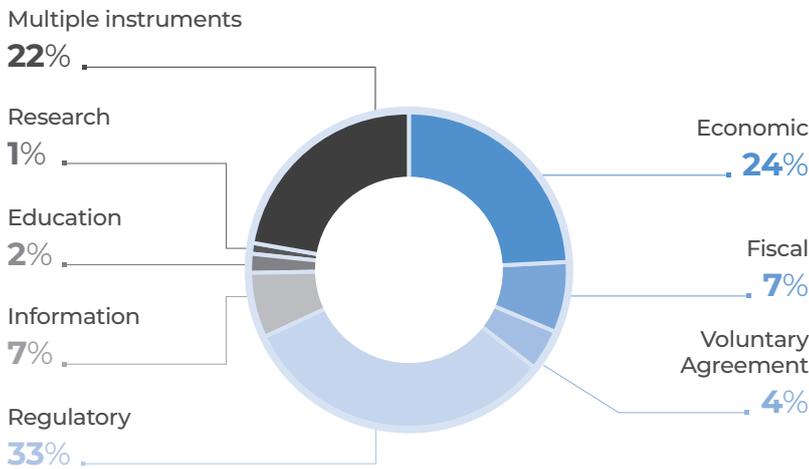
Sectoral distribution of developed countries' mitigation action



Source: UNFCCC

Figure 10

Shares of policy instruments used by developed countries for mitigation action



Source: UNFCCC

Figure 10 presents the policy instruments and indicates their share in the 2,000 mitigation actions reported by developed country Parties in 2018.

The focus sector of Parties' mitigation action depends on their major sources of GHG emissions. Being the largest source of emissions in many countries, the energy sector often attracts the largest share of mitigation actions. Reducing emissions from the energy sector in most cases entails promoting renewable energy (solar, wind, geothermal, etc.) and energy efficiency policies and programmes, and supporting the development of complementary technologies such as smart grids. Efficiency measures for power plants and switching to lower-carbon fuels reduce the emissions intensity of the sector, while end-use efficiency reduces the amount of electricity consumed and thus the sectoral emissions.

Some initiatives in the energy sector bring a wide range of co-benefits: local economic and employment growth; enhanced technology development and value chains in renewable energy; and broader access to energy (e.g. through rural electrification and installation of thermal equipment in households such as solar water heating systems). More broadly, reducing carbon intensity in the energy sector contributes to national energy security through the preservation and better management

of energy resources and enhances the productivity of the public and private sectors. For instance, clean development mechanism projects have brought about many sustainable development benefits and helped to promote the use of domestic technology in some developing countries.

Developed countries, in particular, are shifting towards increasingly distributed energy systems, which is in turn shifting decision-making on energy production and usage towards consumers. Technological advances such as energy management systems, smart grids and improved batteries are allowing end-use customers to increasingly control how they produce, consume and store energy, alongside the associated gains of reduced cost, clean air and the contribution to climate change mitigation.

Mitigation action is also being implemented in other sectors; for example, reducing energy intensity through efficient consumption schemes in the industry sector; developing integrated resource recovery and management in the waste sector; promoting or mandating high-performance buildings; moving towards the creation of sustainable and smart cities, expanding urban mobility systems, increasing vehicle efficiency standards, promoting electrification and reducing short-lived climate pollutant emissions in

The portfolio of actions to reduce emissions and adapt to climate change is expanding as new instruments are adopted, actions proven effective are replicated, existing policies are reformulated and less effective policies are discontinued.

the transport sector; and increasing and preserving natural carbon sinks through improved practices such as greening agriculture, afforestation, and improved forest management in the agriculture and forestry sectors.

Interest in cross-sectoral mitigation action has gradually increased as a single policy can deliver significant benefits and synergies can be exploited to deliver broader benefits. Similarly, greater integration across different jurisdictional levels is seen to lead to increased benefits in terms of cost-effectiveness and more impactful emission reductions. Cross-sectoral policies include:

- » Comprehensive transport policies in which other sectors are given due consideration (e.g. energy, land-use planning, urban issues, private sector development);
- » Enhanced waste management practices at the local level that lead to co-benefits for local communities such as the production of thermal energy or electricity;
- » A local climate investment programme that provides grants for local and regional investments to cut GHG emissions in all sectors that fall outside the regional carbon market.

As countries make progress in climate action, they are able to expand their policy portfolios and adopt more all-encompassing cross-sectoral mitigation action such as carbon pricing (through energy and carbon taxes, emissions trading schemes and competitive tendering of emission

reductions from accredited projects) and framework targets with assigned responsibilities and flexible compliance mechanisms (known as burden-sharing obligations). Broad policies can be more economically efficient and capture greater gains in more sectors. However, they tend to be more complex and difficult to develop, and are often more ambitious in terms of scope and therefore politically harder to implement.

Adaptation

Parties' visions of how to enhance climate resilience and adapt to the adverse effects of climate change are generally aspirational, qualitative, quantitative or a combination of the three. The vision is often captured in national laws, strategies and plans. Many Parties have adopted national adaptation strategies within the last 10 years and embarked on the NAP process.

Some goals and visions for adaptation are climate specific; others are more general. A few Parties align their vision for adaptation with the goal of limiting global warming to below 2 or 1.5 °C above pre-industrial levels. Many define their national adaptation goals with reference to developmental aspirations, highlighting, for example, how addressing climate risks can divert resources from development, but also how climate change adaptation can represent a development opportunity. For example, some link their adaptation efforts with development goals such as achieving a middle-income status by 2030 or improving specific development indices. Some emphasize that development efforts must integrate adaptation considerations, while others underline that adaptation is contingent on economic growth or diversification. Others link their adaptation efforts with international development frameworks such as the United Nations

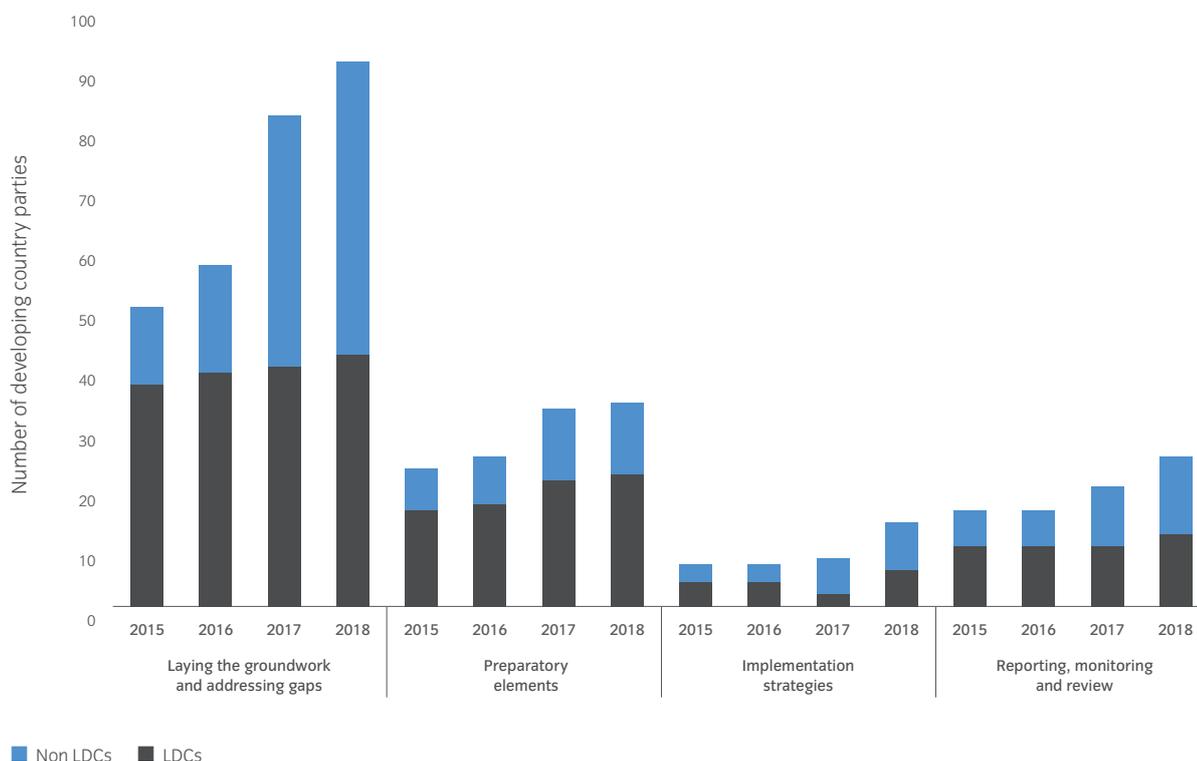
Millennium Development Goals and subsequent Sustainable Development Goals.

Parties that articulate their vision for adaptation in climate- or adaptation-specific terms do so in terms of, for example, mainstreaming adaptation in development generally or in planning for critical sectors. In sharing their long-term goals and visions, Parties emphasize specific elements, such as the need to reduce losses, the importance of the engagement of all sectors or segments of the population, and the need to consider related issues, such as the welfare of women, children, the elderly, people with disabilities and environmental refugees.

The NAP process, established in 2010, enables developing countries to identify medium- and long-term adaptation needs and to develop and implement strategies

Figure 11

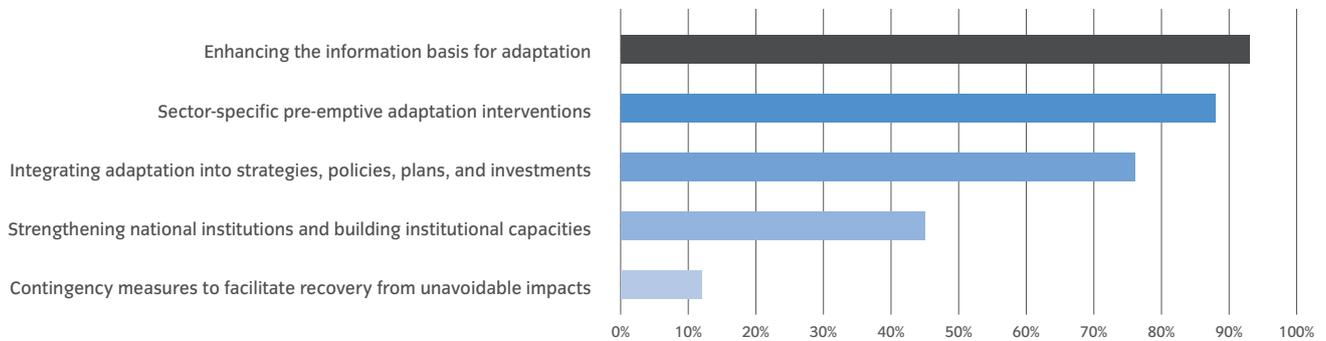
Progress made by developing countries in the process to formulate and implementation national adaptation plans by element of the process



Source: UNFCCC

Figure 12

Types of adaptation measure reflected in national adaptation programmes of action



Source: UNFCCC

and programmes to address those needs with a view to reducing vulnerability to climate change by building adaptive capacity and resilience, and facilitating the integration of adaptation into economic and social policies, programmes and action. As at January 2019, 13 developing country Parties had submitted NAPAs to the secretariat. A few others indicated that their NAPAs had been compiled and were undergoing national multi-stakeholder review or official endorsement. Most other Parties are still laying the groundwork for their NAPAs (see figure 11). None of the Parties that have formulated their NAPAs have yet implemented any of the policies, projects or programmes prioritized therein.

Parties are increasingly integrating adaptation into either their national development plans or their sectoral plans. As part of the NAP process, many developing countries are undertaking activities that support this integration, including by adding consideration of climate change into the design of priority programmes and investment and business plans; identifying the 'climate-proofed' activities and plans of the government; conducting public expenditure reviews to determine the amount spent by the national government on adaptation; and using national budget codes to track budget allocation to national climate change activities.

The portfolio of adaptation measures implemented is growing and diversifying from discrete stand-alone projects to comprehensive integrated programmes. Analysis of NAPAs, adaptation components of (I)NDCs and the NAPAs submitted by 51 LDCs¹⁷ since 2001 suggests that adaptation measures can be categorized into five types (see figure 12):¹⁸

- » Undertaking sector-specific pre-emptive adaptation interventions;
- » Integrating adaptation into strategies, policies, plans and investments, particularly national development plans and sectoral plans, such as by developing tools and guidelines and providing training to policymakers, communities and practitioners in various sectors;
- » Enhancing the information basis for adaptation, with a focus on enhancing and disseminating information, knowledge and data; developing early warning systems; strengthening tools for risk and vulnerability assessment; and putting in place monitoring and evaluation systems;
- » Strengthening national institutions and building institutional capacity, such as by establishing national mechanisms, platforms or training centres for learning

and disseminating information; and enhancing coordination among existing or new institutions such as national climate change committees or sector-specific institutions;

- » Identifying contingency measures to facilitate recovery from unavoidable impacts, such as training civil protection personnel, organizing regular national drills and exercises, and developing and disseminating disaster response plans.

The types of measures highlighted above are often reflected by countries in the context of different sectors of the economy, usually identified based on the vulnerability assessments described in section 4 above. Table 2 provides examples of adaptation measures identified by Parties in priority sectors.

5.3.

Stakeholder involvement at the national level

Stakeholder involvement is not systematically captured in the current reporting under the Convention; however, many Parties referred to stakeholder involvement in their NDCs, NAPAs and national communications. A wide range of stakeholders are engaged, mostly with a view to raising awareness and ambition as

17. Note that three countries have graduated from the LDC group since the submission of their NAPAs.

18. See <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napas-received>.

well as to securing buy-in with respect to NDCs and related long-term development plans. Support from actors in the private sector, academia and civil society, as well as from relevant sectoral ministries and regional and local governments, is critical for identifying realistic targets and identifying, appraising and subsequently implementing adaptation and mitigation policies, measures and action. Some Parties specifically mentioned the need to enhance the participation of and thereby empower certain populations, such as vulnerable communities, including women.

Stakeholders are engaged via sectoral dialogues, public consultation processes, workshops, research cooperation, parliamentary hearings, cross-cutting working groups, expert teams and technical peer reviews, large-scale public consultation, platforms for information exchange, media, awareness-raising and education campaigns, and invitations for written submissions as part of national consultation processes on NDCs and NAPs.

5.4.

Reporting

The transparency framework established under the Convention and enhanced under the Paris Agreement has led Parties to enhance their institutional arrangements and improve the quality of their reporting. More and more developing country Parties in particular are submitting national inventory reports that contain comprehensive GHG emission data.

However, owing to lack of reporting capacity and experience, in the current reporting and review system the information communicated by Parties is far from being received and evaluated in a systematic way to enable a global assessment of progress.

Within the current reporting framework, only developed country Parties are required to assess progress towards achieving their 2020 quantified economy-wide emission reduction targets. The key indicator for assessing progress is the GHG emission level at each year in the implementation period. Parties may use units from market-based mechanisms and LULUCF activities to

Table 2

Adaptation measures identified by Parties in priority sectors

Sector	Examples
Agriculture	<ul style="list-style-type: none"> › Drought-resilient crops › Food storage, monitoring and distribution › Training for farmers, local administrators and other stakeholders › Implementing climate criteria for agricultural programmes › Adapting agricultural calendars
Water	<ul style="list-style-type: none"> › Water harvesting, storage, metering and saving tools › Integrated water resource management practices › Water treatment facilities › Enhancing water allocation schemes › Public awareness campaigns
Health	<ul style="list-style-type: none"> › Developing contingency plans for health emergencies › Early warning systems for extreme events › Public awareness campaigns
Forestry	<ul style="list-style-type: none"> › Sustainable forest management, including through community forest management › Quantitative objectives for forest protection › Economic incentives for forest protection
Biodiversity	<ul style="list-style-type: none"> › Establishing protected areas and biodiversity corridors › Recovering ecosystems, including forests and marine (mangroves and coral reefs) › Providing water and food points for wildlife
Coastal zones	<ul style="list-style-type: none"> › Coastal afforestation, including mangroves › Integrated coastal zone management practices › Sand banks and structural technologies › Implementing local monitoring networks
Fisheries	<ul style="list-style-type: none"> › Aquaculture › Using technology for open sea cultivation › Monitoring, diagnosing and treating diseases
Tourism	<ul style="list-style-type: none"> › Nature-based and sustainable tourism › Diversification of tourism offerings › Artificial snow in ski areas
Energy	<ul style="list-style-type: none"> › Diversification of energy generation › Climate proofing, and integrating climate considerations into energy sector investments › Public awareness campaigns to increase energy efficiency
Disaster risk management	<ul style="list-style-type: none"> › Early warning systems › Risk management institutions › Hazard mapping › Resilience standards for buildings and infrastructure › Emergency operation plans

meet their targets. Forty-three¹⁹ developed country Parties have reported on progress towards their 2020 targets:

- » Seven, including the European Union and its 28 member States as a single Party, have emission levels that are already lower than their base-year level and 2020 target;
- » Two have already achieved over half of the targeted reduction;
- » Three are making progress but still need to achieve the bulk of their targeted reduction in the remaining period;
- » Three had emissions in the reporting year that were at a higher level than their base-year emissions.

Most developing country Parties reported on individual projects and programmes: some in terms of emission reductions; others using quantitative indicators such as renewable energy capacity (MW installed capacity), reduction of energy consumption (MWh reduced by energy efficiency programmes) and number of households benefiting from certain types of mitigation action, programme or project (e.g. efficient stoves, solar panels).

According to the qualitative reporting in the biennial update reports, some mitigation action has already resulted in significant emission reductions. Emission trends are determined by a combination of economy-wide and sector-specific drivers, including structural changes in the economy (i.e. shifting from a manufacturing-based to a service-oriented economy, something that was particularly pronounced in countries with economies in transition); technological improvements in production processes and a shift to using less carbon-intensive fuels (i.e. from coal to natural gas); the increased share of renewable energy sources in power generation (for electricity and heat); and the increase in energy efficiency in all sectors, particularly the transport sector. One sector-specific driver that led to an increase in emissions was the higher fugitive emissions linked to the increase in oil and gas extraction and processing.



Photo: Markus Spiske

While many Parties have formulated NAPs and outlined other adaptation strategies and corresponding plans at the national and even sectoral and local level since the adoption of the Cancun Agreements in 2010, the shift to implementing adaptation has not yet taken place at sufficient scale in developing countries, and it is yet to be seen whether the plans have resulted in enhanced adaptive capacity, strengthened resilience and reduced vulnerability to climate change in line with the global goal on adaptation.

None of the Parties that have formulated NAPs have yet implemented any of the policies, projects or programmes prioritized therein. It is yet to be determined how exactly prioritized policies will result in reducing vulnerability to climate change.

However, Parties are taking incremental measures as part of the NAP process that will contribute towards reducing vulnerability to climate change in the long term.

19. This excludes Turkey because it does not have a target, but includes the European Union and its member States.

6

Climate support

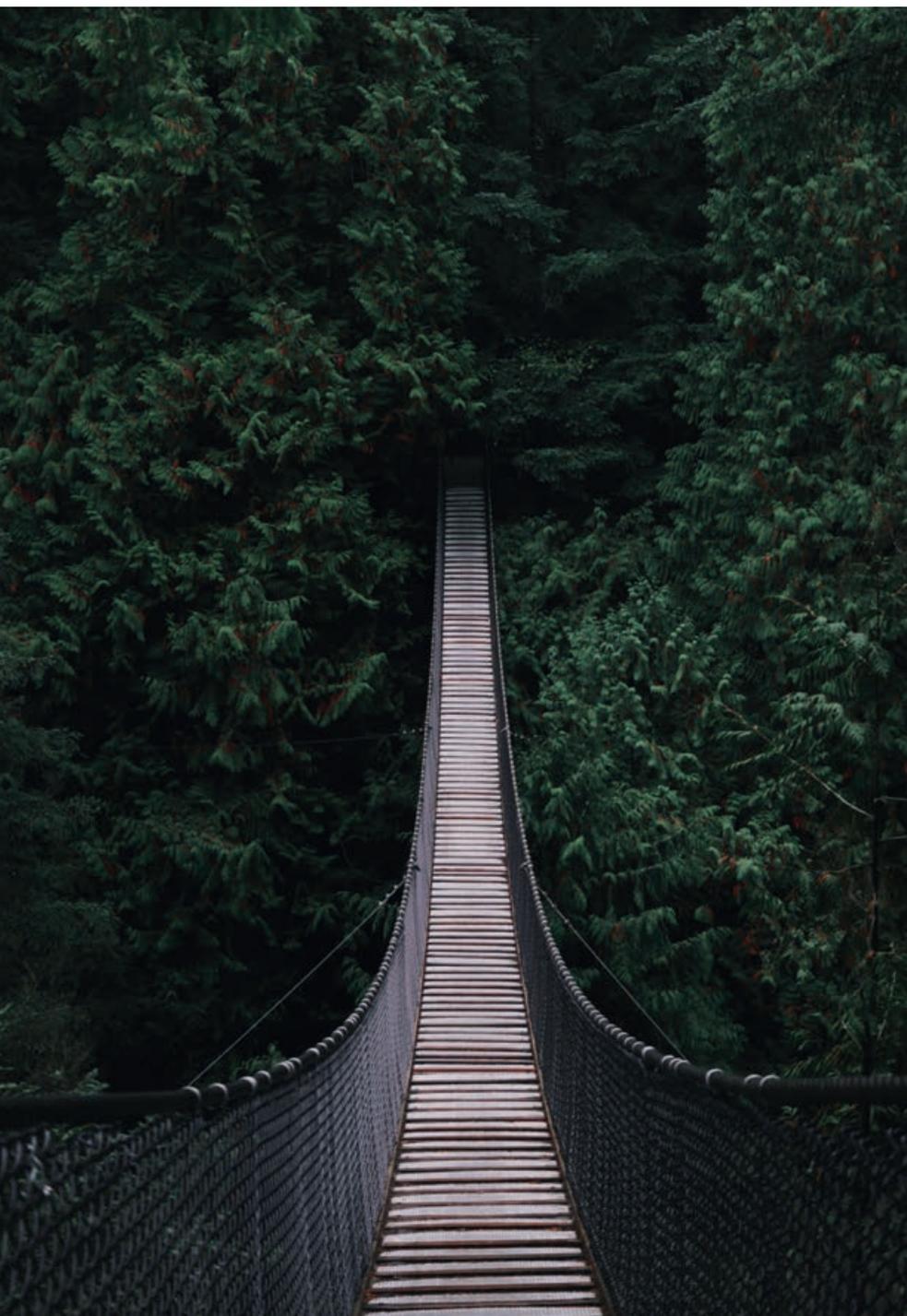


Photo: Andre A. Xavier

Support for and cooperation on climate action are central to achieving mitigation and adaptation objectives and increasing ambition as countries face more and more political, technical, socioeconomic and other barriers.

6.1.

Finance

6.1.1.

Arrangements and mechanisms

The Financial Mechanism of the Convention comprises two operating entities: the GEF, in place since the Convention's entry into force, and the GCF, established in 2010 (at COP 16). Three funds were established at COP 7: the SCCF and the LDCF, both managed by the GEF, and the AF, established and operating under the Kyoto Protocol. COP 16 established the SCF to assist the COP in exercising its functions in relation to the Financial Mechanism (see figure 13).

An innovation of the Paris Agreement is that it encourages voluntary contributions from Parties other than developed countries. Developing countries access finance from funds operating under the Convention and its Kyoto Protocol through accredited entities.

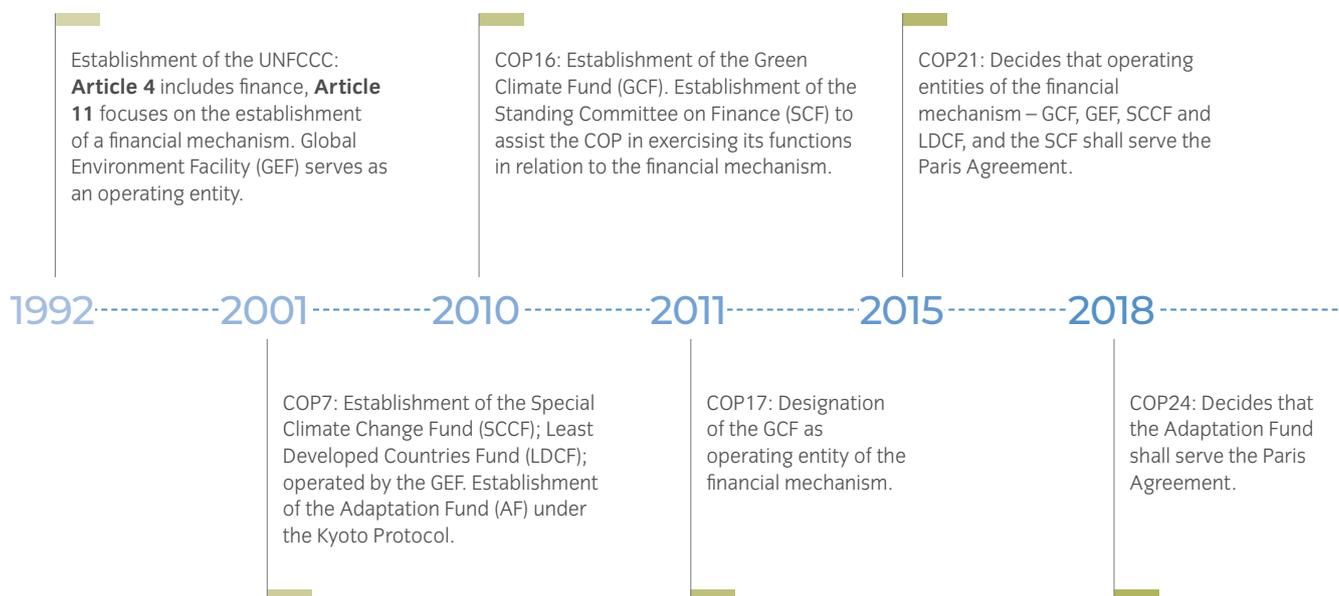
At COP 16, developed country Parties, in the context of meaningful mitigation actions and transparency on implementation, committed to a goal of mobilizing jointly USD 100 billion per year by 2020 to address the needs of developing countries.²⁰ In 2015, COP 21 decided that developed country Parties should continue their existing collective mobilization goal through to 2025. It also decided that, prior to 2025,²¹ the CMA shall set a new collective quantified

20. Decision 1/CP.16.

21. Decision 1/CP.21.

Figure 13

Key milestones in the establishment of the UNFCCC climate finance architecture



Source: UNFCCC

goal from the floor of USD 100 billion per year, taking into account the needs and priorities of developing countries. The CMA decided to initiate deliberations on this matter at CMA 3.²²

Climate finance efforts under the Paris Agreement are guided by the long-term goal in its Article 2, paragraph 2(c), of making financial flows consistent with a pathway towards low GHG emissions and climate-resilient development. Article 9, paragraph 3, of the Paris Agreement states that developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, taking into account the needs and priorities of developing country Parties. The Article places emphasis on the transparency and enhanced predictability of financial support, stipulating in paragraph 6 that information provided by developed country Parties on efforts related to climate finance should be taken into account in the global stocktake.

Developed countries also channel support to developing countries through multilateral and bilateral, regional and other channels, including multilateral financial institutions,

regional development banks, development cooperation agencies and banks.

6.1.2.

Finance needs

In about one third of their reports submitted since 2010, developing country Parties set out quantitative information on their financial needs. Reporting on financial needs is not mandatory within the current reporting framework and no standardized reporting format or specific guidelines exist. It is not easy therefore to obtain a global picture of financial needs on the basis of existing reports. However, in 2018, COP 24 requested the SCF to prepare, every four years, a report on the determination of the needs of developing countries related to implementing the Convention and the Paris Agreement for consideration by the COP, starting at COP 26 in 2020.

Among those that report on finance needs, some identify needs per economic sector, while others focus on financing needs related to capacity and technology. A few Parties provide detailed analysis of financial needs per activity, with information on

preferred financial instrument and priority level. In general, the description of financing needs for mitigation is more detailed than for adaptation. Usually, detailed information on the methodologies used to estimate financial needs and whether and when a country needs assessment was conducted is not provided, and it is also not always clear how country needs are defined. Sometimes the overall cost of implementing proposed activities is reported; in other cases the gap between current financing and expected programme costs is given and international climate finance needs estimated.

In the reporting, quantitative figures either for a set period or on an annual basis are provided. The time frames for activities and financial needs vary significantly and are often unclear, ranging from the very comprehensive and specific (e.g. total financial needs for 2015–2020) to estimates of the needs to implement certain long-term actions (e.g. until the 2040s).

NDCs provide new context for finance for developing countries going forward. Most developing country NDCs outline (in varying levels of detail) the estimated

22. Decision 14/CMA.1.

Improving the availability, volume and coverage of and access to international financial sources could facilitate the implementation of climate action at the scale and speed necessary to meet the global climate goals.

financial costs of the emission reduction and climate adaptation scenarios they describe for 2015–2030. Parties take very different approaches to describing financial needs in their NDCs. In many cases, lower-bound estimates of potential costs are given. The amount of detail provided on the methodologies used for estimating the costs presented also varies, making the figures difficult to compare across Parties.

6.1.3.

Support provided

The most comprehensive global report available on financial support is the SCF BA.²³ It includes information on and analysis of all the different types of climate finance flows, for example flows from developed to developing countries (public and private) through public interventions, and global total flows (including flows to and from both developed and developing countries). The latest BA was published in 2018 and includes information for 2015 and 2016. Other global reports concern themselves with only a subset of finance flows and are typically published biennially.²⁴

Establishing a global picture of finance flows is challenging. First, the coverage of sources and sectors of climate finance remains uneven and incomplete, particularly in the case of domestic, South–South and private finance. For instance, information on private finance in sectors such as renewable energy is extensive, but it is patchy for energy efficiency, sustainable transport, land use

and adaptation. Second, data on private finance mobilized in concert with bilateral and multilateral public finance have been collected only since 2015 and on an ad hoc basis. Finally, different operational definitions of climate finance limit data comparability, making it difficult to collect, aggregate and analyse data from diverse sources.²⁵

In the 2018 BA, developed countries and climate finance providers, as well as

multilateral and financial institutions, private finance data providers and other relevant institutions, were encouraged to enhance the availability of granular country-level data on mitigation and adaptation finance. In addition, private sector associations and financial institutions were invited to continue to improve climate finance data.

Since 2014, under the Convention, developed country Parties have been required to indicate in their BRs the amount

Box 2

Global climate finance flows since 2010

The SCF estimated **global total climate-related finance flows** at USD 340–650 billion in 2011–2012, USD 339–687 billion in 2013, USD 392–741 billion in 2014 (high bound then revised to USD 584 billion due to methodological changes), USD 472–680 billion in 2015 and USD 456–681 billion in 2016 (the methodology for estimating climate finance flows has been improved, resulting in baselines used for comparison (low and high bound)). Climate finance flows (including public and private, international and domestic sources) increased by 17 per cent between 2013–2014 and 2015–2016. The data suggest that private finance represents the largest share of the global total climate-related finance flows, specifically private investment in renewable energy and energy efficiency.

The SCF estimated specific finance flows from developed to developing countries as follows:

- **Multilateral climate finance provided from MDBs'** own resources since 2013 has remained at USD 20–25 billion (USD 20.8 billion in 2013 and USD 25.7 billion in 2014). In 2015 and 2016, MDBs provided USD 23.4 billion and USD 25.5 billion, respectively, in climate finance to eligible recipient countries, an average 3.4 per cent increase from 2013–2014;
- **Total amounts channelled through UNFCCC funds and multilateral climate funds** in 2015 and 2016 were USD 1.4 billion and USD 2.4 billion, respectively. The significant increase from 2015 to 2016 was a result of the GCF ramping up operations. Overall, this represents a decrease of approximately 13 per cent from 2013–2014, which is due to a reduction in the commitments made by the Climate Investment Funds;
- **Climate-specific finance through bilateral, regional and other channels** totalled USD 23.1 billion in 2013, USD 23.9 billion in 2014, USD 29.9 billion in 2015 and USD 33.6 billion in 2016, an approximate 35 per cent increase from 2013–2014 to 2015–2016;
- **Records of climate-related private finance flows** from developed to developing countries are patchy. Organisation for Economic Co-operation and Development estimates suggest that USD 81 billion in private co-finance was mobilized in 2012–2015 by bilateral and multilateral finance (as reported in the 2016 BA). In addition, MDBs report USD 10.9 billion and USD 15.7 billion mobilized private climate finance in 2015 and 2016, respectively. In 2015, private climate finance mobilized by bilateral, regional institutions accounted for USD 2.3 billion.

Source: 2018 BA (except where noted otherwise); for the latest information and the 2018 BA report, see: <https://unfccc.int/process/bodies/constituted-bodies/standing-committee-on-finance-scf>.

23. See <https://unfccc.int/topics/climate-finance/resources/biennial-assessment-of-climate-finance>.

24. Other metadata studies and key reports include the Global Landscape of Climate Finance of the Climate Policy Initiative, the Joint Report on Multilateral Development Banks' Climate Finance (latest available for 2017), the Green Finance Mapping of the International Development Finance Club (latest available for 2016) and the Global Trends in Renewable Energy Investment report of the United Nations Environment Programme and Bloomberg (latest available for 2018).

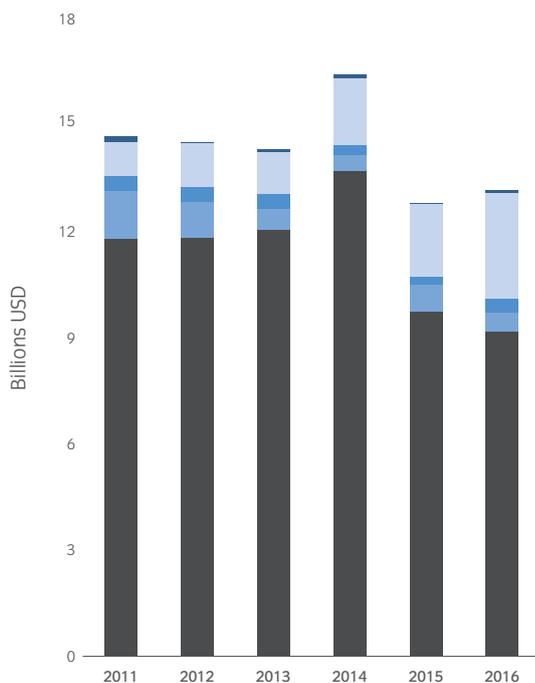
25. See annexes B and C to the 2016 BA for a comparison of operational definitions of climate finance and reporting approaches used by different institutions; available at http://unfccc.int/files/cooperation_and_support/financial_mechanism/standing_committee/application/pdf/2016_ba_technical_report.pdf.

Figure 14

Public financial support provided in 2011–2016

Contributions through **multilateral channels**

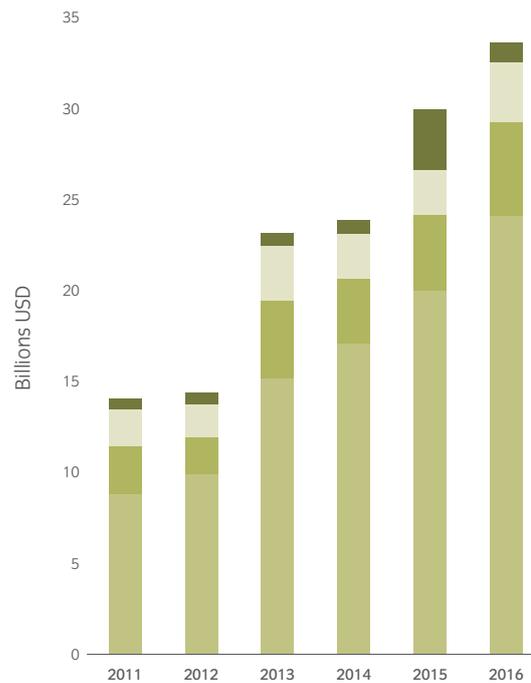
Climate-specific total	2011	2012	2013	2014	2015	2016
Climate-specific total	14.7	14.5	14.3	16.5	12.8	13.2
Core/General total	11.8	11.8	12.0	13.7	9.7	9.1



■ Climate-specific: Other
■ Climate-specific: Adaptation
■ Climate-specific: Cross-cutting
■ Core/General

Contributions through **bilateral, regional and other channels**

Climate-specific total	2011	2012	2013	2014	2015	2016
Climate-specific total	14.0	14.4	23.1	23.8	29.9	33.6



■ Climate-specific: Other
■ Climate-specific: Adaptation
■ Climate-specific: Cross-cutting
■ Climate-specific: Mitigation

Source: UNFCCC

of public financial support that they provided to developing countries during the reporting period.²⁶ Parties report on how much finance they contributed, the channels used (multilateral, including climate change funds and MDBs, regional development banks and specialized United Nations bodies, bilateral, regional and other channels), status, funding course, financial instrument and sector. They report their climate-specific contributions for mitigation, adaptation and cross-cutting action separately, as well as contributions that are not climate specific (core or general).

Aggregating the reported public finance information to form a global picture is not straightforward owing to the different methodologies, currencies and sector

attributions used. Collectively, developed country Parties reported a provision of public financial support (climate-specific and core or general contributions) to developing countries totalling USD 28.8 billion in 2011, USD 28.9 billion in 2012, USD 37.5 billion in 2013, USD 40.3 billion in 2014, USD 42.7 billion in 2015 and USD 46.8 billion in 2016. This represents a 45 per cent increase in reported finance flows from 2011–2012 to 2013–2014, followed by more modest growth (13 per cent) from 2013–2014 to 2015–2016.

Climate-specific public finance through multilateral channels, comprising climate-specific public finance provided through dedicated climate funds under the Convention and other channels, as well as financial contributions categorized as core

or general, increased between 2011–2012 and 2013–2014, and then dropped again to more or less previous levels in 2015–2016 (see figure 14). A large part of those resources flowed through financial channels outside the Convention.

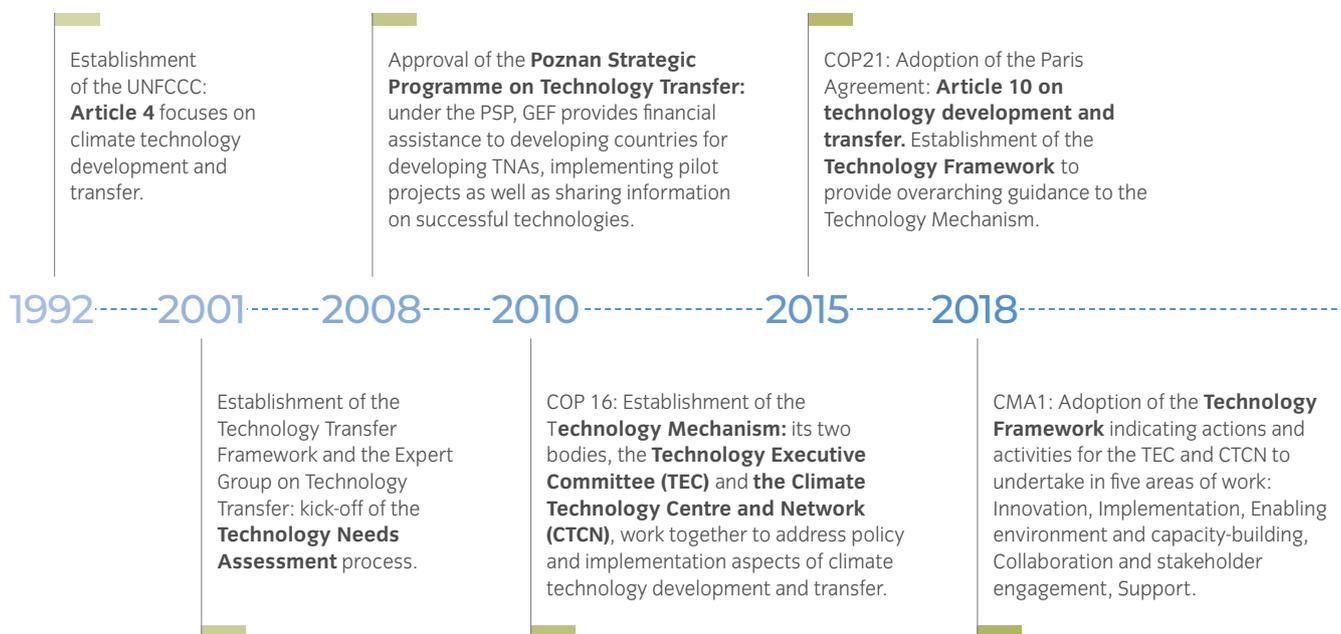
Public climate finance through bilateral, regional and other channels increased significantly, by 65 per cent, between 2011–2012 and 2013–2014, and continued to increase by a further 35 per cent until 2015–2016.

About two thirds of the reported public finance since 2010 was for mitigation, about a fifth was for adaptation and the rest was for cross-cutting (adaptation and mitigation) and other (see figure 14).

26. Decision 2/CP.17, annex I.

Figure 15

Key milestones in the establishment of technology transfer arrangements and mechanisms under the Convention



Source: UNFCCC

In terms of sectoral distribution, the reporting suggests that the largest amount of bilateral, regional and other funding was provided to the energy sector, followed by cross-cutting, transport, agriculture, water and sanitation, and forestry.

6.2.

Technology development and transfer

6.2.1.

Arrangements and mechanisms

At the international level, developing and transferring technologies to support national action on climate change has been an essential element of the climate process under the Convention (Article 4, paragraphs 1 and 5) from the start. Over time the importance of climate technology development and transfer has been confirmed and efforts scaled up.

The establishment of the framework for meaningful and effective actions to enhance the implementation of Article 4, paragraph 5, of the Convention and the Expert Group on Technology Transfer in 2001²⁷ kicked off the TNA process, which was strengthened in 2008 with the approval of the PSP.²⁸ Under the PSP, the GEF provides financial assistance to developing countries for developing their TNAs, implementing pilot projects responding to specific technology needs and sharing information on successfully implemented technologies.

In 2010, the Technology Mechanism was established to accelerate and enhance action on climate change.²⁹ Its two bodies – the TEC and the CTCN – work together to address both policy and implementation of climate technology development and transfer. They ensure coherence and synergy in the delivery of climate technology support and respond to countries' needs. The Technology Mechanism became an integral part of the Paris Agreement and is key to its

implementation. The technology framework established under the Paris Agreement (Article 10, paragraph 4) and eventually adopted at CMA 1 is to provide overarching guidance to the Technology Mechanism for actions and activities in five areas of work: innovation, implementation, enabling environment and capacity-building, collaboration and stakeholder engagement, and support.

At the national level, arrangements for technology development and transfer vary widely from country to country, particularly as regards the approach to and status of implementation. Examples of national arrangements include technology road maps to guide research and development decisions and accelerate market entry of priority technologies; NDC commitments linked to a specific technology transfer strategy; and carbon taxes to encourage a shift in production patterns towards low-carbon and energy-efficient technologies that create incentives for technology research, development and innovation.

27. Decision 4/CP.7.

28. Decision 2/CP.14.

29. Decision 1/CP.16.

6.2.2.

Technology needs

To determine their technology needs, countries undertake TNAs. The aim of TNAs is to support national sustainable development, build national capacity and facilitate the implementation of prioritized climate technologies. Since 2001, more than 80 developing countries have conducted TNAs to address climate change. A key outcome of the TNA process is TAPs, concise plans for countries' uptake and diffusion of prioritized technologies. Developing countries are currently seeking support for more than 300 TAPs prepared between 2009 and 2013.

The third synthesis report on TNAs³⁰ highlights the following as prioritized sectors:

- » For mitigation: energy (55 per cent of TNAs), agriculture, forestry and land use (22 per cent), waste (13 per cent) and industrial processes and product use (10 per cent). Examples of specific prioritized technologies include solar, biomass, efficient lighting (energy), bagasse combined heat and power, and optimal forest plantation (agriculture and forestry);
- » For adaptation: agriculture (37 per cent), water (34 per cent), infrastructure and settlements (14 per cent), climate observation (6 per cent) and other sectors (5 per cent). Examples of specific prioritized technologies include biotechnology, improved agricultural practices, rainwater harvesting and water catchment.

Developing countries without a TNA often identify their technology needs in their reporting within the current framework. The needs that they identify tend to be similar to those of countries with a TNA. Most developing countries identify needs around specific technologies for supporting their climate mitigation and adaptation action such as smart grids, high-efficiency boilers and high-efficiency electric vehicles. Others highlight the sectors most relevant to them, such as renewable energy, waste-to-energy,

agriculture and LULUCF, and transport. Most Parties' reports do not include clear information on technology support received, owing to, for example, a lack of a centralized database of all support received for climate change activities, and so an overview of this cannot be provided.

6.2.3.

Support provided

Within the current framework, developed country Parties are required to report on how they promote, facilitate and finance

the transfer of, and access to, climate technologies and know-how in developing countries. They also report on the steps taken to enhance developing countries' capacity and technology.

Developed country reports show that the number of supported technology development and transfer activities went from 190 in 2010–2012 to almost 300 in 2013–2014, with a marginal increase to just above 300 in 2015–2016.

Support has primarily been directed at technologies to reduce GHG emissions,

Box 3

Action under the Technology Mechanism in 2011–2018

In 2011–2018, the TEC:

- Issued **analyses and policy recommendations** on technology policy issues in six key areas: adaptation technologies; climate technology financing; emerging and cross-cutting issues; innovation and research, development and demonstration; mitigation technologies; and TNAs;
- Provided **key messages and policy recommendations to the COP** and produced 12 **policy briefs** on technologies for adaptation in the agriculture and water sectors, enhancing access to climate technology financing, strengthening national systems of innovation, South–South cooperation concerning adaptation technologies, industrial energy and material efficiency in carbon-intensive sectors, and ways of supporting entrepreneurs in their efforts to innovate climate technologies;
- Supported the **development of TNAs** and explored their linkages with the NAP and NDC processes.

Over the same period, the CTCN:

- Provided **technical assistance** in response to requests submitted by developing countries via their national designated entities. As at September 2018, technical assistance in response to 137 requests had been completed or was under way, contributing to 79 countries' NDCs or NAPs;
- **Recruited about 450 institutions**, organizations and companies from 89 countries to offer the expertise to provide countries with targeted solutions for implementing their NDCs and NAPs;
- Provided **training and capacity-building** to developing countries;
- Developed and shared **knowledge-based resources and tools** (e.g. portals, webinars, case studies);
- Supported **networking and collaboration** among governments, the private sector and financial institutions.

The latest information on the Technology Mechanism can be found at www.unfccc.int/ttclear/ and www.ctc-n.org.

30. FCCC/SBSTA/2013/INF.7.

mainly in the energy sector and, within that, chiefly for renewable energy and energy efficiency. Developed countries have supported a wide spectrum of low-emission technologies, including carbon dioxide capture and storage, global smart grids, solar home systems and efficient cooking stoves.

Support for adaptation technologies has been on the rise since 2010. Adaptation activities supported and reported by developed country Parties went from 20 per cent of over 170 reported activities in 2010–2012 to 40 per cent of almost 300 reported activities in 2013–2014 and to 35 per cent of over 300 activities reported in 2015–2016. Adaptation technologies are most frequently deployed in the agriculture sector (e.g. land and crop management). Since 2015, technology support for adaptation has also been channelled to other areas, such as adaptation planning and disaster risk reduction.

Technology activities supported by developed countries in developing countries were predominantly related to the later stages of the technology cycle, often efforts to foster enabling environments to enhance technology transfer. More than half of all reported technology activities were related to the transfer or deployment of mature climate technologies.

Factors that contributed to the successful implementation of climate technology transfer activities include alignment between the activities and the national policy framework of the recipient country (policies, priorities, plans and strategies); a holistic and integrated approach to technology transfer that includes capacity-building and awareness-raising; robust market analysis; the availability of innovative financing; strong and capable institutions, networks and expert capacity; and suitable stakeholder partnerships (see figure 16).

By region, the greatest share of technology activities in 2013–2014 went to Africa (39 per cent), followed by Asia-Pacific (33 per cent) and Latin America and the Caribbean (14 per cent). In 2015–2016, the Asia-Pacific

Figure 16

Factors leading to successful technology transfer



Source: UNFCCC

region overtook Africa as the recipient of the greatest share of reported technology activities (almost 40 per cent).

Further, more than 50 per cent of technology activities in 2013–2014 covered the LDCs and more than 40 per cent small island developing States. This shifted a little in 2015–2016, when the share was over 45 per cent for each of those categories of countries.

6.3. Capacity-building

6.3.1. Arrangements

Capacity-building helps individuals, organizations and societies to mitigate and adapt to climate change. It takes the form of bilateral and multilateral efforts, under and outside the Convention.

Several international arrangements for capacity-building were put in place under the Convention (see figure 17). In 2001, two frameworks were established to provide a set of guiding principles and approaches and to identify priority areas for capacity-building: one for developing countries and the other for countries with economies in transition.³¹ Activities for implementing the frameworks are monitored and reviewed through the annual Durban Forum on capacity-building³² (launched in 2011) and the capacity-building portal³³ (established in 2012). Finally, in 2012, the Doha work programme on Article 6 of the Convention was established, which comprises annual in-session dialogues for Parties, constituted bodies and other stakeholders to share experience and exchange ideas, good practices and lessons learned regarding the implementation of Article 6 of the Convention, which focuses on education, training, public awareness, public participation, public access to information and international cooperation.

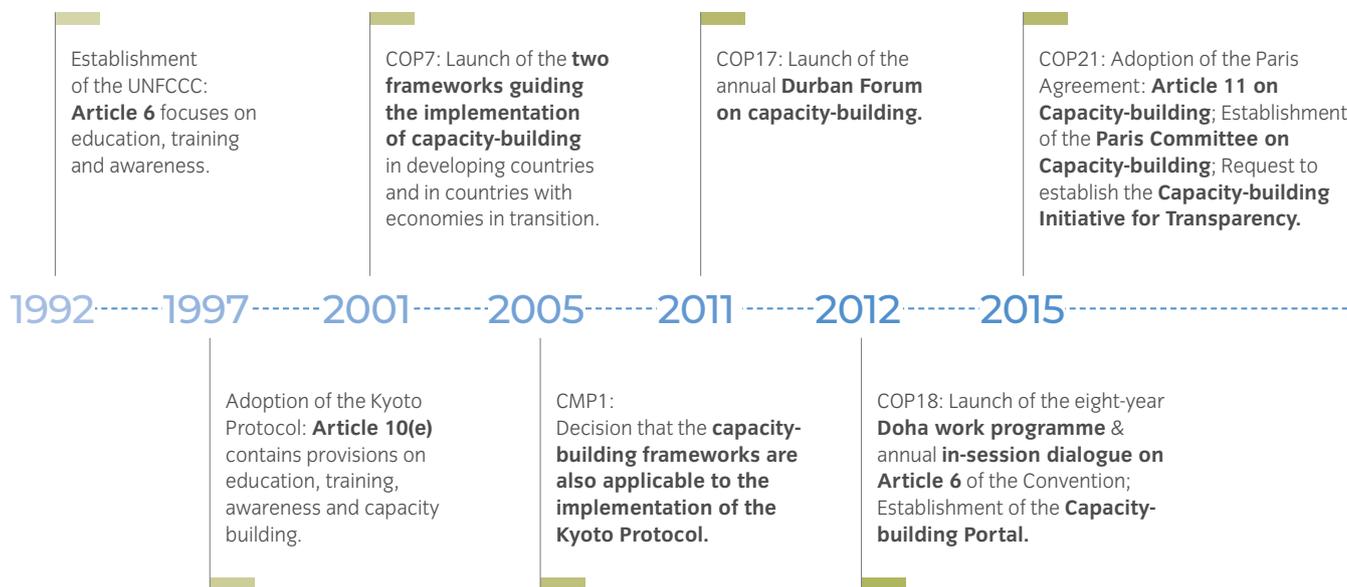
31. Decisions 2/CP.7 and 3/CP.7, respectively.

32. Decision 2/CP.17.

33. <https://unfccc.int/topics/capacity-building/workstreams/capacity-building-portal>.

Figure 17

Key milestones in the establishment of capacity-building arrangements under the Convention



Source: UNFCCC

More recently, the Paris Agreement has set out capacity-building goals, guiding principles and procedural obligations for all Parties. Developed countries are called upon to enhance support for capacity-building in developing countries, and developing countries to regularly communicate progress in implementing capacity-building.

COP 21 also led to the establishment of two further arrangements: the PCCB, a new constituted body to address both current and emerging capacity gaps and needs and to enhance capacity-building efforts; and the Capacity-building Initiative for Transparency, an initiative to build developing countries' capacity to meet the transparency requirements under the Paris Agreement.³⁴

COP 25 is expected to adopt a decision on enhancing the institutional arrangements for capacity-building under the Convention, on the basis of the outcomes of the review by the COP of the PCCB and its fourth review of the framework for implementing capacity-building in developing countries under the Convention. In addition, CMA 2 is expected to decide on the initial

institutional arrangements for capacity-building under the Paris Agreement.

The number of national policies and entities (government, research) dedicated to climate change in developing countries has grown significantly in recent years and led to enhanced climate-related capacity. Efforts of developing countries aimed at enhancing existing institutional capacity include setting up new institutions, such as a national designated authority for the GCF or a disaster management department; strengthening existing institutions through training, knowledge transfer, cooperation, transformation programmes or development policies; and helping to enhance institutional capacity-building activities. Governments in developing countries are seeking to increase national climate-related capacity through awareness-raising and educational activities and by integrating climate change issues into school curricula.

6.3.2.

Capacity needs

In their biennial update reports and national communications, many developing

country Parties reported persistent gaps in individual and institutional capacity in government ministries and agencies. Specifically, increased and improved capacity is necessary to coordinate relevant agencies and ministries across government levels and sectors, and for better mainstreaming of climate considerations in national planning and budgeting. With respect to the implementation of mitigation and adaptation measures, developing country Parties reported capacity gaps and needs for GHG emission accounting, research and systematic observation, data collection, risk modelling and vulnerability assessment. The need for capacity-building of local governments and communities, particularly for adaptation, was also frequently identified. A technical analysis conducted in 2016 found that reliance on project-based interventions and lack of permanent institutional arrangements for and integrated approaches to capacity-building at the national level are barriers to building and retaining capacity.³⁵

At the 2018 Durban Forum, Parties reported emerging capacity gaps and needs in relation to the implementation of NDCs in a range of areas, including governance, integrated approaches to

34. Decision 1/CP.21.

35. See document FCCC/TP/2016/1.

Box 4

Paris Committee on Capacity-building

The PCCB became operational in 2017 and is implementing its rolling workplan for 2017–2019, which includes activities in three main areas:

- Coherence and coordination of capacity-building under and outside the Convention;
- Technical support and guidance for building climate-related capacity;
- Awareness-raising, outreach and sharing of knowledge and information.

Since its inception, the PCCB has:

- Issued **recommendations to the COP** on capacity-building issues, including capacity-building related to NDC implementation and cross-cutting issues;
- Prepared **analyses** related to capacity gaps and needs and coherence and coordination of capacity-building activities under the Convention;
- Organized **technical workshops and side events** to support capacity-building for implementing the Paris Agreement and the Convention, including related to NDC implementation and integrating gender considerations, human rights and indigenous peoples' knowledge into climate action, and adaptation finance and capacity-building support;
- Developed, enhanced and shared **knowledge-based resources and tools** (e.g. portals, webinars, capacity-building portal);
- Supported **coherence, coordination, networking and collaboration** among constituted bodies under the Convention, governments, the private sector, academia and civil society.

The PCCB produces annual technical progress reports capturing its activities and achievements. The latest information is available at <https://unfccc.int/node/9993>.

implementing NDCs and achieving the Sustainable Development Goals, and cross-cutting issues such as human rights, gender responsiveness and indigenous peoples' knowledge, access to information at the local level and consultation of local stakeholders, resource mobilization, tracking and reporting on NDC implementation, and capturing and sharing lessons learned.

Capacity gaps and needs reported most recently by developing country Parties continue in the main to match the priority areas for capacity-building identified in the framework for capacity-building. Assessing progress towards filling those gaps and needs is impeded by the lack of metrics and indicators to measure capacity. The reporting also indicates the emergence of new capacity gaps and needs in the areas of strengthening NDCs, linkages with sustainable development, involvement of stakeholders in capacity-building efforts, South–South and regional cooperation, measurement, reporting and verification of action and support, REDD+ and access to and availability of finance.³⁶

6.3.3.

Support provided

Within the current framework, developed country Parties report on the capacity-building support that they provide to address existing and emerging capacity-building needs in developing countries (for mitigation, adaptation, and technology development and transfer). They are requested to report on individual measures and activities in textual and tabular format. However, several only included illustrative lists of capacity-building activities in their reporting, with the rationale that capacity-building is an integral component of most cooperation projects that cannot be categorized or reported on separately.

Hence, Parties' reporting on capacity-building varies considerably. There may be many more capacity-building activities than the reporting suggests and it does not capture in any systematic way how substantial the activities are (e.g. in monetary terms).

Capacity-building may target individuals or institutions or be systemic in nature. The capacity-building activities reported by developed country Parties for 2015–2016 target all three. Specifically, half of the reported activities focus entirely or in part on individual capacity, while the other half target activities that support institutional or systemic capacity-building, or both. The project descriptions provided in the reports do not easily lend themselves to a clear-cut distinction between institutional and systemic capacity-building. Further, of all the reported activities, at least 30 per cent target more than one level of capacity, with the rest targeting just one of the three.

Of the capacity-building activities reported, twice as many aim to build capacity for adaptation (40 per cent) as for mitigation (21 per cent). In addition, numerous activities address capacity-building in multiple sectors (34 per cent) and a minority focus on technology development and transfer (5 per cent).

Concerning the regional distribution of capacity-building activities supported by developed countries, African countries accounted for the largest share of activities in 2015–2016 (30 per cent). Eastern Europe (8 per cent) and to a lesser degree Latin America and the Caribbean (14 per cent) have seen increases in their share of the reported activities from 2013–2014 to 2015–2016, while the proportions of multiregional or global activities (22 per cent) and activities in Asia-Pacific (26 per cent) have decreased.

As long as the reporting does not explicitly capture the sector in which capacity-building activities take place, an assessment of the sectoral distribution of capacity-building activities can only rely on the qualitative project descriptions. On that basis, key sectors supported by activities with a mitigation objective reported for 2015–2016 appear to be energy and LULUCF, while adaptation activities tend to target agriculture and land use, water, and disaster risk reduction. Emerging areas seeing increasing support include REDD+, readiness for and access to climate finance, NDC implementation and transparency, which corresponds with developing country Parties' reported emerging needs.

36. See document FCCC/SBI/2019/3.

7

Enabling success

Unleashing climate action at the scale and speed necessary to meet global climate goals requires effectively addressing socio-economic and behavioural aspects, technology, market and trade conditions, financial, regulatory and institutional frameworks, financial support and significantly building capacity at the individual, institutional and/or systemic level.

Parties have identified several challenges in the way of implementing climate action at the scale and speed necessary to meet global climate goals. Successfully addressing the challenges often revolves around improving socioeconomic and behavioural aspects; technology, market and trade conditions; financial, regulatory and institutional frameworks; and financial support. In many instances, suboptimal situations are underpinned by challenges in multiple areas, as well as pervasive gaps in capacity at the individual, institutional and systemic level.

Socioeconomic and behavioural changes leading to more conducive environments depend on promoting a shift towards more sustainable and less resource-intensive consumer choices, increasing climate awareness and literacy among the general population, and generally overcoming poverty and economic inequality. Understanding the essential driving forces of consumption is seen as crucial to devising strategies for overcoming social, informational and behavioural barriers.

Action to address **administrative, institutional and regulatory** challenges depends on improving the coordination and clarity of the mandates across different government departments that pursue different or potentially conflicting policy goals (e.g. energy security versus sustainability, mainstreaming of climate change) and across different economic sectors, between national and subnational authorities and between public sector and private actors. Other administrative, institutional and regulatory challenges can be addressed through increased policy certainty, an optimal level of regulation, increasing public awareness of climate change and increasing the public's trust in the public sector.

Better **market and trading conditions** can be created by establishing pricing mechanisms to incorporate the costs of climate change, moving away from monopolies, promoting economic competition, removing market distortions, changing production patterns and taming adverse macroeconomic policies and trends. Relevant action includes enabling new entrants to supply goods and services and reforming the tax and subsidy systems for better alignment with green growth; for instance, turning carbon subsidies into carbon taxation may lead to a more level playing field for green technologies.

Resolving **technical challenges** depends on filling data and data capacity gaps, in relation, for example, to evaluating and projecting GHG emission trends or downscaled climate data; on securing the technical knowledge and capacity required for assessing mitigation potential, vulnerability and adaptation approaches; and on putting in place research and development institutions dedicated to climate change.

On **capacity-building**, more stable institutional arrangements for capacity-building at the international and national level and more integrated and coordinated approaches are effective ways of increasing developing country ownership and retention of capacity gains. Institutional strengthening and capacity-building are required at the local level, as well as strengthened networking, partnerships and sharing of experience.

More effective **technology development and transfer** is contingent upon simultaneously tackling challenges of a financial, technical, policy, legal and regulatory nature. A possible solution is to introduce or expand financial incentives and ensure that they are aligned with

technology objectives. Increased financial resources available for technology would clearly act as an enabler and could be delivered, for instance, through new or increased allocation in national budgets or by identifying and creating financial schemes, funds, mechanisms or policies. Barriers to technology development could be reduced by increasing institutional capacity to develop and deploy the necessary technologies.

Finally, on **finance**, it is necessary to improve availability, volume, coverage and access to financial sources, especially international sources; secure adequate finance for adaptation and mitigation plans (e.g. vulnerability assessment, adaptation planning and implementation, NDCs); and put in place effective financial mechanisms for programme implementation. Efforts stand a better chance of succeeding when coordination among stakeholders (development banks, multilateral funds, national funds, aid agencies, private companies) and capacity are both enhanced. Finally, more policy certainty and enhanced national arrangements and coordination systems are necessary for boosting private investment.

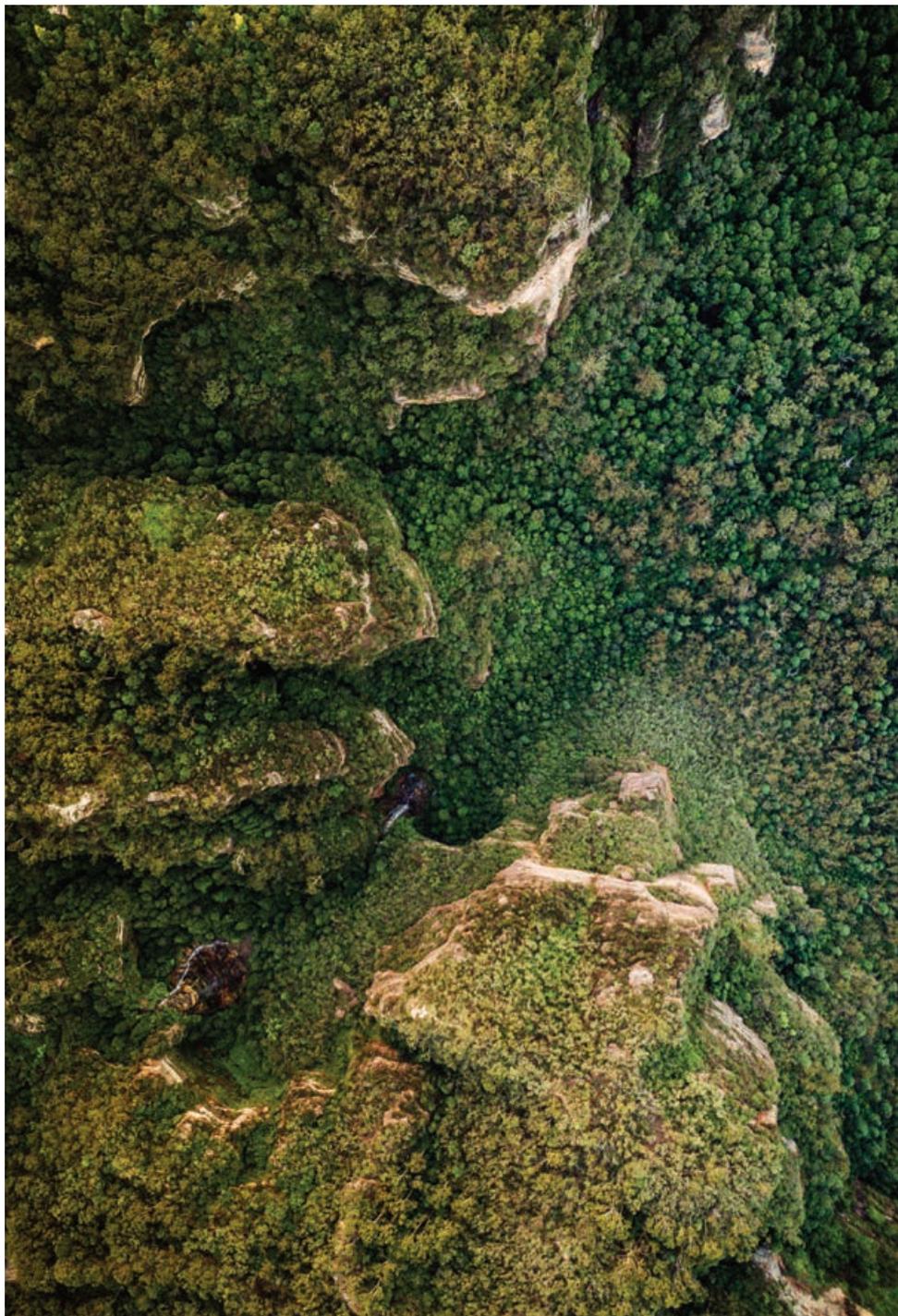


Photo: Josh Withers



United Nations
Climate Change