STUDY

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European Parliament

The COP26 Climate Change Conference

Status of climate negotiations and issues at stake

Policy Department for Economic, Scientific and Quality of Life Policies
Directorate-General for Internal Policies
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Abstract

The 26th Conference of the Parties to the United Nations Framework Convention on Climate Change focuses on increasing ambition and implementing the Paris Agreement. This study provides an overview of the international framework to address climate change, the Parties and stakeholders involved, the status of the negotiations and recent developments that affected the international process.

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CONTENTS

LIST OF ABBREVIATIONS

ABU	Group of Argentina, Brazil and Uruguay
AC	Adaptation Committee
ACE	Action for Climate Empowerment
AILAC	Independent Alliance of Latin America and the Caribbean (Asociación Independiente de Latinoamérica y el Caribe)
AFOLU	Agriculture, Forestry and Other Land Use
AGN	African Group of Negotiators
ALBA	Bolivarian Alliance for the Peoples of our America (Alianza Bolivariana para los Pueblos de Nuestra América)
AOSIS	Alliance of Small Island States
AR6	Sixth Assessment Report (of the Intergovernmental Panel on Climate Change)
ATAG	Air Transport Action Group
AUD	Australian Dollar
BAU	Business As Usual
BECCS	Bio Energy and Carbon Capture and Storage
BINGO	Business and Industry NGOs
bn	billion
BTR	Biennial Transparency Report
CBAM	Carbon Border Adjustment Mechanism
CBDR/RC	Common but Differentiated Responsibilities and Respective Capabilities
CDM	Clean Development Mechanism
CFCs	Chlorofluorocarbons
CGE	Consultitative Group of Experts

CII	Carbon Intensity Indicator
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	Carbon Dioxide
CO_2eq	Carbon Dioxide Equivalent
COP	Conference of the Parties
COVID-19	Coronavirus Disease 2019
COY	Conference of the Youth
CTCN	Climate Technology Centre and Network
DACCS	Direct Air Carbon Capture and Storage
DCS	Data Collection System
ECONGO	Education and Capacity Building and Outreach NGOs
EEDI	Energy Efficiency Design Index
EEXI	Energy Efficiency Existing Ship Index
ENGO	Environmental NGOs
ETS	Emissions Trading System
EU	European Union
ExCom	Executive Committee (of the Warsaw International Mechanism for loss and damage)
F-gas	Fluorinated gas
FAO	Food and Agriculture Organization
FBOs	Faith Based Organisations
FMCP	Facilitative, Multilateral Consideration of Progress

G7	Group of Seven
G20	Group of Twenty
G-77	Group of 77 at the United Nations
GAP	Gender Action Plan
GcoM	Global Covenant of Mayors for Energy and Climate Change
GDP	Gross domestic product
GGA	Global Goal on Adaptation
GHG	Greenhouse Gas
GST	Global Stocktake
Gt	Gigatons
GWP	Global Warming Potential
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
HFOs	Hydrofluoroolefins
ICAO	International Civil Aviation Organization
ICC	International Chamber of Commerce
ICLEI	International Council for Local Environmental Initiatives
IGO	Intergovernmental Organisation
IMO	International Maritime Organization
INDC	Intended Nationally Determined Contribution
IPO	Indigenous Peoples Organizations
ITMO	Internationally Transferred Mitigation Outcome
ITUC	International Trade Union Confederation
JI	Joint Implementation

KCI	Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
KJWA	Koronivia Joint Work on Agriculture
kWh	Kilowatt hour
LCIPP	Local Communities and Indigenous Peoples Platform
LDC	Least Developed Countries
LGMA	Local Government and Municipal Authorities
LEG	Least Developed Countries Expert Group
LMDC	Like-Minded Developing Countries
LNG	Liquid Natural Gas
LPAA	Lima Paris Action Agenda
LULUCF	Land Use, Land Use Change and Forestry
MEF	Major Economies Forum on Energy and Climate
MEPC	Marine Environment Protection Committee
MOP	Meeting of the Parties (to the Montreal Protocol)
MPGs	Modalities, Procedures and Guidelines (for the transparency framework for action and support)
Mt	Megatons
MWh	Megawatt hour
NAP	National Adaptation Plan
NAZCA	Non-state Actor Zone for Climate Action
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
ODS	Ozone Depleting Substances

OECD	Organisation for Economic Co-operation and Development
OEWG	Open-Ended Working Group
PAWP	Paris Agreement Work Programme
PCCB	Paris Committee on Capacity Building
pH	Potential of Hydrogen
ppm	parts per million
RINGO	Research and Independent Non-Governmental Organisations
SARPs	Standards and Recommended Practices
SBI	Subsidiary Body for Implementation
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCF	Standing Committee on Finance
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
TEC	Technology Executive Committee
TF	Technology Framework
TM	Technology Mechanism
TUNGO	Trade Union Non-Governmental Organisations
TWh	Terawatt hour
UNFCCC	United Nations Convention on Climate Change
UG	Umbrella Group
UN	United Nations
USD	United States Dollar
WGC	Women and Gender Constituency
WIM	Warsaw International Mechanism (for loss and damage)

WMO	World Meteorological Organization
YOUNGO	Youth Non-Governmental Organisations

LIST OF BOXES

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) is scheduled to take place in Glasgow from 31 October to 12 November 2021, after it was delayed a year due to the COVID-19 pandemic. At this conference, delegates will discuss the rules for the implementation of the Paris Agreement and address issues such as the adaptation to climate change and support to developing countries. In addition, the conference will provide an important opportunity for governments to commit to increased mitigation ambition and for civil society representatives to emphasise the need for urgent action.

The international framework for addressing climate change

The United Nations Framework Convention on Climate Change entered into force in 1994. Its objective is to stabilise the concentrations of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Kyoto Protocol, which required a limited number of developed country Parties to limit or reduce their greenhouse gas emissions up to 2020, was adopted under the Convention in 1997.

In order to address climate change more broadly, the Paris Agreement was negotiated and adopted in 2015. This agreement, which entered into force in 2016, requires climate change mitigation and adaptation actions from all Parties. The goals of the Paris Agreement are to hold the increase in the global average temperature to well below 2°C above pre-industrial levels, to pursue efforts to limit this increase to 1.5°C, to increase the ability to adapt to the adverse impacts of climate change and to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Under the Paris Agreement, Parties regularly communicate their Nationally Determined Contributions (NDCs) as part of the global response to climate change; the ambition of these contributions has to increase over time. The Paris Agreement also provides for a global stocktake, which assesses the collective progress of all Parties towards achieving the goals of the agreement.

Besides the UNFCCC, its Kyoto Protocol and its Paris Agreement, the Montreal Protocol addresses emissions of certain greenhouse gases: The Kigali Amendment to the Montreal Protocol schedules the phase-down of hydrofluorocarbons, a group of gases which gained in importance as substitutes for ozone-depleting substances. Emissions of carbon dioxide from international aviation and maritime transport are also addressed by two specialised United Nations Agencies – the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO).

Main issues at stake at the Climate Change Conference in Glasgow

As required under the Paris Agreement, many Parties communicated new or updated NDCs in 2020 and 2021. The level of ambition of these NDCs will constitute a major topic of discussions at the Glasgow conference. In addition, negotiators will discuss technical issues relating to mitigation, such as common time frames of NDCs and the rules for market-based approaches under Article 6 of the Paris Agreement. With regard to these approaches, there are open questions on how to avoid double counting of emission reductions, how to deal with different time frames and scopes of NDC targets, and how to manage a transition from the mechanisms under the Kyoto Protocol. The rules on Article 6 and the details for reporting under the transparency framework are important for making the Paris Agreement fully operational.

In addition, Parties will discuss progress in the adaptation to the impacts of climate change and ways to address loss and damage associated with these impacts. Developing countries will make suggestions for a global goal on adaptation and point out the importance of financial, technology and capacity-building support.

Besides the negotiations under the Paris Agreement, Parties will continue to address a number of topics under the Convention and cross-cutting issues such as the role of local communities and indigenous peoples, gender and climate change, issues related to agriculture and, research and systematic observation.

The Conference of the Parties will serve as the meeting of the Parties to the Kyoto Protocol (CMP) and to the Paris Agreement (CMA). In addition, work on implementation and technical issues will continue under the Convention's Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBSTA).

Stakeholders in the negotiations

Representatives from 197 Parties participate in the climate change negotiations under the UNFCCC. They organise themselves in groups of countries with similar interests such as the Umbrella Group which represents a number of developed countries or the group of G-77 and China which represents the majority of developing countries. The European Union (EU) and each of its Member States are Parties to the Convention. Positions are coordinated between the Union and its Member States.

Besides the Parties to the Convention, observers play a prominent role in the process. Non-governmental organisations, including environmental, research, youth and business organisations, as well as local and regional governments organise events and call for more ambitious action during the climate change conferences. Observers also include organisations under the United Nations system such as the Intergovernmental Panel on Climate Change (IPCC), and other international organisations.

In order to achieve the goals of the Paris Agreement, Parties have to implement ambitious domestic policies and measures. Members of the Group of Twenty (G20) play a pivotal role because they are responsible for the majority of global greenhouse gas emissions. Climate polices vary across the G20 members, and many have to strengthen and extend their current policies in order to make them compatible with their NDCs and long-term targets.

Related developments

The international negotiation process continues to be affected by the COVID-19 pandemic. Besides the rules and restrictions for participation at the upcoming conference, discussions on an international level have been severely hampered and many countries have encountered difficulties in preparing and updating their NDCs over the past 1.5 years.

Several important virtual events were held in 2021, including the Leaders Summit convened by the United States and informal dialogues organised by the subsidiary bodies under the UNFCCC. In recent months, ministers have met in person to prepare for COP26.

With governments and individuals struggling with the COVID-19 pandemic, the issue of climate change has played a less prominent role in recent months but is still high on the agenda of many of NGOs, businesses and governments. Civil society representatives will urge governments during the COP to step up their climate action and ambition.

Outlook

With economies recovering from the pandemic, greenhouse gas emissions will continue to rise in many countries and sectors. As current NDCs are highly insufficient to achieve the goals of the Paris Agreement and limit global warming to a maximum of 1.5°C or well below 2°C, countries will have to initiate transformational changes and deepen multilateral cooperation. The global stocktake, which starts in 2021 and continues until 2023, will provide a comprehensive picture of where the global community stands in the response to climate change and of the areas in which further action is needed most urgently.

1. INTRODUCTION

As the impacts of global climate change become increasingly apparent across the world, bold action is needed at international level to mitigate these impacts. Although the COVID-19 pandemic required urgent attention in 2020 and 2021, climate action is high on the international political agenda, and from 31 October to 12 November 2021 delegates are scheduled to meet at the Climate Change Conference in Glasgow, the first such meeting since the conference in Madrid in 2019.

After many countries have increased their climate ambition under the Paris Agreement in 2020 and 2021, others are urged to follow suit. Besides a focus on increased ambition of countries' targets, negotiators in Glasgow are expected to finalise the rulebook for operationalising the Paris Agreement, and adaptation to climate change will be discussed along with support to developing countries. The Glasgow conference will also provide room for civil society representatives to make the case for more ambition, although in-person involvement will continue to be hampered by the pandemic.

For attendees and external observers alike, it is challenging at times to keep an overview of the topics discussed at climate change conferences, and to keep up-to-date with the issues at stake. This study aims to provide an overview of the topics discussed and of the state and non-state actors involved. It was prepared as a background document for the European Parliament delegation to the Climate Change Conference in Glasgow, but it also aims at informing other readers interested in the various aspects of climate negotiations.

After introducing the international framework for addressing climate change (chapter 2), the study provides an overview of the status of negotiations and main issues at stake in Glasgow (chapter 3). Chapter 4 addresses the stakeholders in the negotiations, from groups of Parties to observers. For the main Parties in the negotiations, their climate policies are laid out in chapter 5. After discussing recent developments with potential impacts on the negotiations (chapter 6), the study closes by looking forward to the climate change agenda in 2022 and beyond (chapter 7).

Chapters 2.1 to 2.3, 3 and 4 constitute an update of chapters 2.1 to 2.3, 3 and 4 of the study 'International climate negotiations – issues at stake in view of COP25' (Moosmann et al. 2019).

2. THE INTERNATIONAL FRAMEWORK FOR ADDRESSING CLIMATE CHANGE

2.1. The United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC 1992) was adopted at the UN Conference on Environment and Development in Rio de Janeiro in 1992. The objective of the UNFCCC is to stabilise the concentrations of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Parties to the Convention commit to implementing measures to mitigate climate change and to facilitating adequate adaptation to its effects.

In the months and years following the 1992 Rio conference, most countries signed and ratified the Convention. Currently it has 197 Parties, including the European Union and each of its Member States. After the entry into force of the Convention in 1994, its first Conference of the Parties (COP) convened in 1995. From 1995 onwards, climate change conferences took place annually, with the exception of 2020, when the conference was postponed due to the COVID-19 pandemic. Besides the COP, other bodies convene at each climate change conference, as summarised in Table 1.

Table 1: The Conference of the Parties and other related bodies

Body	Meetings	Purpose
Conference of the Parties (COP)	Annually since 1995	The COP is the supreme body of the Convention. It reviews and promotes the implementation of the Convention.
Subsidiary Body for Scientific and Technological Advice (SBSTA)	Biannually since 1995	The SBSTA assesses the state of scientific knowledge relating to climate change and responds to scientific, technological and methodological questions raised by the COP.
Subsidiary Body for Implementation (SBI)	Biannually since 1995	The SBI considers the information provided by Parties and assists the COP in the preparation and implementation of its decisions.
Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP)	Annually since 2005	The CMP keeps the implementation of the Kyoto Protocol (cf. chapter 2.2) under regular review and promotes its effective implementation.
Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)	Annually since 2016	The CMA periodically takes stock of the implementation of the Paris Agreement (cf. chapter 2.3) and promotes its effective implementation.

Source: Moosmann et al. (2019) based on UNFCCC (1992) and related COP decisions.

2.2. The Kyoto Protocol

In order to support the achievement of its objectives, the UNFCCC provides for the adoption of protocols. Following the entry into force of the Convention, the Kyoto Protocol was adopted by the Conference of the Parties in Kyoto in 1997 (UNFCCC 1998).

The Kyoto Protocol required developed country Parties to limit or reduce their greenhouse gas emissions. The reductions or limitations agreed for the first commitment period (2008-2012) were slightly below the emissions levels of 1990 in most cases, and for some countries they constituted an increase compared to that year. The largest emitter at the time of the adoption of the Kyoto Protocol, the United States of America, did not ratify the protocol, and another important emitter, Canada, withdrew from it in 2011. The remaining Parties to the Kyoto Protocol fulfilled their obligations in the Protocol's first commitment period.

The Kyoto Protocol allows countries to achieve their emission reductions or limitations using three carbon market mechanisms: Under the Clean Development Mechanism (CDM), developed countries are allowed to use certified emission reductions from mitigation projects in developing countries to achieve their commitments. Under Joint Implementation (JI), developed countries can acquire emission reduction units resulting from projects in other developed countries. Moreover, developed countries can transfer parts of their assigned emission budgets to other developed countries.

Box 1: The Doha Amendment

As the first commitment period of the Kyoto Protocol ended in 2012, countries agreed on a second commitment period at the Climate Change Conference in Doha in 2012. The so-called Doha Amendment to the Kyoto Protocol (UNFCCC 2012) committed a restricted number of developed country Parties to limiting or reducing their emissions in the period from 2013 to 2020. Since large emitters such as the Russian Federation or Japan did not assume a commitment for this period, emissions reductions under the Doha Amendment are mainly achieved through the commitment of the European Union to decrease its greenhouse gas emissions by 20 % compared to 1990, in line with the EU's 2020 climate and energy package (European Commission 2021).

The Kyoto Protocol stipulates that amendments to the Protocol enter into force on the ninetieth day after acceptance by at least three fourths of its Parties. As it took until 2 October 2020 until a sufficient number of instruments of acceptance were received from Parties, the Doha Amendment entered into force on 31 December 2020 only, which was the last day of its commitment period.

With its entry into force on that day, the commitments under the Doha Amendment became binding for all Parties. Although final greenhouse gas inventory numbers for the year 2020 are not yet available, the EU and its Member States are on track to achieving their -20 % emission reduction commitment (EEA 2021). Other Parties that did not achieve their commitments domestically may make use of the carbon market mechanisms under the Kyoto Protocol to fulfil their commitments.

2.3. The Paris Agreement

2.3.1. Negotiation history

At the beginning of the 21st century, greenhouse gas emissions from emerging countries, most notably from China, increased rapidly. As the commitments under the Kyoto Protocol covered a limited number

of developed countries only, the international community prepared a successor to the Kyoto Protocol, which would include mitigation commitments by a larger group of countries. The first major attempt ended in a failure at COP15 in Copenhagen in 2009, where countries only 'took note' of a document that laid out principles for voluntary contributions in the period up to 2020.

The subsequent negotiations focused on an agreement that would allow Parties to determine their contributions in a bottom-up approach but would have legal force and would require all Parties to contribute to its mitigation goals.

The negotiations on this agreement came to a closure in 2015, the same year the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction were adopted. The decisive conference, COP21 in Paris in December of that year, was preceded by announcements by many countries on contributing to climate change mitigation – the so-called Intended Nationally Determined Contributions (INDCs). Despite the positive momentum that took hold before the conference, negotiators still had to resolve a number of key issues such as how to find a balance between ambitious action and the needs of developing countries, and how to enshrine increased ambition over time in the agreement.

Guided by the French COP presidency, Parties reached an agreement on 12 December 2015 adopting the Paris Agreement. It is the first global agreement requiring climate change mitigation and adaptation action from all Parties (UNFCCC 2015b). While each Party determines the extent of its action (the bottom-up approach of the nationally determined contributions), the Paris Agreement also contains universal legal obligations that apply to all Parties, thus establishing a shared rules-based system (top-down approach).

The Paris Agreement is included in the annex of COP decision 1/CP.21 (UNFCCC 2015a). This decision adopted the Paris Agreement and laid out additional details, including technical work to be completed in order to make the Paris Agreement fully operational. This technical work, the so-called 'Paris Agreement Work Programme' (PAWP), constituted the main focus of climate negotiations from 2016 onwards. As the Paris Agreement focuses on the period after 2020, the COP decision of 2015 also addressed increased climate change mitigation and adaptation ahead of the year 2020 ('pre-2020 action').

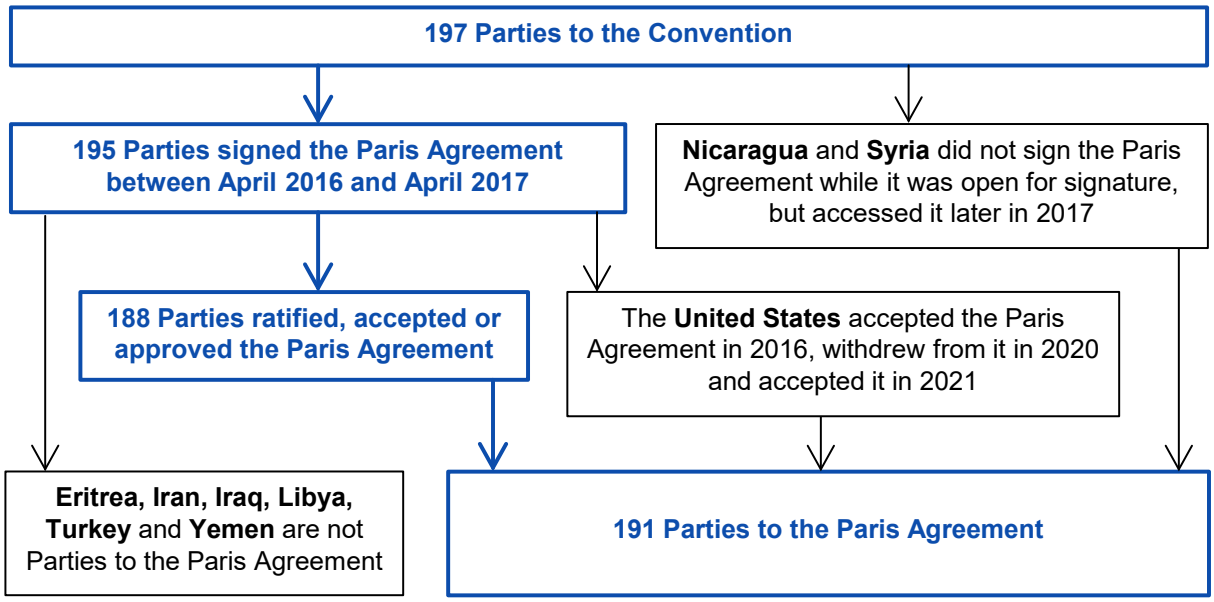
2.3.2. Signature, ratification and entry into force

After its adoption, the Paris Agreement was open for signature for one year, starting in April 2016. 195 of the 197 Parties to the Convention signed the Paris Agreement in that period. What is more important than the signing is the actual ratification, which legally binds Parties to the Agreement. In this step, countries deposit so-called instruments of ratification with the UN Secretary General. Depending on their legislative procedures, some countries deposit instruments of acceptance or approval rather than ratification, and Parties that did not sign the agreement while it was open for signature have the possibility of accessing it.

Progress in ratification was more rapid than many had expected, with the pivotal moment coming in September 2016 when U.S. President Barack Obama and China's President Xi Jinping delivered their instrument of acceptance/ratification to the UN Secretary General. Other large emitters, such as India and the European Union, deposited their instrument of ratification in October 2016. Having been ratified by over 55 Parties, which accounted for more than 55 % of global greenhouse gas emissions, the requirements for entry into force of the Paris Agreement were met, and it entered into force on 4 November 2016.

Figure 1 provides an overview of the status of signature and ratification of the Paris Agreement. At the time of writing this study, there are six Parties which have signed the agreement but not ratified it. For details on the withdrawal and re-joining of the Paris Agreement by the United States, see chapter 5.3.1.

Figure 1: Status of signature and ratification of the Paris Agreement



Source: United Nations (2021).
Note: Status of 1 October 2021.

2.3.3. The goals of the Paris Agreement and the ambition cycle

The Paris Agreement is guided by three goals, which are laid out in Article 2 of the Agreement (Figure 2). The temperature goal aims to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit this increase to 1.5°C. The adaptation goal aims to increase the ability to adapt to the adverse impacts of climate change and to foster climate resilience and low greenhouse gas emissions development. Finally, the 'finance flows' goal aims to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Figure 2: Goals of the Paris Agreement

Temperature goal	Adaptation goal	Finance flows goal
Article 2.1(a)	**Article 2.1(b)**	**Article 2.1(c)**
Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change	Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production	Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development

Source: UNFCCC (2015b).

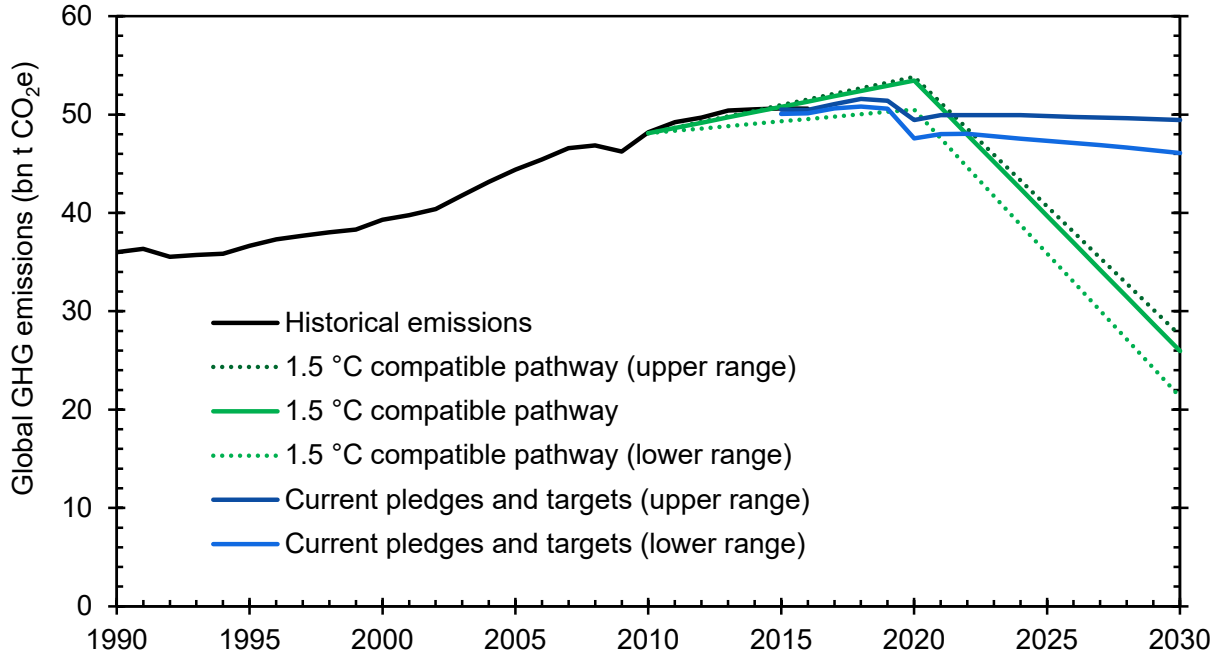
The 'finance flows' goal needs to be distinguished from the '100 billion dollar' goal, a commitment by developed country Parties, first made at the COP in Copenhagen in 2009, to mobilise climate finance amounting to USD 100 billion per year by 2020, from public and private sources. The '100 billion dollar' goal was reiterated in the decision on the Paris Agreement (UNFCCC 2015a), and it was decided that it shall apply from 2020 to 2025 and a new global goal shall be set from a floor of USD 100 billion per year, which is to apply thereafter.

It should also be noted that the 'finance flows' goal is broader than the concept of financial support addressed in Article 9 of the Paris Agreement (cf. chapter 2.3.4 below). While Article 9 addresses financial support to developing countries, the 'finance flows' goal aims also to address finance flows within countries, e.g. the distribution of subsidies or private investments.

Parties are only at the beginning of their path towards achieving the goals of the Paris Agreement. In Figure 3, a possible pathway of greenhouse gas emissions is presented that could limit the global temperature increase to 1.5°C above pre-industrial level. It shows that emissions resulting from current pledges and targets strongly deviate from such a pathway.

Due to the huge gaps between the current status and the goals of the Paris Agreement, the ambition cycle constitutes a critical overarching feature of the Paris Agreement. The ambition cycle is not explicitly stated or defined in the Paris Agreement; it refers to the overall architecture and functioning of the Paris Agreement that results from the interplay of the different individual and collective obligations it contains. Each Party is required to undertake ambitious efforts to strengthen the global response to climate change. The specific efforts are determined by each Party, hence referred to as 'Nationally Determined Contributions' (NDCs). Many Parties already provided Intended Nationally Determined Contributions ahead of the Paris conference and maintained these as their NDCs under the Paris Agreement. Others provided their NDCs in the course of the ratification process of the agreement. All Parties were required to communicate a new or updated NDC by the end of 2020.

Figure 3: Emission pathways to limit global temperature increase, and projected pathways based on current pledges and targets

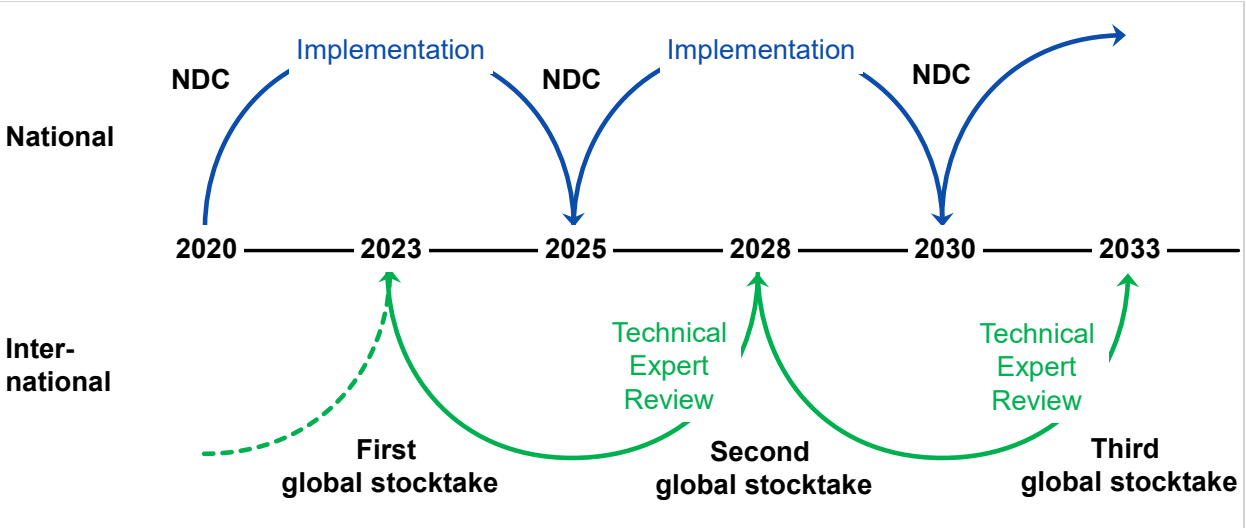


Source: Climate action tracker, © Climate Analytics and NewClimate Institute, https://climateactiontracker.org/global/cat-emissions-gaps/.

Note: NDCs submitted and pledges made by May 2021 are included.

As the NDCs communicated by Parties vary in their scope and ambition, the Paris Agreement stipulates that contributions have to represent a progression over time, and it introduces a mechanism of taking stock and increasing ambition (cf. Figure 4). In the so-called global stocktake (GST), the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) assesses the collective progress towards achieving the goals of the agreement. The aim of the global stocktake is to inform Parties in updating and enhancing their NDCs. The first global stocktake will take place in 2023, and preparations are starting in 2021. The so-called Talanoa Dialogue, which was conducted in 2018, already contained elements of such a stocktake.

Figure 4: NDCs and the global stocktake as parts of the ambition cycle



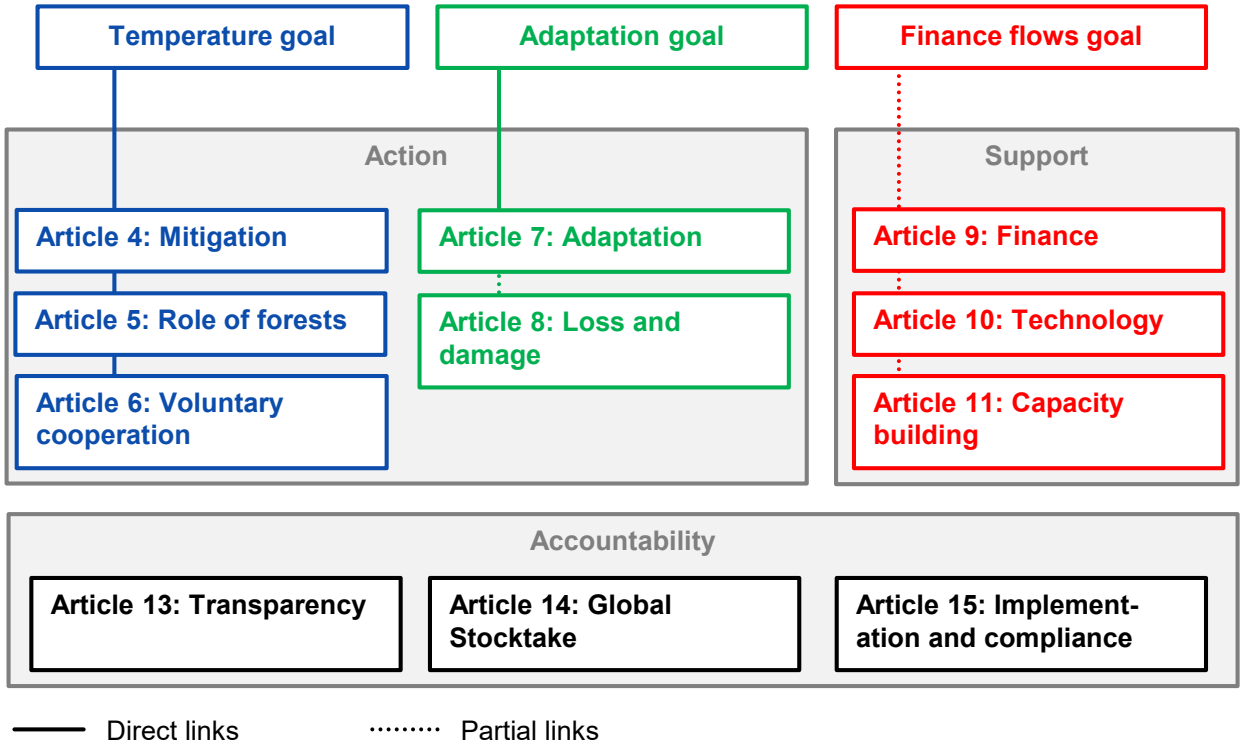
Source: Based on Jeffery et al. (2021).

The global stocktake consists of three phases: information collection for a technical assessment, technical assessment of collective progress, and consideration of outputs. Following the global stocktake, countries need to communicate NDCs in 2025. Both the global stocktake and the communication of NDCs take place every five years, thereby enhancing climate action over time.

2.3.4. Overview of the main topics of the Paris Agreement

The Paris Agreement addresses a wide range of topics, from mitigation to adaptation and support, as depicted in Figure 5. In the following, an overview of the topics of the Paris agreement is provided.

Figure 5: Topics addressed by the Paris Agreement



Source: UNFCCC (2015b); figure based on Moosmann et al. (2016) and UNFCCC (2021j).

Note: Loss and damage is partially linked to the adaptation goal, because increasing resilience helps to avert and minimise loss and damage. Financial, technology and capacity building support are partially linked to the 'finance flows' goal, because this goal is broader and goes beyond the topic of support to developing countries.

a. Mitigation

Mitigation, i.e. the reduction of greenhouse gas emissions and the enhancement of sinks of greenhouse gases, is a cornerstone of the response to climate change. The Paris Agreement, in Article 4, sets out the emissions goal, according to which Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, and to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century. The main instrument for reaching the emissions goal is the NDC, which each Party has to submit every five years; successive NDCs represent a progression beyond the Parties' then current NDCs. Developed countries should establish economy-wide absolute emissions reduction targets in their NDCs. Developing countries may also establish other forms of targets (e.g. for renewable energy or for some sectors only) but are encouraged to move, over time, towards economy-wide emission reduction or limitation targets.

In addition to their NDCs, Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies. Decision 1/CP.21 invited Parties to communicate such strategies with a mid-century time horizon by 2020.

Besides the reduction of emissions, the uptake of carbon dioxide from the atmosphere will have to play an important role in achieving the temperature goal of the Paris Agreement (IPCC 2018). Article 5 of the Paris Agreement states that Parties should take action to conserve and enhance sinks and reservoirs of greenhouse gases, including forests.

As Parties may choose to cooperate in their mitigation actions, including through international carbon market mechanisms, the Paris Agreement addresses such voluntary cooperation, with a similar

approach as that taken in the Kyoto Protocol. Article 6 provides a framework for using mitigation outcomes achieved in other countries to achieve a Party's NDC. This article also establishes a new carbon crediting mechanism under international oversight and a framework for countries to engage in non-market approaches.

b. Adaptation and loss and damage

As human influence has already warmed the atmosphere and changes in the climate system have already occurred (IPCC 2021), adaptation to climate change is needed as a complementary approach to mitigation. It has become more relevant with the passing of time and failure of the international community to address the mitigation of greenhouse gas emissions adequately. Article 7 of the Paris Agreement establishes a goal on adaptation; its pillars are the enhancement of adaptive capacity, the strengthening of resilience and the reduction of vulnerability to climate change.

Adaptation to climate change is a central political and practical priority for developing countries since they are more vulnerable than developed countries and they possess fewer adaptive capacities. In this regard, the Paris Agreement recognises the importance of support, of international cooperation and of taking into account the needs of developing countries.

The Paris Agreement requires each Party to engage, as appropriate, in an adaptation planning process and in the implementation of adaptation actions. Each Party should report on these actions in a so-called adaptation communication, which is to be submitted and updated periodically.

Despite adaptation efforts, the adverse impacts of climate change cause loss and damage, such as the loss of low-lying land as a result of sea level rise or the damage to property and infrastructure as a result of extreme weather events. Like adaptation, this topic is of special importance to developing countries, particularly Small Island Developing States (SIDS) and Least Developed Countries (LDC) whose capacity to avert, minimise or address loss and damage is limited.

Article 8 of the Paris Agreement addresses loss and damage. It lists areas of cooperation, inter alia on early warning systems, emergency preparedness, risk assessment and management, and resilience of communities, livelihoods and ecosystems. The Warsaw International Mechanism (WIM) on Loss and Damage, established by the COP in Warsaw in 2013, is subject to the authority and guidance of the CMA.

c. Support

Mitigation and adaptation actions require, among other things, financial resources, technologies and skills. As has already been the case under the Convention, the Paris Agreement requires developed country Parties to provide financial, technology and capacity building support to developing countries.

The Paris Agreement extends the group of countries providing financial support: While the Convention, in its Annex II, lists a limited number of developed country Parties that are required to provide financial support, the Paris Agreement, under Article 9, requires all developed country Parties and encourages others (e.g. emerging countries) to do so. For the distribution of funds to developing countries, the so-called Financial Mechanism was established under the Convention, and this mechanism also serves under the Paris Agreement. The main entities operating under the Financial Mechanism are the Global Environment Facility (GEF) and the Green Climate Fund (GCF).

Besides *providing* financial resources, developing country Parties should continue to take the lead in *mobilising* climate finance from a wide variety of sources. As decided at the COP in Paris, developed countries intend to continue their existing goal of mobilising USD 100 billion annually from 2020

through 2025 and to set a new collective quantified goal for the time period after 2025, from the floor of USD 100 billion per year.

Besides financial support, the Paris Agreement notes the importance of the development and transfer of mitigation and adaptation technologies. Under Article 10, it establishes the so-called Technology Framework (TF), This framework should facilitate, inter alia, technology needs assessments, the provision of enhanced financial and technical support, the assessment of technologies that are ready for transfer, and the enhancement of enabling environments for technology development and transfer.

These activities are supported by the Technology Mechanism (TM), which had been established under the Convention. The technology mechanism consists of the Technology Executive Committee (TEC), which analyses policy issues and provides recommendations, and the Climate Technology Centre and Network (CTCN), which provides technical assistance, creates access to knowledge and fosters collaboration.

As another aspect of support, Article 11 of the Paris Agreement addresses capacity building. Its aim is to enhance the capacity and ability of developing countries to take effective climate action. The COP in Paris established the Paris Committee on Capacity-building (PCCB), with the aim of addressing capacity building gaps and needs and enhancing capacity-building efforts.

d. Accountability

In order to be able to track the overall progress towards the goals of the Paris Agreement, the Parties' efforts need to be transparent. Article 13 of the Paris Agreement establishes an enhanced transparency framework for action and support. This transparency framework comprises the three layers of biennial reporting, technical expert review and facilitative, multilateral consideration of progress. Figure 6 provides an overview of the topics to be reported under the Paris Agreement and under the Convention.

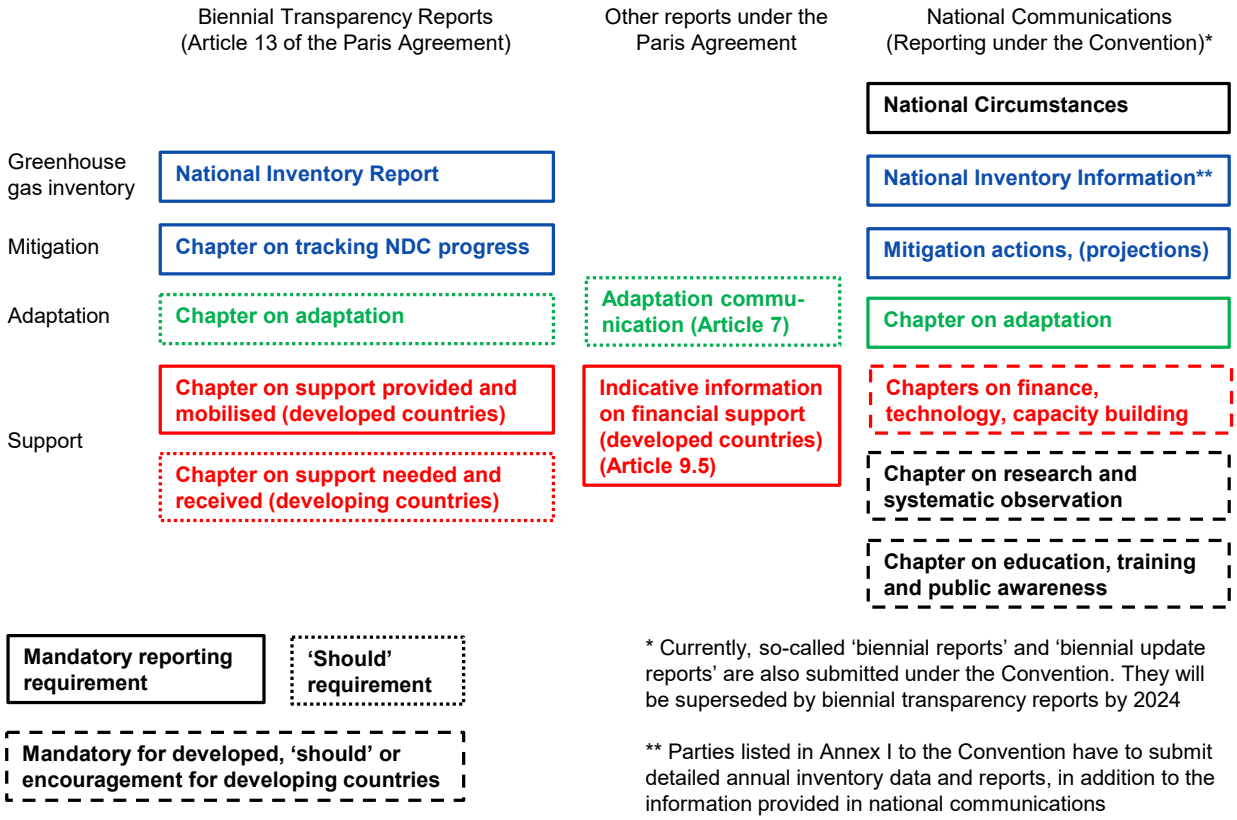
According to Article 13 of the Paris Agreement, each Party shall regularly provide a national inventory of anthropogenic greenhouse gas emissions and removals and information necessary to track progress made in implementing and achieving its NDC. Each Party should also provide information related to climate change impacts and adaptation.

The information to be provided on support differs between developed and developing countries: Developed country Parties *shall* provide information on financial, technology transfer and capacity-building support provided. Other Parties (e.g. emerging countries) that provide support *should* provide such information. Finally, developing country Parties *should* provide information on support *needed* and *received*.

Information on the national inventory, on tracking of progress and on support provided will undergo a technical expert review. Part of that information will be discussed in the so-called Facilitative, Multilateral Consideration of Progress (FMCP) – a question-and-answer session organised under SBI.

The enhanced transparency framework builds upon reporting and review practices established under the Convention, but it introduces new reporting elements and requires, for the first time, that all Parties provide relevant information, and thereby ends the differentiation in reporting requirements between Annex I and non-Annex I Parties under the Convention and the Kyoto Protocol. However, exceptions exist for SIDS and LDCs and some flexibility is granted to those developing countries that need it in the light of their capacities.

Figure 6: Information reported under the Paris Agreement and under the Convention



Source: UNFCCC (2015b); UNFCCC (2018a); UNFCCC (2003); UNFCCC (2019c).
Note: Reports under the Paris Agreement and under the Convention can be combined in order to reduce the reporting burden.

The transparency framework will play an important role in providing information on the implementation of the Paris Agreement and input to the global stocktake under Article 14 of the Paris Agreement (cf. chapter 2.3.3). In addition, the implementation of and compliance with the provisions of the Paris Agreement will be examined by a committee. Article 15 of the Paris Agreement established this committee, which will be expert-based and facilitative in nature and shall pay particular attention to the respective national capabilities and circumstances of Parties.

To summarise, the Paris Agreement addresses all main topics relating to climate action and support. While the text of the Paris Agreement is rather concise, additional details such as the tasks of various committees were specified in a COP decision in Paris (UNFCCC 2015a). In addition, this COP decision mandated the subsidiary bodies (SBI, SBSTA and a temporary body under the Paris Agreement) with elaborating the modalities and procedures for operationalising the various articles of the Paris Agreement. The status of this work, which came to be known as the 'Paris Agreement Work Programme,' is discussed in chapter 3 below.

2.4. Sectoral agreements outside the UNFCCC

Mitigation actions under the Paris Agreement address greenhouse gas emissions from all main sectors and from all greenhouse gases that are not also ozone-depleting substances. However, three sub-sectors with growing importance are addressed by separate international processes and agreements.

International aviation and international maritime transport have seen rapid global growth in recent decades. Their growth is associated with an important increase of emissions from fossil fuels (the fuels

used in these sectors are also known as bunker fuels). Greenhouse gas emissions from bunker fuels have been on the agenda of climate negotiations since 1995. However, these emissions are not included in the total of national greenhouse gas inventories under the UNFCCC and were not included in the scope of the targets under the Kyoto Protocol. Instead, the Kyoto Protocol mandated two specialised United Nations Agencies – the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) respectively – to address climate change mitigation in these sectors. These organisations regularly provide reports and information on work relevant to the SBSTA (see section 3.7.5).

The Paris Agreement does not directly refer to international aviation and maritime transport, but Article 4.1 calls on all Parties to achieve a balance between anthropogenic emissions by sources and removals by sinks. In contrast to the Kyoto Protocol, all greenhouse gas emissions are covered under the Paris Agreement. However, countries can determine for themselves which emission sources and greenhouse gases are included in their national targets. With the exception of the EU, no country has yet included international flights in the scope of their national targets. Measures to reduce greenhouse gas emissions from international flights have, therefore, been discussed primarily under the ICAO in recent decades.

Besides emissions from international aviation and shipping, emissions of hydrofluorocarbons (HFCs) constitute another area with rapid emission growth. HFCs are a group of greenhouse gases containing hydrogen, fluorine and carbon, mostly used as cooling agents. Many countries address these gases as part of their climate change mitigation actions. In addition, the 2016 Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer addresses these gases.

2.4.1. International aviation

a. Emissions from European and international aviation

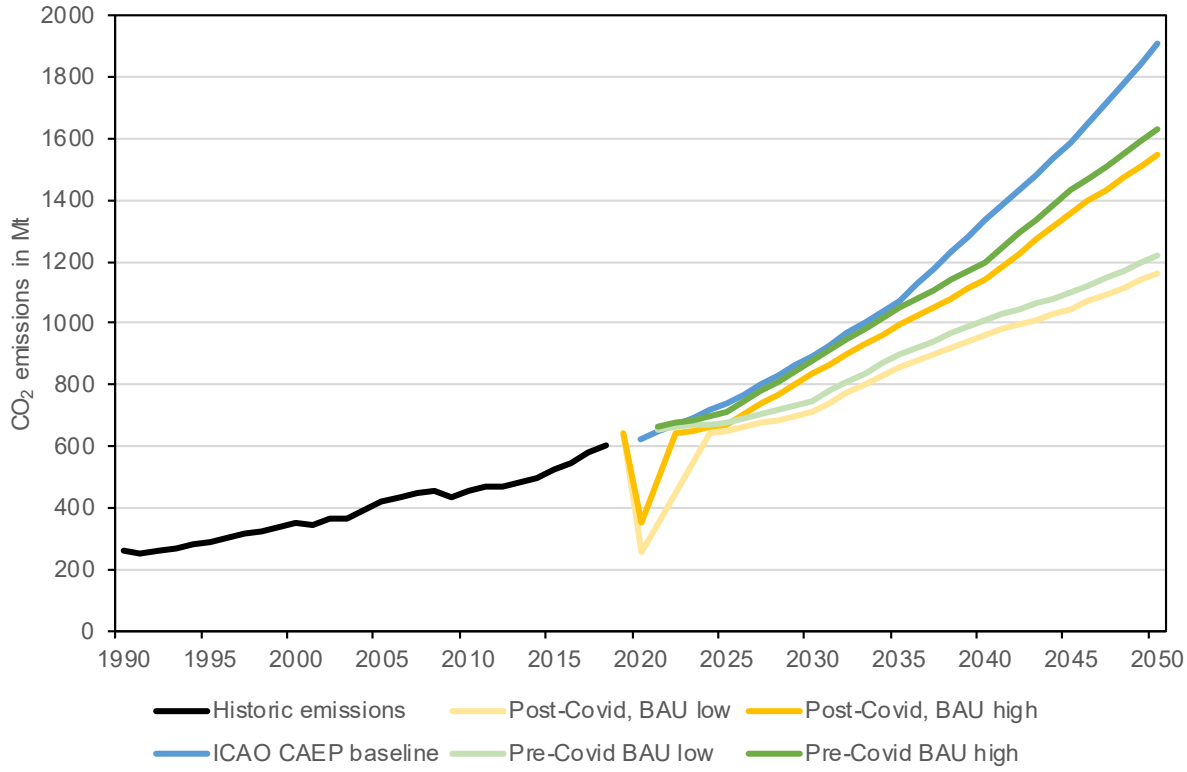
Emissions from international aviation were among the fastest growing greenhouse gas emission sources before the start of the COVID-19 pandemic. In 2018, aviation caused 2.4 % of all CO_2 emissions worldwide. However, the actual contribution to global warming is estimated to be about three times the effect of CO_2 emissions alone (Lee et al. 2021). This is because in addition to direct greenhouse gas emissions, aviation has other harmful effects on the climate through cloud formation and other chemical processes (non-CO_2 effects); these effects are not taken into account when analyses consider only the CO_2 emissions resulting from the combustion of kerosene.[1] According to calculations made by Oeko-Institut, aviation was responsible for a total of about 5.5 % of anthropogenic global warming in 2018 (German Government 2021).

Prior to the COVID-19 pandemic, CO_2 emissions from aviation had been steadily growing; between 2013 and 2019 they increased globally by approx. 29 % (Graver et al. 2020), which corresponds to an average annual growth rate of 5 %. In 2018, CO_2 emissions from international aviation amounted to 604 million tonnes of CO_2 (IEA 2020a), which would put it in tenth place in a list of the top ten countries with the highest CO_2 emissions worldwide in that year (excluding emissions from the land sector) (Gütschow et al. 2021a). In the EU, domestic and international aviation caused approximately 4.0 % of total greenhouse gas emissions (excluding the land use sector) in 2019 (EEA 2021).

[1] See https://www.offsetguide.org/understanding-carbon-offsets/air-travel-climate/climate-impacts-from-aviation/total-climate-impact-from-aviation/ for further information.

Figure 7 shows the historic development of CO_2 emissions from international aviation between 1990 and 2018 based on top-down data from the International Energy Agency on fuel sales (IEA 2020a). It also shows different scenarios for the future development of CO_2 emissions from international aviation. All scenarios predict a significant growth in aviation emissions until 2050.

Figure 7: Historic and future development of CO_2 emissions from international aviation



Source: Authors' own compilation based on ICAO (2019a), Climate Action Tracker (2020c), IEA (2020a).

Note: The blue line shows a business-as-usual (BAU) scenario from ICAO. The green and yellow lines show BAU projections for international aviation from Climate Action Tracker (2020); the yellow lines consider the impact of COVID-19 on future emissions development.

Before the COVID-19 pandemic, forecasts predicted that the passenger kilometres travelled by plane would continue to grow (ICAO 2019b, p. 18). Yet, the COVID-19 pandemic led to an unexpected, drastic and unprecedented decrease in air transport in 2020. The number of total global passengers in 2020 dropped by about 60 % in 2020 compared to 2019. For 2021, ICAO predicted a decline of 41 to 49 % compared to 2019 levels in May 2021 (ICAO 2021). It remains to be seen to what extent global aviation will return to pre-2020 levels in the future. In autumn 2020, the global network Air Transport Action Group (ATAG) estimated that about 10 billion passengers per year will travel by air in 2050. That is a doubling of 2019 levels, but 16 % below previous forecasts due to the impact of the COVID-19 pandemic (ATAG 2020).

To make the aviation sector compatible with the goals of the Paris Agreement, it is inevitable to reduce its emissions impact. However, current efficiency gains are rather low at around 1 % to 1.5 % annually, falling short of the 2 % target proclaimed by ICAO (ICCT 2020, p. 5). Moreover, new technologies to reduce the climate impact of flying (such as e-fuels, hydrogen-powered planes or electric aircrafts) will most likely not be available on a large scale in the next two decades. According to current assessments, it will therefore be highly challenging to achieve climate neutrality in the aviation sector by 2050 (Leipold et al. 2021).

b. Policy instruments to mitigate emissions from aviation

In 2016, ICAO adopted a new global scheme – the Carbon Offset and Reduction Scheme for International Aviation (CORSIA) – which aims to achieve carbon neutral growth after 2020. The increase in CO_2 emissions beyond 2020 is to be avoided by means of technical and operational measures, the use of alternative fuels or the purchase of offsets in the period from 2021 to 2035.

However, the climate impact of CORSIA is very limited in practice for a number of reasons (Siemons et al. 2021):

- CORSIA only regulates CO_2 emissions and thus only about one third of the actual climate impact of flights.
- The obligations under CORSIA only apply to flights between countries that participate in CORSIA. Participation is voluntary in the period from 2021 to 2026 and hence CORSIA covers only part of all emissions from international aviation.
- Due to the COVID-19 pandemic, the ICAO Member States decided in June 2020 to adjust the base year for the first phase of CORSIA from 2021 to 2023. While the original versions of CORSIA envisaged using the average of 2019 and 2020 as the base level, the emissions level of 2019 (i.e. prior to the effects of the pandemic) is now taken as the basis for calculating the offsetting requirement. This change increases the baseline by approx. 30 % and thus significantly reduces the mitigation efforts that have to be undertaken by air operators (Schneider and Graichen 2020; ICCT 2020). According to an analysis conducted by the Environmental Defense Fund, recalculating the baseline could delay the implementation of offsetting obligations under CORSIA by three to five years (EDF 2020).
- The requirements for the quality of offsets are low and the quality of the currently approved offsets is questionable in part. For example, under the rules of CORSIA, the continued existence of a forest project must be ensured only for the duration of CORSIA (Schneider et al. 2019b). In addition, old credits from projects developed under the Clean Development Mechanism (CDM) of the Kyoto Protocol are eligible under CORSIA even if they do not have any mitigation effect (Warnecke et al. 2019; Schneider et al. 2017). It is also expected that many projects for avoiding deforestation will be used under CORSIA. These involve numerous problems – in particular, high uncertainties in determining the reference level and the risk of carbon leakage (Schneider et al. 2018). Finally, there are currently no rules for appropriately accounting carbon credits used for compliance with CORSIA under Article 6 of the Paris Agreement. This does not yet ensure that double counting of emission reductions between CORSIA and nationally determined contributions under the Paris Agreement is avoided. Overall, it is therefore anticipated that the purchase of offsets under the current rules of CORSIA will barely have a mitigation effect.
- CORSIA enables airlines to meet their obligations by using alternative fuels. This includes fossil fuels that emit fewer greenhouse gases during extraction and production. However, such emission reductions are also counted towards meeting national climate targets. Furthermore, it is unclear to what extent all upstream chains of biogenic alternative fuels are sufficiently accounted. In the light of the objectives of the Paris Agreement, the current overarching goal of 'carbon-neutral growth' must thus be regarded as insufficient overall.

These considerations suggest that ICAO's current policy is not compatible with the Paris Agreement. To strengthen ICAO's mitigation ambition, a long-term target for 2050 would need to be defined. Some stakeholders are therefore calling on the EU to use its own climate policy instruments instead of

CORSIA. The EU Emissions Trading System (EU ETS) currently only covers intra-European flights and not – as originally planned – all outbound and inbound flights. While the sector has received 85 % of its allowances through free allocation in the past, the European Commission proposes to phase out free allocation by 2027 as part of its 'Delivering the European Green Deal' package released in July 2021 (cf. chapter 5.1). The package also foresees an increase of the linear reduction factor which caps emissions from aviation from the current factor of 2.2 % to 4.2 % annually from 2024 onwards. Additionally, the EU ETS only covers CO_2 emissions of the aviation sector but not the climate-damaging non-CO_2 effects. While the Commission acknowledges the important role of non-CO_2 effects of aviation in an explanatory memorandum as part of its July 2021 package, it does not propose any measures to tackle these effects (EC - European Commission 2021c). While the proposal would increase EU ambition to reduce aviation emissions, it still remains insufficient with regard to tackling non-CO_2 effects from aviation.

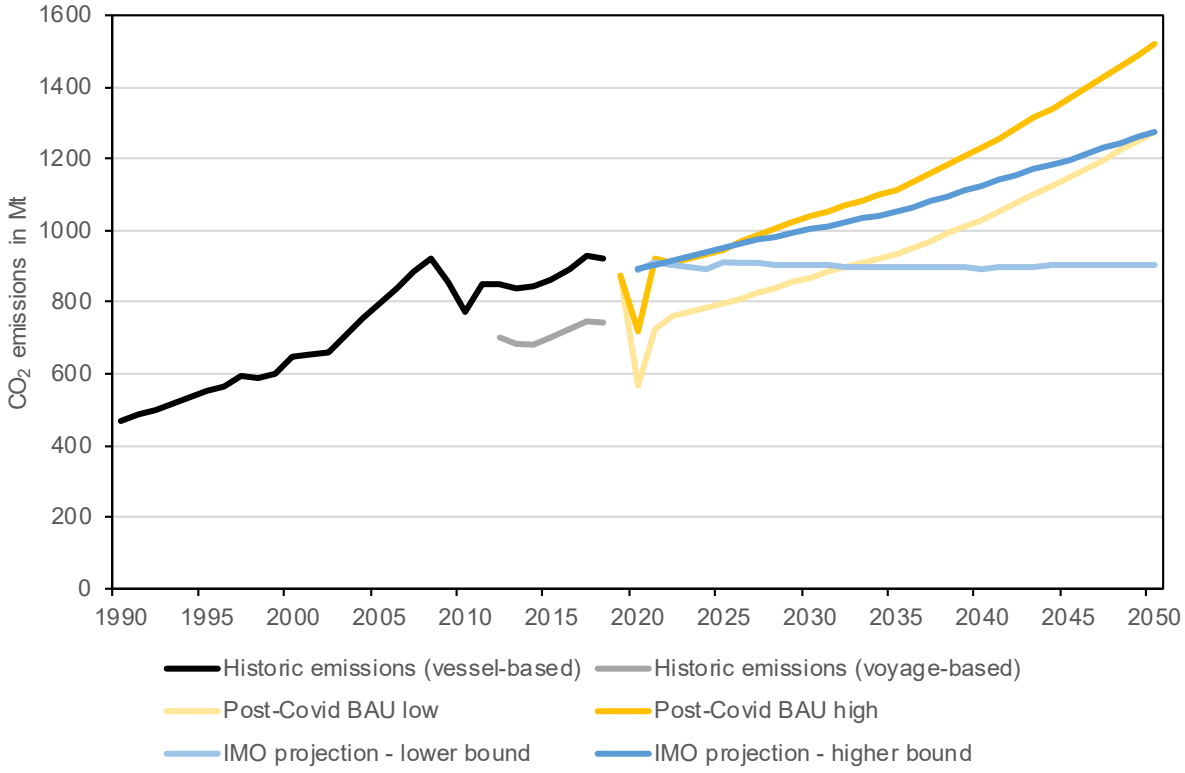
2.4.2. International maritime transport

a. Emissions from international maritime transport

In 2018, maritime transport contributed approx. 2.9 % to global greenhouse gas emissions (IMO 2020). If international maritime transport was a country, it would be ranked the 7th largest emitter of CO_2 globally (Gütschow et al. 2021a). In the EU, emissions from international maritime transport amounted to 3.9 % of its overall emissions in 2019 (EEA 2021). Although there have been improvements in energy efficiency in recent years, the rate of carbon intensity reduction has decreased since 2015 (IMO 2020). Future growth of emissions is expected because the demand for maritime transport is highly dependent on economic growth.

Figure 8 provides an overview of the CO_2 emissions development to date and a range of emission projections up to 2050. The business-as-usual (BAU) scenarios all lead to an increase in emissions in 2050 compared to today with a wide range of projected emissions in 2050 (represented by the lower and upper bound in Figure 8). International maritime transport is expected to be impacted less by the COVID-19 pandemic than aviation. Climate Action Tracker (2020c) analysed the impact of COVID-19 on BAU emissions projections of international maritime transport: the impact of the pandemic might be confined to the next few years and does not significantly change the emissions growth in the long term.

Figure 8: Historic and projected CO_2 emissions from international maritime transport



Source: Authors' own compilation based on Climate Action Tracker (2020c), IMO (2009), IMO (2014), IMO (2020).

Note: Historic emissions are based on bottom-up data from the IMO of the activity of the global fleet. The latest IMO greenhouse gas study (IMO 2020) refines the methodology by using a voyage-based approach compared to the previous vessel-based approach which decreases the share of international maritime transport of the total maritime transport. Projections are based on business-as-usual data from the IMO and an analysis of the impact of COVID-19 from Climate Action Tracker (2020c).

b. Policy instruments to mitigate emissions from maritime transport

As it is difficult to apportion shipping emissions to individual nations because shipping occurs in international waters, it is crucial that action is taken at the international level to make maritime transport compatible with the goals of the Paris Agreement. The global nature of international shipping and the large variety of stakeholders pose challenges to the decarbonisation of maritime transport.

Operational measures, e.g. the reduction of speed or speed optimisation, can have a large potential (up to 35 % CO_2 emission reduction), depending on the vessel type (Bouman et al. 2017). Technical measures like hull-form optimisation or coating can also improve the energy efficiency by up to 15 % (DNV GL 2019). However, the biggest levers are the electrification of short-sea shipping and the switch to post-fossil fuels (e.g. green ammonia or methanol) for deep-sea shipping (DNV GL 2019). A full decarbonisation of international maritime transport is only possible by deploying post-fossil fuels on a large scale and is widely acknowledged. It is not currently clear which synthetic e-fuels will be dominant in maritime transport in the future, even though long lifetimes of ships require investment decisions in the near term. Post-fossil fuels are currently very expensive and projections on future prices vary a lot (e.g. between 140 and 210 EUR per megawatt hour (MWh) (Perner et al. 2018). To incentivise a full and fast decarbonisation of the sector, an appropriate policy mix will be necessary which may include (among other things) a fuel quota, carbon pricing and subsidies for the generation of post fossil-fuels.

In 2018, IMO adopted emission reduction targets for the shipping sector in its Initial Greenhouse Gas Strategy (IMO 2018). This strategy includes the long-term goal 'to peak greenhouse gas emissions from international shipping as soon as possible and to reduce the total annual greenhouse gas emissions by at least 50 % by 2050 compared to 2008 whilst pursuing efforts towards phasing them out'. The IMO Member States also set the goal of reducing the average carbon intensity (CO_2 emissions per transport work) by at least 40 % by 2030, and 70 % by 2050, compared to 2008 (IMO 2018). EU Member States argued, however, in favour of reducing emissions to net zero by 2050.

IMO's Greenhouse Gas Strategy includes 20 candidate measures to mitigate greenhouse gas emissions from the sector. While it is planned that so-called short-term measures will be agreed by 2023, mid- and long-term measures are expected to be agreed by or beyond 2030. These measures range from technical and operational measures to increase energy efficiency (before 2023) to the development and uptake of synthetic e-fuels in the medium to long term (IMO 2018).

In recent years, IMO has adopted several policies to reduce greenhouse gas emissions from ships. The Energy Efficiency Design Index (EEDI) sets compulsory energy efficiency standards for new ships built after 2013, the Ship Energy Efficiency Management Plan (SEEMP) requires ships to develop a plan to monitor and possibly improve their energy efficiency, and the Data Collection System (DCS) requires that ships collect and report data on fuel consumption from 2019 onwards and report it to their flag state; this will allow IMO to monitor maritime greenhouse gas emissions as a basis for the development of short-, medium- and long-term policies.

In the period of 2007 to 2010, the IMO discussed market-based policies to address greenhouse gas emissions from international maritime transport, including an emissions trading system and a global greenhouse gas fund. In 2020, a new proposal to establish an International Maritime Research Board Fund was submitted to the IMO by ICS et al. (2019), which envisaged a contribution of merely USD 2 per tonne of fuel (approx. EUR 0.60 per tonne of CO_2) to finance research and development towards greenhouse gas reducing technologies. Arguably, it can be considered a weak instrument with a very low price and a short timeline. Additionally, it could delay more stringent carbon pricing policies (Wissner et al. 2021).

At its meeting in June 2021, the IMO Marine Environmental Protection Committee (MEPC76) did not reach a conclusion on this proposal and will consider it at the next meeting. MEPC76 received submissions on mid- and long-term measures for the implementation of the IMO Greenhouse Gas Strategy. Among the submissions were also documents mentioning market-based measures. For example, the Marshall and Solomon Islands proposed a levy of USD 100 USD per tonne of CO_2 from 2025 onwards.

At MEPC76, Member states adopted a work plan to develop mid- and long-term measures, and they adopted the following short-term measures which will enter into force in 2023 (IMO 2021):

- An Energy Efficiency Existing Ship Index (EEXI), which will require every ship operator to improve the technical energy efficiency of existing ships in order to catch up with a new ship of the same type and deadweight in correspondence with the applicable Energy Efficiency Design Index. The EEXI has been criticised for making a weak contribution to the 2030 goal of the IMO (e.g. Rutherford et al. 2020).
- A Carbon Intensity Indicator (CII), which rates the attained annual carbon intensity reduction measures of ships.

Thus, on an international level, there is a still a lack of stringent instruments to mitigate emissions of the sector. At EU level, effective instruments to mitigate maritime emissions have been lacking thus far. However, as part of the 'Delivering the European Green Deal' package released in July 2021, the

European Commission has proposed several measures to address these emissions. According to the proposal for amending the EU ETS, shipping would be included in the current EU ETS from 2023 onwards, with a three-year phase-in until 2026 (EC - European Commission 2021c). While this is a positive development, it comes with several caveats: small ships' emissions from international shipping and emissions from ships that do not commercially transport passengers and/or cargo would not be covered. Additionally, it is not fully clear to what extent the sector would receive free ETS allowances (EC - European Commission 2021c).

Furthermore, the Commission's July 2021 package includes a proposal for a regulation on the use of renewable and low-carbon fuels in maritime transport by setting a limit to the greenhouse gas (GHG) intensity of energy used on-board of a ship. This limit would decrease over time from 2 % below the reference value in 2025 to 75 % below the reference value in 2050 (EC - European Commission 2021d). While this proposal provides a starting point, forecasts up to 2025 indicate that the required emissions intensity in 2025 will be met with existing policies anyway. Additionally, the proposed greenhouse gas intensity limits might lead to a significant increase in fossil liquid natural gas (LNG), since methane emissions are not covered by the ETS.

Lastly, the package includes a proposal for amending the Energy Taxation Directive so that tax exemptions for 'waterborne navigation' would be abolished for intra-EU navigation but left to the discretion of Member States for extra-EU navigation from 2023 onwards. The tax base would be switched from volume to energy content while setting the tax rate for electricity, advanced biofuels, renewable hydrogen etc. to zero for 10 years (EC - European Commission 2021b). This proposal marks an important step towards ending the tax exemptions for maritime fuels, yet only within the EU. Several open questions remain, including the extent to which vessels will try to avoid the tax.

2.4.3. Addressing fluorinated gases under the Montreal Protocol

a. The importance of hydrofluorocarbons and their control under the Montreal Protocol

The Montreal Protocol initially regulated ozone depleting substances:

- Chlorofluorocarbons (CFCs) which were banned under the Montreal Protocol by all countries by 2010; and
- Hydrochlorofluorocarbons (HCFCs) with a full global phase out by 2040.

With the phase-out of CFCs and HCFCs, increasingly hydrofluorocarbons (HFCs) penetrated the market as a replacement substance. HFCs are not ozone-depleting but have a significant climate warming potential. With the successful regulation of CFCs and HCFCs through the Montreal Protocol, Parties adopted the Kigali Amendment in 2016 (UNEP 2016). Under the Kigali Amendment, HFCs will be phased down to a large extent by a group of developed countries by 2036 and by developing countries, grouped in two clusters, by 2045 and 2047[2].

The efficient implementation of the Kigali Amendment, which controls the production and the consumption of HFCs, has been projected to reduce global average warming by 0.2-0.4°C in 2100 compared with the baseline (WMO 2018). Analyses of Working Group I of the Intergovernmental Panel on Climate Change (IPCC) estimate a residual warming of HFCs of about 0.1–0.3°C in 2100, with most scenarios estimating a residual warming of below 0.1°C (IPCC 2021).

[2] The Kigali Amendment has different phase-down schedules. For developed countries the phase-down of HFCs started in 2019 with a reduction of the HFCs to 15 % of the 2012 consumption level by the year 2036. For the Group 1 of the developing countries ('Non-Annex 5 countries') HFCs consumption will decrease to 20 % of the 2020-2021 baseline year of HFC and HCFC consumption by the year 2045. For Group 2 (Countries with hottest climatic conditions), the phase-down will reduce to 15 % of 2024-26 HFC consumption levels by the year 2047.

The replacement refrigerants to HFCs are either hydrofluoroolefins (HFO), which do not naturally occur in the atmosphere, or natural refrigerants, e.g., substances like carbon dioxide, propane, ammonia or water, which naturally occur in the atmosphere. There is a current investigation of the European Chemicals Agency on the environmental impact of HFOs as chemicals. The environmental impacts of natural refrigerants are significantly less harmful than the impacts of HFOs.

b. Kigali Amendment complementing climate actions under the Paris Agreement

The Kigali Amendment supplements the Paris Agreement by regulating HFCs as a specific group of greenhouse gases with a set of features which were effectively applied under the Montreal Protocol for controlling ozone depleting substances:

- A legally binding agreement with a non-compliance sanctions mechanism to ensure its implementation;
- an effective institutional set-up with regular Meetings of the Parties (MOP) and Open-Ended Working Group (OEWG) meetings, the Multilateral Fund with funding provided by developed countries, and the network of Ozone Units as national coordination agencies; and
- different targets and phase down schedules for countries depending on the status of development, following the principles of 'Common but Differentiated Responsibilities and Respective Capabilities' (CBDR/RC).

It is being debated whether the role and mandate of the Montreal Protocol should be extended so that it not only controls HFCs but also the energy efficiency of the targeted appliances. Most HFCs are used as refrigerants in heating and cooling appliances. For new appliances, the change of refrigerants requires the re-design of appliances and their production lines. Therefore, the change from HFCs to low global warming potential (GWP) alternatives provides the opportunity and synergies for simultaneously changing to appliances with energy efficiency improvements (Shah et al. 2015). The Energy Efficiency Task Force of the Technical Assessment Panel of the Montreal Protocol reported that synergies with energy efficiency during the HFC phase-down will significantly increase the climate benefits; the use of best available technologies could result in emission savings between 130 and 260 gigatons CO_2 equivalent (Gt CO_2eq) accumulated over the period 2030-2050 with 25 % resulting from the transition to low GWP refrigerants and 75 % through energy savings of highly energy-efficient appliances.

Expanding the Montreal Protocol and its Kigali Amendment to include the energy efficiency of the targeted appliances would build on its effective implementation mechanisms and could also strengthen the implementation of the Paris Agreement, e.g. by further extending the effective tools of the Montreal Protocol including its compliance mechanisms. The United States, so far, has reacted positively towards further integrating energy efficiency aspects for refrigeration, air conditioning and heat pump appliances under the Montreal Protocol and the Kigali Amendment. It would be particularly beneficial for an expanded Montreal Protocol and Kigali Amendment to supplement the Paris Agreement since the current round of NDCs does not put the world on a pathway to limiting temperature in line with the goals of the Paris Agreement.

As of 17 September 2021, 125 Parties have ratified the Kigali Amendment, including the European Union, China and India (UNEP 2021). The US has not ratified the amendment yet but announced in April 2021 that it would do so.

The main instrument for addressing emissions of fluorinated gases (F-gases) at the EU level has already been in place for several years. The F-gas Regulation (EU 2014) limits the amount of F-gases that can be put on the marked within the EU, prohibits to use of certain F-gases and includes requirements to

detect and prevent leaks. This regulation, together with a separate directive addressing fluorinated gases used in mobile air condition, helped reverse the trend of growing F-gas emissions in recent years – these emissions have been decreasing after a peak in 2014 (EEA 2021). The F-gas Regulation is currently under review and the European Commission is expected to provide a proposal for a new regulation by the end of 2021.

3. STATUS OF NEGOTIATIONS AND MAIN ISSUES AT STAKE AT COP26

Following the two-year pause in negotiations, the agenda of the Glasgow conference is full. A wide range of topics are listed on the agendas of the bodies under the Convention (COP, SBI and SBSTA), under the Kyoto Protocol (CMP) and under the Paris Agreement (CMA)[3] . Not all agenda items are of equal importance, and some may not be negotiated in Glasgow but considered at the conference in 2022.

In the following, the status of negotiations is structured according to the following main topics:

- Increasing mitigation ambition under Article 4 of the Paris Agreement (chapter 3.1);
- voluntary cooperation under Article 6 of the Paris Agreement (chapter 3.2);
- adaptation under Article 7 of the Paris Agreement (chapter 3.3);
- loss and damage under Article 8 of the Paris Agreement (chapter 3.4);
- support to developing countries under Articles 9 to 11 of the Paris Agreement (chapter 3.5);
- transparency under Article 13 of the Paris Agreement (chapter 3.6); and
- other topics in recent negotiations, such as agriculture, gender, research, and others (chapter 3.7).

Finally, an overview of international climate action initiatives is provided, which will feature in several events during the COP in Glasgow (chapter 3.8).

3.1. Increasing mitigation ambition

At COP26 in Glasgow, the topic of increasing ambition, particularly in the area of mitigation of greenhouse gas emissions, will be centre stage. This is because according to Article 4 of the Paris Agreement, each Party has to prepare, communicate every five years and maintain successive NDCs, and Parties were required to communicated new or updated NDCs by 2020. In addition, current projected pathways of global emissions are far from being in line with meeting the temperature goal of the Paris Agreement (cf. Figure 3 in chapter), and civil society representative are urging governments to step up their ambition.

According to Article 4 of the Paris Agreement, each new NDC is to represent a progression in comparison to the current NDC and to represent the highest possible ambition. Parties are also obliged to pursue domestic mitigation measures to achieve the objectives they have established in their contributions.

However, the new or updated NDCs submitted in 2020 and 2021 fall severely short of the level of ambition required in order to limit global warming to 1.5°C and to meet the goals of the Paris Agreement. A continued lack of ambition may negatively affect the negotiations. It may limit the willingness of Parties to increase their ambition if others are not moving into the same direction. As a result, the ambition cycle built into the Paris Agreement will not be able to take full effect (see e.g. Milkoreit and Haapala 2019; Hermwille et al. 2019; Müller and Ngwadla 2016). Observing that other

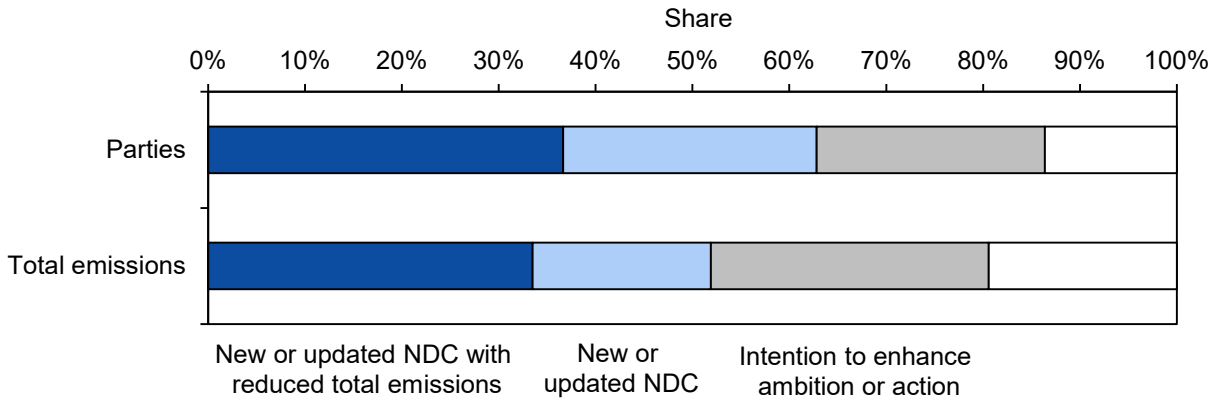
[3] The provisional agendas can be found at the conference main page: https://unfccc.int/process-and-meetings/conferences/glasgow-climate-change-conference.

countries are not raising the ambition of their NDCs may also undermine trust that other Parties remain committed to the goals of the Paris Agreement and may obstruct the negotiation process.

3.1.1. Status of communicated NDCs

In the COP decision accompanying the Paris Agreement, those Parties whose NDCs contained a time frame up to 2025 were requested to communicate by 2020 a new NDC and to do so every five years thereafter. Those Parties whose NDC contained a time frame up to 2030 were requested to communicate or update their NDC in 2020. By the end of 2020, only 75 of the then 190 Parties to the Paris Agreement had communicated a new or updated NDC. Additional NDCs followed in 2021, and by 17 September 2021, 117 Parties have communicated a new or updated NDC, covering slightly more than half of global greenhouse gas emissions (Climate Watch 2021b). The delay in NDC submissions can be explained, inter alia, by difficulties in government planning during the COVID-19 pandemic, and by the fact that no COP took place in 2020, at which NDC submissions would have been addressed. Figure 9 shows the status of NDCs communicated by September 2021.

Figure 9: Status of communicated NDCs



Source: Climatewatch, https://www.climatewatchdata.org/2020-ndc-tracker, NDCs are available at https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx.
Note: NCDs communicated by 1 October 2021 are covered.

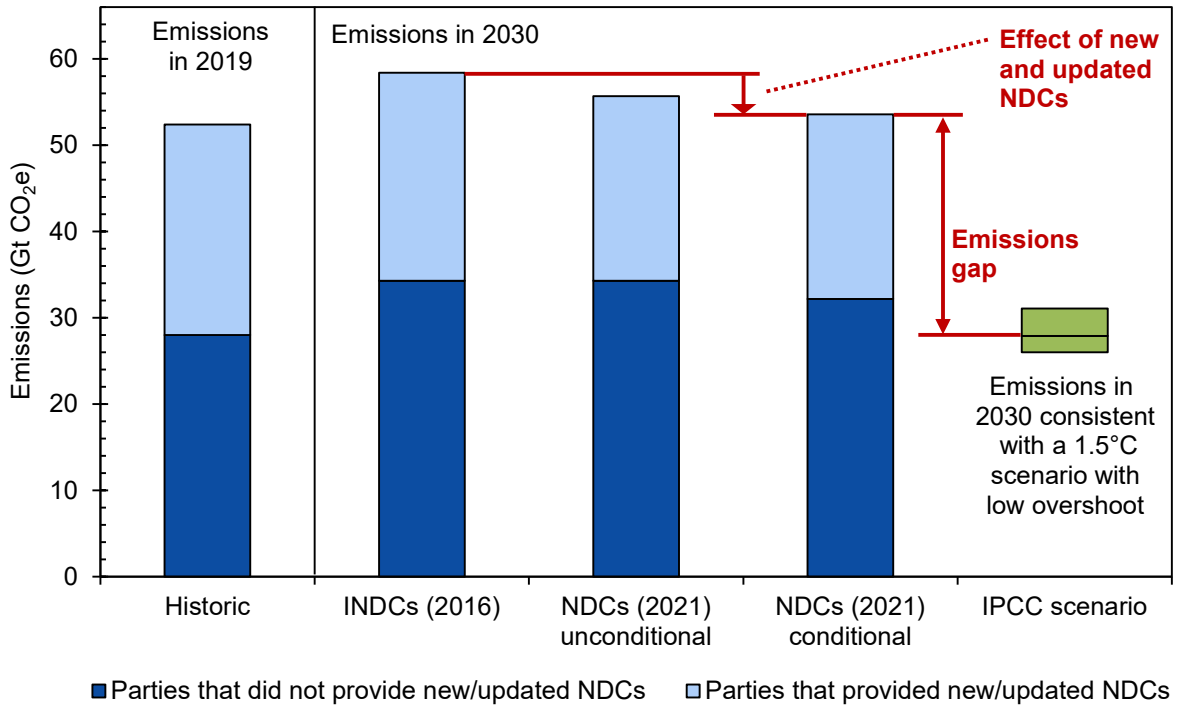
As shown in the figure, only a minority of Parties communicated NDCs with more ambitious emission reduction targets. Several other Parties updated their NDCs but did not tighten their targets. The lack of NDC submissions with more ambitious mitigation targets is in sharp contrast with the principle of the Paris Agreement that successive NDCs shall represent a progression beyond the Parties' previous NDCs, and it further impedes the efforts of the global community to meet the temperature goal of the Paris Agreement.

Just how limited the overall increase of mitigation ambition in the new NDCs is can be seen in the results of the NDC synthesis report, which was published by the UNFCCC Secretariat in mid-September 2021 (UNFCCC 2021f). Figure 10 shows the historic greenhouse gas emissions in 2019, which amount to approx. 52 Gt CO_2eq. These emissions are projected to increase by 2030 as follows: Assuming that the targets of the original NDCs are met (to be precise, the targets of the INDCs submitted by April 2016), emissions in 2030 would be considerably higher at 58.5 Gt CO_2eq (second column in the figure). This increase in emissions mainly happens in those countries that did not communicate a new or updated NDC.

If the new and updated NDCs submitted by the end of July 2021 are taken into account, emissions are projected to reach 55.7 Gt CO_2eq (third column) and 53.6 Gt CO_2eq (fourth column – here it is assumed

that all conditional targets are met). Hence, based on the NDCs available for this analysis, greenhouse gas emissions in 2030 would still be above 2019 levels and they would be approx. twice as high as emissions compatible with a 1.5°C scenario, as shown by the green bar in the figure. This result of the UNFCCC Secretariat's synthesis report clearly shows the large remaining emissions gap to meet to temperature goal of the Paris Agreement.

Figure 10: Projected greenhouse gas emissions based on NDC targets



Source: UNFCCC (2021f).

Note: NDCs communicated by 30 July 2021 are covered. Total greenhouse gas emissions in 2019 are based on Gütschow et al. (2021b). The emissions scenario is based on IPCC (2018). Emissions and removals from the LULUCF sector are not included.

It should be noted that several Parties who did not submit a new or updated NDC communicated their intention to enhance climate action or ambition, with several planning to do so ahead of the COP in Glasgow. Hence, the status of NDCs will remain dynamic and may change ahead of the COP.

Large emitters, such as the members of the Group of Twenty (G20), play a particularly important role in closing the emissions gap. Table 2 provides an overview of the NDCs communicated by G20 members. More information on the targets and climate policies of each G20 member is provided in chapter 5.

Table 2: NDCs communicated by G20 members by the end of September 2021

Member	NDC submitted	Increased mitigation ambition	Type of mitigation target
Argentina	Second NDC	Yes	Economy-wide emissions cap
Australia	Updated NDC	No	Economy-wide emissions reduction target
Brazil	Updated NDC	No	Economy-wide emissions reduction target
Canada	Updated NDC	Yes	Economy-wide emissions reduction target
China	No new or updated NDC, but increase in ambition announced		
European Union	Updated NDC	Yes	Economy-wide emissions reduction target
India	No new or updated NDC		
Indonesia	Updated NDC	No	Emissions reduction compared to a business-as-usual scenario
Japan	Updated NDC	No, but increase in ambition announced	Economy-wide emissions reduction target
Mexico	Updated NDC	No	Emissions reduction compared to a business-as-usual scenario
Republic of Korea	Updated NDC	No, but increase in ambition announced	Economy-wide emissions reduction target
Russian Federation	Updated NDC	No	Economy-wide emissions reduction target
Saudi Arabia	No new or updated NDC		
South Africa	Updated NDC	Yes	Economy-wide emissions reduction target
Turkey	Not a Party to the Paris Agreement, hence no NDC submitted Steps towards ratification of the Paris Agreement are underway		
United Kingdom	Updated NDC	Yes	Economy-wide emissions reduction target
United States	First NDC (2021)	Yes (compared to NDC of 2016)	Economy-wide emissions reduction target

Source: Climatewatch, https://www.climatewatchdata.org/2020-ndc-tracker.

Note: More information on the NDCs and announcements of each G20 member can be found in chapter 5. The EU Member States France, Germany and Italy are G20 members, but are not listed in this table. The EU NDC applies to the EU and its Member States.

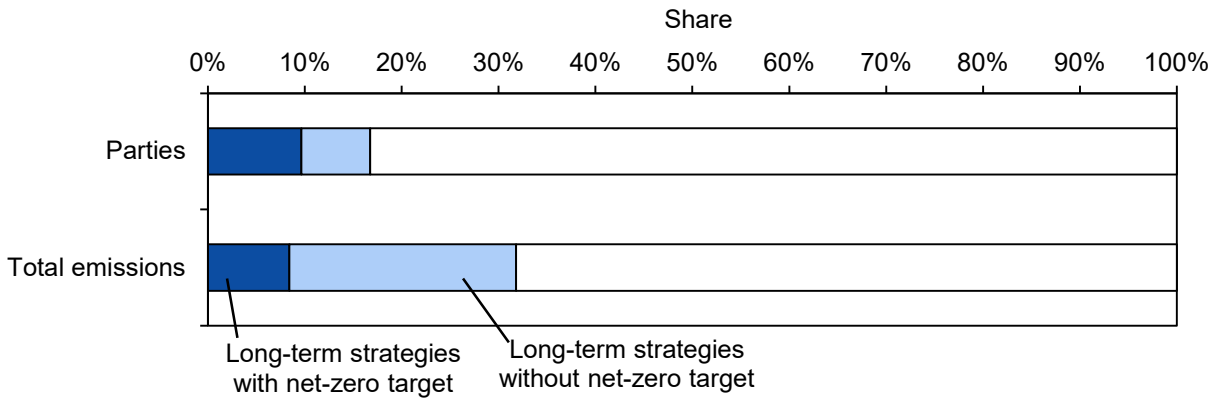
Of all G20 members, only Argentina, Canada, the EU (including its Member States), South Africa, the United Kingdom and the United States have submitted an NDC with a more ambitious mitigation

target compared to their original NDC submission. While some countries announced that they intend to submit a more ambitious NDC later in 2021, it is important to note that several G20 members submitted an NDC which does not constitute an increase in mitigation ambition compared to their first NDC. The fact that only a minority of G20 members submitted NDCs with increased mitigation ambition illustrates the gaps in commitments made so far by many large emitters and the urgency of additional action.

3.1.2. Long-term strategies and climate neutrality

According to Article 4 of the Paris Agreement, all Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies. The COP in Paris invited Parties to communicate, by 2020, such strategies with a mid-century time horizon. Figure 11 provides an overview of the long-term strategies communicated to date.

Figure 11: Status of communicated long-term strategies



Source: Climatewatch, https://www.climatewatchdata.org/lts-explore, Long-term strategies are available at https://unfccc.int/process/the-paris-agreement/long-term-strategies.
Note: Long-term strategies communicated by 1 October 2021 are covered.

Figure 11 shows that relatively few Parties submitted a long-term strategy and only some included a 'net zero' target. The EU is among these Parties, and several EU Member States communicated their own long-term strategy (cf. chapter 5.1). While net-zero targets have been communicated by relatively few countries, they are under discussion in many more. According to a compilation by the Energy & Climate Intelligence Unit (Energy & Climate Intelligence Unit 2021b) net zero emissions have been achieved in two countries (Suriname and Bhutan), they are enshrined in law in 11 countries and in the EU, and they are contained in proposed legislation in four countries, in policy documents in 37 countries and under discussion in more than 70 countries.

The term 'net-zero' is used to denote that anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period (IPCC 2018). Some net-zero targets do not include all greenhouse gases, but rather aim to balance CO_2 emissions and removals only. Such targets are sometimes referred to as carbon 'neutrality targets'.

'Climate neutrality' refers to a 'state in which human activities result in no net effect on the climate system' (IPCC 2018) and requires the balancing of all greenhouse gas emission by the removal of CO_2 from the atmosphere.

As some emissions of greenhouse gases will be inevitable in the long term, reliable ways of removing of CO_2 from the atmosphere are needed in order to achieve climate neutrality. Table 3 provides a brief overview of the main approaches for removing CO_2 from the atmosphere.

Table 3: Approaches for removing CO_2 from the atmosphere

Approach	Description	Main challenges
CO_2 removal by the land sector	CO_2 is taken up by plants and carbon is stored in biomass (e.g. forests) and soils	Demand for land Competition with food production Non-permanence of the carbon pool
Biochar	Produced by pyrolyzing biomass and used as soil amendment	Demand for land Competition with food production Residence times between decades to centuries Reduction of albedo
Bio energy and carbon capture and storage (BECCS)	Biomass is combusted for energy use, and the resulting CO_2 is captured and stored permanently	Demand for land Competition with food production Safety concerns with long-term CO_2 storage
Direct air carbon capture and storage (DACCS)	CO_2 is captured from the air and stored permanently	High energy demand Safety concerns with long-term CO_2 storage
Enhanced weathering	Grinding of natural or artificially created CO_2 absorbing minerals (e.g. concrete) and spreading on land or ocean	Increase in water pH Changes in hydrological soil properties Ocean alkalinisation

Source: IPCC (2018), summary by the authors.

With all approaches, it is important that CO_2 is removed from the atmosphere permanently and not re-emitted later. Hence, for CO_2 removed by the land sector, precautions must be taken so that it is not emitted, for example, in the course of land use change including deforestation or through wildfires. CO_2 removed by carbon capture technologies must not be used and emitted later, but must be stored safely in the long term, e.g. in geological storage sites.

3.1.3. Preparation for the global stocktake

As discussed in chapter 2.3.3, the implementation of the NDCs is critical for the progress towards achieving the goals of the Paris Agreement, and this collective progress will be assessed regularly during the global stocktake. As the first global stocktake will be completed by 2023, preparations have already begun and will be a topic of interest in Glasgow.

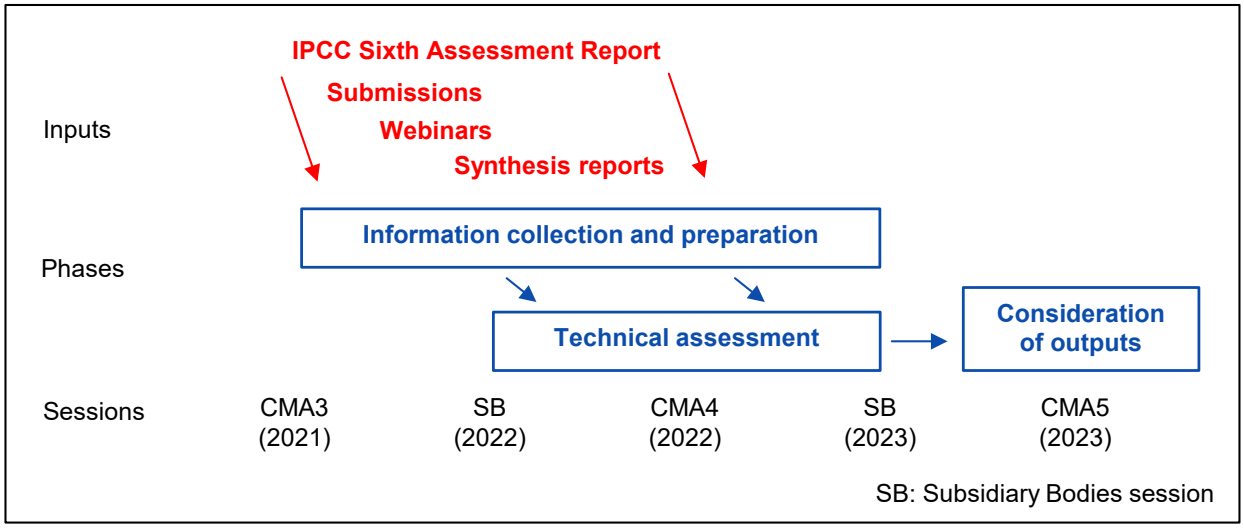
The SBSTA agenda features an item on the 'sources of input for the global stocktake under the Paris Agreement'. In the May/June 2021 session of the SBSTA, Parties found the list of sources of information for the global stocktake, which had been agreed in Katowice (UNFCCC 2018b) to be sufficiently complete[4]. These sources of input include information on greenhouse gas emissions and removals, adaptation efforts and finance flows as reported by Parties according to their obligations under the transparency framework and the latest reports of the Intergovernmental Panel on Climate Change as well as relevant reports from the UN and UNFCCC process.

[4] Informal note by the SBSTA chair: https://unfccc.int/documents/279052.

At the conference in Glasgow, it can be expected that Parties will focus their discussions on the guiding questions for the global stocktake. First discussions on such guiding questions took place in June 2021 (Mpanu Mpanu 2021). Representatives from developing countries called for priority issues such as equity and adaptation to be addressed, while developed countries suggested that guiding questions related to the 'finance flows' goal and questions relating to the temperature and adaptation goals should be handled equally.

In September 2021, an updated list of guiding questions was provided (Mpanu Mpanu and Karlsen 2021). These questions cover the thematic areas of mitigation; adaptation; means of implementation and support; and cross-cutting topics. They are intended to support the information collection and preparation phase, which starts at the COP in Glasgow and will continue throughout 2022 and parts of 2023 (Figure 12). It makes use of inputs such as the reports from the IPCC, submissions by Parties and observers, and synthesis reports prepared by the UNFCCC secretariat. The collected information will feed into the technical assessment and ultimately into the political phase, the consideration of outputs during the climate change conference in 2023.

Figure 12: Simplified timeline for the first global stocktake



Source: Based on UNFCCC (2018b); Mpanu Mpanu and Karlsen (2021).

3.1.4. Common time frames of NDCs

The Paris Agreement requires Parties to communicate an NDC every five years (Article 4.9). In the COP decision accompanying the Paris Agreement, the COP requested Parties with a five-year NDC (ending in 2025) to communicate a new NDC by 2020 and requested Parties with a ten-year NDC (ending in 2030) to communicate or update their NDC by 2020. In both cases Parties were requested to repeat this action five years thereafter. The Paris COP thereby provided a clear timing for the procedure of communication, but did not specify the time frame, i.e. the duration of NDCs (Winkler 2017).

The time frame was left open to accommodate the variety of NDCs put forward in 2015. The majority of first NDCs included a time frame up to 2030, while from the perspective of increasing ambition, the Paris Agreement timed the communication of NDCs and the global stocktake every five years. In Paris, Parties gave the mandate to 'consider common time frames' as part of the Paris Agreement Work Programme, and at the Climate Change Conference in Katowice in 2018 Parties agreed that common time frames shall apply starting in 2031, but did not specify their duration.

The issue of common time frames for NDCs is related to the progression of ambition of NDCs. Article 4.3 of the Paris Agreement specifies that each successive NDC 'will represent a progression beyond the Party's current NDC'. Under the current arrangement, some Parties with five-year NDCs have communicated new and more ambitious NDCs in 2020 or 2021, while in other cases the updated NDC contains a reduced level of ambition or a new NDC has not been communicated (cf. section 3.1.1). Some Parties with ten-year NDCs have updated their NDCs and increased ambition, while many have not yet updated their NDCs. This situation serves to illustrate the ambiguity contained in the Paris Agreement around progression of NDCs, which many argue could be reduced with a common time frame that leads to regular increases in ambition every five years.

In the May/June 2021 session of the subsidiary bodies, Parties continued the discussion on common time frames. All the options currently on the table were summarised in an informal note prepared by the chair of the SBI[5]. In general terms, the options range from a single five-year or a single ten-year common time frame for all Parties, to a continuation of the current arrangement until 2040 or beyond, or a time frame composed of two five-year parts. Many ambitious countries call for five-year common time frames in order to allow for a complete update of targets every five years. Others point out that a ten-year time frame (including updates after five years) facilitates planning and administration. The question of five- vs. ten-year time frames is also under discussion within the EU, as it has a ten-year climate and energy framework in place. It should be noted that in the event of a ten-year common time frame, Parties still have to communicate a NDC every five years.

In the discussions under the SBI, some developing country Parties introduced elements of differentiation (i.e. flexibility for developing country Parties) to the discussion of common time frames. This is not in line with the Paris Agreement, which includes no wording related to differentiation in Articles 4.2. or 4.9. Likewise, options referencing adaptation or finance are beyond the scope of Article 4, which focuses on mitigation.

3.1.5. NDC registry

The Paris Agreement established that NDCs shall be recorded in a public registry hosted by the Secretariat. The development of modalities and procedures for the operation of this registry were part of the PAWP and an interim registry[6] was made available in 2016. In Katowice, Parties agreed to establish a public registry portal, which will have one part to host NDCs and a second part to host the adaptation communications (cf. chapter 3.3). At COP25, Parties were not able to conclude their deliberations on the registry portal, so the issue will be discussed again at COP26.

3.2. Voluntary cooperation under Article 6 of the Paris Agreement

International rules for Article 6 were the only major part of the PAWP that remained incomplete at COP24 in Katowice in 2018. A year later, at COP25 in Madrid, Parties came much closer to an agreement but also failed to reach a consensus. Thus, negotiations on Article 6 will be of great political interest in Glasgow.

Article 6 of the Paris Agreement includes three distinct approaches for Parties to pursue 'voluntary cooperation in the implementation of their NDCs to allow for higher ambition in their mitigation and adaptation actions' (Article 6.1). Two approaches are market-based approaches, entailing the international transfer of emission reductions, and one is a non-market approach that does not foresee such transfers (see Table 2). Article 6.2 establishes a framework for countries to count the international

[5] The informal note is available at https://unfccc.int/documents/279077.

[6] An interim NDC registry is available until the registry portal is finalised: https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx.

transfer of emission reductions towards their NDCs. Article 6.4 establishes a new carbon crediting mechanism under international oversight, which is commonly viewed as a successor to the Kyoto Protocol's Clean Development Mechanism (CDM). One of the main distinctions between these two approaches is governance. The international transfer of emission reductions under Article 6.2 is implemented under the responsibility of the participating Parties and foresees only limited international oversight, while the new mechanism established by Article 6.4 is implemented under the oversight of an international supervisory body and the CMA. Article 6.8 establishes a framework for using non-market-based approaches, an approach requested by Parties that are generally against the use of markets.

Table 4: Summary of Article 6 approaches

Approach	Main features/characteristics of each approach as defined in Article 6 and Decision 1/CP.21
6.2. Cooperative approaches	• Countries can use Internationally Transferred Mitigation Outcomes (ITMOs) to achieve their NDC; • when cooperating, Parties shall: promote sustainable development and environmental integrity; ensure transparency, including in governance; and apply robust accounting and avoid double counting; transfers of IMTOs between Parties are implemented through corresponding adjustments to their emissions; • use of ITMOs for achieving an NDC requires authorisation by the cooperating Parties.
6.4. Mechanism under CMA authority	• The mechanism is established to contribute to the mitigation of greenhouse gas emissions and support sustainable development; • the mechanism stands under the authority of the CMA and is supervised by a body designated by the CMA; • participation is voluntary; • participating entities (public or private) require Party authorisation; • the mechanism aims to deliver overall mitigation in global emissions; • a share of proceeds from activities will be levied to cover administrative expenses and support adaptation actions in developing countries.
6.8. Framework for non-market approaches	• The framework promotes integrated, holistic and balanced non-market approaches that assist Parties in NDC implementation; • the context of the framework is sustainable development and poverty eradication; • the approaches aim to promote mitigation and adaptation ambition, enhance participation and enable coordination.

Source: Authors elaboration.

At COP25 in Madrid, significant progress could be made on some technical aspects. However, three policy matters were particularly contentious and will also be a focus in the negotiations at COP26:

- Avoiding double counting;
- a share of proceeds for adaptation; and
- transition from the CDM.

These issues are summarised below, followed by a summary of other issues of importance for the negotiations.

3.2.1. Avoiding double counting

Double counting means that the same emission reduction is counted more than once to achieve NDCs or other climate goals. It presents a serious risk to the integrity of international carbon markets. If not prevented, actual greenhouse gas emissions could end up being higher than the aggregated achievement reported by countries participating in the carbon market.

However, Parties disagree on the extent to which a robust accounting system for the international transfers of emission reductions to prevent double counting should be established for cooperative approaches under the Paris Agreement. Guidance for accounting for such international transfers is currently being negotiated under Article 6.2. Under the Paris Agreement, double counting is avoided through a form of double-entry bookkeeping, referred to as 'corresponding adjustments'. As with bank transfers, an entry in the form of an addition in one account requires a corresponding, opposite entry of a subtraction in another account. The country selling emission reductions makes an addition to its emission level, and the country acquiring and using the emission reductions makes a subtraction. All countries prepare an emissions balance in which the country's target level is compared with its emissions, adjusted for any international transfers of mitigation outcomes. This ensures that the acquiring country can count the transferred emission reductions towards its mitigation target, while the transferring seller country cannot count them any longer (Schneider et al. 2019a).

However, Brazil, supported by some other countries, proposes that seller countries should not have to apply corresponding adjustments if the emission reductions are generated under the new crediting mechanism established by Article 6.4 of the Paris Agreement. Brazil argues that the requirement that emission reductions from the mechanism must be additional obviates the need for corresponding adjustments by seller countries because it ensures that the emission reductions go beyond the climate action which the country would pursue to achieve its NDC. This would entail implementation of accounting similar to the Kyoto Protocol where only developed countries have climate mitigation targets, with the result that there would be no need for developing countries to account for transfers of emission reductions. However, it could result in double counting in the new context of the Paris Agreement, under which all countries have pledged NDCs. The EU and most other countries have, therefore, taken the position that corresponding adjustments must be applied by both selling and acquiring countries for the new mechanism established by Article 6.4. Disagreement over this matter was central to the failure of the attempt to reach a consensus at COP24 and COP25 (Schneider et al. 2019a). Since COP25, no significant progress has been made on this topic. Brazil still holds the same view.

Double counting of emission reductions could also occur between ICAO's Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and NDCs (cf. chapter 2.4.1). Under ICAO, countries have formally agreed that double counting between countries' mitigation targets and ICAO's aviation scheme should be avoided (ICAO 2016). Yet under the Paris Agreement, Saudi Arabia and a few other countries have taken the position that international rules under Article 6 should not address such double counting, arguing that Article 6 only refers to transfers of emission reductions to achieve Paris targets, but not transfers to airlines, and that ICAO and the Paris Agreement are independent treaties. Without a requirement for countries to apply corresponding adjustments for emission reductions sold to the aviation industry, however, there is a risk that these reductions are double counted: once by the selling countries to achieve their Paris targets and once by airlines to achieve their obligations under ICAO. Failure to resolve this matter could undermine the integrity of CORSIA (Schneider et al. 2019a). The draft negotiation text from Madrid[7] addresses this issue by clarifying that

[7] Draft negotiating text: Guidance on cooperative approaches (Article 6.2): https://unfccc.int/event/sbsta-51#eq-30.

the guidance also covers 'international mitigation purposes other than achievement of its NDC or for other purposes'. The draft negotiation text would allow countries to authorise the use of Article 6 emission reductions for other purposes, including CORSIA or the voluntary carbon market. This would allow countries to avoid entities in the voluntary carbon market claiming the same emission reductions as countries under the Paris Agreement, which had caused controversy in various fora outside the negotiations under the Paris Agreement as well (Fearnehough et al. 2020; Kreibich and Obergassel 2019; Taskforce on scaling voluntary carbon markets 2021).

Avoiding double counting is also challenging because countries communicated very diverse NDCs, including different types of targets, different coverage of gases or sectors and different target time frames. This makes accounting for transfers of carbon market units technically complex.

A key challenge is that many countries have targets for a single year only (e.g. 2030). This could undermine environmental integrity in various ways, for example, if the seller country only accounted for transfers that occurred in its target year (e.g. 2030). The draft negotiation text on Article 6.2 guidance foresees two approaches to address this matter: (1) averaging, which means that countries accounted in the target year for the average number of emission reductions they transferred or acquired over the entire NDC implementation period, and (2) multi-year approaches, under which countries would either adopt multi-year targets or define multi-year trajectories for accounting purposes. The negotiation text, however, allows each country to select among these two approaches. This can lead to higher or lower aggregated emissions, depending on the specific situation of the country. As countries can pick and choose an approach, there is a risk that environmental integrity could be undermined.

There is also debate about whether, and under what conditions, countries should be allowed to sell emission reductions of greenhouse gases or from economic sectors which they have not included in their targets under the Paris Agreement. China, for example, has a target for CO_2 but not for other greenhouse gases. If the country sold emission reductions from a project that captures methane from landfills, it would not lead to double counting because only the buying country would use the emission reductions to achieve its NDC, and corresponding adjustments would thus not be necessary on the part of transferring seller countries. However, allowing such transfers without adjustments by seller countries could create a disincentive for them to include more sectors and greenhouse gases in their future targets, because doing so would compel them to make adjustments whenever they wish to sell such emission reductions (Schneider et al. 2020; Schneider et al. 2019a).

To address this concern, the draft Article 6.2 guidance from Madrid establishes that seller countries should apply corresponding adjustments for all transfers, regardless of whether the emission reductions occur within or outside the scope of their Paris targets. This creates incentives for seller countries to expand the scope of their targets and makes accounting simpler as it avoids the need to determine whether emission reductions occur inside or outside the scope of their targets, which can be challenging for some activities (Schneider et al. 2020). However, such an approach makes it more difficult to use international carbon markets for reducing emissions that occur outside the scope of Paris targets. This is because the country would need to make an adjustment to the emissions covered by its NDC but only observe emission reductions from sectors or gases that are not covered by its NDC. In the above example of a landfill gas capture project in China, the country would need to make an addition to its reported CO_2 emissions (which are covered by the NDC), while it would observe a reduction in its methane emissions (which are not covered by its NDC). The draft negotiation text on the Article 6.4 mechanism includes possible exemptions for applying corresponding adjustments if the emission reductions are not covered by the NDC. The exemptions are formulated in ambiguous ways and may also cover emissions from sectors or gases that are actually covered. The formulation of any

exemptions from applying corresponding adjustments under the Article 6.4 mechanism will thus be a source of dispute in the Glasgow negotiations.

Overall, robust accounting and environmental integrity of international carbon market mechanisms would be greatly facilitated if all countries moved towards targets that are expressed in terms of absolute greenhouse gas emission levels, included the entire economy and all greenhouse gases, were ambitious, and applied to continuous multi-year periods.

3.2.2. A share of proceeds for adaptation

Article 6.6 of the Paris Agreement establishes that a 'share of proceeds' from activities implemented under the Article 6.4 mechanism shall be used to assist developing countries to meet the costs of adaptation, in a similar way to the CDM where a fraction of its certified emission reductions (CERs) is forwarded to the Adaptation Fund. Many developing countries propose that this principle should not only apply to emission reductions generated under the Article 6.4 mechanism, but also to any bilateral cooperation under Article 6.2. A key argument is that this would not only generate more revenues for adaptation but also create a level playing field between different carbon market mechanisms. Most developed countries, including the EU, do not want to extend this principle to Article 6.2 cooperation, as they fear that it could hinder such cooperation, e.g. the linking of the EU's and the Swiss emissions trading systems. Along with the applicability of a share of proceeds, the amount of the levy is also a controversial issue.

3.2.3. Transition from the CDM

Another major policy controversy is whether and how the CDM should be migrated to the Paris Agreement. The main debate is about whether CERs generated in the period up to 2020 could be used to achieve NDCs after 2020. Brazil and India strongly argue for allowing such units to be used to achieve NDCs, stating that this provides for continuity, whereas many other countries are against such banking, arguing that it dilutes ambition under the Paris Agreement if emissions reductions achieved in years prior to the start of the Paris Agreement can be accounted to achieve NDCs. A possible compromise considered at COP25 in Madrid would be to establish limits on how many CERs may be used after 2020. The main proposal is that only CERs from projects registered after a certain date (e.g. 2013 or 2016) are eligible for use after 2020, whereas for CORSIA, ICAO has used the start of the first crediting period of registered CERs as a cut-off date (cf. chapter 2.4.1). Both the cut-off date and the type of restriction have significant implications for the number of CERs that would be eligible.

Besides the use of CERs after 2020, there is a broader debate about the transition from the Kyoto Protocol's carbon market mechanisms to the Paris Agreement era. Under the CDM, new requests for registering projects or issuing CERs have been put on hold, given that the second commitment period of the Kyoto Protocol ended on 31 December 2020. Parties need to decide in Glasgow whether, and under what conditions, CDM projects may transition to the new Article 6.4 mechanism, and whether and how the CDM should operate in the future.

3.2.4. Other matters

The Paris Agreement establishes that the new Article 6.4 mechanism should lead to an 'overall mitigation in global emissions'. There is no common view on what this exactly means. One interpretation, supported in particular by members of the Association of Small Island States (AOSIS), is that a portion of the mitigation should be neither used by the seller nor by the buyer country to achieve their NDCs but as a benefit for the atmosphere. Other countries, such as the Umbrella Group, take the position that this principle does not need to be further operationalised since carbon markets can help raise ambition by lowering the costs of mitigating climate change. They argue that the mechanism

established by Article 6.4 should rather set ambitious baselines to achieve this goal. As with the share of proceeds for adaptation, there is also debate about whether this principle should only apply to emission reductions generated under the Article 6.4 mechanism or also apply to bilateral carbon market approaches under Article 6.2. AOSIS and other developing country representatives argue that applying this principle to all emission reductions would ensure a level playing field and thus be a more effective means to achieve this objective. Finally, the amount of a levy, if applicable, still needs to be agreed.

With respect to the mechanism established by Article 6.4, another key controversy relates to the ambitiousness of crediting baselines. While Brazil proposes that the approaches from the CDM should continue to be used, e.g. using historical emissions, the EU argues vocally for ambitious baselines, e.g. best available technologies or ambitious emission benchmarks.

Some countries, most vocally Saudi Arabia, propose the use of other metrics than CO_2 emissions to engage in international transfers, such as kilowatt-hours of renewable energy. The EU and many other countries favour an approach whereby only emission metrics (tons of CO_2 equivalent) are internationally transferred and accounted towards NDCs. Allowing other metrics provides more flexibility to countries but also raises several concerns: it could create a disincentive for countries to move towards emissions targets, give rise to emissions, and be difficult to implement practically.

In addition to these political matters, there are numerous more technical issues on which significant progress was made in Madrid and thereafter, but which may still require attention in Glasgow. A key cross-cutting theme – represented in many technical debates – is how it can be ensured that Article 6 achieves its goal of raising climate ambition, rather than undermining environmental integrity. Another important element is ensuring transparency and consistency in the implementation of Article 6. These cross-cutting themes come up in many technical debates, including:

- what participation requirements countries should fulfil to participate in Article 6;
- how environmental integrity can be ensured in quantifying emission reductions, such as mitigating the risk of non-permanence and leakage;
- what environmental and social safeguards should apply, such as non-violation of human rights;
- how exactly countries apply corresponding adjustments, such as the calendar years in which corresponding adjustments should be added or subtracted;
- how countries report on their use of Article 6 and international transfer of emission reductions; and
- what information needs to be reported and tracked and how accounting and reported information is reviewed.

3.3. Adaptation

A key feature of the Paris Agreement's architecture is the balance between mitigation and adaptation issues. This is inter alia enshrined in the Agreement's objectives in Article 2 which stipulate – in addition to the temperature goal – that the global response to climate change also includes increasing the ability to adapt to its adverse impacts and foster climate resilience.

Strengthening global cooperation on adaptation was a particular concern for developing countries throughout the negotiating process leading to the Paris Agreement as they already face significant economic losses due to the adverse impacts of climate change. The Paris Agreement's Article 7 consequently establishes a global goal on adaptation (GGA) that contains the following three elements:

- Enhancing adaptive capacity;
- strengthening resilience; and
- reducing vulnerability to climate change.

Many developing countries have voiced the expectation that COP26 must deliver progress on the GGA. South Africa in this context has called for translating the GGA into quantifiable targets of improving the climate resilience of the global population by 50 % by 2030 and at least by 90 % by 2050 (Climate Home News 2021c). The objective of this proposal is to put adaptation on an equal footing as mitigation by formulating concrete global targets.

The quantification of increased resilience on a global scale will entail, however, significant methodological challenges as adapting to climate change can take many forms and depends highly on local contexts. In contrast to mitigation, there is currently no universal metric to account for improvement in climate resilience across different sectors and cultural contexts.

The review of the overall progress made in achieving the global goal on adaptation is a component of the first global stocktake in 2023. In 2019, the CMA requested that the Adaptation Committee (AC) consider approaches to reviewing the overall progress made in achieving the GGA and to reflect the outcome of this consideration in its 2021 annual report. The AC published a technical paper that sets out key challenges and reflections on potential methodologies in March 2021[8].

A potential landing zone for COP26 could be to initiate a process or programme of work to define a framework for assessing progress on adaptation, which could be used to inform the global stocktake. At the July 2021 informal ministerial meeting, which was convened by the incoming COP presidency, this proposal received broad support (Sharma 2021).

Increasing support for adaptation and simplifying access to such support will be another key component of the adaptation negotiations at COP26. Developing countries are concerned that current levels of adaptation finance are not sufficient to cope with the adverse impacts of climate change. These discussions will have close linkages to the negotiations on climate finance that will inter alia deliberate on approaches for setting the new collective quantified 2025 mobilisation goal for climate finance, including potential sub-goals for mitigation and adaptation finance (cf. chapter 3.5).

A further issue with relevance to adaptation funding are the discussions on Article 6.4 which foresees that a share of proceeds from the transactions under the Article 6.4 mechanism will be directed to the Adaptation Fund. Some developing countries such as SIDS and LDCs advocate for placing a similar levy on transactions through voluntary cooperative approaches under Article 6.2 to increase revenue streams for adaptation finance (cf. chapter 3.2.2).

3.4. Loss and Damage

Formally, the only agenda item at COP26 that is related to loss and damage is the consideration of the report of the Executive Committee on the Warsaw International Mechanism for Loss and Damage (WIM). At the recent meetings of the subsidiary bodies in May/June 2021, developing countries however requested to put loss and damage on the agenda of that meeting, too, and the current and incoming COP presidencies convened an informal meeting on the operationalisation of the Santiago Network, which was established at COP25 in Madrid.

[8] Considering approaches to reviewing the overall progress made in achieving the global goal on adaptation, AC19/SUM-INFO/6A, https://unfccc.int/documents/268841.

The Santiago Network has been established under the WIM with the vision to act as a catalyst for technical assistance of relevant bodies, networks and experts, for the implementation of approaches for averting, minimise and addressing loss and damage at the local, national and regional level, in developing countries that are particularly vulnerable to the adverse effects of climate change.

Its establishment at COP25 was a compromise between developing countries that had argued for financial and technical assistance for loss and damage beyond existing structures and developed countries who were concerned about further fragmenting support channels.

The COP25 outcome did not provide a detailed roadmap for the operationalisation of the Santiago Network, but there have been frequent discussions outside the negotiating process in which initial exchanges on the network's principles and functions, governance and membership take place.

The Chilean (COP25) and UK (COP26) presidencies have prepared a discussion paper on the Santiago Network, which served as a basis for consultations among Heads of Delegation in August 2021.[9] The paper foresees further consultations by the Presidencies ahead of COP26 to further refine the ideas for the network and its development. In Glasgow, the CMA/COP should be invited to endorse the stakeholder consultations for the network undertaken so far and may ask the UK and incoming African (COP27) presidencies to continue the process of developing the network in consultations with Parties and stakeholders.

As 2021 has seen numerous extreme weather events, including devastating wildfires, hurricanes, droughts and floods across all regions of the globe, loss and damage will likely have prominent political significance at COP26. At the July 2021 ministerial meeting convened by the UK COP presidency, the urgent need for action was shared among all participants; views diverged as to whether there should be a dedicated funding stream or mechanism to address loss and damage or whether existing funds and mechanisms within and outside the UNFCCC would be better placed to provide the needed support.

3.5. Support

The support from developed countries to developing countries for the joint ambition for meeting the goals of the Paris Agreement is outlined under Articles 9 (finance), 10 (technology development and transfer) and 11 (capacity building) of the Paris Agreement. Under Article 13, developed countries report on the support provided and mobilised, and developing countries report on the support needed and received.

In the evolution of the UNFCCC, the Paris Agreement distinguishes between 'developed' and 'developing' country Parties instead of the terms 'Annex I' and 'non-Annex I Parties'. The Paris Agreement also adds the phrase 'in the light of national circumstances' to the Convention's principle of CBDR/RC. With altering national circumstances, the common but differentiated responsibilities will evolve. The Paris Agreement also makes reference to 'other' (non-developed country) Parties, who are encouraged to provide financial support on a voluntary basis (Article 9.2) and encourages such other Parties to communicate information about support provided (Article 9.5, 9.7, 13.9).

[9] Presidencies' Amended Second Discussion paper on the Santiago Network https://unfccc.int/sites/default/files/resource/presidencies%20_amended_second_discussion_paper.pdf.

3.5.1. Finance

The financial support provided through developed countries has been a key negotiation item at previous COPs. Also, in the run up to COP26, the gap in financing of the USD 100 billion goal is one of the key discussion topics. In 2009, developed countries committed to jointly mobilise USD 100 billion per year by 2020 (UNFCCC 2009). At the 2015 Paris conference, the agreement reaffirmed the commitment to mobilise USD 100 billion annually in climate finance by 2020 and developed country Parties agreed to continue mobilising this amount annually until 2025. At the COP in Glasgow, Parties will negotiate a new collective quantified goal on climate finance for the post-2025 period.

The pledge from developed countries was not specific to what type of financing would count, i.e. public or private, grant or debt (Roberts et al. 2021). Hence there are diverging views in what counts towards the 100 billion goal and about the actual level of financial support provided.

In September 2021, the Organisation for Economic Co-operation and Development (OECD) released a report stating that climate finance reached USD 79.6 billion in 2019 and hence a more than USD 20 billion increase would be required to meet the USD 100 billion goal (OECD 2021). Of the funds compiled by the OECD, 64 % were spent on mitigation, 25 % on adaptation and 11 % on cross-cutting activities in 2019. At the time of writing this study, a compilation of final data for 2020 is not yet available.

Given the importance of support for developing countries, the UK COP presidency announced the mobilisation of finance as one of its key goals for COP26 (cf. Box 6 in chapter 5.8). The topic of financial support for the global South has been an important complication at previous UNFCCC meetings and will continue to be a key issue at COP26. The commitment of providing USD 100 billion in climate finance per year has served as a basis of trust between developed and developing countries; yet it seems likely that this target will not be reached and that the amount of funding declared by developed countries will be questioned with regard to the types of financial means included (Euractiv 2021; Roberts et al. 2021). To what extent developed countries will be able to re-build trust on finance-related topics at COP26 will be decisive for the success of the conference.

At a ministerial meeting in July 2021, convened by the COP26 presidency, Canada and Germany agreed to lead developed countries in setting out a plan for how they will collectively deliver the USD 100 billion per year climate finance mobilisation goal through to 2025 (Sharma 2021). Since then, both the EU and US have made announcement for additional resources: On 15 September 2021, European Commission President Ursula von der Leyen announced that the EU would provide an additional EUR 4 billion for climate finance over the period 2021-2027 (Reuters Media 2021a). This funding will come from the EU budget. In his address to the UN general assembly on 21 September 2021, US president Joe Biden announced that he is working with Congress to double the US climate finance contribution to USD 11.4 billion per year by 2024 (The White House 2021c).

3.5.2. Technology development and transfer

The Technology Mechanism (TM) under the Convention is composed of two bodies, the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN). The TM was established in 2010 under the COP; the Paris Agreement established the Technology Framework (TF) through Article 10.4 to provide 'overarching guidance' to the Technology Mechanism. The TM and the TF have the objective to support the transformational changes envisioned by the Paris Agreement through addressing the following key themes: innovation, implementation, enabling environment and capacity-building, collaboration and stakeholder engagement and support. The Paris Agreement stipulated that developing countries will be supported (Article 10.6) on cooperative action on technology development and transfer and that the financial mechanism of the Convention will support the thematic area 'innovation' related to the cooperative action.

In recent years, the CTCN, which is the operational unit of the TM engaging with the global network of National Designated Entities, has continuously stepped up its efforts to engage with countries and support them on their technology needs requests and other activities to foster collaboration and the transfer of technologies[10]. The funding of the CTCN takes place through voluntary contributions of Parties and non-Party stakeholders. To date, the main funding Parties for the CTCN have been the EU and its Member States, Japan and the Republic of Korea.[11] The sustainable financing of the CTCN has repeatedly been a discussion point in past COP sessions. The CTCN also receives funds through the GCF as part of the linkages between the TM and the financial mechanism supported by the COP.

The COP has mandated TEC and CTCN with a joint publication on technology and NDCs. The draft joint publication[12] recommends, among others, to stimulate the uptake of climate technologies in support of NDC implementation through the development of action-oriented technology roadmaps on a global, regional and national level for different sectors in line with NDC targets.

During COP26, according to the mandate of CMA1, the first periodic assessment of the TF will take place, to review the effectiveness of the TM. In order to increase the effectiveness Parties to the CMA seek a decision on aligning the timelines of the periodic assessment of the TM with the review of the CTCN.

3.5.3. Capacity Building

Capacity building is the third element of support to developing countries. Parties agreed on the obligation to regularly communicate on actions or measures on capacity building and established the Paris Committee on Capacity Building (PCCB) to address capacity building needs and gaps. Activities include the capacity building particularly of LDCs related to their capacity for implementing NDCs, the mainstreaming of climate consideration into national planning and budgeting and addressing institutional capacity gaps required for the implementation of the Paris Agreement[13].

3.6. Transparency

The particular importance of the transparency framework under the Paris Agreement is that it constitutes a common reporting framework for all Parties. Recognising that countries have different starting points on the reporting of information, the Paris Agreement provides for flexibility for those developing country Parties which need it in the light of their capacity.

A first milestone in the implementation of the transparency framework under the Paris Agreement was reached at the Climate Change Conference in Katowice in 2018, when Parties agreed on the information to be provided in the reports under the framework, on the modalities for reviewing these reports, and on the procedures for the Facilitative, Multilateral Consideration of Progress, which had been introduced by the Paris Agreement (cf. chapter 2.3.4). The 'Modalities, Procedures and Guidelines (MPGs) for the transparency framework for action and support' (UNFCCC 2018a), which were agreed in Katowice, can be regarded as one of the central elements of the 'Paris Agreement rulebook'.

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[10] CTCN request visualizations, https://www.ctc-n.org/technical-assistance/request-visualizations.

[11] CTCN financial overview, https://www.ctc-n.org/sites/www.ctc-n.org/files/Agenda%20item%2015_CTCN%20AB17_CTCN%20financial%20matters.pdf.

[12] Draft joint publication on technology and NDC, https://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/tn_meetings/271151184cce4d758b748b84ca51bb17/f93a4cc4d6de4d4e92ab40d12dac0c79.pdf.

[13] Capacity-building architecture under the UNFCCC, https://www.cbd.int/doc/c/482c/4575/04f993fec24814a31bbdaa49/post2020-ws-2020-02-unfccc-capacity-building-architecture-en.pdf.

The MPGs provide guidance for reporting on the greenhouse gas inventory, on tracking of progress in implementing and achieving NDCs, on adaptation and on support. This information is to be provided biennially and the first so-called biennial transparency report (BTR) is to be submitted by the end of 2024 at the latest. In addition, the MPGs contain the rules for the organisation of reviews and of the Facilitative, Multilateral Consideration of Progress.

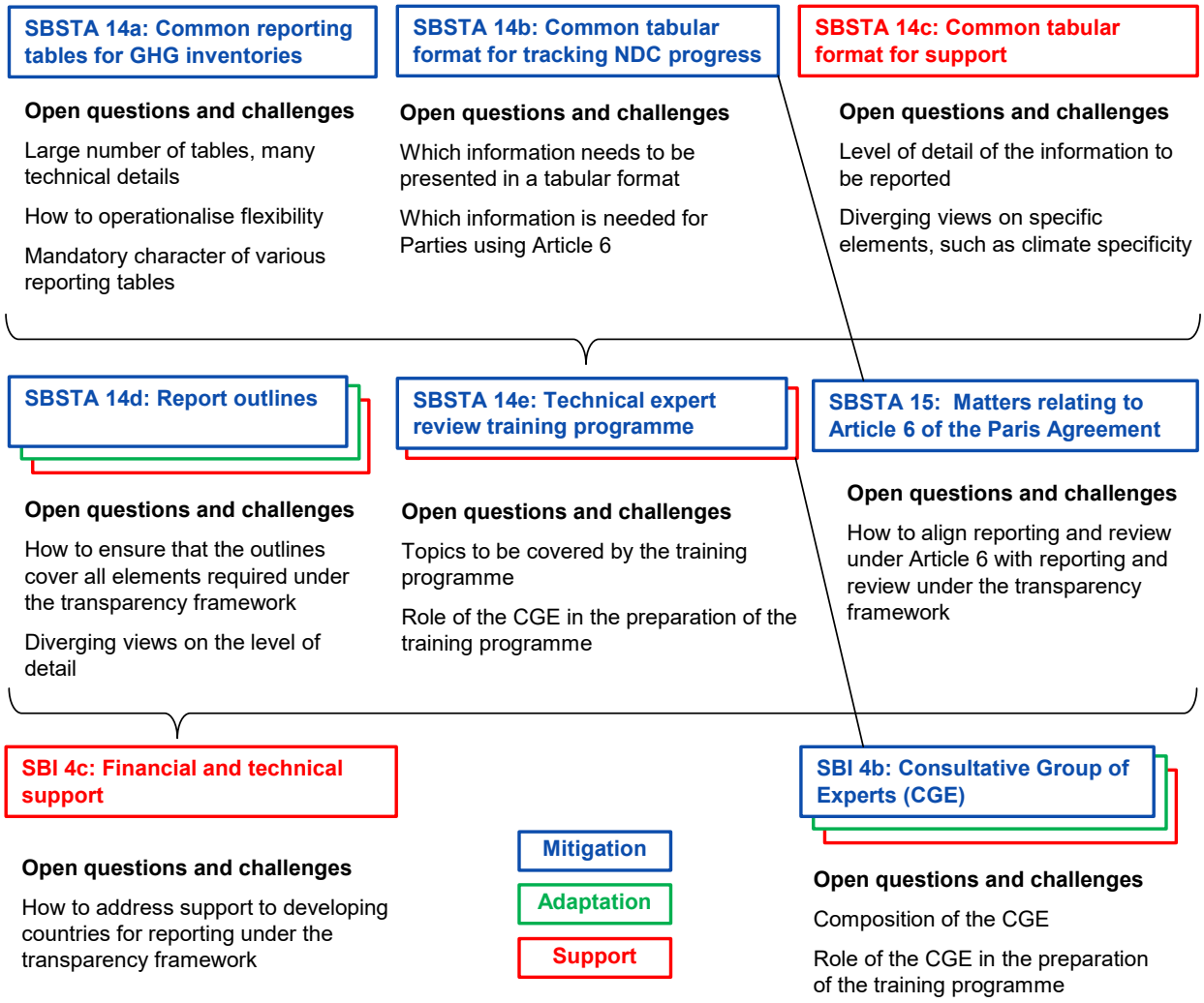
However, the negotiation time prior to the Katowice conference was not sufficient to agree on report outlines or on detailed reporting tables. Therefore, the CMA requested that SBSTA develop such outlines and tables, and a training programme for reviewers. Although Parties worked on draft tables and outlines during 2019, they were not able to agree on SBSTA conclusions at COP25 in Madrid. In the course of 2020 and 2021, work continued in virtual formats, but only limited progress was made.

As a possible starting point for the negotiations in Glasgow, informal notes are available, which contain suggestions for the various outlines and tables.[14] Whereas the mandate as such is rather technical and requires the translation of already agreed decisions into tabular formats, the negotiation process is still political, because Parties try to accommodate positions and views not agreed in the MPGs through the tabular formats. Therefore, many conflicting views such as the extent to which developing countries should face the same reporting requirements as developed countries continue to dominate the negotiations. Figure 13 provides an overview of the agenda items to be discussed in Glasgow, and the main challenges in the discussions.

Due to the various challenges shown in Figure 13, and the limited time available, a concerted effort and the willingness to find landing grounds will be required from negotiators to reach agreement on the agenda items under the transparency framework. A timely agreement at the conference in Glasgow will be particularly important because Parties will need time to collect data, to prepare greenhouse gas inventories and to develop, test and implement electronic reporting procedures. Only with such an agreement in place can Parties start their detailed preparations for their biennial transparency reports and provide their first reports in 2024, which play a key role with regard to accountability and trust under the Paris Agreement.

[14] The informal notes including tables and outlines are available at: https://unfccc.int/event/SBSTA-may-june-2021#eq-30.

Figure 13: Agenda items relating to the transparency framework under the Paris Agreement, including challenges and linkages



Source: Authors' views, based on informal notes available at https://unfccc.int/event/SBSTA-may-june-2021#eq-30.
Note: Adaptation plays a less important role in the current negotiations on the outlines and tables under the transparency framework because each Party determines individually the type of information it wishes to report, and Parties should provide such information, but are not required to do so.

3.7. Other topics in recent negotiations

Besides the implementation of the Paris Agreement, negotiators have discussed a number of other topics under the Convention and under the Kyoto Protocol in recent years, many of which are also on the agenda at COP26. The COP addresses some of these topics; other, more technical agenda items are negotiated under its subsidiary bodies, SBI and SBSTA.

3.7.1. Koronivia Joint Work on Agriculture

Agriculture is a sector which is closely linked to both mitigation and adaptation. On the one hand, agricultural activities lead to greenhouse gas emissions, e.g. from livestock; on the other hand, the sector is one of the most vulnerable to climate change. To address these issues, COP23 launched the Koronivia Joint Work on Agriculture (KJWA). The work programme was named after the Koronivia Research Station, the agricultural research station of Fiji, which presided over COP23. According to the

agreed roadmap, six thematic workshops and expert meetings have taken place. These addressed a number of agriculture-related issues, taking into consideration the vulnerability of agriculture to climate change and addressing food security (UNFCCC 2017c).

At the May/June 2021 subsidiary bodies session, Parties discussed how to address reports from the workshops in draft conclusions. A particularly controversial point was whether to include a bullet point on 'reducing total livestock numbers' in an informal note in one of the workshops. While reducing meat consumption is essential to meet the goals of the Paris Agreement, it is a sensitive issue that may contradict other political priorities as well as the food culture and tradition of numerous countries. The second part of an additional workshop on strategies and modalities to increase resilience and sustainable production in agricultural systems is to be held before COP26. At COP26, the subsidiary bodies are expected to report on the progress and outcomes of the KJWA. Central conflict lines persist with regard to the role of agriculture in mitigating climate change while ensuring food security and adapting to climate change at the same time. Also, the role that the KJWA can play in the implementation of concrete measures is a contested issue. Developing countries claim additional financial support for the agricultural sector, particularly to support adaptation to climate change.

3.7.2. The Local Communities and Indigenous Peoples Platform

The 'Local Communities and Indigenous Peoples Platform' (LCIPP) was also established at COP23. Its aim is to strengthen the knowledge, technologies, practices, and efforts of local communities and indigenous peoples related to addressing and responding to climate change (UNFCCC 2017a). In 2021, a web portal was created to spread the work of the platform and the work of the Facilitative Working Group, comprised of representatives from Parties and indigenous peoples' organisations.[15] In addition, a work plan has been developed for the platform for 2020-21, the implementation of which will be discussed further at COP26.

3.7.3. The Gender Action Plan

In many countries, women are more exposed to the impacts of climate change than men, while they have not been equally involved in addressing its causes and impacts. To advance gender balance and the mainstreaming of a gender perspective in the implementation of the Convention, the Lima work programme on gender was established in 2014 (COP20) and the first gender action plan (GAP) was agreed at COP23 (UNFCCC 2017b). At COP25, Parties adopted an enhanced five-year Lima work programme on gender and the gender action plan (UNFCCC 2019b). The work programme encompasses a number of dialogues, reports and workshops in five priority areas (enhancing knowledge, enhancing the participation of women, mainstreaming of gender considerations, gender-responsive implementation of the Convention and the Paris Agreement and monitoring and reporting of the work programme).

3.7.4. Impacts of the implementation of response measures

One mitigation-related aspect which has been discussed under the Convention since it began and is also addressed under the Paris Agreement is the impacts of the implementation of response measures. Whenever measures in response to climate change are taken, e.g. the reduction of fossil fuel consumption, they may have impacts on other economic sectors and other countries. The oil-producing countries, in particular Saudi Arabia, point out the importance of addressing these impacts

[15] Local Communities and Indigenous Peoples Platform Web Portal, https://lcipp.unfccc.int/.

and of acknowledging and supporting related activities, such as economic diversification in countries relying on fossil fuel production.

Under the Convention, the impact of the implementation of response measures has been addressed by a forum since 2012. The modalities, work programme and functions of this forum under the Paris Agreement were agreed at the COP in Katowice (UNFCCC 2018d). The Katowice Committee of Experts on the Impacts of the Implementation of Response Measures (KCI) supports the forum. COP25 adopted a 6-year workplan for the forum (UNFCCC 2019a). At the May/June 2021 subsidiary bodies session, there was intense debate as to whether to hold a KCI meeting before COP26 and the decision was left open. At COP26, the forum will consider the annual report of the KCI.

3.7.5. International aviation and maritime transport

There are three main areas in which emissions from international aviation and maritime transport or policies of ICAO and IMO are discussed under the UNFCCC.

a. Reports of ICAO and IMO

Since COP1 in Bonn in 1995, ICAO and IMO have reported on their work to control and reduce emissions from international bunker fuels under the SBSTA. Prior to each SBSTA session, they submit a report on their work since the previous session. In addition, ICAO and IMO provide a short statement at the SBSTA opening plenary, in which their report is summarised. These statements were used by Parties to comment on the efforts made under ICAO and IMO, i.e. progress made in terms of relevant decisions or on the level of mitigation ambition.

At SBSTA 48 and 49 in 2018, Saudi Arabia has called into question further reports of IMO and ICAO because Saudi Arabia considered its position under IMO not adequately reflected in the IMO Secretariat's report. IMO and ICAO have again submitted a report in 2019 and the UNFCCC Secretariat clarified that SBSTA conclusions cannot overrule the standing invitation of the COP to submit regular reports. However, Parties have not been able to agree on draft conclusions on IMO and ICAO reports since 2018, including at the SBSTA session in June 2021. However, two Parties made use of the invitation to submit their views on ICAO's and IMO's reports (EU and Japan).

b. Global stocktake pursuant to Article 14 of the Paris Agreement

At COP24 in Katowice, Parties adopted decision 19/CMA.1 in which they agreed on details on how to implement the global stocktake (cf. chapter 3.1). Some of these details are relevant for efforts under ICAO and IMO to reduce greenhouse gas emissions from international aviation and maritime transport.

The decision on the global stocktake clarifies that events outside the UNFCCC (such as events organised by ICAO and IMO) can contribute to the global stocktake. In the decision, Parties agreed to consider outputs with a view to enhancing their actions and support and to enhancing international cooperation for climate action, which implicitly includes actions under ICAO and IMO. Finally, Parties requested that SBSTA and SBI identify potential information gaps in relation to the global stocktake. Taking into account the stringent temperature goal of the Paris Agreement, it is clear that potential gaps in global emissions captured by NDCs need to be addressed by additional mitigation actions outside the NDCs.

For the global stocktake in 2023, it will be important that both ICAO and IMO submit documents in which they explain their contributions to the global efforts to mitigate climate change.

c. Negotiations on voluntary cooperation under Article 6 of the Paris Agreement

ICAO's Carbon Offset and Reduction Scheme for International Aviation (CORSIA) includes the possibility of reducing emissions through purchasing offsets, i.e. units which ensure that emissions are reduced elsewhere (see chapter 2.4.1). This can either be a certified unit from a project-based baseline and credit programme (CP) or an allowance from an emissions trading system (ETS). To date, ICAO has only adopted Standards and Recommended Practices which enable the use of units from CP. For CORSIA's 2021-2023 pilot phase, the ICAO Council identified six carbon-offsetting programmes that are eligible as providers of offsets (IISD 2020). In the continuation of negotiations on cooperative approaches and on transparency at COP26, it will be important to ensure that emission reductions used under CORSIA will not be double counted towards emission reductions under the NDCs (cf. chapter 3.2). Whereas international aviation emissions are to be addressed under ICAO, measures to reduce domestic aviation emissions, which constitute approx. 35 % of total emissions from aviation, need to be taken by countries and are usually covered by NDCs with an economy-wide scope (Lee et al. 2018).

3.7.6. Action for Climate Empowerment

The field of education, training, public awareness, public participation and public access to information constitutes another important aspect of the response to climate change. This topic is enshrined in the Convention and in Article 12 of the Paris Agreement. Education-related topics are discussed in annual dialogues under the 'Action for Climate Empowerment' (ACE) programme (UNFCCC 2019d). At COP25, the terms of reference for the review of the Doha work programme on Article 6 of the Convention was adopted (UNFCCC 2021g). At the May/June 2021 subsidiary bodies session, the review of the ACE programme as well as elements for a new programme were discussed. Considerations will continue at COP26. In cooperation with the UNFCCC Secretariat, a partnership led by the Austrian Federal Ministry for Climate Action was launched in May 2021, aiming to empower all members of society, specifically non-Party stakeholders, to engage in climate action (UNFCCC 2021a).

3.7.7. Research and systematic observation

Finally, the SBSTA has research-related items on its agenda. Under the heading 'research and systematic observation,' Parties discuss inter alia the work of the IPCC, research-related mandated events like the Earth Information Day (to take place again during COP26) and activities of the Global Climate Observing System. In the May/June 2021 subsidiary bodies session, debates evolved around more inclusion of Indigenous Peoples' knowledge systems in future research.

While the scientific evidence of climate change and its impact mounts year to year, the negotiations on this topic have the difficulty of needing to find a common wording acceptable to all Parties. Although generally all Parties appreciate and welcome the work of the scientific community, some may not agree with particular results, which then leads to rather general conclusions in the negotiations. For example, at COP25, views strongly diverged as to whether to 'welcome,' 'note' or 'note with appreciation' the release of the IPCC Special Reports on Climate Change and Land and the Ocean and Cryosphere in a Changing Climate. Similarly, in June 2021, Parties' views diverged as to whether the IPCC's ongoing work on the 6th Assessment Report should be 'welcomed' or 'acknowledged'.

Under the 'Second periodic review of the long-term global goal under the Convention and of overall progress towards achieving it,' the appropriateness of the long-term goal of the Convention and progress towards this goal are discussed, with close links to the goals of the Paris Agreement. COP25 decided that this review should begin in the second half of 2020 and conclude in 2022, including a structured expert dialogue. In June 2021, developed country Parties were keen to prevent an extension of the review in order to avoid overlaps with the global stocktake process.

3.8. International climate action initiatives

3.8.1. Importance for ambition

Considering the current gap in implementation and ambition of Parties to achieve the goals of the Paris Agreement, international climate action initiatives involving non-state actors play an important role in enhancing climate action. A growing number of subnational and non-state actors is taking climate action and setting climate targets, while more effort is needed for these actors collectively to achieve their targets (NewClimate Institute et al. 2021). However, research has shown that their integration into national-level goals can enhance ambition beyond existing targets (NewClimate Institute 2021).

3.8.2. Global Climate Action Agenda (the Marrakech Partnership)

Building on the Lima Paris Action Agenda (LPAA),[16] Parties agreed in Paris to convene annual high-level meetings at the COPs to focus on the implementation of policy options for enhancing climate action, to showcase successful examples of scaling up efforts to address climate change and foster collaboration between Parties and non-Party stakeholders (e.g. cities, regions, the private sector, and financial institutions).[17] The Global Climate Action Agenda also offers the opportunity for collaboration with the wider UN agenda and the SDG process.

The COP also decided that the COP Presidencies should appoint High-Level Champions to coordinate these efforts on their behalf. Each champion serves two years, so there is an overlap between an experienced and a new champion. At COP22, the High-Level Champions appointed by the French and Moroccan COP presidencies relaunched the Action Agenda as the Marrakech Partnership for Global Climate Action[18] to continue and scale up efforts and coordination. COP25 decided to continue appointing High-Level Champions until 2025. The current serving champions are Mr. Gonzalo Muñoz (Chile, entrepreneur and social change-maker) and Mr. Nigel Topping (UK, former CEO of We Mean Business, which brings together NGOs and influential businesses). The objectives of the Partnership for 2020-2021 are to strengthen the collaboration amongst national governments and non-Party stakeholders, to broaden participation, to create enabling conditions for breakthroughs in ten tipping points for systems transformation, to ensure continuity and coherence and to track progress, impacts and results (UNFCCC 2021l).

The rationale behind establishing an explicit link between the formal (understandably more rigid) UNFCCC Party-driven process and non-Party actors who are addressing climate change on the ground was to give voluntary and concrete climate action efforts more visibility and thus lay the basis for political goodwill, enhanced ambition and collective action. Non-party stakeholders have the potential to complement the UNFCCC process and bring momentum to political discussions.

3.8.3. Momentum for change initiative

Momentum for Change is an initiative by the UNFCCC Secretariat to highlight the numerous activities taking place globally to take action against climate change while also addressing other economic, social and environmental challenges. The website provides a platform to share and spread information

[16] A collaboration between the Peruvian COP20 Presidency, the French COP21 Presidency, the UN Secretary General's Office and the UNFCCC secretariat to convene Party and non-Party stakeholders throughout 2015 to showcase concrete progress in climate action and induce accelerated action.

[17] Other arrangements installed to further strengthen collaboration between Parties and non-Party stakeholders are the technical examination processes on mitigation and adaptation and the Non-State Actor Zone for Climate Action (NAZCA) Platform, which serves as a repository of non-Party climate initiatives and helps to track their progress, see https://climateaction.unfccc.int/.

[18] Marrakech Partnership for Global Climate Action, https://unfccc.int/climate-action/marrakech-partnership-for-global-climate-action.

on these activities.[19] The most inspiring and transformational activities, known as 'Lighthouse Activities' are showcased at COPs. The website lists five focus areas for the initiative: Women for Results, Climate Neutral Now, Financing for Climate Friendly Investment, Planetary Health, ICT Solutions and Urban Poor.

3.8.4. Climate Neutral Now Initiative

The Climate Neutral Now Initiative is one example of several initiatives launched by the UNFCCC Secretariat in 2015 to increase climate action by engaging non-Party stakeholders, including sub-national governments, companies, organisations and individuals. It serves to promote additional voluntary climate action and to provide recognition for such action, aiming to act now in order to achieve a climate neutral world by 2050. Starting from a mandate to promote the voluntary use of carbon market mechanisms recognised under the Convention, it has become a wider tool for awareness-raising, capacity building, partnership development, promoting and facilitating the evaluation of carbon footprints, the reduction of those footprints and voluntary offsetting. To become a member, an organisation needs to sign the Carbon Neutral Now Pledge, following three steps: 1) measure: quantifying emissions and spotting main sources; 2) reduce: identifying potential reductions and, planning and implementing corresponding actions; 3) contribute: choosing a project and compensating emissions. Thereafter, the organisation needs to report on its actions and achievements annually. To date, more than 400 organisations have pledged their commitment to Climate Neutral Now (UNFCCC 2021d).

3.8.5. Race to zero campaign

Race to zero is a global campaign for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs and unlocks inclusive, sustainable growth. Various initiatives representing cities, regions, businesses, investors and higher education institutions as well as 120 countries form an alliance committed to achieving net zero greenhouse gas emissions by 2050 at the latest. These actors cover approx. 25 % of global CO_2 emissions and more than 50 % of global gross domestic product (GDP). The campaign also includes the Net Zero Asset Managers Initiative, an alliance of investors managing more than USD 9 trillion in assets. Actors wishing to join the campaign need to fulfil minimum criteria that have been developed. The campaign was launched on World Environment Day 2020 by the High-Level Champions from Chile and the UK. Its aim is to build momentum for the shift to a decarbonised economy ahead of COP26 in order to send a signal to governments that business, cities, regions and investors are united in meeting the goals of the Paris Agreement. Before COP26 and based on feedback received during a public consultation, the UN High Level Climate Action Champions will develop a plan for the continuation of the campaign beyond COP26 (see UNFCCC 2020).

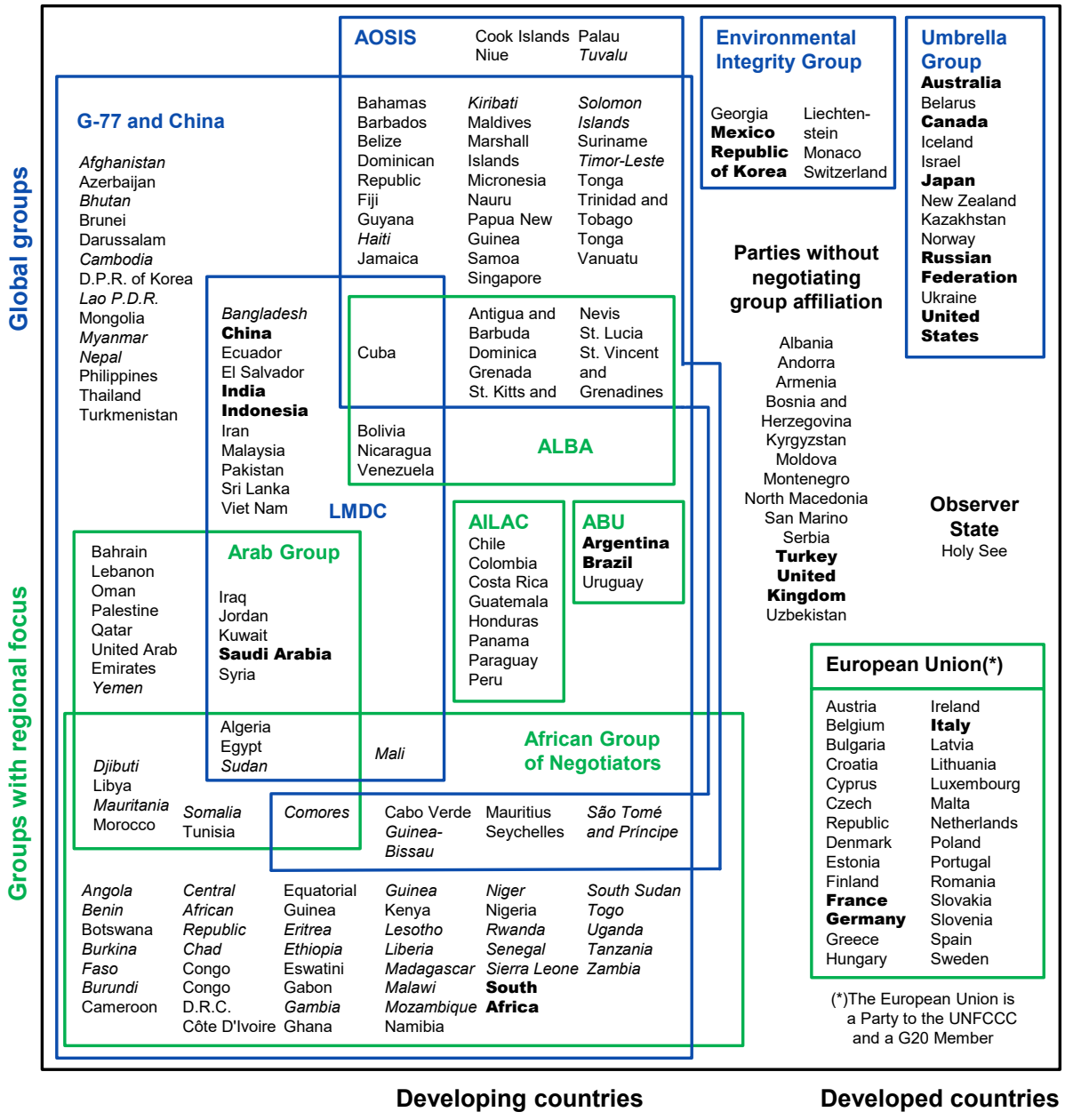
[19] Momentum for Change, www.momentum4change.org.

4. STAKEHOLDERS IN THE NEGOTIATIONS

4.1. Groups of Parties

In the negotiations under the UNFCCC, approx. 10 groups of Parties have formed which regularly coordinate their positions. Some of these groups generally coordinate in UN processes such as the 'G-77 and China' group. These negotiating groups need to be distinguished from the five United Nations regional groups (African States; Asia-Pacific States; Eastern European States; Latin American and the Caribbean States; and Western European and other States). The regional groups play a role in appointing representatives to various bodies, and the COP presidency rotates between them.

Figure 14: Parties and Observer State to the UNFCCC, and group affiliations



Source: AGN (2021), AOSIS (2021), G-77 (2021), UNFCCC (2021i), Moosmann et al. (2019).
Note: Members of the Group of Twenty (G20) are shown in bold. Members of the Group of Least Developed Countries (LDC) are shown in italics. There are 197 Parties to the Convention. The Holy See is the only Observer State.

Unlike the five UN regional groups, the negotiating groups gather along similar interests rather than geographical location. Some of these groups have a regional focus, such as the African Group of Negotiators or the group of Argentina, Brazil and Uruguay. Although there is some fluctuation and groups are not active at the same level at each conference, we can distinguish between the following groups, as depicted in Figure 14 and discussed below.

As far as the influence of the various negotiating groups is concerned, it is important to note that all COP, CMP and CMA decisions and all conclusions of subsidiary bodies are made unanimously. Hence, every single Party can influence the outcome of the negotiations. Nevertheless, the larger groups have an advantage because they have a sufficient number of experts available in their delegations to cover all topics in-depth and to reach out to delegates from other groups to discuss and find compromises.

4.1.1. Umbrella Group

The Umbrella Group is a coalition of developed countries comprising Australia, Belarus, Canada, Iceland, Israel, Japan, New Zealand, Kazakhstan, Norway, the Russian Federation, Ukraine and the United States (UNFCCC 2021i). Most of its members have high per-capita greenhouse gas emissions. Hence, some of the members of this group are cautious about ambitious mitigation actions and the group generally calls for developing countries to contribute to mitigation action.

In the negotiations, members of the Umbrella Group aim at overcoming the differentiation between developed and developing countries which was introduced in the Convention. In general, the group calls for high standards of transparency in reporting, both for developed and developing country Parties.

4.1.2. Environmental Integrity Group

The Environmental Integrity Group (EIG) consists of three small developed countries (Liechtenstein, Monaco and Switzerland) and three developing/emerging countries (Mexico, Republic of Korea and Georgia). Members of the EIG call for ambitious mitigation action, including from developing countries, and they are proponents of transparent reporting.

The majority of EIG members plan to make use of voluntary cooperation under Article 6 of the Paris Agreement to achieve their NDCs. The group therefore shows a strong interest in the current negotiations on Article 6 and calls for high transparency standards and the promotion of environmental integrity in the cooperative approaches and the mechanism under Article 6.

4.1.3. Independent Alliance of Latin America and the Caribbean (AILAC)

The Independent Alliance of Latin America and the Caribbean (Asociación Independiente de Latinoamérica y el Caribe – AILAC) comprises Chile, Colombia, Costa Rica, Guatemala, Honduras, Panama, Paraguay and Peru (AILAC 2021).

AILAC aims at bridging divides between developing and developed countries. Its members call for ambitious mitigation action, not only from developed, but also from developing countries. AILAC also supports an effective transparency framework for all countries. Like other groups of developing countries, AILAC also points out the importance of adaptation action and of financial, technological and capacity building support.

4.1.4. Alliance of Small Island States (AOSIS)

The Alliance of Small Island States (AOSIS) comprises 39 small island and low-lying coastal developing states (AOSIS 2021). As these countries are affected disproportionately by rising sea levels and by

extreme weather events, AOSIS is a proponent of ambitious mitigation action. In the negotiations for the Paris Agreement, the introduction of the 1.5°C goal constituted one of the achievements of AOSIS.

In current negotiations, the group calls for high levels of transparency and environmental integrity, while being mindful about the limited capacities available to developing countries. Consisting of mostly low-income and small countries, the group calls for support, e.g. financial support and capacity building in the area of adaptation.

However, as the possibilities to adapt to effects such as global sea level rise is limited for low-lying islands and coastal areas, members of AOSIS also show high interest in the topic of loss and damage associated with the impacts of climate change.

4.1.5. Least Developed Countries (LDCs)

The Least Developed Countries (LDCs) are a group of 46 low-income countries; the affiliation to this group follows specific criteria and is reviewed regularly by the Committee for Development under the United Nations Economic and Social Council (UN Economic Analysis & Policy Division 2021).

Similarly to AOSIS countries, the LDCs have limited capacity to respond to the impact of climate change. In the negotiations, the group stresses the importance of adaptation action and of addressing loss and damage. LDCs are also vocal in the negotiations on support for developing countries.

4.1.6. African Group of Negotiators (AGN)

The African Group of Negotiators (AGN) comprises all 54 African countries (AGN 2021). Like other groups of developing countries, the AGN points out the challenges faced by their members in adapting to the adverse impacts of climate change. Hence, the AGN calls for giving the same level of importance in the negotiations to adaptation as to mitigation. In addition, the AGN points out the limited capacities available in African countries and calls for financial, technological and capacity building support. Within the AGN, South Africa is an important country that supports high transparency standards.

4.1.7. Group of Argentina, Brazil and Uruguay (ABU)

The group of Argentina, Brazil and Uruguay (ABU) comprises three important agricultural producers. For these countries, it is important to recognise the specific role of agriculture in mitigation and adaptation. As agricultural activities lead to the emission of specific greenhouse gases (methane and nitrous oxides) besides carbon dioxide, ABU is active in the discussion on global warming potentials of various greenhouse gases.

Another area in which ABU (mostly Brazil) is vocal is the discussion on Article 6 of the Paris Agreement. Brazil has been very active in the Clean Development Mechanism under the Kyoto Protocol and aims to establish a mechanism with similar rules and few restrictions under the Paris Agreement (cf. chapter 3.2).

4.1.8. Bolivarian Alliance for the Peoples of Our America (ALBA)

The Bolivarian Alliance for the Peoples of Our America (Alianza Bolivariana para los Pueblos de Nuestra América – ALBA) is an association of ten Latin American and Caribbean countries with socialist/social democratic governments. Although the group is less active at present, it has played a prominent role in supporting the interests of indigenous peoples in the climate negotiations.

The group was also a proponent of introducing concepts such as 'climate justice' in the Paris Agreement and supports the development of non-market approaches to cooperation between Parties.

4.1.9. Like-Minded Developing Countries (LMDC)

The group of Like-Minded Developing Countries (LMDC) comprises 24 developing countries (Algeria, Bangladesh, Bolivia, China, Cuba, Ecuador, Egypt, El Salvador, India, Indonesia, Iran, Iraq, Jordan, Kuwait, Malaysia, Mali, Nicaragua, Pakistan, Saudi Arabia, Sri Lanka, Sudan, Syria, Venezuela and Vietnam). This group often refers to the principle of common but differentiated responsibilities and calls for ambitious action and support from the part of developed countries. The group stresses the historical responsibility of developed countries, as they have been responsible for the majority of greenhouse gas emissions over the past decades.

The LMDCs point out the importance of taking into account sustainable development and poverty eradication when addressing climate change. The topic of loss and damage is also on the group's agenda.

4.1.10. Arab Group

The Arab Group comprises 22 Parties from the Arab Peninsula and Northern Africa. As some of them are important oil and gas producers, the Arab Group pays particular attention to possible impacts of mitigation measures (such as a shift away from fossil fuels) on their economies. The topic of 'impacts of the implementation of response measures' is a regular item on the agenda at climate change negotiations (cf. chapter 3.7.4). The Arab Group and other oil producing countries point out the challenges of diversifying their economies in response to mitigation actions; Saudi Arabia is the most vocal member of the group.

4.1.11. Group of G-77 and China

In addition to being a member of one of the groups introduced above, most developing countries are members of the 'G-77 and China' group. The 'Group of 77 at the United Nations' (G-77) was founded by 77 developing countries at the United Nations Conference on Trade and Development in 1967 (G-77 2021). Since then, the group has grown to 134 members, and in climate change negotiations, China associates itself with the group. Hence, the G-77 and China group is the largest group of Parties at UNFCCC negotiations.

Like other groups of developing countries, the G-77 and China emphasise the common but differentiated responsibilities and respective capabilities in the Convention. Representatives of the group point out that developed countries are responsible for a large share of historical emissions and should take the lead in climate change mitigation.

Another focus of G-77 and China is the call for support to developing countries. On specific technical topics, however, there are diverse views among the members of G-77 and China. On such topics, G-77 and China holds a general position, while other groups of developing countries bring forward more nuanced positions.

4.1.12. European Union

Among the groups of Parties, the European Union constitutes a special case. The EU is a Party to the UNFCCC and to the Paris Agreement, and the same is true for each of its Member States. Delegates from the EU and its Member States coordinate their position throughout the year and prepare shared positions before each negotiating session. For each agenda item negotiated at a climate change conference, a representative (from a Member State or from the European Commission) is selected who negotiates on behalf of the EU and its Member States. Member States do not speak for themselves in the negotiations.

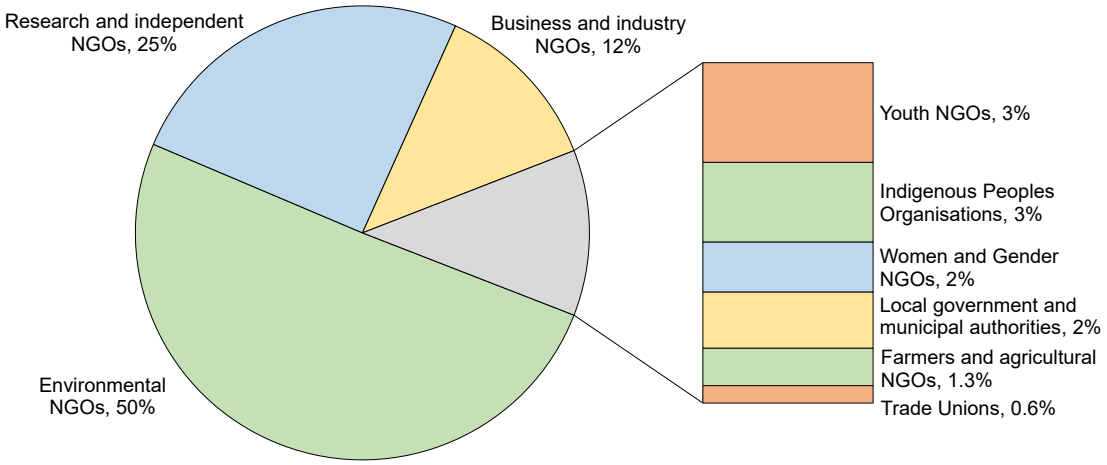
The focus of the EU in the negotiations is on increasing mitigation ambition. The EU also acknowledges the importance of support to developing countries and points out the related efforts by the EU and its Member States. It calls for transparent reporting on both action and support. Although the EU does not intend to participate in voluntary cooperation under Article 6 of the Paris Agreement, it is a proponent of strict and transparent rules for such cooperation in order to preserve the environmental integrity of such approaches.

4.2. Observers

In the UNFCCC process, observer organisations comprise different types of actors: The United Nations System and its Specialised Agencies, intergovernmental organisations (IGOs) and non-governmental organisations (NGOs). IGOs and NGOs need to be granted observer status by the UNFCCC Secretariat. Thereafter, they can register delegates on behalf of their organisation. As of September 2021, over 2,300 NGOs and 130 IGOs are registered as observer organisations to the UNFCCC. They cover a broad variety of topics, interests and types of organisations (UNFCCC 2021h). The number of observer organisations has been steadily growing since COP1 (UNFCCC 2021k).

NGOs in the UNFCCC process organise themselves in constituencies in which they are clustered according to common interests or perspectives. They mirror the 9 'Major Groups' which were established in the Agenda 21 and re-confirmed by the Rio+20 summit: business and industry NGOs (BINGO), environmental NGOs (ENGO), farmers and agricultural NGOs (Farmers), indigenous peoples organisations (IPO), local government and municipal authorities (LGMA), research and independent NGOs (RINGO), trade union NGOs (TUNGO), women and gender constituency (WGC), youth NGOs (YOUNGO). In addition, faith-based organisations (FBOs), education and capacity building and outreach NGOs (ECONGO) and parliamentarians are recognised as informal NGO groups by the Secretariat since 2016 (UNFCCC 2021c). **Figure 15** shows the breakdown of NGOs per constituency.

Figure 15: Breakdown of NGOs per constituency



Source: UNFCCC (2021h).

In the following, we describe the activities of the various observer organisations. We distinguish between (a) civil society, (b) local and regional governments (although they are also a constituency under the UNFCCC), and (c) international organisations.

4.2.1. Civil society

The current list of admitted NGOs[20] denotes more than 1100 organisations as part of the constituency of environmental NGOs. The most prominent voice representing environmental NGOs in the international climate negotiations is the Climate Action Network (CAN).[21] It is a worldwide network of over 1500 NGOs in more than 130 countries that consists of numerous regional and national networks. During the UNFCCC negotiation sessions, CAN publishes the well-known daily 'Eco' Newsletters which provide an NGO perspective on the negotiation process. Furthermore, CAN awards the daily 'Fossil of the Day' which is given to countries or stakeholders in the negotiations which it regards as obstructing progress or acting unsustainably. CAN also coordinates advocacy and communications of civil society groups at the Intergovernmental Panel on Climate Change (IPCC), the Green Climate Fund (GCF), the Group of Seven (G7) and the G20 as well as the World Bank, the International Monetary Fund meetings and other diplomatic fora. CAN is organised in regional and national nodes as well as in thematic working groups covering the main topics of the negotiations.

The group of youth NGOs covers 80 admitted NGOs. They elect two focal points (one for the global north and one for the global south) to coordinate communication with the UNFCCC secretariat. In the days preceding COPs, the youth NGOs organise so-called conferences of the youth (COY) as a forum for exchange and establishing common strategies. During UNFCCC sessions, YOUNGO provides a space, called Spokes Council where youth can learn about the process, network with other youth and collaborate[22].

More than 60 indigenous peoples NGOs are included in the constituency of indigenous peoples' organisations. Through the International Indigenous Peoples Forum on Climate Change[23], they elaborate common strategies for the UNFCCC process. The Local Communities and Indigenous Peoples Platform (LCIPP, cf. chapter 3.7.2) has been established under the UNFCCC framework as a basis for strengthening the knowledge, technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change, to facilitate the exchange of experience and sharing of best practices and lessons learned on mitigation and adaptation and to enhance the engagement of local communities and indigenous peoples in the UNFCCC.

Forty NGOs are listed as part of the constituency of women and gender NGOs. The constituency is a platform for exchange of NGOs working on gender issues in the context of climate change and to promote the rights of women as they are particularly affected by the adverse impacts of climate change. A Gender Action Plan seeking to advance women's full, equal and meaningful participation and to promote gender-responsive climate policy and the mainstreaming of a gender perspective in the implementation of the Convention was adopted by the COP in 2017 (cf. chapter 3.7.3).

Research and independent NGOs comprise organisations engaged in independent research and analysis in order to develop sound strategies to address the causes and consequences of global climate change. More than 580 organisations belong to the RINGO constituency under the UNFCCC. RINGO representatives play an active part in climate change conferences, e.g. by organising side events to address a wide range of topics.

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[20] List of admitted NGOs, https://unfccc.int/process/parties-non-party-stakeholders/non-party-stakeholders/admitted-ngos/list-of-admitted-ngos.

[21] Climate Action Network, http://climatenetwork.org/.

[22] YOUNGO, http://www.youngo.uno/.

[23] Indigenous Peoples Forum on Climate Change, http://www.iipfcc.org/.

Activities by the more than 300 business and industry NGOs under the BINGO constituency are coordinated by the International Chamber of Commerce (ICC) which undertakes efforts to help businesses take climate action. In 2019, the Chambers Climate Coalition was launched, providing a platform for chambers to demonstrate their commitment to an effective global response to climate change[24].

The International Trade Union Confederation (ITUC) as the umbrella organisation for trade unions, lists climate justice and industrial transformation as one of its central priorities. Its aim is to implement global climate action 'on the basis of just transition principles and plans: national and industry/enterprise plans that protect and create new jobs by investing in the necessary industrial transformation'[25]. 14 NGOs are listed as part of the trade unions' constituency under the UNFCCC.

The farmers' constituency comprises 30 NGOs. In 2017, COP23 initiated the Koronivia Joint Work on Agriculture (KJWA) which requests the SBSTA and SBI to jointly address issues related to agriculture (cf. chapter 3.7.1). In the view of the Food and Agriculture Organization (FAO), this work is an 'important step forward in the negotiations on agriculture with the UNFCCC and emphasises the importance of agriculture and food security in the climate change agenda. By mainstreaming agriculture into the UNFCCC process, the KJWA can drive transformation in the agricultural sector and address synergies and trade-offs between adaptation, mitigation and agricultural productivity' (FAO 2019). The farmers' constituency as well as a number of individual NGOs with a stake in agriculture have regularly expressed their views in submissions on topics discussed under the KJWA.

4.2.2. Local and regional governments

The constituency of local government and municipal authorities is coordinated by 'ICLEI – Local Governments for Sustainability'. ICLEI (International Council for Local Environmental Initiatives) is a global network of more than 2,500 local and regional governments committed to sustainable urban development, active in more than 125 countries. In the UNFCCC negotiations, ICLEI aims to ensure that the needs, interests and priorities of local and regional governments are represented and taken up in official decisions. At the same time, it engages in spreading information on developments at the international level and peer exchange through their networks to the local and regional level.[26] ICLEI launched a Climate Neutrality Framework in 2020, aiming to accelerate climate action by local and regional governments[27].

Another important initiative from cities is the Global Covenant of Mayors for Climate and Energy (GCoM). It is the largest alliance for city climate leadership and covers over 10,000 cities and local governments from 140 countries, representing more than 930 million people. With a secretariat based in Brussels, GCoM has also established regional/national covenants, which serve as local chapters of the global alliance. The three main initiatives of the GCoM are: 1) data4cities initiative – an initiative to collect data on cities' climate action and implement common ways of reporting among cities; 2) invest4cities initiative: a platform to facilitate and mobilise cities' access to climate finance and technical assistance for critical investment in urban climate change mitigation and resilience projects, and 3) innovate4cities initiative: a research and innovation initiative to identify specific data,

[24] Chambers Climate Coalition, https://www.chambers4climate.iccwbo.org/.

[25] International Trade Union Confederation – Climate justice and industrial transformation, https://www.ituc-csi.org/climate-justice-and-industrial?lang=en.

[26] ICLEI – Our approach, https://iclei.org/en/our_approach.html.

[27] The ICLEI Climate Neutrality Framework, https://iclei.org/en/climate_neutrality.html.

information and technology priorities and drive investment in these areas[28]. The GCoM brings together the EU's Covenant of Mayors[29] and the former Compact of Mayors.

The world's megacities have joined forces in the network C40, connecting 97 of the world's largest cities to take bold climate action and representing more than 700 million citizens[30]. Through networks on central climate-related topics, city practitioners exchange experiences about successes and challenges of implementing climate action. The Cities and Climate Change Initiative by UN-Habitat supports and connects cities in emerging and developing countries to share experiences on addressing climate change[31].

Additionally, local and regional actors have launched sub-national initiatives on climate change such as initiatives of US state governments that join forces in the US Climate Alliance founded in 2017. Under this alliance, which represents 57 % of the US population, states pursue common initiatives aimed at collaborating in combating climate change through e.g. enhancing carbon sinks, reducing hydrofluorocarbons, energy efficiency standards and international cooperation, including with Mexico and Canada[32].

4.2.3. International organisations

The UNFCCC provides that representatives of the United Nations system may be represented as observers at the negotiations (UNFCCC 1992).

The IPCC is one of these UN organisations and as a scientific body plays a prominent role in the UNFCCC negotiations. It assesses the scientific, technical and socio-economic information relevant for understanding the risk of human-induced climate change. The IPCC's work covers physical scientific aspects of the climate system and climate change, the vulnerability of socio-economic and natural systems to climate change as well as options for mitigating climate change. It produces general assessment reports (every five to seven years) as well as special reports and technical papers on specific issues, often upon the request of the COP or the SBSTA, which then find entrance into COP decisions. In the course of 2021 and 2022, the IPCC publishes its Sixth Assessment Report (AR6), comprising contributions from each of the three IPCC working groups on the physical science basis; impacts, adaptation and vulnerability; and mitigation of climate change as well as synthesis report on climate change in 2022. It summarises the state of scientific knowledge on the drivers of climate change, its impact and how mitigation and adaptation can reduce the risks related to climate change. AR6 will be a major input to the global stocktake process under the UNFCC, taking place between 2021 and 2023 (see section 3.1). Also, the IPCC has developed guidelines for national greenhouse gas inventories which are used by all Parties to prepare national reports on their greenhouse gas emissions (UNFCCC, 2018c).

[28] Global Covenant of Mayors- Our initiatives, https://www.globalcovenantofmayors.org/our-initiatives-new/.

[29] Covenant of Mayors, https://www.covenantofmayors.eu/.

[30] About C40, https://www.c40.org/about.

[31] UN Habitat Cities and Climate Change Initiative, https://unhabitat.org/programme/cities-and-climate-change-initiative.

[32] United States Climate Alliance, https://www.usclimatealliance.org/.

Box 2: The Working Group I contribution to the IPCC Sixth Assessment Report: The Physical Science Basis

In August 2021, the 54th session of the IPCC approved the Summary for Policymakers and accepted the report of IPCC Working Group I, which brings together the latest scientific knowledge on the climate system. The report addresses the changing state of the climate system, human influence on this system and the effects of climate change on the ocean, on the cryosphere and on extreme weather events. In addition to the Summary for Policymakers, a collection of concise headline statements is available.

Compared to previous reports, the knowledge on the human influence on the climate system has been extended considerably. According to the report, it is unequivocal that human influence has warmed the atmosphere, ocean and land. In addition, the knowledge base on global and regional impacts of climate change has increased and the report finds that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions can be achieved in the coming decades.

Source: IPCC (2021) , IPCC - Intergovernmental Panel on Climate Change (2021).

4.2.4. UN bodies vs. inter-governmental organisations

The International Civil Aviation Organisation (ICAO) and the International Maritime Organisation (IMO) are two other UN organisations with close links to the UNFCCC negotiations. Apart from making submissions to the UNFCCC process, they report under SBSTA on their activities (see section 3.7.5) and ICAO's CORSIA scheme for emissions offsetting plays a role in the negotiations on cooperative approaches under Article 6 (see chapter 2.4.1).

In addition, intergovernmental organisations (IGOs) outside the UN system may be admitted by the COP as observers to the UNFCCC. More than 130 IGOs have observer status, including a great variety of organisations, e.g. the Secretariat of the Pacific Community, the Permanent Secretariat of the Alpine Convention, the Islamic or the European Investment Bank or the Gas Exporting Countries Forum (UNFCCC 2021b).

Like other observer organisations, representatives from international organisations may participate in sessions open to observers, make submissions, make statements at high-level segment sessions, organise side events and present their work in the exhibition area.

5. CLIMATE POLICIES OF MAIN PARTIES

In order to mitigate climate change at a global level, it is central that large economies implement policies to reduce greenhouse gas emissions. While each country is different in its capabilities and national circumstances, it is instructive to have a closer look at the Group of Twenty (G20), which comprises the largest economies and most important emitters of greenhouse gases.

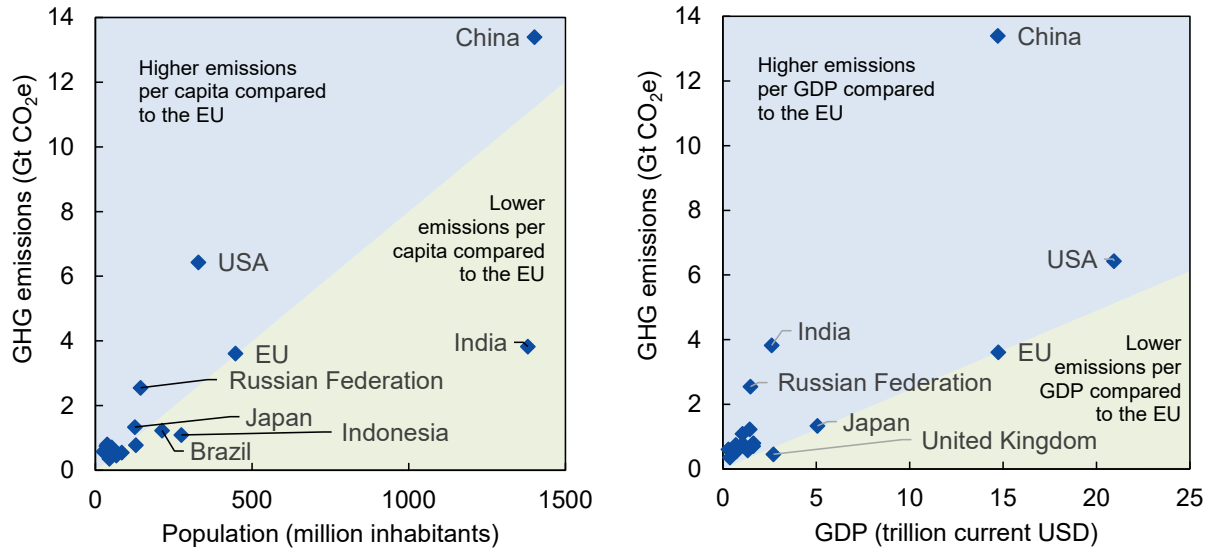
For each G20 member, a brief overview of climate policies and their relationship to their NDC and long-term goal is provided. This overview starts with the EU; G20 members which are also EU members (i.e. France, Germany, Italy) are not discussed separately. Next, China as the world's largest emitter of greenhouse gases is presented. For easier reference, the remaining countries are grouped as follows:

- members of the Umbrella Group (United States, Russian Federation, Japan, Canada and Australia);
- members of the Environmental Integrity Group (Mexico and Republic of Korea);
- countries with important land use sectors (Brazil, Indonesia and Argentina);
- other large emerging countries (India and South Africa); and
- parties with particular strategic importance in the negotiations (Saudi Arabia and Turkey).

Finally, the climate policies and priorities of the United Kingdom, the COP26 presidency, are presented.

An overview of G20 members' GHG emissions, population and GDP is presented in Figure 16. China, the USA, the EU, India and the Russian Federation are the top 5 emitters of greenhouse gases.

Figure 16: Greenhouse gas emissions, population and gross domestic product of G20 members



Source: See https://data.worldbank.org/indicator/SP.POP.TOTL, https://data.worldbank.org/indicator/NY.GDP.PCAP.CD, Gütschow et al. (2021b), EEA (2021).

Note: GHG data are total annual emissions excluding LULUCF in 2019; population and GDP data are from 2020.

5.1. European Union

The 27 Member States of the European Union were responsible for emissions of approx. 3.6 gigatons CO_2 equivalent (Gt CO_2eq) per year in 2019. The energy sector constitutes the dominant source,

accounting for 77 % of emissions. Emissions from agriculture contributed 11 %, followed by industrial processes and product use with 9 %. The LULUCF sector constitutes a net sink of approx. 250 megatons (Mt) CO_2eq (EEA 2021). Greenhouse gas emissions in 2019 were 28 % below 1990 levels in the 27 EU Member States (EEA 2021) and although final greenhouse gas inventory data for 2020 are not yet available, they can be expected to have decreased further in 2020. In 2019, combustible fuels such as natural gas and coal accounted for approx. 44 % of net electricity generation, followed by nuclear (26 %), wind (13 %), hydropower (12 %) and solar (4.5 %).

The European Union and its Member States submitted an updated NDC in December 2020 (EU 2020). With this submission, they committed to a binding target of a net domestic reduction of at least 55 % in greenhouse gas emissions by 2030 compared to 1990. This target constitutes an important increase in ambition compared to its previous -40 % target. However, it should be noted that the new target is a 'net target' which takes into account CO_2 removals in the LULUCF sector. Due to these removals, the actual emission reduction required to meet the target will be less than 55 %.

Box 3: The EU long-term strategy

In addition to its NDC, the EU communicated in March 2020 a long-term strategy under Article 4 of the Paris Agreement (EU 2020a). This long-term strategy is a concise document which explains that the European Council endorsed the objective of achieving a climate-neutral EU by 2050. The document contains as an annex the European Council conclusions on climate change of 12 December 2019. These conclusions lay out the objective of a climate-neutral EU and address some of the challenges associated with this objective.

The EU long-term strategy is short compared to the strategies communicated by other Parties, which often contain background information on strategy development and on planned mitigation policies. Detailed background information on the policies and scenarios considered during the development of the EU long-term strategy can be found in the European Commission's Communication 'A Clean Planet for all' (EC 2018a) and its accompanying in-depth analysis (EC 2018).

The particular importance of the EU long-term strategy is that with its submission the EU became the first large economy that committed to climate neutrality. Besides the EU as a whole, several Member States communicated their own long-term strategies under the Paris Agreement. All submitted long-term strategies are available at https://unfccc.int/process/the-paris-agreement/long-term-strategies.

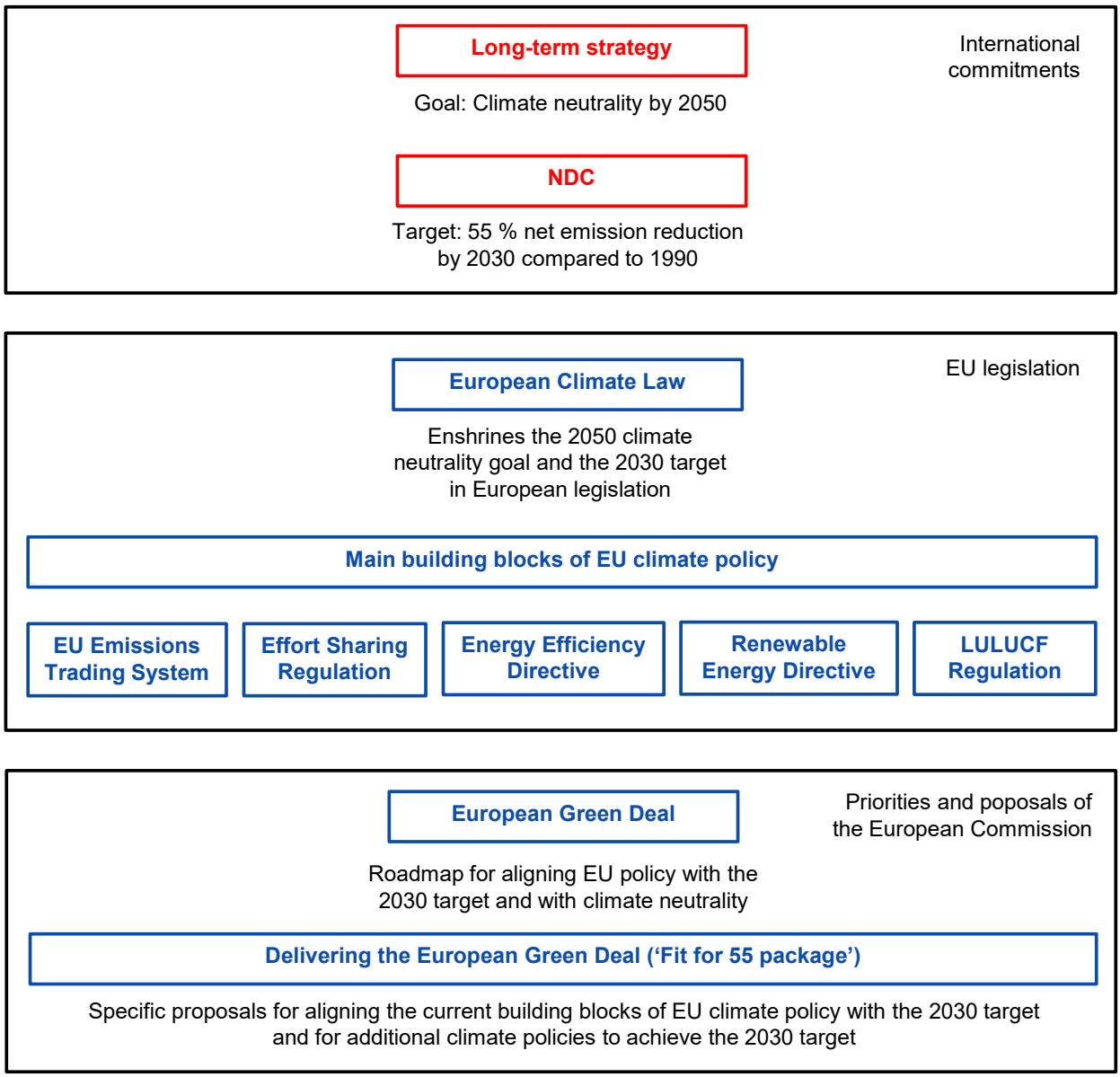
In order to achieve the 2030 NDC target, and climate neutrality by 2050, transformational change is required across all sectors of the EU's economy. Hence, the current EU legislative framework for addressing climate change needs to be strengthened and extended. A roadmap for these changes to the EU legislative framework was presented by the European Commission in December 2019 – the so-called European Green Deal. The Commission Communication on the European Green Deal (EC - European Commission 2019) presents the policies and measures across all sectors which the EU Commission proposes to introduce or strengthen in order to achieve a climate neutral economy. The communication contains, as an annex, a list of legislative proposals including an indicative timeline.

As the first major legislative act, the European Climate Law was proposed by the Commission in 2020 and agreed by the European Parliament and the Council in April 2021 (EU 2021). It covers Union-wide greenhouse gas emissions and removals regulated in Union law. The European Climate Law enshrines the binding objective of Union-wide climate neutrality by 2050, meaning that emissions shall be balanced within the Union. After 2050, the Union shall aim to achieve negative emissions. It also defines the 2030 climate target of reducing domestic emissions by at least 55 % compared to 1990. As already

stated in the EU NDC, it constitutes a net target, i.e. removals of CO_2 from the atmosphere to the land sector are taken into account and the actual emission rection target is less than 55 %. However, the total amount of removals which can be counted towards the achievement of the target is limited to a maximum of 225 Mt CO_2eq.

Besides defining the 2030 target, the European Climate Law lays out the process for developing the 2040 climate target, which will start after the first global stocktake (to take place in 2023) and will take into account an indicative greenhouse gas budget for the period 2030 to 2050. The European Climate Law also establishes a European Scientific Advisory Board on Climate Change, requires the adoption of adaptation strategies and lays out the rules for the assessment of progress. Figure 17 depicts the set-up for the implementation of the EU climate policy framework.

Figure 17: The EU climate policy framework

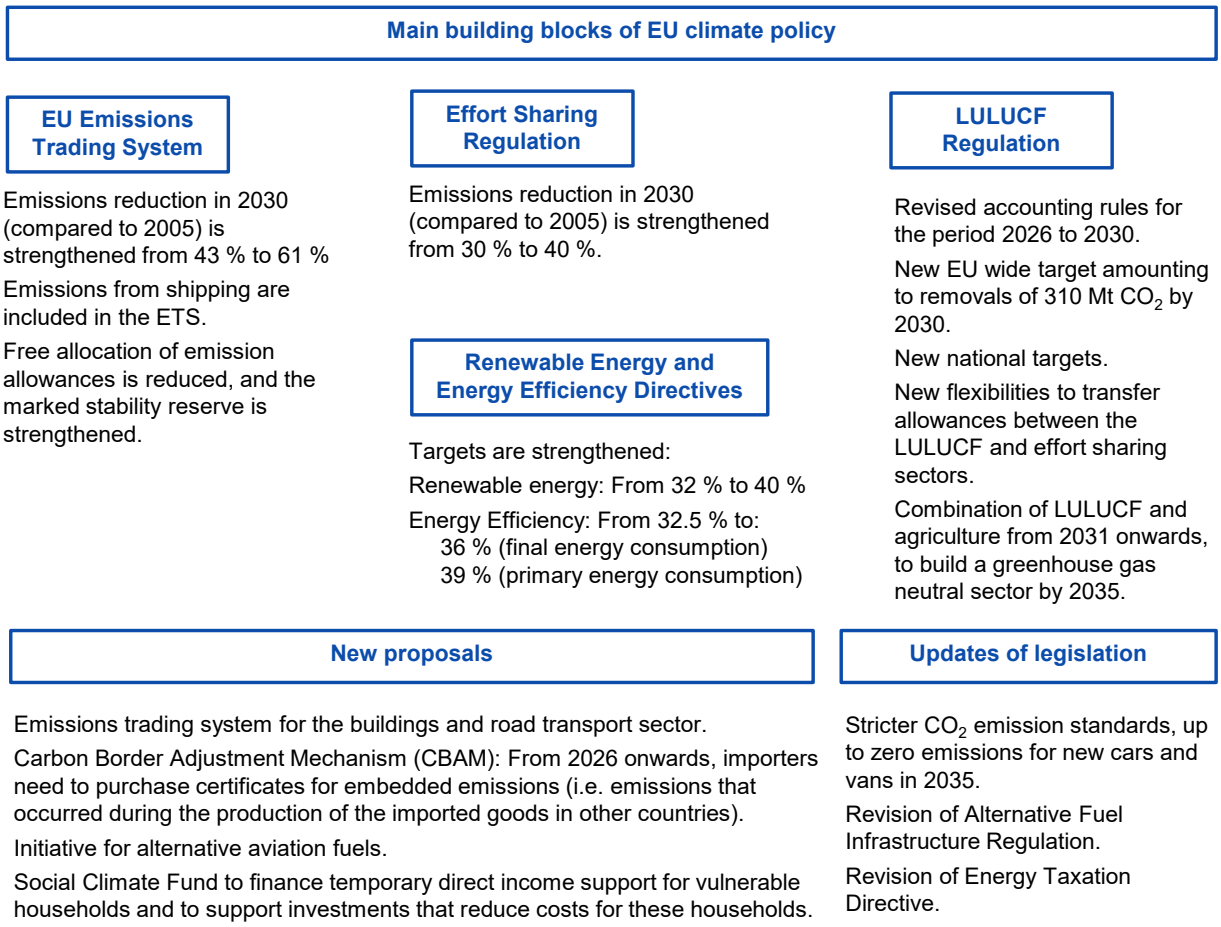


Source: EC - European Commission (2019), EC - European Commission (2021a), EU (2021), authors' views.

The main building blocks of EU climate policy, such as the EU Emissions Trading System and the concept of effort sharing between Member States, have already been in place for many years, but they

are not sufficient to deliver the 55 % emissions reduction stipulated in the EU NDC in December 2020. Hence, the EU is currently revising its legislation. As a main milestone, the European Commission presented in July 2021 its 'Delivering the European Green Deal' package (also known as the 'Fit for 55' package), which contains proposals for updated and new climate change policies (EC - European Commission 2021a). A total of 17 legislative proposals was presented, which can be found at the European Commission's Green Deal website[33]. The key elements of the package are depicted in Figure 18.

Figure 18: Updates to EU climate policies and new policies proposed in the European Commission's package for delivering the European Green Deal



Source: EC - European Commission (2021a).

The Commission's proposals will form the basis for new legislation to be discussed in the coming months by the European Parliament, Council and Commission, and adopted thereafter by the Parliament and Council.

[33] Delivering the European Green Deal, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en.

Box 4: Addressing methane emissions

Methane constitutes the second most important greenhouse gas after CO_2, amounting to approx. 11 % of EU emissions. In 2020, the European Commission published a methane strategy (EC - European Commission 2020). This strategy lays out the Commission's plans to establish an international methane emissions observatory and to propose legislation to strengthen monitoring, leak detection and repair in the energy sector. It should be noted that the methane strategy does not introduce specific mitigation initiatives in the agriculture sector, although agriculture is the most important methane source in the EU, amounting to 53 % of total methane emissions in the 27 EU Member States in 2019 (EEA 2021).

As the EU is an importer of oil and gas, and production and distribution of these fuels are important sources of methane emissions, the methane strategy also includes actions to support partner countries in reducing their emissions. On 18 September 2021, the European Union and the United States announced the Methane Pledge, an initiative to reduce global methane emissions to be launched at COP26. Countries joining the Global Methane Pledge commit to a collective goal of reducing global methane emissions by at least 30 percent from 2020 levels by 2030 (EC - European Commission 2021b).

5.2. China

China is the world's largest emitter of greenhouse gases. Its emissions in 2018 (excluding LULUCF) were approx. 12.4 Gt CO_2eq (Climate Watch 2021a). They increased for a second year in a row after they have been stable over the period 2013-2016. Compared to 1990 (3.2 Gt CO_2eq), emissions almost quadrupled – mainly due to a massive expansion of the country's coal power plant fleet.

Coal accounted for approx. 66 % of electricity output in 2019, a share that has been declining for several years after it reached a peak of 81 % in 2007 (Carbon Brief 2020a). Despite this decline, China's policies on coal remain inconsistent with the Paris Agreement. The country would need to phase out coal before 2040 under emission pathways that are consistent with the 1.5°C temperature limit (Climate Action Tracker 2021e). After a ban on new coal plants was lifted in 2018, there is currently 100 GW of new coal capacity under construction (Carbon Brief 2020a) and, as part of the response to the COVID-19 pandemic, many provinces received applications for adding additional coal capacity as a measure to stimulate economic growth. At the same time, the average utilisation rate of the country's coal fleet already today is below 50 %. By the end of September 2021, China was experiencing a power crunch as many power plants cut coal purchases to avoid economic losses due to high coal prices, which are said to have surged as a result of increased coal consumption after the COVID-19 pandemic (Climate Home News 2021a).

Further, China is considered to be the largest international funder of coal power plants, with 26 GW of overseas capacities currently receiving funding through different Chinese entities such as the China Development Bank or the Silk Road Fund (Gallagher et al. 2021) amongst others.

Reaching a moratorium on financing international coal-fired projects has been a centrepiece of diplomatic engagement with China ahead of the Glasgow climate summit (Hua et al. 2021). At a meeting of G20 energy and environment ministers in July 2021, an agreement on a phase-out date for international financing of coal power projects and a target date of a complete phase-out of fossil fuel subsidies could not be reached due to opposition by China and India. At his speech at the UN General Assembly in September 2021 President Xi however announced that China will stop support for new

coal power plants abroad, a move that has been hailed as a major step by many analysts and civil society groups (Climate Home News 2021b).

China did not meet the extended deadline of 31 July 2021 for countries to submit a new or updated NDC to the UNFCCC. President Xi Jinping announced, however, before the UN General Assembly in September 2020 that China aims to achieve carbon neutrality before 2060 and to peak emissions before 2030. This announcement for the first time provided a long-term target for decarbonisation in China.

At the Climate Ambition Summit in December 2020, President Xi Jinping further announced updated near term targets which include the following commitments (Ministry of Foreign Affairs of the People's Republic of China 2020):

- Lower carbon dioxide emissions per unit of GDP by 65 % from 2005 levels in 2030 (previously 60-65 %):
- peaking carbon dioxide emissions before 2030 (previously 'around 2030 and making efforts to peak earlier');
- increase the share of non-fossil fuels in primary energy consumption to around 25 % by 2030 (previously 'around 20%');
- increase forest stock by 6 billion cubic meters above 2005 levels (previously 4.5 cubic meters); and
- bring the total installed capacity of wind and solar power to over 1,200 GW by 2030.

The announcement of these more ambitious commitments was an important boost for renewed international cooperation on climate change, both because they reciprocated EU commitments to increase ambition and were made at a time of a US administration that was inactive on climate change.

Despite their importance for raising global ambition on climate change, the new near-term commitments have been assessed as not consistent with the Paris Agreements temperature goal. Most importantly, the new commitments do not include a fixed or economy-wide absolute emission reduction target. Whether the 'before 2060' carbon neutrality goal is compatible with the Paris Agreement depends on its coverage and how fast the decarbonisation will happen (Climate Action Tracker 2020b).

In May 2021, China formed a new high-level climate leaders group, which is chaired by China's vice premier Han Zheng and will steer the country's emission reduction activities. The formation of this group was viewed as a milestone as it raises climate change at the top of the country's governance structure (Carbon Brief 2021a).

A main instrument for the implementation of its climate commitments will be China's nation-wide emissions trading scheme (ETS) which officially launched on 16 July 2021 after seven pilot schemes had been operating in larger cities since 2013. The scheme initially covers coal and gas fired power plants and will be extended to other industries in the coming years (Nogrady 2021).

5.3. Members of the Umbrella Group

5.3.1. United States of America

The United States is the second-largest emitter of greenhouse gases after China. Its emissions in 2019 (excluding LULUCF) were approx. 6.6 Gt CO_2eq (U.S. Environmental Protection Agency 2021). Notably, these emissions saw a decline in most years after their peak in 2007, mainly due a shift from coal to natural gas in electric power generation.

As the world's largest economy, the United States plays a pivotal role in climate action and support. Its lack of engagement in the past four years made it more difficult for other countries to commit to ambitious outcomes in the climate negotiations.

Box 5: The return of the United States to the Paris Agreement

While the U.S. was among the first large economies to ratify the Paris Agreement in September 2016, this course of action was reversed by the Trump administration. In June 2017, President Trump announced that the U.S. intends to withdraw from the Paris Agreement. According to Article 28 of the agreement, a Party may withdraw from it by giving a written notification, at any time after three years from the date on which the agreement entered into force for that Party. The notification of withdrawal was submitted at the earliest date possible, 4 November 2019, and withdrawal became effective one year later, on 4 November 2020, which happened to be one day after next the U.S. presidential election.

On his first day in office, 20 January 2021, the newly elected President Biden paved the way for the U.S. to re-join the Paris Agreement. Under U.S. law, the President can ratify the agreement by accepting it on behalf of the United States. The statement of acceptance (Biden 2021b) was communicated to the United Nations Secretary-General and confirmed on the same day (UN Secretary-General 2021). As stipulated in Article 21 of the Paris Agreement, the agreement entered into force for the U.S. on the 30th day after the date of deposit, i.e. on 19 February 2021.

In addition to ratifying the Paris Agreement, President Biden signed an executive order on his first day in office on 'Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis' (Government of the USA 2021a). The heads of all agencies were ordered to review and address actions taken in the preceding four years in the areas of methane emissions, standards for fuel economy, energy efficiency and electric utility emissions, and restoration of national protected areas. In this executive order, the president also established an interagency working group on the social costs of greenhouse gases and revoked the permit for the construction of the Keystone XL Pipeline between Canada and the United States.

With the return to the Paris Agreement, the U.S. had to communicate an NDC. Its Nationally Determined Contribution was published at the occasion of the Leaders' Summit on Climate, which was convened by President Biden in April 2021 (cf. chapter 6.2). In its NDC, the United States sets an economy-wide target of reducing its net greenhouse gas emissions by 50-52 percent below 2005 levels in 2030 (Government of the USA 2021b). In developing this NDC, sector-by-sector pathways were considered, and a goal to reach 100 % electricity free of carbon pollution by 2035 was set. However, the polices and measures to put the U.S. on track towards the 2030 target have not yet been adopted.

As the main piece of legislation to help reduce greenhouse gas emissions in the coming years, the Biden Administration proposed the so-called 'American Jobs Plan' in March 2021 (The White House 2021a). This proposal foresees investment in transport, power and buildings infrastructure, among others. As a first part of the proposed package, the House of Representatives approved a USD 715 bn surface transportation and water infrastructure bill in July 2021 (Reuters Media 2021f).

On 17 September 2017, President Biden convened the Major Economies Forum on Energy and Climate (MEF), a forum which had last been active during the years of the Obama administration and brings together heads of state and government from mostly developed countries (The White House 2021b). Participants discussed, inter alia, further commitments and actions to be undertaken in the

remaining weeks before COP26, and the Global Methane Pledge to be launched at COP26 (cf. box 4 in chapter 5.1).

Besides the national government, the individual States can play an important role in addressing climate change. Under the United States Climate Alliance,[34] governors from 25 States committed to implementing policies that advance the goals of the Paris Agreement, to reduce collective net greenhouse gas emissions by at least 50-52 percent below 2005 levels by 2030 and collectively achieve overall net-zero greenhouse gas emissions as soon as practicable and no later than 2050.

5.3.2. Russian Federation

The Russian Federation is the world's eleventh largest economy and the fourth largest emitter of greenhouse gases. It is the most energy-intensive economy in the G20 and its emissions are projected to rise beyond 2030.

The fossil-fuel based energy sector contributes between 20 % and 23 % of Russian GDP, 25 % to 26 % of consolidated budget revenues and 55 % to 60 % of export revenues and the Russian Federation is the largest supplier of energy to the European Union. Renewables only have a small share in the Russian electricity mix, with a 2015 government decree foreseeing an increase in its share to 4.5 % by 2024 (The Moscow Times 2021).

The decarbonisation efforts of its Western neighbouring countries and main energy-related trade partners thus represent a challenge for the export dependent fossil fuel-based economy of the Russian Federation. Despite this, efforts for decarbonising its own economy do not currently appear to be a priority as the country has ventured to intensify energy relations with emerging economies in Asia in recent years.

In November 2020, the Russian Federation submitted an updated NDC target of reducing emissions (incl. LULUCF) by at least 30 % below 1990 levels by 2030. The previous target was within a range of 25 - 30 % below 1990 levels (incl. LULUCF) (Russian Federation 2020). While the new target introduces a floor for 2030 emissions, it has been criticised as highly insufficient as it is higher than the Russian Federation's own 2030 emission projections under current policies (Climate Action Tracker 2021f).

The Russian Federation further published a draft long-term strategy in March 2020, which does not include a net zero target for 2050 as has been brought forward by many other major emitters. In contrast, the draft strategy includes 2050 projections that foresee that greenhouse gas emissions remain roughly at current levels under the most ambitious scenarios (Climate Action Tracker 2021f).

The Russian Federation has adopted a roadmap for hydrogen development in October 2020, underscoring its interest in becoming a leading exporter of this new energy carrier (Zabanova and Westphal 2021). As it is foreseen that green hydrogen will play an important role in the decarbonisation efforts of the EU and its Member States, hydrogen could become a potential future area of cooperation. There remain however many challenges, including the current low share of renewable energy in the country's energy mix, pointing to the need for Russia to embrace decarbonisation domestically first in order to tap hydrogen-related export potentials for its economy.

5.3.3. Japan

Japan is the world's third largest economy and seventh largest emitter of greenhouse gases. Its emissions have been continuously decreasing since 2013, reaching a level of 1.19 Gt CO_2eq in 2018,

[34] U.S. Climate Alliance, http://www.usclimatealliance.org/.

which corresponds almost exactly to emission levels in 1990. The country's main sources of emissions are energy generation for power and heat, industry and transport (Climate Watch 2021a).

With 45 GW of operating plants, Japan has the world's sixth largest fleet of coal-fired power stations. Japan has been expanding the share of its coal capacity in electricity production from 27 % in 2010 to 34 % in 2017 after it moved away from nuclear power following the Fukushima Daiichi nuclear disaster (Carbon Brief 2018a). However, natural gas has been the main replacement of nuclear capacities. As of April 2021, there are no plans for additional coal power plants in the country after the last project was cancelled; several units remain under construction, however, mainly as replacements of older equipment (Bloomberg Green 2021). Researchers have stressed the need to phase out all coal plants by 2030 in order to align with the Paris Agreement goals (Climate Action Tracker 2021a).

After China, Japan is the second largest provider of public finance for overseas coal projects. Between 2018 and 2019, Japanese entities provided funding or insured lending for 21 coal power plant projects in Bangladesh, India, Indonesia, Mongolia, Myanmar and Vietnam with the Japan Bank for International Cooperation as the biggest lender (Downie and Hughes 2020). Often criticised for its stand on overseas coal finance, there are now signs that Japan might stop funding overseas coal in the future. At this year's G7 summit in Cornwall in June 2021, Japan joined an agreement to stop international financing of coal projects by the end of this year (Reuters Media 2021c).

With its first NDC submitted to the UNFCCC in 2016, Japan committed to an economy-wide emissions reduction of 26 % below 2013 levels by 2030 (Government of Japan 2015). This corresponds to a reduction of approx. 15 % below 1990 levels (excl. LULUCF). At the leaders' summit convened by U.S. President Biden on 22 April 2021, Japan's then Prime Minister Yoshihide Suga announced a more ambitious target of reducing emissions by 46 % by 2030 compared to 2013 levels and to further 'continue strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50 percent' (Ministry of Foreign Affairs of Japan 2021). This announcement followed an earlier submission of an updated NDC in March 2020 that merely confirmed the initial NDC target (Government of Japan 2020), which drew heavy criticism internationally and from civil society.

Like several other major emitters, Japan has announced a long-term goal of cutting greenhouse gas emissions to net-zero by 2050 which has been considered as a major shift in the national position on climate change (Reuters Media 2020).

5.3.4. Canada

Canada's emissions have only decreased slightly in the last two decades. In 2019, Canada's greenhouse gas emissions amounted to 730 $MtCO_2eq$, representing a net decrease of only 1.1 % from 2005 emissions (Government of Canada 2021). The main sources of emissions are the oil and gas as well as the transport sector. In both economic sectors, emissions have been increasing (37 Mt CO_2eq or 23 % and 12 Mt CO_2eq or 7 %, respectively) from 2005 to 2017 (Government of Canada 2020). Particularly, oil sands continue to be a major source of emissions in the country (Climate Action Tracker 2021d). In 2018, more than two thirds of the electricity was generated from renewable sources with the greatest share being provided through hydro-electricity (Climate Action Tracker 2021d). The land use sector is a net source of emissions (Government of Canada 2021).

Canada submitted an updated NDC in July 2021, committing to reduce emissions by 40 % to 45 % below 2005 levels by 2030 (an increase of ambition compared to the previous pledge to reduce emissions by 30 % by 2030) and to net-zero by 2050 (Climate Action Tracker 2021d).

The Pan-Canadian Framework on Clean Growth and Climate Change adopted in 2016 provides the main framework for action on climate change. It is built on four pillars: pricing carbon pollution,

complementary actions to reduce emissions across the economy, adaptation and climate resilience and clean technology, innovation and jobs. The strategy includes more than fifty policy actions across all sectors of the economy. In 2018, an act establishing a carbon pollution pricing system was established. In December 2020, the plan *A Healthy Environment and a Healthy Economy* was released, including measures to reduce emissions by 2030 below the target set in its NDC. Canada has adopted a 2050 target of net zero emissions; however, this target is not yet enshrined into law and there is no implementation plan available on how to achieve it (Government of Canada 2021).

5.3.5. Australia

Total net greenhouse gas emissions including the LULUCF sector amounted to 519 Mt CO_2eq in 2019 and have decreased by 16 % compared to 1990 (Government of Australia 2021). Emissions from electricity generation are the largest contributor to Australia's emissions with 34 % of total emissions in 2020. In 2020, Australia's renewable share of generation in the electricity sector amounted to approximately 23 %; in 2030, the share is projected to rise to 50% (Government of Australia 2020a).

Stationary energy caused approx. 20 % of total emissions and transport 18 % of emissions in 2020. The LULUCF sector provides a sink of 25 Mt CO_2eq in 2020 (Government of Australia 2020a). Emissions from stationary energy (+43 %), transport (+64 %) as well as industrial processes (+21 %) rose between 1990 and 2019, but declined between 2019 and 2020 due to the effects of the COVID-19 pandemic (Government of Australia 2021). Australia also attributes this decline to an additional uptake of renewables and the inclusion of new measures to accelerate the deployment of low emissions technologies (Government of Australia 2020a).

Australia has set an economy-wide emission reductions target for 2030 of 26 % to 28 % emission reductions below 2005 level, including LULUCF. It did not increase its ambitions in recent years as the target for 2030 has not changed since 2015. The inclusion of LULUCF reduces the actual reduction target for 2030 to 11 % to 15 % below 2005 levels. Australia does not have a set net-zero target; according to its NDC, the government of Australia aims to "achieve net zero emissions as soon as possible," but there is no timeline or roadmap to achieve this goal (Government of Australia 2020b). This NDC does not include information on the intended use of Article 6 under the Paris Agreement and Australia does not rule out the usage of carry-overs from the Kyoto Protocol.

Australia aims to reduce emissions by the development and deployment of low-emissions technologies. For that purpose, the 'Technology Investment Roadmap' was presented in 2020. The government wants to invest AUD 18 billion in the period between 2020 and 2030 and leverage investments in the amount of AUD 50 billion from the private sector, research institutions and the State and Territories (Government of Australia 2020b). The main existing policy is the Emissions Reduction Fund and its safeguard mechanism through which carbon credits are issued and auctioned in a voluntary scheme[35].

The Australian climate policies have been heavily criticised for a lack of ambition and insufficient policies across all sectors. Australia is one of the few G20 countries without mandatory emissions or fuel efficiency standards for cars. It does not have any policy in place to reduce emissions from freight trucks or a strategy to support electric vehicles. Furthermore, the government was criticised for supporting a fossil fuel-centred instead of a green recovery after the COVID-19-Pandemic (Climate Action Tracker 2021c) . At the same time, Australia has been hit by heat waves and heavy bushfires that have been shown to become more likely as a result of global warming.

[35] Emissions Reduction Fund, http://www.cleanenergyregulator.gov.au/ERF/About-the-Emissions-Reduction-Fund.

5.4. Members of the Environmental Integrity Group

5.4.1. Mexico

Mexico is the world's fifteenth largest economy and the eleventh largest emitter of greenhouse gas emissions. The country is the second largest economy in Latin America after Brazil. It has joined the Organisation for Economic Cooperation and Development (OECD) in 1994. Mexico's greenhouse gas emissions increased by 63 % compared to 1990 and are projected to rise further (Climate Transparency 2020 2020).

Mexico has been considered a climate leader in the past, after the then President Felipe Calderón introduced comprehensive national climate legislation during his term between 2006 and 2012. Mexico, in 2010, further played a pivotal role in putting the climate negotiating process back on track through its role as host to COP16 after the talks had collapsed at the previous year's climate summit in Copenhagen.

In recent years, however, Mexico has taken a different approach to climate change with the current government supporting the use of oil for electricity generation in an attempt to strengthen the state-owned companies Mexican Petroleum and Federal Electricity Commission (reference). Oil (46 %) and natural gas (37 %) are the country's largest sources of primary energy supply. In 2019, the government further suspended the fourth clean energy auction creating uncertainties for investors in renewable energy. Previous auctions have been very successful, with the second auction setting a global record for low solar prices (Bloomberg New Energy Finance 2016).

The country has a target to generate 35 % of electricity from clean sources by 2024 with an interim target of 30 % in 2021 and a long-term target of 50 % in 2050. In 2020, the share of clean sources for electricity generation stood at 25 % making it unlikely that Mexico will meet its 2021 and 2024 targets (Carbon Brief 2021b).

Mexico submitted an update to its NDC in December 2020 (Government of Mexico 2020). The updated targets, however, remain the same as communicated previously:

- An unconditional reduction of greenhouse gas emissions by 22 % below business as usual by 2030; and
- a conditional target of 36 % below business as usual subject to international support.

As the updated NDC revises the baseline emissions for the business-as-usual scenario upwards, the target would result in higher emissions than communicated in the previous NDC (Villafranca Casas et al. 2021).

5.4.2. Republic of Korea

Total greenhouse gas emissions in the Republic of Korea in 2017 reached a level of approx. 700 Mt CO_2eq (excluding LULUCF) which represents an increase of over 140 % compared to 1990 levels (Government of the Republic of Korea 2020). Korea is one of the countries with the fastest growing emissions among OECD members and before the COVID-19 pandemic, per capita emissions amounted to 13.5 t CO_2eq, which was well above the G20 average of 7.5 t CO_2eq. In 2019, the electricity and heat sector was the largest contributor to the country's greenhouse gas emissions, at approx. 40 %. In 2018, 44 % of electricity was produced from coal and 23 % from nuclear power plants. The share of renewable energy in electricity production amounted to only 4 % in 2018, which is well below the G20 average of 25 % (Climate Transparency 2019).

The Republic of Korea submitted its updated NDC in December 2020. It includes a target of reducing greenhouse gas emissions by 24.4 % below 2017 levels by 2030. The targeted emission levels in 2030 are the same as presented in the first NDC, hence the updated NDC does not represent an increase in ambition. However, President Moon Jae-in pledged in May 2021 to strengthen the NDC target of the Republic of Korea ahead of COP26 (The Korea Times 2021).

The main policy instrument for the implementation of the updated NDC is the Korea Emissions Trading Scheme, which covers 73 % of domestic emissions (ICAP 2021b). It is planned that parts of the 2030 target are realised through the purchase of international credits and increasing sinks in the LULUCF sector.

With the 'Third Energy Master Plan (2019-2040)', the country set out a strategy to raise the share of renewable energy in the power mix to 20 % by 2030 and 35 % by 2040. The government plans to close half its currently existing coal units by 2034 but did not specify a date for a complete coal phase-out. The National Council on Climate & Air Quality proposed a phase-out year of 2045 or earlier and to consider 2040 or earlier in light of the 2050 carbon neutrality goal (Carbon Tracker Initiative 2021).

5.5. Countries with important land use sectors

5.5.1. Brazil

Brazil is the largest economy in Latin America and currently the eighth-largest economy in the world. Globally, it is the sixth largest emitter of greenhouse gases. The main drivers of its emissions are deforestation, agriculture and energy consumption.

Greenhouse gas emissions, excluding forestry, have risen by 84 % between 1990 and 2017. In recent years these emissions have stabilised (Climate Transparency 2020). The transport sector is the largest source of energy-related emissions at 47 %, with the power sector only responsible for 9 % of energy-related emissions as Brazil produces 82 % of its electricity from renewable energy sources (mostly hydropower). The share of renewables in the power sector is the highest among all G20 countries. Brazil is, furthermore, one of the least energy-intensive economies of the G20 countries.

The country has plans to further increase the share of non-hydro renewables in the power sector to 23 % by 2030 (their share currently amounts to approx. 19 %, with approx. 9 % coming from onshore wind, 1 % from solar power and 9 % from biomass and waste).

The land use sector is a major emissions source. Between 2005 and 2012, Brazil made significant progress in reducing emissions from deforestation, inter alia by reducing the deforestation rate by 84 % in 2012 compared to the historical peak of 2004 (Solva Junior et al. 2021). Since 2013 this positive trend was reversed with deforestation rates increasing again. The Brazilian Amazon Deforestation Monitoring Program estimates that deforestation was 9.5 % above 2019 levels in 2020 and thus at a 12-year high (BBC 2020). The increase in deforestation is inter alia driven by the current government's roll-back of environmental regulation and encouragement of agriculture and mining activities in the region.

Brazil is the only large developing country that has submitted an absolute emission reduction target in its NDC (Carbon Brief 2020b). In its first NDC, which was submitted in 2016, Brazil committed to reducing emissions by 37 % by 2025 and 43 % by 2030 compared to 2005 levels (Federative Republic of Brazil 2016). In the updated submission of December 2020, Brazil merely confirmed these targets and communicated increased levels of base-year emissions which allows it to emit more greenhouse gases than under the previous NDC, de facto weakening the original 2030 targets (Climate Action Tracker 2020a). Further, Brazil's first NDC contained a target for stopping illegal deforestation and restoring forests and native forest management, which has been removed in the updated NDC.

The updated NDC includes an 'indicative long-term objective' of reaching climate neutrality in 2060; it notes, however, that the final determination of any long-term strategy would depend on a 'proper functioning' of the market mechanisms provided for in the Paris Agreement (Federative Republic of Brazil 2020). It further highlights that the 'possibility for adopting a more ambitious long-term objective at the appropriate time is not ruled out'. It should be noted that Brazil's position on market mechanisms under the Paris Agreement has been controversial and is seen as potentially jeopardising the environmental integrity of these mechanisms if adopted (see sections 3.2.1 and 3.2.3).

5.5.2. Indonesia

Indonesia is the third largest greenhouse gas emitter among developing countries. Indonesia's emissions amounted to approx. 1.5 Mt CO_2eq including the Agriculture, Forestry and Other Land Use (AFOLU) sector in 2016 (Government of Indonesia 2018). Of the total emissions, the largest greenhouse gas emitting sector was the AFOLU sector with 705 Mt CO_2eq in 2016, amounting to a share of 52 % of total emissions; it had an average annual growth rate of 1.4 % between 2000 and 2016.

The energy sector is the second largest emission sector with 538 Mt CO_2eq in or a share of 37 % of total emissions. Emissions from the energy sector grew strongly with an average annual growth rate of 3.2 % from 2000 to 2016. Indonesia is among the group of large emitters in the G20 with strongly growing greenhouse gas emissions.

In recent years, Indonesia has progressed in assessing the transition to a climate neutral economy. Studies from its planning Ministry, Bappenas, indicate that the transition will benefit the economy and create employment (World Resources Institute 2021).

Indonesia has established the basis for an emissions trading system, with a voluntary pilot emissions trading trial from March 2021 that covers eight coal-fired power plants (ICAP 2021a). Indonesia's renewable electricity generation sector has not reached the same level of competitiveness as, for example, in China or India. The installation costs for PV solar, for example, are almost double the costs compared to China or India (IRENA 2021), and, the Levelized Costs of Energy of coal power in Indonesia is lower than renewable energy (BloombergNEF 2020).

While belonging to the top four countries in terms of primary forest loss in 2020 (see WRI Indonesia 2021), Indonesia has made progress with decreasing deforestation in recent years (World Resources Institute 2021).

For lowering its carbon footprint, Indonesia needs to exit fossil fuel power plants, primarily coal and gas, promote the development of renewable energies by removing relevant barriers. Moreover, Indonesia needs to make further progress on lowering or ending its deforestation.

Indonesia submitted its updated National Determined Contribution in July 2021. Indonesia left the 2030 targets unchanged from its initial NDC, with greenhouse gas emissions of -29 % compared to business as usual unilaterally and -41 % with international support (Government of Indonesia 2021).

Indonesia has not yet committed to a net zero target but is exploring scenarios that could lead to net zero by 2060 or earlier through updated NDCs. As an update to the previous NDC, Indonesia is now providing further details on its sectoral mitigation and adaptation programs. In all updated scenarios, Indonesia's projected GHG emissions will significantly increase from current levels up to 2030 without peaking. Therefore, Indonesia so far plans insufficient contributions by 2030 for closing the emissions gap for reaching the temperature goal under the Paris Agreement.

5.5.3. Argentina

In its latest inventory submitted to the UNFCCC, Argentina's emissions are reported at a level of 364 Mt CO_2eq for 2016. Energy made up 53 % of total emissions in 2016, and the agriculture, forestry and AFOLU sector 37 %. In all sectors but AFOLU, emissions have been rising since 1990 (Government of Argentina 2020). Renewable energy sources (predominantly hydro energy) account for more than a quarter of the electricity generated in Argentina. More than 60 % of electricity is generated by natural gas, which is abundant in the country (IEA 2021a).

The AFOLU sector has continuously been a net source of emissions. As stated in Argentina's 3rd biennial update report, 'emissions from the AFOLU sector reflect changes in deforestation patterns of native forests due to the shifting of the agricultural frontier and variations in livestock stocks due to climate issues' (Government of Argentina 2020). Agriculture is an important economic sector in the country; Argentina is the world's third-largest exporter of soy and the fifth-largest exporter of beef (ADHB 2021; INDEC 2020). More than half of Argentina's land area is used for agricultural production (World Bank et al. 2015).

The second NDC submitted by Argentina in December 2020 sets an absolute, economy-wide and unconditional target of limiting greenhouse gas emissions (excluding LULUCF) to 313 Mt CO_2eq by 2030 (MAyDS 2020). This target represents a clear progression from the previously submitted target. It implies an increase in emissions of 35 % by 2030 above 1990 levels (Climate Action Tracker 2021b).

In April 2021, Argentina's President announced at the Leaders' Summit on Climate that Argentina will further increase its climate action. Additionally, it has been announced that Argentina will present a long-term strategy at COP26, including the goal of carbon neutrality by 2050 (Climate Action Tracker 2021b). Argentina's current energy sector strategy focuses on the exploitation of gas resources, potentially counteracting the expansion of renewable energy. Since 2018, a carbon tax on liquid and solid fuels is in place, covering about 20 % of the country's greenhouse gas emissions. Critics point out that there is no comprehensive strategy for reducing emissions in the agricultural sector and that economic recovery measures to address the effects of the COVID-19 pandemic are not geared towards fulfilling climate objectives (Climate Action Tracker 2021b).

5.6. Other large emerging countries

5.6.1. India

With its growing population and its economic development, India is after China the world's second largest contributor to the growth of global GHG emissions per year in the period 2010 to 2019 (Minx et al. 2021).

India's total greenhouse gas emissions excluding LULUCF amounted to 2.8 Mt CO_2eq in 2016 (Government of India 2021). India's emissions are rapidly growing and increased from 2000 to 2016 with a compound annual growth rate of 6 %. The energy sector is the sector with the largest overall emissions contribution, at 75 % of the total emissions (Gütschow et al. 2021a). Besides the energy sector, the industrial process and waste sectors have rapidly growing emissions.

India's greenhouse gas emissions peaked in 2018 with declining total emissions during the years 2019 and 2020, due to influence of the economic slowdown (2019) and the COVID-19 pandemic (2020). 2019 and 2020 were the first years since 1990 in which coal power generation declined (Lolla 2021). While India's government still targets a capacity increase of coal and the fossil-fuel based infrastructure (Government of India 2018), the actual development is significantly behind schedule (Andrew 2020),

e.g. with a reduced growth rate of coal power emissions of 8 % between 2010-2014 and 3 % between 2015-2019, and negative growth rates in 2019 and 2020.

India's renewable power generation costs, particularly PV solar but also wind, are at record low levels globally. According to Bloomberg New Energy Finance, India has record low solar generation costs globally with Levelized Costs of Energy of USD 25 per MWh or about EUR 2.1 cent per kilowatt hour (kWh) for utility scale power plants (BloombergNEF 2020). The Levelized Costs of Energy of photovoltaic solar are now lower than the Levelized Costs of Energy of coal with USD 26 USD per MWh. Given the competitiveness of renewable energies in India, the International Energy Agency predicts declining coal power generation in its India Vision Case and Sustainable Development scenarios in the 2030s (IEA 2021d). In 2020, solar and wind power generation capacity increased and coal power generation decreased, demonstrating that the transition is possible. To increase the renewable energies on the scale required, it will be necessary that India further removes barriers for the expansion of renewable energies, including frequent cancellation and renegotiations of power purchase agreements through cash strapped electricity distribution companies, lacking investment of these companies, lacking investments in the grid and storage infrastructure (Andrew 2020). Currently, India has a wind and solar power generation capacity of 118 terawatt-hours (TWh) which is behind its targets for fiscal year 2021-22 of 274 TWh and its 2029-30 target of 793 TWh.

To achieve green growth, India needs to rapidly electrify its energy demand, particularly transport and industry, continue to improve energy efficiency, and meet the increasing electricity demand with renewable energy sources. To address the strong growth in cooling demand, and the resulting strong increase in cooling-related energy demand, energy and refrigerant-related emissions, India has developed a comprehensive National Cooling Action Plan (IEA 2021c). India's electricity demand is projected to increase from currently below 1,500 TWh in 2020 to more than 2,200 TWh in 2030 and more than 5,000 TWh in 2050.

India has not yet submitted an updated NDC or committed to a target year on climate neutrality. In its initial NDC, India committed to reducing greenhouse gas emission intensity by 33 % to 35 % by 2030. Several recent studies show that India is on track to meeting the commitment of its initial NDC; however, there remain significant uncertainties in tracking India's greenhouse gas emissions (Ideas For India 2021).

The future pathway of India's greenhouse gas emissions remains unclear. India has continued to decline requests in the G20 for a moratorium on new coal power plants. The government forecasts a rapid increase in the electricity demand, which it currently plans to meet flexibly with both fossil fuel and renewable energy sources. In order to contribute to global greenhouse gas emissions pathways in line with the 1.5°C goal and to close the emission gap it is important that India, as a big emitter, aims for its emissions to peak before 2030 with a decarbonisation pathway thereafter (Climate Action Tracker 2021g; Reuters Media 2021b).

5.6.2. South Africa

South Africa's emissions amounted to 460 Mt CO_2eq in 2015 (Government of South Africa 2019). The energy sector, particularly the electricity generation sector, causes most of South Africa's GHG emissions, at 430 Mt CO_2eq in 2015 or 93 % of national emissions and an average annual growth rate of 1.5 % (Government of South Africa 2019). 90 % of the country's electricity generation is coal-based and generated by the national utility Eskom (Government of South Africa 2020). South Africa is the most carbon-intensive G20 economy with the highest coal reliance (Climate Home News 2021d). The transformation of the electricity generation from coal to renewable energies is the key driver for South

Africa's mitigation strategy, representing 70 % to 90 % of South Africa's emission reductions between 2020 and 2030 (Government of South Africa 2020).

South Africa has good conditions for the expansion of renewable energy, with a high level of solar irradiation and many locations with favourable wind conditions. Similarly to Indonesia, South Africa's renewable energy market has not yet reached the competitive level of, for example, China and India, and has higher renewable energy installation and operating costs (IRENA 2021). Other than in China and India, the Levelized Costs of Energy of coal power in South Africa are lower than those of renewable energy (BloombergNEF 2020). For reaching the crossover of renewable energy over coal, South Africa needs to remove the remaining barriers to the expansion of renewable energies with a supportive carbon pricing strategy for fossil fuel energies. South Africa's Low Emission Development Strategy forecasts that the transition to renewable energy will create new economic and employment benefits. The transition will also cause job losses, which South Africa needs to address with an appropriate Just Transition Strategy (Government of South Africa 2020).

In its Low Emissions Development Strategy, South Africa proposes the vision of climate neutrality in 2050 but lacks a clear sectoral description for achieving the target. To reach the 2050 target, President Cyril Ramaphosa has established the Presidential Climate Commission to advise the government on how to ensure the transition from coal to renewable energy sources. This commission recommended a tighter 2030 emissions target of 350 to 420 Mt CO_2eq (Reuters Media 2021d).

On 27 September 2021, South Africa submitted its updated NDC (Republic of South Africa 2021), taking into account the advice from the Presidential Climate Commission. The NDC consists of an adaptation component, which constitutes South Africa's adaptation communication under Article 7 of the Paris Agreement, and a mitigation component. Under the mitigation component, South Africa commits to GHG emissions in the range of 398 to 510 Mt CO_2eq in 2025 and 350 to 420 Mt CO_2eq in 2030. These targets represent an important progression compared to the original NDC, and the new target for 2030 constitutes an emissions reduction compared to current levels.

The NDC assumes the implementation of the Integrated Resource Plan for Electricity 2019. This plan marks a significant shift in energy policy from coal to renewables, which is an important step for a coal-dominated country like South Africa. Still, South Africa plans to build 1.5 gigawatts of new coal power capacity by 2030 (Creamer 2021).

5.7. Parties with particular strategic importance in the negotiations

5.7.1. Saudi Arabia

Saudi Arabia is one of the world's largest oil producers and the largest exporter of oil. According to the information provided in its First Biennial Update Report (Saudi Arabia Designated National Authority 2018), the energy sector was responsible for approximately 89 % of CO_2 emissions in 2012, followed by the industrial processes sector. Important methane emissions originate from the waste and energy sector. More recent greenhouse gas inventory information is currently not available; Gütschow et al. (2021b) estimate that total GHG emissions amounted to approx. 750 Mt CO_2eq in 2019.

Saudi Arabia's economy is centred around fossil fuels and will have to diversify once its exports decrease due to the decarbonisation efforts in other countries. Hence, Saudi Arabia follows the climate change negotiations very actively and points out the challenges that fossil-fuel based economies face in a transition towards other energy sources. Saudi Arabia engages particularly in the negotiations on the impacts of the implementation of response measures (cf. chapter 3.7.4).

In 2016, Crown Prince Mohammed bin Salman launched the 'Vision 2030' strategic framework, which aims to create a more diverse and sustainable economy (Kingdom of Saudi Arabia 2021). In March 2021, bin Salman announced the 'Saudi Green Initiative' which includes a 50 % renewables target for Saudi Arabia's energy mix in 2030, a target of reducing carbon emissions by more than 4 % of global contributions and targets for trees planted and areas of protected land (Saudi Green Initiative 2021). However, several questions remain concerning the details and implementation of these targets; it should also be noted that despite a move toward renewables in the domestic energy system, important emissions of greenhouse gases remain from the exploration, production and transport of fossil fuels.

Saudi Arabia did not communicate a new or updated NDC. Its original NDC of 2016 focused on economic diversification and lists diversification and adaptation actions which generate mitigation co-benefits (Kingdom of Saudi Arabia 2015). According to the NDC, these actions seek to achieve mitigation co-benefits of up to 130 Mt CO_2eq avoided by 2030 annually.

Saudi Arabia will host inaugural events for the Saudi Green Initiative and the 'Middle East Green Initiative', which is a similar project at regional level, on October 23 to 25 (Arab News 2021), just a few days ahead of October's G20 meeting and the start of the COP.

5.7.2. Turkey

Turkey plays an unusual role in the negotiations because it is listed in Annex I to the Convention with developed countries, while other emerging countries that are comparable to Turkey are not listed in this Annex. As an Annex I Party, Turkey is not eligible for support under the Convention. Arguing that it is a developing country in many ways, Turkey aims to be removed from Annex I to the Convention. At COP25 in 2019, Turkey proposed and later withdrew a proposal for a COP agenda item on deleting it from Annex I (IISD Reporting Services 2019). Last-minute discussions on this and other proposals for the COP agenda led to a delay in the start of COP25. In the provisional agenda for COP26, the proposal by Turkey to delete it from the list in Annex I is once again included [36].

In 2019, Turkey emitted 506 Mt CO_2eq, excluding LULUCF, which constitutes an emissions increase of 131 % compared to 1990 (Turkish Statistical Institute 2021). The 2020 greenhouse gas emissions are estimated to be 3 to 5 % lower than 2019 levels due to the effects of the COVID-19 pandemic; by 2021, emissions are expected to return to 2019 levels (Climate Action Tracker 2021h). The increase in emissions results from the substantial growth of Turkey's economy in recent decades and rising energy needs. In the future, emissions are expected to continue to grow (Carbon Brief 2018b).

Turkey stands out as one of the countries with the largest potential for the expansion of renewable energy sources in Europe. In 2015, approx. 6 % of Turkish electricity came from renewables, excluding hydropower (Carbon Brief 2018b). Including hydropower, the current installed capacity already has a share of 52 % of renewable energy (AA 2021). Nevertheless, the country continues to rely on fossil fuels and is planning to increase its coal capacity (IEA 2021e).

Turkey it is one of six Parties to the UNFCCC which have not yet ratified the Paris Agreement (United Nations 2021). It submitted an INDC in 2015 stating that it will cut its emissions by 2030 by up to 21 % compared to a business-as-usual scenario (Republic of Turkey 2015). This target includes LULUCF and implies an emissions level of 929 Mt CO_2eq in 2030. This target has been criticised for its lack of ambition and an inflated baseline scenario. Since the business-as-usual scenario expects a very high annual

[36] Item 14(c) of the provisional agenda dated 3 September 2021. The most recent agenda versions can be found on the COP26 main page: https://unfccc.int/process-and-meetings/conferences/glasgow-climate-change-conference.

emissions growth of 5 %, the country's pledge may lead to no reductions at all (Carbon Brief 2018b; Climate Action Tracker 2021h). Turkey has not set a long-term target beyond 2030.

On 21 September 2021, during his speech at the UN General Assembly, President Recep Tayyip Erdogan announced that the Turkish Government is preparing to seek parliamentary approval for the ratification of the Paris Agreement in October 2021 (Reuters Media 2021e). If Turkey ratified the Paris Agreement still in October, all G20 members would be Parties to the agreement by the start of COP26.

The implementation of climate action in Turkey has been sporadic; mainly the Energy Efficiency Action Plan and renewable energy auctions have shown progress (Climate Action Tracker 2021h). The country shows interest in market-based instruments to achieve climate targets, also aiming 'to use carbon credits from international market mechanisms to achieve its 2030 mitigation target' (Republic of Turkey 2015). The forest areas in Turkey are growing, because the government is pushing for the largely state-owned forests to increase. This has led to increasing removals in the LULUCF sector (Turkish Statistical Institute 2021).

5.8. The United Kingdom (COP Presidency)

Holding the presidency of COP26 in partnership with Italy[37], the UK's climate change policy is under public focus. It is trying to lead by good example: In June 2021, the government announced that it would phase out coal from electricity production by 2024, one year earlier than originally planned (UK Government 2021a). Additionally, the UK submitted its ambitious first NDC in December 2020 (UK Government 2020b). Prior to Brexit, its commitments had been included in the EU's NDC. The UK commits to reducing economy-wide GHG emissions by at least 68 % by 2030 compared to 1990 levels, for which additional measures will be necessary. It reserves the right to use voluntary cooperation under Article 6 of the Paris Agreement to achieve this target, even though the UK Government had committed to not using international credits to meet its domestic target (UK Government 2020a). For 2035, the UK government has set a carbon budget in April 2021, implying a reduction of emissions by 78 % by 2035 compared to 1990 levels (UK Government 2021c).

Between 1990 and 2019, emissions have declined by approx. 43 % in the UK (excluding LULUCF and international aviation) (EEA 2021). Due to the effects of the COVID-19 pandemic, emissions are estimated to drop by a further 11 % in 2020 (UK Government 2021b). Particularly in the energy sector, emissions have declined rapidly due to large investments in renewable energy and a sharp decline in the production and consumption of coal. The transport sector was the largest single source in 2018, accounting for 27 % of total emissions; since 1990 emissions in this sector have only decreased by 5 % (UK Government 2021b).

The Climate Change Act, which was revised in 2019, provides the legal basis for achieving net-zero emissions by 2050.[38] It sets carbon budgets for the UK Government, capping emissions over successive five-year periods. The UK has announced that it will publish a comprehensive net zero strategy ahead of COP26. Current policies and measures are described in the Clean Growth Strategy published in 2017.[39] In 2021, the UK introduced its own emissions trading system, which is set up in a similar way as the EU ETS. In addition, the UK has set a Carbon Price Floor, requiring UK power generators to pay a

[37] Italy plays an important role in organising preparatory work before the conference such as hosting a Pre-COP session and an event for young people. The Pre-COP took place in Milan from 30 September to 2 October 2021, after the cut-off date for this study.

[38] Climate Change Act 2008, https://www.legislation.gov.uk/ukpga/2008/27/contents.

[39] The Clean Growth Strategy, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf.

minimum carbon price, under the Carbon Price Support Mechanism[40]. In the transport sector, a Fuel Duty tax on road fuels is in place[41]. From 2030, the sale of new petrol and diesel cars and vans will be banned[42]. To accelerate the expansion of renewable energy, a Contracts for Difference Scheme is in place, guaranteeing a fixed price per unit of low-carbon power generation. To increase energy efficiency, the UK's Energy Company Obligation scheme requires large energy firms to boost the efficiency of homes, and in the business sectors, polluters pay a Climate Change Levy per unit of energy consumption (Energy & Climate Intelligence Unit 2021a)[43].

Box 6: Goals of the COP26 presidency

For COP26, the UK has formulated four goals (Government of the United Kingdom 2021), which cover the major issues at stake in the negotiations:

- **Secure global net zero by mid-century and keep 1.5 degrees within reach** by accelerating the phase-out of coal, curtailing deforestation, speeding up the switch to electric vehicles and encouraging investment in renewables. After its announcement of phasing out coal from electricity generation by 2024, the UK government is asking governments to set coal phase out dates and end overseas coal investments. In May 2021, the G7 agreed to end all new finance for coal power by the end of 2021 (Government of the United Kingdom 2021). Also, the UK has set up the Energy Transition Council aiming to promote dialogue for ensuring that clean power is the most attractive option for countries in the global South and to support just transition (Government of the United Kingdom 2021).
- **Adapt to protect communities and natural habitats** by protecting and restoring ecosystems and building defences, warning systems and resilient infrastructure and agriculture to avoid loss of homes, livelihoods and lives.
- **Mobilise finance** from the private and the public sector and delivering the goal of mobilising at least USD 100 billion in climate finance per year by 2020.
- **Work together to deliver** by finalising the Paris Rulebook and accelerating action to tackle the climate crisis through collaboration between governments, businesses and civil society.

[40] Carbon Price Floor (CPF) and the price support mechanism, https://commonslibrary.parliament.uk/research-briefings/sn05927/.

[41] Tax on shopping and services https://www.gov.uk/tax-on-shopping/fuel-duty.

[42] Outcome and response to ending the sale of new petrol, diesel and hybrid cars and vans, https://www.gov.uk/government/consultations/consulting-on-ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans/outcome/ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans-government-response.

[43] The governments of Scotland and Wales and the Northern Ireland Assembly have additional targets and policies in place.

6. RECENT DEVELOPMENTS AND THEIR IMPACT ON THE NEGOTIATIONS

6.1. The COVID-19 pandemic

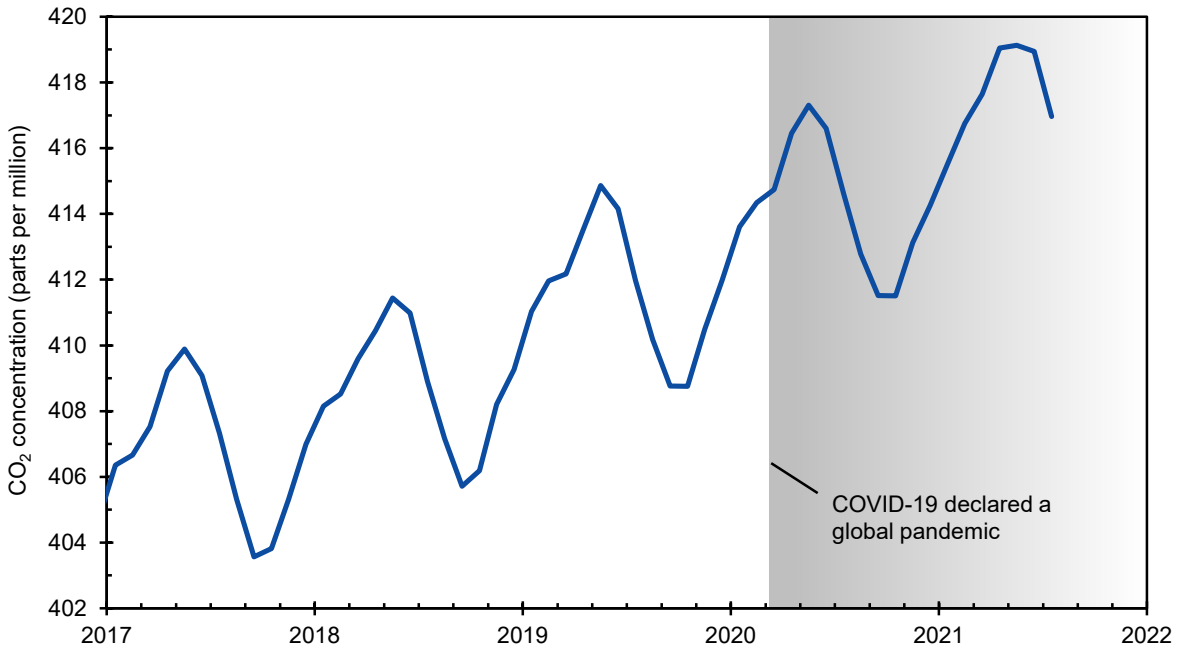
Like almost all aspects of national policy and international collaboration, the response to climate change and the international negotiations were severely impacted by the COVID-19 pandemic. Due to lower economic activity during the pandemic, greenhouse gas emissions dropped significantly as a response to lockdown policies. Global CO_2 emissions in 2020 were estimated to be 6.4 % or 2.3 billion tonnes below 2019 levels, with the largest decrease taking place in the US (-13 % compared to 2019) (Tollefson 2021).

According to the IEA (2021b), global energy-related emissions fell by 5.8 % in 2020, marking the largest relative annual decline since World War II. The transport sector accounted for more than half of this global drop of CO_2 emissions as a result of the restrictions imposed on travel. The aviation sector was among those sectors hit hardest by the pandemic (see chapter 2.4.1).

However, these emission reductions were only a temporary result of lockdown measures. After a sharp drop in the first half of 2020, emissions started to rebound and followed the pre-2020 growth trend. In December 2020, emissions surpassed the level of December 2019 (IEA 2021b). The 6.4 % dip in emissions in 2020 is below the cuts of 7.6 % per year which are needed on average over the coming decade to keep global warming to 1.5°C, according to the UNEP Emissions Gap Report (UNEP 2019).

Additionally, it should be noted that despite reduced CO_2 emissions during the COVID-19 pandemic, CO_2 concentrations in the atmosphere continued to increase. Concentrations measured at Mauna Loa (Hawaii) show seasonal variations with peaks in spring and dips in autumn; the concentration reduction during summer is caused by the CO_2 uptake by plants during the growing season in the northern hemisphere.

Figure 19: Measured atmospheric CO_2 concentrations



Source: NOAA/GML, https://gml.noaa.gov/ccgg/trends/data.html.

Note: Monthly averages of CO_2 concentrations measured at Mauna Loa (Hawaii).

As can be seen in Figure 19, CO_2 concentrations in the atmosphere followed a similar annual pattern and reached new record highs in the months after many economies went into lockdown in 2020, and concentrations reached new records again in 2021. The reason that global CO_2 concentrations are hardly affected by temporary emissions reductions is that CO_2 has a lifetime in the atmosphere of several hundreds of years. The growth of CO_2 concentrations in the atmosphere can be slowed only if long-term emission reductions can be achieved.

To reverse the trend of rising emissions, it is critical that the COVID-19 crisis is followed by an economic recovery which is decoupled from emissions. However, on a global scale, national recovery plans have been found to 'primarily support the global status quo of high-carbon economic production' (UNEP 2020, p. 38). For the EU, national recovery plans are falling short of ambitions to 'build back better', with most recovery plans not being aligned with the EU's new 2030 climate target (Green Recovery Tracker 2021). Only around a quarter of G20 members have dedicated a share of their recovery packages explicitly to low-carbon measures, accounting for up to 3 % of GDP (UNEP 2020, p. 40). According to the OECD (2021), only 17 % of total funding allocated to COVID-19 economic recovery is aimed at achieving positive environmental effects. Not designing recovery measures in a way to foster climate targets is a missed opportunity: If COVID-19 economic recovery were used as an opportunity to pursue strong decarbonisation (in line with the IEA sustainable recovery scenario (IEA 2020b)), 2030 emissions could be 25 % lower than projected by original current policy scenarios (UNEP 2020, pp. 32–33).

In general, governments had to shift resources to address the massive economic and health impacts of the COVID-19 pandemic, and attention was diverted from climate action and support. As an example, the fact that only 75 Parties communicated a new or updated NDC by the end of 2020 (cf. chapter 3.1.1) can be attributed to a large part to the pandemic.

Besides its impact on economies world-wide, the pandemic affected international processes including the climate negotiations. The meetings of the subsidiary bodies in 2020 and the COP, which had originally been planned for November 2020, had to be postponed. Instead, virtual informal dialogues were convened in which delegates discussed selected items from the agendas of SBSTA and SBI. However, representatives from many developing countries pointed out that connectivity issues and time zone differences posed difficulties and that the outcomes of these informal meetings do not have a formal status. Unlike the IPCC, which convened for a virtual session with a formal outcome in August 2021 (cf. chapter 4.2.3), the bodies under the UNFCCC will adopt formal conclusions and decisions only once delegates meet again in person.

In any case, the conference in Glasgow will still be affected by the pandemic. With distancing and quarantining rules, attendance will be less inclusive, and representatives from developing countries, where vaccination rates are lower and infection rates are higher in many cases, face additional hurdles. The opportunities for the participation of civil society inside events and exhibits will be limited, too.

6.2. Events at international level

Despite the complications caused by the COVID-19 pandemic, several international events took place in 2021, which provided important input to the international process in the run-up to the Glasgow conference.

On 21 and 22 April 2021, U.S. President Biden hosted a 'leaders' summit on climate change'. In a virtual format, heads of state and government from 40 countries announced their actions and targets to mitigate climate change (IISD Reporting Services 2021a). Many reiterated the pledges which they had already communicated in their NDCs, but the summit convened leaders that had not been vocal on

climate change in recent years, including from the Russian Federation and Brazil. At this summit, the U.S. communicated its NDC under the Paris Agreement (cf. chapter 5.3.1).

Under the UNFCCC, a virtual session of the subsidiary bodies took place from 31 May to 17 June 2021 (IISD Reporting Services 2021b). As some Parties raised concerns about making formal decisions in a virtual setting, work was organised in informal consultations based on the draft provisional agendas of the SBSTA and the SBI. The outcomes of the deliberations were summarised in informal notes by the SBI and SBSTA chairs[44]. These notes provide general information on the progress made during the session and include links to separate informal notes for each of the agenda items. The texts in these separate notes constitute important input for the deliberations in Glasgow, but it is still open whether all Parties will accept them as a starting point for the negotiations under the various agenda items.

On 25 and 26 July, the incoming COP President, Alok Sharma, invited minsters to participate, either in person in London or virtually, in a ministerial meeting (Sharma 2021). The meeting was an important opportunity to prepare for the COP in Glasgow and to exchange on topics including mitigation and adaptation action, loss and damage, the mobilisation of climate finance, and how to find an agreement on the rules for cooperative approaches under Article 6 of the Paris Agreement.

In 2021, the United Kingdom does not only assume the presidency of the COP, but also of the Group of Seven (G7). At the G7 summit at Carbis Bay in Cornwall from 11 to 13 June 2021, the G7 leaders committed, inter alia, to net zero emissions no later than 2050 and to halving collective emissions over the two decades to 2030 (G7 2021).

The Group of Twenty (G20) is presided by Italy this year, which also assumes the presidency of the Pre-COP. In the Ministerial Communiqué of the G20 climate and energy ministers' meeting of 23 July 2021 (G20 2021), minsters urged all G20 members to formulate long-term strategies that set out pathways consistent to achieving a balance between anthropogenic emissions and removals as soon as possible, but did not agree on setting a specific date for decarbonisation.

The summit of the G20 leaders will take place on 30 and 31 October 2021; its second day will coincide with the first day of the COP. Hence, this summit will provide an opportunity for the G20 presidency and heads of state and government to reiterate the importance of climate action, of the contributions to be made by the world's major economies, and of the progress to be made during the climate negotiations.

6.3. Civil society movements

Although citizens' lives across the globe have been affected by the COVID-19 pandemic the issue of climate change continues to be of major importance to civil society. Established in 2018, 'Fridays for Future' has become the largest climate movement, mobilising young people to call for ambitious climate action, inter alia through regular strikes. More than 14 million people are part of the global movement[45]. Additionally, the Extinction Rebellion movement emerged in 2018, which uses non-violent civil disobedience to call for a halt to the extinction of species[46].

Ahead of COP26, a UK-based civil society coalition of groups and individuals ('COP26 Coalition') is mobilising movements around the world to call on COP26 to take strong action against climate change.

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[44] Informal note by the SBI chair: https://unfccc.int/documents/279106; informal note by the SBSTA chair: https://unfccc.int/documents/279105.

[45] Fridays for future, https://fridaysforfuture.org/.

[46] Extinction rebellion, https://rebellion.global/.

From 7 to 10 November 2021, the coalition will organise the People's Summit for Climate Change in order to join forces in calling for climate justice[47].

These movements continue to help put climate change at the centre of political debates in Europe and elsewhere, inducing numerous actors on the political stage to take a stance on the issue. It remains to be seen to what extent civil society action will be able to generate concrete political action needed to tackle climate change in the near future.

Beyond traditional forms of initiatives and protests, environmental NGOs play an increasingly important role by bringing in lawsuits against governments or corporations. For example, the Urgenda Foundation representing more than 800 Dutch citizens won a court case against the Dutch government; the Dutch Supreme Court confirmed in 2019 that the Dutch government has obligations to urgently and significantly reduce greenhouse gas emissions in line with its human rights obligations (Urgenda 2019). Similarly, a group of young climate activists supported by civil society organisations filed a constitutional complaint with the Federal Constitutional Court of Germany which held, in April 2021, that insufficient climate policies affect tomorrow's freedom and fundamental rights. As a result, the German Climate Act had to be amended to spell out more precisely the way to achieve climate neutrality by the middle of the century (Germanwatch 2021). As a result of a case brought to court in the Netherlands in 2019 by the NGO Friends of the Earth, the court ruled that Shell must cut its CO_2 emissions by 45 % by 2030 compared to 2019, marking the first time a company has been legally obliged to take more ambitious climate action (BBC 2021).

The number of cases of climate change litigation is constantly increasing; there are currently more than 1,800 ongoing or concluded cases around the world. A large majority of almost 1,400 cases were filed before courts in the United States, but the number of climate litigation cases in the Global South continues to grow. In this way, climate litigation is becoming an additional instrument of civil society to put governments and major emitters under pressure to take ambitious mitigation action (Setzer and Higham 2021).

[47] Climate justice movement, https://cop26coalition.org/.

7. OUTLOOK

With COP26 taking place under difficult circumstances due to the COVID-19 pandemic, it is difficult to judge how much specific progress can be made during the conference, and which topics and issues may remain unresolved after it has ended. The COP in Glasgow represents an important opportunity for announcing increased ambition for those Parties which have not yet done so in 2020 or 2021. However, if major emitters of greenhouse gases fail to come forward with ambitious announcements, important momentum and time will be lost in the effort to curb global greenhouse gas emissions.

In general, it can be expected that with the return of the US to the Paris Agreement, multilateral efforts have a better chance of succeeding than during the years of the Trump administration. However, it can also be expected that the US will defend its own positions more vigorously, e.g. on climate finance or on the rules for Article 6 of the Paris Agreement.

As with every climate change conference, it remains an open question on which agenda items Parties can reach a conclusion, and which items will continue to be negotiated in 2022. For the agenda items on the technical implementation under the Paris Agreement, in particular on Article 6 and on the transparency framework, there is a risk that Parties may not come to an agreement in Glasgow.

The absence of such an agreement would severely hamper the implementation of the Paris Agreement. Under Article 6, Parties wish to make use of cooperative approaches or of the international mechanism from 2021 onwards, and a lack of rules means that these instruments cannot be used as intended, or that they may be implemented in a way that compromises environmental integrity. Under the transparency framework, Parties and the UNFCCC Secretariat need to prepare for the electronic reporting of information. A further delay in the agreement on reporting formats makes it difficult, particularly for developing countries, to collect and provide all information required under the transparency framework by the reporting deadline in 2024.

Even if all major emitters commit to more ambitious mitigation actions by the end of the Glasgow conference, the world will still be far away from an emissions pathway that would meet the temperature goal of the Paris Agreement. In order to keep the goals of the Paris Agreement within reach, countries will have to initiate transformational changes in their economies and in parallel increase their efforts to adapt to the impacts of climate change.

Under the Paris Agreement, the global stocktake constitutes the formal mechanism for ratcheting up climate ambition. The preparations for the global stocktake started at the Subsidiary Bodies session in June 2021; in the months ahead, the information collection and preparation phase will continue. The inputs which are to be used in the global stocktake, such as the IPCC's Sixth Assessment Report, will be of central interest during 2022. In addition, Parties were invited to submit inputs to the global stocktake by February 2022 at the latest (UNFCCC 2021e). The various inputs will be technically assessed in preparation for the political phase of the global stocktake in 2023.

The preparation for the global stocktake will also be one of the main topics of interest of the subsequent COP, which is scheduled for November 2022. In line with the rotation of regional groups under the UNFCCC, an African country will assume the presidency of COP27. In coordination with the African Group and the African Group of Negotiators, Egypt has expressed interest in hosting this COP (Egypt Today 2021).

Given the delays and difficulties caused by the COVID-19 pandemic and taking into account uncertainties about how much progress can be made in Glasgow, it will be critical that climate change stays high up on the political agenda in 2022 and that governments and civil society work on new and ambitious solutions in response to the increasing risks and impacts associated with climate change.

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The 26th Conference of the Parties to the United Nations Framework Convention on Climate Change focuses on increasing ambition and implementing the Paris Agreement. This study provides an overview of the international framework to address climate change, the Parties and stakeholders involved, the status of the negotiations and recent developments that affected the international process.
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