DESIGNING AND PREPARING INTENDED NATIONALLY DETERMINED CONTRIBUTIONS (INDCs)

KELLY LEVIN, DAVID RICH, YAMIL BONDUKI, MICHAEL COMSTOCK, DENNIS TIRPAK, HEATHER MCGRAY, IAN NOBLE, KATHLEEN MOGELGAARD, AND DAVID WASKOW

WORLD RESOURCES INSTITUTE

UNDP

Empowered lives.
Resilient nations.

WRI.ORG | UNDP.ORG

TABLE OF CONTENTS

1 Foreword
3 Executive Summary
7 Introduction

PART I: OVERVIEW OF INDC PREPARATION AND DESIGN

CHAPTER 1
13 Background on INDCs

CHAPTER 2
17 How can Parties organize a national process to prepare an INDC?

CHAPTER 3
23 What data and analysis can inform an INDC?

CHAPTER 4
31 What form can the INDC take?

CHAPTER 5
37 How can Parties communicate their INDC transparently?

PART II: TECHNICAL GUIDANCE

CHAPTER 6
45 What options exist for the design of an INDC for mitigation?

CHAPTER 7
75 What options exist for the design of an INDC for adaptation?

CHAPTER 8
87 What means can Parties use to implement the INDC?

94 Annexes
105 Glossary
107 Acronyms
109 References
113 Endnotes
116 Acknowledgments

FOREWORD

The commitment of Parties to develop Intended Nationally Determined Contributions (INDCs) will form a key part of the climate agreement expected to be agreed in Paris in December 2015 at the 21st Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC).

As the impacts of climate change mount, the urgency to take collective action has never been greater. Through coordinated global efforts, there is still an opportunity to meet the two degree Celsius (2°C, or 3.6°F) goal necessary to avoid dangerous climate change. Delaying action will be costly and can make achieving the 2°C goal almost impossible.

The importance of tackling climate change is clear. So is the opportunity that collective climate action represents to drive sustainable development in all countries.

Over the coming months, countries can take an important step toward realizing this opportunity and putting the world on a sustainable path, through the development of strong INDCs and an ambitious global climate agreement at COP21.

While the Paris climate agreement might not address all actions necessary to prevent a climate crisis, it must mark the turning point for how the global community commits to solutions and concrete steps for global action.

INDCs will be foundational for the Paris climate agreement, demonstrating countries' intent to decarbonize their economies and invest in resilience.

Countries' INDCs could set in motion a virtuous and reinforcing set of decisions at the national and international level. With the right policies and incentives in place, private and public investment, new technologies, and greater innovation can be unleashed to lower emissions, grow our economies, eradicate poverty, and achieve sustainable development for all.

It is our hope that this guidance helps Parties as they develop meaningful contributions toward solving one of the greatest global challenges of our time, and supports countries to advance low emissions and climate-resilient development.

Helen Clark
Administrator
United Nations Development Programme

Andrew Steer
President
World Resources Institute

EXECUTIVE SUMMARY

As the world marches toward the UNFCCC Conference of the Parties (COP21) in December 2015, governments are determining what effort they will make to reduce emissions and address climate change. Countries are already in the midst of implementing commitments through 2020. Now they are turning their attention to preparing their commitments for the post-2020 period through pledges known as intended nationally determined contributions (INDCs).

Atmospheric concentrations of key greenhouse gases (GHG) are higher now than over the past 800,000 years (Global Carbon Project 2014). As a result of human activity, such as fossil fuel burning and land-use change, greenhouse gas emissions have increased significantly since the pre-industrial era. The human influence on the climate system is clear, and it is very likely the dominant cause of recent observed warming (IPCC 2013b).

In recent decades, anthropogenic GHG emissions have contributed to warming of the atmosphere and ocean, changes in the global water cycle, reductions in snowfall and icepacks, sea level rise, and changes in some climate extremes, among other impacts (IPCC 2013b). To avoid catastrophic impacts in the future, the United Nations Framework Convention on Climate Change (UNFCCC) has adopted a goal of limiting global warming to 2°C above pre-industrial levels.

As the key vehicle for governments to communicate internationally how they will cut emissions for the post-2020 period, INDCs allow countries to demonstrate leadership on addressing climate change. While climate change is a global challenge, each country faces unique circumstances, including different emissions profiles and emissions-reduction opportunities, different risks from a changing climate, and different resource needs. Through their INDCs, countries can tailor their contributions to their own national priorities, capabilities, and responsibilities. These individual measures can be the basis for collective action, and, if they are ambitious enough, set a path toward a low-carbon, climate-resilient future.

In 2014-2015, the United Nations Development Programme (UNDP) and the UNFCCC convened a series of Regional Technical Dialogues on INDCs to support countries in the process of preparing and putting forward their contributions. The countries that participated in those dialogues requested additional detailed guidance on INDC preparation; this guidance document responds to that request. It captures ideas shared during the dialogues, reflects the current state of negotiations, and puts forward options for the preparation of INDCs based on research from recent literature and relevant UNFCCC documentation.

This document guides Parties on the preparation and design of INDCs, including detailed technical guidance and process-related considerations. It walks Parties through the choices they will face in preparing and designing their INDCs, laid out in five general steps: identifying the benefits of an INDC, organizing the INDC process, identifying data and analysis to inform the INDC, designing the INDC, and communicating the INDC.

Identifying the Benefits of an INDC

There are significant domestic and international benefits that can be realized through the development and implementation of an INDC. Collectively, INDCs offer an opportunity to set the world on track toward the 2°C goal. Developing and implementing INDCs can demonstrate political commitment and help realize non-climate benefits associated with mitigating climate change. INDC preparation and implementation can also strengthen institutional and technical capacity, enhance policy integration, and inform key stakeholders.

Organizing a National Process to Prepare an INDC

Parties are invited to communicate their INDC in advance of COP21 in December 2015. Given the short timeframe available for the preparation of an INDC, building upon existing relevant processes can help Parties prepare an INDC in a timely manner. Ideally, INDC preparation can help strengthen the integration of climate change into existing planning processes as well as strengthen institutional cooperation on climate change in a way that can be useful for future implementation. The process should also provide legitimacy to the INDC.

While every national circumstance will be different, several elements may prove helpful in preparing a robust INDC through a consultative, efficient process:

- National leadership
- Clearly defined roles, responsibilities, and timeline
- Coordination
- Stakeholder engagement
- Ensuring the necessary resources and capacities

Identifying Data and Analysis to Inform an INDC

The development of an INDC should, in general, be informed by data and analysis regarding several elements, including:

- Internationally communicated pre-2020 climate actions
- National objectives and priorities
- Current emissions profile of the country
- Projected future emissions
- Assessment of mitigation potential
- Resource mobilization strategies

Parties may already have sufficient data and analysis that can be used when preparing the INDC, and collecting a significant amount of new data or conducting new analysis may not be necessary. Also, proxy data can help address data gaps that exist.

With relevant data and analysis, Parties can identify the sectors and greenhouse gases that should be prioritized by the INDC. Parties can also use their data to design an INDC that is realistic and achievable as well as fair and ambitious in contributing to achieving the objective of the Convention.

Options for Designing an INDC

INDCs can be framed either in terms of means or desired outcomes. A Party could commit to implementing specific emissions-reduction actions, such as policies or mitigation actions like advancing a feed-in tariff for renewable energy technologies, phasing out fossil fuel subsidies, or converting to no-tillage agricultural practices. Alternatively, a Party could commit to a certain outcome or result, for example, reducing emissions to a specific level (a greenhouse gas outcome) or generating a certain percentage of renewable energy or increasing energy efficiency to a certain level (both non-greenhouse gas outcomes). The variety of domestic situations each country faces in reducing emissions will drive a wide diversity of INDCs, ranging from emissions targets to energy targets to actions in particular sectors.

Quantified outcomes can provide a better understanding of future emissions reductions and emissions levels associated with the contributions, which, when aggregated, facilitate an assessment of future global emissions.[1] Quantified outcomes also facilitate tracking of progress in achieving the INDC, offer more credibility when securing finance and access to markets, and enhance comparability between Parties' INDCs. Additionally, it is simpler to estimate the GHG effects of quantified outcomes than of actions. If a quantified outcome is chosen, it may also be beneficial for Parties to provide information on key actions that will be undertaken to achieve the outcome, which can help other Parties understand how the contribution will be implemented and achieved.

At COP20, in December 2014, the Lima Call for Climate Action invited Parties to consider either communicating undertakings in adaptation or including an adaptation component in their INDCs. Accordingly, some countries may choose to include adaptation in their INDC. Developing countries may furthermore choose to highlight needs and priorities to assist in the INDC's implementation—including those relating to finance, technology, and capacity building—and may articulate the additional ambition or action that could be realized with greater support.

Transparently Communicating an INDC

Transparent information about the INDC is critical to understanding individual and aggregate impacts of Parties' INDCs. Transparent communication will also enable an assessment of whether global emissions after 2020 will be in line with the goal to hold the increase in global average temperature below 2°C. Providing more detailed information can also enhance domestic implementation by clarifying assumptions needed to implement the contribution and communicating those assumptions to domestic stakeholders, as well as communicating resource needs to others.

The Lima Call for Climate Action specifies information that Parties can put forward in their INDCs. In this document we provide additional guidance to assist Parties in fulfilling the Lima Call for Climate Action in order to ensure clarity, transparency, and understanding.

INTRODUCTION

Many Parties are taking steps to prepare their INDCs. Because Parties are invited to put forward their contributions well before COP21 in Paris, it is important that INDCs are designed through a process that facilitates rapid decision-making and action and does not add unnecessary burdens. Without prejudice to the outcome of the UNFCCC negotiations, this guidance document provides examples of good practice and outlines key technical issues for Parties seeking guidance on how to prepare their INDCs. We hope that it supports Parties in their efforts to respond to existing COP decisions in a timely manner.

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) are negotiating a new international agreement for the post-2020 period, to be adopted by the end of 2015. At the 17th Conference of the Parties (COP17) in December 2011, the Parties established the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP).[2] The ADP's mandate is to "develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties" to come into effect and be implemented from 2020.

The Parties established the ADP in recognition of the need to fulfill the ultimate objective of the Convention, which is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Parties have recognized the need to take urgent action to meet the long-term goal of holding the increase in global average temperature below 2°C above pre-industrial levels.[3,4] The ADP addresses, inter alia, mitigation, adaptation, finance, technology development and transfer, capacity building, and transparency of action and support.

TIMELINE FOR INDCs

Parties may communicate their INDCs to the UN Climate Change Secretariat at any time. Parties in a position to do so communicated their INDCs by the end of March 2015; the rest are invited to communicate their INDCs well in advance of the 21st session of the Conference of the Parties (COP21) at the end of 2015. The UN Climate Change Secretariat will compile a synthesis report that includes all INDCs communicated by 1 October. Accordingly, the effects of the contributions submitted by Parties after this date will not be included in the report. Because the new agreement will likely establish a long-term process for future climate action, it is likely that Parties will communicate subsequent contributions in future years.

At COP20 in December 2014, the Lima Call for Climate Action reiterated an invitation for Parties to communicate intended nationally determined contributions (INDCs), or Parties' post-2020 contributions to achieving the objective of the Convention. In the Lima Call for Climate Action, the Conference of Parties also agreed on information to be provided by Parties when communicating their INDCs, and requested that the UN Climate Change Secretariat publish INDCs on a UNFCCC website and produce a synthesis report on the aggregate effects of INDCs communicated by Parties.

This document responds to requests for more specific guidance on INDCs from countries participating in the UNDP-UNFCCC Regional Technical Dialogues on INDCs held in Latin America and the Caribbean, Africa, the Asia-Pacific region, and Eastern Europe. It reflects the ideas shared during these regional dialogues, taking account of the current state of negotiations, and puts forward options for the preparation of INDCs based on research from recent literature and relevant UNFCCC documentation.

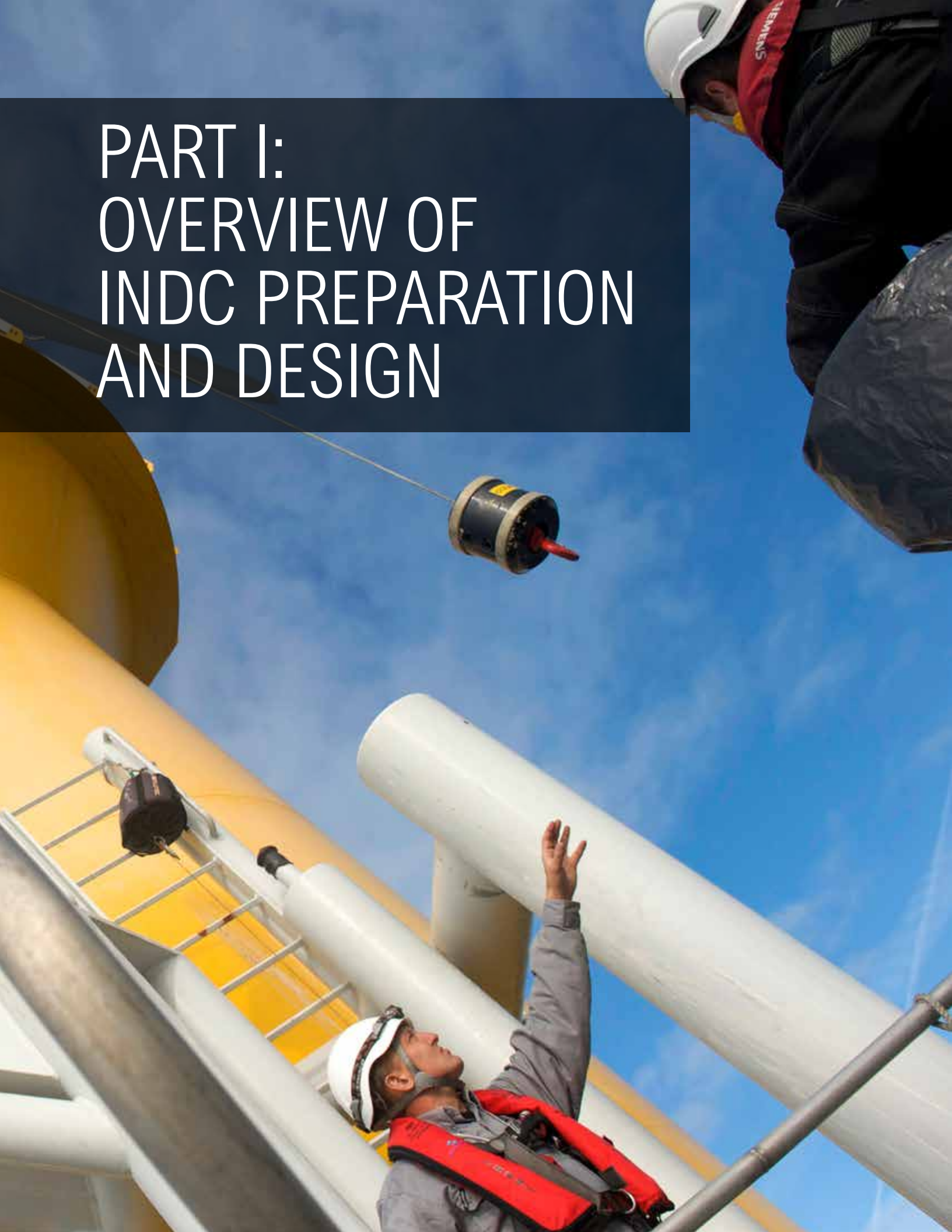
The guidance document is divided into two parts. Part I provides a general overview of INDC preparation and design, while Part II provides technical guidance on INDC design. Part I opens with an overview of what an INDC is and the benefits of preparing an INDC (Chapter 1), and discusses how to organize a national process to prepare a contribution (Chapter 2). It then provides an overview of the types of data and analysis that can help in the preparation of an INDC (Chapter 3), the options that exist for the form of an INDC (Chapter 4), and how an INDC can be communicated transparently (Chapter 5). Part II describes the various choices Parties can make when designing their contribution for mitigation (Chapter 6), adaptation (Chapter 7), and means of implementing the INDC (Chapter 8).

Figure 1.1 summarizes the structure of this document. While the document provides an overview of various INDC preparation and design choices, it does not provide comprehensive technical guidance; Parties may need to refer to additional resources. There are also ongoing efforts to support INDC preparation and design. (For more information, see LECB 2014.)

Figure 1.1 | **Overview of Document**

OVERALL STEPS	CHAPTER TITLE	CHAPTER
PART I	**OVERVIEW OF INDC PREPARATION AND DESIGN**	**1-5**
Identify objectives	Background on INDCs	1
Prepare and initiate process	How can Parties organize a national process to prepare an INDC?	2
	What data and analysis can inform an INDC?	3
Choose INDC form	What form can the INDC take?	4
Communicate	How can Parties communicate their INDC transparently?	5
PART II	**TECHNICAL GUIDANCE**	**6-8**
Choose design: mitigation	What options exist for the design of the INDC for mitigation?	6
Choose design: adaptation	What options exist for the design of the INDC for adaptation?	7
Identify resource needs	What means can Parties use to implement the INDC?	8

PART I: OVERVIEW OF INDC PREPARATION AND DESIGN



CHAPTER 1

BACKGROUND ON INDCs

INDCs are the contributions that Parties will make toward achieving the objective of the Convention after 2020. While the term INDC is not defined by any COP decision, the language "intended nationally determined contribution" provides some indications of the anticipated process that can inform Parties' preparation (see Box 1.1).

BOX 1.1 INTENDED NATIONALLY DETERMINED CONTRIBUTIONS

Intended: The term "intended" reflects the fact that the legal status of the contributions and their final form under the 2015 agreement are yet to be decided. Contributions might also be subject to adjustment, for example, if future rules change the assumptions (for example, concerning land sector accounting) that Parties made when preparing their INDCs.

Nationally determined: The language "nationally determined" underscores that contributions will be developed by countries in accordance with their national circumstances rather than determined collectively.

Contribution: INDCs were defined at COP19 as contributions "towards achieving the objective of the Convention as set out in its Article 2." That objective is "to achieve the stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (UNFCCC 1992). INDCs may also contribute to numerous domestic objectives associated with the shift to a low-carbon economy, including gains in energy efficiency, reduced deforestation, and improved air quality, among others, as further described below. The term "contribution" is used without prejudice to the legal nature of the contribution or type of contribution.

1.1 Benefits of Putting Forward an INDC

Recognizing the risks that climate change poses to communities and ecosystems around the world, the international community has adopted a goal under the UNFCCC to limit global warming to 2°C compared to pre-industrial temperatures.[5] While the IPCC's Fifth Assessment Report (AR5) suggests that it is still possible to limit the average global temperature rise to 2°C, it will require rapid reductions of emissions and changes to our current energy mix. Efforts to reduce emissions in the short term will have significant implications for whether dangerous impacts of climate change can be avoided. Studies have shown that delaying mitigation action will increase the costs and limit our chances of stabilizing greenhouse gas concentrations at around 450 ppm CO_2 equivalent (CO_2e) by the end of the century.[6]

The longer we delay emissions reductions, the more difficult it will be to stay within the 2°C goal. Choices on infrastructure developments (such as power plants, transportation systems, buildings, and the ways in which cities are built) that are made without considering climate change mitigation could lock societies into emissions-intensive pathways that may be impossible or very expensive to change in time to limit warming. Delay will also necessitate unprecedented rates of emissions decline later and a greater reliance on potentially risky technologies, which currently face major challenges of financing and testing at scale (IPCC 2014a). Preventing undue economic and environmental hardships, then, requires ramping up international climate action—this decade and beyond. See Annex A for more information on necessary emissions reductions to limit warming to 2°C.

Against the backdrop of rising emissions and an increased urgency for action, there are significant domestic and international benefits that can be realized through the development and implementation of an INDC, including:

- **Getting on track toward the 2°C goal:** The greater the number of countries that put forward contributions, the greater chance we have to limit warming to 2°C. There will be more emissions reductions covered and tracked globally, and political momentum can build, encouraging others and catalyzing further action. There is no single formula for how the world can fairly and efficiently achieve the necessary global emissions reductions. However, what is clear is that it will require international cooperation, as countries have varying capacities and responsibilities to reduce emissions and adapt to climate impacts. If collective actions are perceived to be fair, further cooperation and action can be gained.
- **Demonstration of a political commitment:** Putting forward an INDC can demonstrate a political commitment to limit warming and, in

turn, to limit future risks posed by higher temperatures. The Durban decision to launch a process to develop the 2015 Agreement noted its applicability to all Parties. Climate change is a problem of the global commons, and, therefore, every country should participate in its solution. Given the significant risks posed by higher temperatures, the costs of inaction are dangerously high. The INDC process is an opportunity for countries around the world to come forward with their best efforts, regardless of whether their mitigation potential is high or low. If an adaptation component is included in the INDC, the INDC can also raise the profile of adaptation, articulate a country's long-term vision for adaptation, and help Parties gain international recognition for national adaptation actions and investments.

- **Realization of non-climate benefits associated with mitigating climate change:** INDCs can provide an opportunity to design policies that make economic growth and climate objectives mutually reinforcing. At least half of the measures that could drive the necessary emissions reductions needed by 2030 could have multiple economic and development benefits (Global Commission on the Economy and Climate 2014). For example, policies that advance renewable energy supply not only can lower emissions, but also can reduce countries' vulnerability to energy price volatility and supply disruptions, and can produce significant benefits for human health and ecosystems by curbing air pollution. Policies that reduce emissions from deforestation and forest degradation also deliver significant benefits for maintaining biodiversity, ecosystem services, and proving support for livelihoods. Significant investments will be made in the next decades and today's decisions will determine whether inefficient infrastructure and systems are locked in or whether we transition to a low-carbon path that strengthens resilience (Global Commission on the Economy and Climate 2014).

- **Strengthening institutional and technical capacity:** The INDC preparation and implementation process has the potential to strengthen national institutional capacity and transfer knowledge to sectoral institutions. As progress is tracked toward the implementation of INDCs over time, the capacity of technical staff will increase and a foundation will be built for tracking progress not only in implementing the contribution, but other climate change interventions as well.

- **Policy integration:** Developing an INDC can enable countries to link climate change to other national priorities, such as sustainable development and poverty reduction. It can also help countries coordinate among sectors that currently work too much in isolation from each other, and allow decision makers to identify synergies among sectoral plans. Furthermore, sending a credible signal regarding future plans to reduce GHG emissions and enhance carbon stocks can stimulate investment and international support for mitigation activities, promote technological innovation, and engage the private sector. Submission of an INDC might also allow for access to possible incentives, such as access to any market mechanisms created under the 2015 Agreement and capacity-building support.

- **Informing key stakeholders:** The communication of INDCs can provide the opportunity to advance the understanding of national stakeholders, as well as the international community, regarding future policymaking, implementation strategies, and expected emissions reductions and non-climate benefits that may result from the INDC. This can help build political will for mitigation and adaptation action, and encourage stakeholders to engage in climate change policy development or planning. It can also provide an opportunity to highlight needs and priorities that must be addressed during the INDCs' implementation.

- **Communicate resource needs:** The communication of an INDC can also represent an opportunity for developing country Parties to communicate the additional action that could be taken if further resources were available. It can help Parties describe support needs for completion and implementation of low emissions development strategies and national adaptation plans or activities. Clear communication of such needs might enhance Parties' abilities to mobilize public and private, and national and international, investments to help take ambitious climate action while addressing other key developmental priorities. For more information see Chapter 8.

CHAPTER 2

HOW CAN PARTIES ORGANIZE A NATIONAL PROCESS TO PREPARE AN INDC?

A national process to prepare an INDC can build trust and mutual accountability with domestic and international stakeholders. Given the short timeframe provided for the preparation of an INDC, building upon any existing relevant processes can help Parties prepare an INDC in a timely manner. Ideally, INDC preparation will help strengthen the integration of climate change into existing planning processes, as well as strengthen institutional cooperation on climate change in a way that can also be useful for future implementation. The process should also provide legitimacy to the INDC.

A national process should cover the main steps of the INDC preparation and design process:

- *Initiation:* Before planning and policy options are considered, officials should engage key stakeholders in defining the needs that an INDC must address. Given the political nature of INDCs, it can be highly beneficial to secure a mandate to initiate the preparation process from high-level decision-makers. The process could be initiated by a head of state, who provides a mandate for its development, or it could be initiated by the leadership of a ministry or department and then raised with the head of state for his or her involvement soon thereafter.

- *Data and analysis:* As Chapter 3 describes, gathering relevant data and analysis can be helpful in the design of the INDC. Taking advantage of existing data, and using proxy data to fill data gaps where necessary, can help to ensure that this process is efficient and not resource intensive. Data and analysis that can be helpful to the INDC preparation and design process include national objectives and priorities, current and future GHG emissions, current mitigation activities, mitigation potential, relationship to the 2°C goal, and resource mobilization strategies to achieve that potential.

- *Design of INDCs:* Decision-makers, with the support of experts and key stakeholders, can formulate options and, with the support of technical experts, analyze their effectiveness based on mutually agreed criteria. Decision-makers can then choose which design option(s) they will pursue, building upon existing or planned activities. Chapters 4 and 6 provide further information on the advantages and disadvantages of various design choices for mitigation, and Chapter 7 provides further information relevant to adaptation, if included in an INDC. The public should be engaged in this step, through public consultation processes, in order to gain feedback on the INDC and build support for the INDC's implementation.

- *Communication:* INDCs should be communicated in a manner that facilitates transparency, clarity, and understanding. Chapter 5 describes information that can be provided with an INDC to fulfill these objectives.

While every national circumstance will be different, the following elements might prove helpful to those initiating or intensifying the above-mentioned stages of the INDC process:[7]

- *National leadership:* Securing a political commitment at the highest level can help give the process legitimacy, thereby ensuring that all relevant stakeholders come together to carry out the technical work and maintain the political cooperation necessary to formulate an INDC in a timely manner. Strong leaders often not only define the process activities, but also maintain momentum and quality of the analysis and process outputs (National Research Council of the National Academies 2010). It will be critical for high-level political commitments to be sustained over time. The choice of government institutions to lead and coordinate the INDC process could make a significant difference in the efficiency and prioritization of the process. Weak outcomes might result if the process does not engage the president's or prime minister's office or departments with broad national responsibilities for development and other national priorities (OECD 2009). Some Parties might find that it is easier to engage and sustain leadership if INDCs are approached in the context of development and poverty eradication, linking climate change to other domestic priorities such as improving access to energy.

- *Clearly defined roles, responsibilities, and timeline:* Regardless of the choice of institutional arrangements for coordination, clearly defined roles and responsibilities, as well as a clear and detailed timeline for the INDC process, can help set expectations and ensure efficiency. For example, see Box 2.1 for an INDC timeline established in Colombia. The national coordinating body for the process could be responsible for establishing a timeline for the development of the INDC, coordinating roles and responsibilities, managing resources and tracking deliverables, and mediating conflicting interests of stakeholders, among other roles (Höhne et al. 2014). It can be beneficial for the national coordinating body to be inter-ministerial, given that the INDC could affect multiple sectors. Subsidiary committees can be tasked

with scientific and technical responsibilities. For countries with less capacity, consultants may be relied upon for such duties, but they should closely engage with the government to ensure studies are nationally relevant.

- *Coordination:* Government institutions most relevant to INDC preparation include economic development and finance ministries and sectoral ministries such as those responsible for environment, water, energy, planning,

BOX 2.1 TIMELINE ESTABLISHED IN COLOMBIA FOR DEVELOPMENT OF THE INDC

		APRIL - JUNE 2014	JULY - SEPT 2014	OCT - DEC 2014	JAN - MARCH 2015	APRIL - JUNE 2015	JULY - SEPT 2015	OCT - DEC 2015
Decision making at the political level	Senior inter-ministerial meetings to launch and review progress of the process		✓	✓	✓	✓		
	Consultation with experts on methodological aspects and design of a consultancy to support political aspects of the process		✓					
Technical process	Top-down analysis	✓	✓	✓				
	Bottom-up analysis		✓	✓	✓			
	Consultations		✓	✓	✓			
	Impact assessments	✓	✓	✓	✓	✓	✓	✓
INDC deliverables	Preliminary version of INDC				✓			
	Presentation of INDC before UNFCCC					✓		
	Final version to Paris Agreement							✓
Participatory process	Communication strategy for the contribution	✓	✓	✓	✓	✓	✓	✓
	Discussions with civil society		✓	✓	✓	✓	✓	✓
INDC implementation	Development of agreements for the implementation of INDC elements					✓	✓	✓

agriculture, and transport. National climate change coordination agencies, such as climate change committees, may also play important roles (UNDP et al. 2011). Coordination among these bodies will be essential and can result in improved efficiency and problem solving. In some countries, coordination around the INDC process might require new institutional arrangements because planning for climate change is often divided among different ministries and lacking in a coordinating authority.[8] New committees or institutional structures to develop and approve INDCs might prove necessary in some countries. However, in other countries, it might be easier and more effective over the long run to integrate the decision-making process into existing institutional arrangements. The INDC preparation process might also benefit from a neutral third-party facilitator who can mediate discussions if there are conflicting priorities among agencies.

- *Stakeholder engagement:* Consultation with key stakeholders is critical to ensure that the INDC responds to the needs of affected stakeholders and has long-term support. Early and ongoing engagement with stakeholders, including all relevant public sector actors, civil society, the private sector, and academia, can lay the groundwork for successful outcomes. Public engagement should not be treated as a "rubber stamp" on predetermined activities, because lack of engagement throughout the decision-making process can cause costly investments to fail. Rather, if engagement is built into all steps of the decision-making process, it can enhance the quality of analysis, build support for choices, and improve the effectiveness and long-term viability of the contribution. Affected communities and experts are often most aware of local needs; by consulting with the public first, decision-makers can increase the likelihood that plans serve the needs of those who will be affected by them. The scope and timing of public consultation should be clearly defined. See Box 2.2 for an example of the public consultation process in Chile. While time does not always allow for such extensive consultations, a meaningful level of engagement with key stakeholders is critical for gaining support of and feedback from key constituencies.

- *Capacity building:* It is also important to build the necessary knowledge and technical capacities, and to secure and manage the right resources, for preparing an INDC. Donors and governments should promote and fund technical training and strengthen human resources, which can enable more informed decision-making. Decision-makers can also enlist the assistance of research institutes, universities, and other organizations in preparing the INDC.

See Box 2.3 for an example of Singapore's national process to develop an INDC.

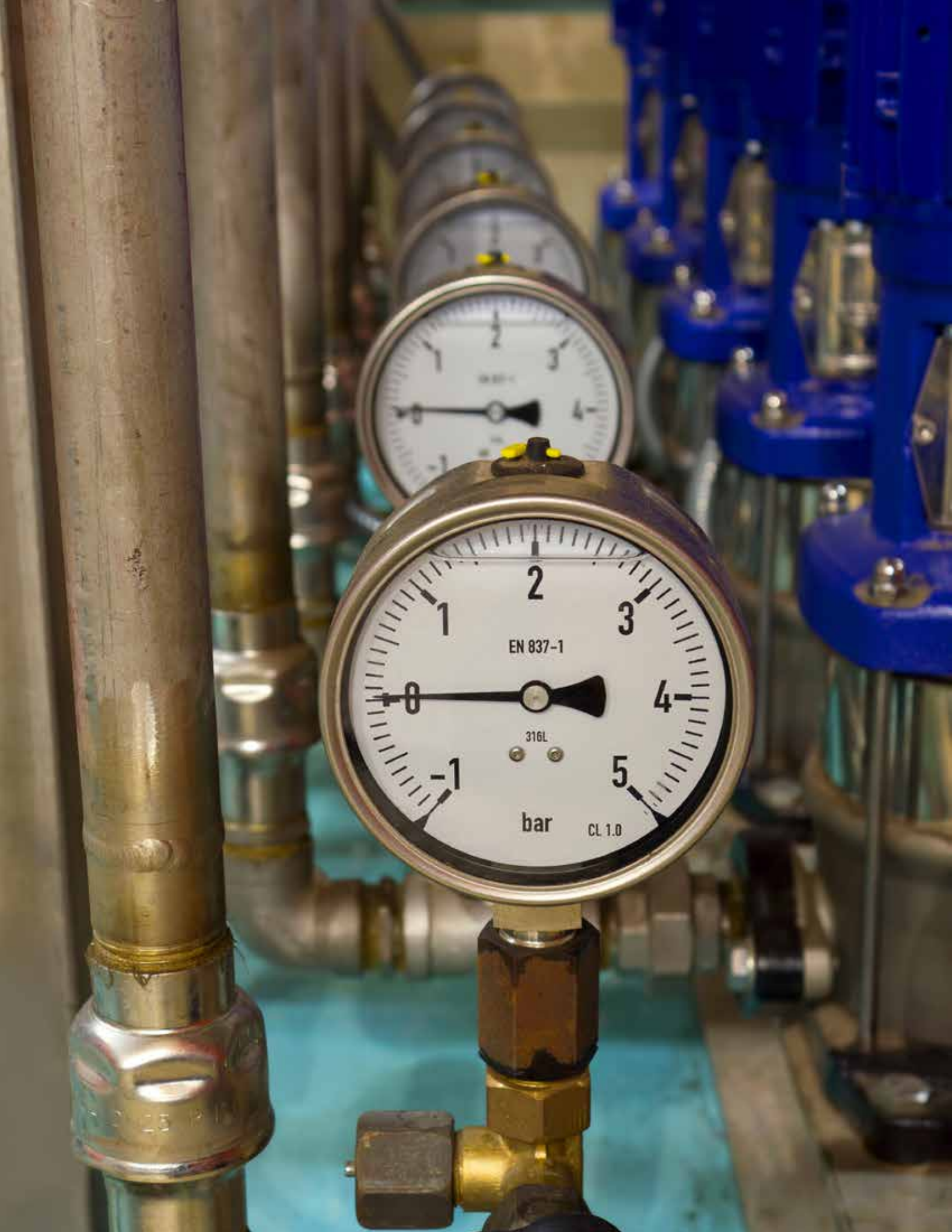
BOX 2.2 STAKEHOLDER ENGAGEMENT IN CHILE

The Chilean government is holding a public consultation process on the draft INDC lasting for 105 days from mid-December 2014 until the end of March 2015. The public can provide comments online at http://publico.mma.gob.cl/cpcontribucion/. In addition, there are informational workshops being held in several cities, as well as presentations to the National Advisory Council and to members of parliament. The Office of Climate Change and the Environmental Education Division of the Ministry of Environment are leading the public consultation period.

BOX 2.3 SINGAPORE'S PROCESS FOR DEVELOPING AN INDC

The development of Singapore's INDC is a work-in-progress. It is supervised by the Inter-Ministerial Committee on Climate Change (IMCCC), which is chaired by the Deputy Prime Minister and supported by the National Climate Change Secretariat, the national coordinating agency for climate change issues under the Prime Minister's Office. This process involves a government-wide approach to discuss and develop an appropriate set of climate measures that takes into account Singapore's national circumstances and challenges. For example, what is the long-term mitigation potential for a small city-state of 5.47 million people with limited access to alternative energy sources? How does Singapore achieve energy security and environmental sustainability?

Under the IMCCC, a Long-Term Emissions and Mitigation Working Group (LWG) was formed to envision Singapore's post-2020 future in a carbon-constrained world. The LWG provides the planning framework for government agencies to work together to discuss and identify the mitigation actions through a combination of top-down and bottom-up analysis. An iterative process has been adopted whereby government agencies consider mitigation actions in their respective sectors and the possible measures are evaluated in terms of cost effectiveness and practicability. External consultants are also engaged to conduct independent studies on possible mitigation measures, taking into account Singapore's circumstances, international best practices and data on best available technology, among other data and analysis. Technology roadmaps, prepared by the government in collaboration with industry stakeholders, academic experts, and technical consultants, serve as additional inputs for estimating the potential of future technologies for long-term mitigation in Singapore. Public consultations are also being carried out to obtain public feedback on possible further measures to reduce GHG emissions and to promote green growth. This process also helps to create greater public awareness and understanding of Singapore's climate actions. Inputs from these various channels are then analyzed by the LWG and considered for inclusion as part of Singapore's mitigation contribution under its INDC.


2
1
3
EN 837-1
0
4
316L
-1
5
bar
CL 1.0

CHAPTER 3

WHAT DATA AND ANALYSIS CAN INFORM AN INDC?

Developing an INDC based on relevant data and analysis can help ensure that the INDC is realistic and achievable, clear and concrete, ambitious, aligned with national priorities, and contributes to achieving the objective of the Convention.

Parties may already have significant quantities of data and analysis that can be used when preparing the INDC. Existing information might be sufficient, in which case collecting a significant amount of new data or conducting new analysis will not be necessary.

The information listed in Tables 3.1 and 3.2 can be used when designing the INDC for mitigation and adaptation, respectively. Both tables outline data elements that can be useful when designing the INDC, the purpose of each, and examples of data sources. Specifically, the information can help answer questions such as what should be targeted by the contribution (for example, sectors, greenhouse gases, vulnerable communities and ecosystems), what should be the peaking year and level for emissions (if applicable), and what should be the target level of emissions in the target year or period.

If certain types of information are not available, Parties should use whatever information does exist. In many cases, especially for mitigation, it may be possible to use proxy data to fill data gaps.

See Box 3.1 and Box 3.2 for examples of data and analysis that are being used in the INDC preparation processes in Colombia and South Africa.

Table 3.1 | **Types of Information Useful for Developing a Mitigation Contribution**

TYPE OF INFORMATION	PURPOSE OF INFORMATION	EXAMPLES OF DATA SOURCES
Internationally communicated pre-2020 GHG emissions reduction plans	Provide a starting point for the post-2020 contribution	Submissions to the UNFCCC under the Copenhagen Accord, Cancun Agreements, Kyoto Protocol[a]
National objectives and priorities	Ground the contribution in the broader national context, understand how it can help achieve non-climate benefits, and ensure that the contribution is "nationally determined"	Laws, climate change strategy, economic development strategies and plans, energy planning and policies, transportation plans, water plans, coastal zone plans, agriculture plans, forest protection and management plans, electricity plans, green growth plans, five-year budget documents
Current GHG emissions profile of the country	Identify which sectors and gases contribute most to national emissions	Latest national GHG inventory (based on IPCC *Guidelines for National Greenhouse Gas Inventories*). If not available, proxies for estimating current GHG emissions profiles, governmental annual estimates. Sources may include inventory reports, Biennial Reports and Biennial Update Reports, and National Communications, sector specific analyses
Current mitigation activities	Identify current efforts that an INDC can build upon	Clean Development Mechanism (CDM) projects, nationally appropriate mitigation actions (NAMAs), REDD+ strategies, technology needs assessments, climate change plans, economic development plans, sectoral strategies and plans, laws/strategies (national climate change laws, national climate funds, low emission development strategies (LEDS), green growth strategies), sub-national mitigation activities, private sector mitigation activities Sources may include: National Communications, Biennial Reports or Biennial Update Reports

Table 3.1 | **Types of Information Useful for Developing a Mitigation Contribution (continued)**

TYPE OF INFORMATION	PURPOSE OF INFORMATION	EXAMPLES OF DATA SOURCES
Projected future emissions under a business-as-usual scenario (or other scenarios)	Understand expected growth in emissions by sector in the future, taking into account current mitigation activities	National Communications, Biennial Reports or Biennial Update Reports, national energy or environmental reports, economic projections, International Energy Agency (IEA),[b] U.S. Energy Information Administration (EIA),[c] Climate Action Tracker[d]
Assessment of mitigation potential	Identify additional mitigation technologies, opportunities, policies, and actions that are technically and economically feasible, as a basis for determining the scale of GHG reductions that could be feasibly achieved; identify barriers that are preventing realization of mitigation potential	National mitigation assessment studies, abatement cost curves, IEA reports,[e] Climate Action Tracker,[f] UNFCCC mitigation assessment resources,[g] The Integrated Climate Modeling and Capacity Building Project in Latin America (CLIMACAP),[h] MAPS (Mitigation Action Plans and Scenarios) Programme,[i] UNEP Climate Technology Centre and Network,[j] LEDS Global Partnership remote expert assistance on LEDS service and list of resources and tools,[k] MARKAL,[l] TIMES modeling tools,[m] McKinsey & Company GHG abatement cost curves[n]
Relationship to global 2°C goal	Understand the scale of GHG reductions needed to limit warming and avoid the most dangerous climate change impacts	IPCC Fifth Assessment Report,[o] IPCC Fourth Assessment Report, fairness indicators and principles[p]
Resource mobilization strategies	Facilitate the assessment of the feasibility of mitigation scenarios, taking into account resource requirements (including budgetary, technological and human resources), and strategies to mobilize public and private, national and international investments in support of the implementation of actions, communicate resource needs	An estimation of financing needs to mitigate at different levels; domestic budgetary expenditures for business-as-usual (brown) projects and programs in key sectors and estimated investments for mitigation (green) options; current and planned investments by the private sector in key sectors; data on bilateral and multilateral financial support provided to the country; types of capacity needs, including human, technical, institutional, and financial capacity

Notes:

[a] The UNFCCC website lists Parties' targets and actions at: http://unfccc.int/focus/mitigation/pre_2020_ambition/items/8165.php

[b] Available at http://www.iea.org/

[c] Available at http://www.eia.gov/

[d] Available at http://www.eia.gov/

[e] Available at http://www.iea.org/publications/freepublications/

[f] Available at http://climateactiontracker.org/

[g] Available at http://unfccc.int/resource/cd_roms/na1/mitigation/index.htm

[h] Available at http://www.climacap.org/

[i] Available at http://www.mapsprogramme.org/

[j] Available at http://www.unep.org/climatechange/ctcn/

[k] Available at http://ledsgp.org/assistance and http://ledsgp.org/tools

[l] Available at http://www.iea-etsap.org/web/Markal.asp

[m] Available at http://www.iea-etsap.org/web/Times.asp

[n] Available at http://www.mckinsey.com/client_service/sustainability/latest_thinking/greenhouse_gas_abatement_cost_curves

[o] Available at http://www.ipcc.ch/report/ar5/

[p] Factors Parties may wish to consider may include responsibility; capability; equality; responsibility, capability, and need; equal cumulative emissions per capita; staged approaches; equal marginal abatement costs (see IPCC 2014, Chapter 6, Table 6.5 and Figure 6.28).

Table 3.2 | **Types of Information Useful for Contributions that Include Adaptation Components**[9]

TYPE OF INFORMATION	PURPOSE OF INFORMATION	EXAMPLES OF DATA SOURCES
Climate change trends, impacts, and vulnerabilities	Identify vulnerable groups and sectors within the country	National Communications to the UNFCCC; reports by national, multinational, and civil society organizations; IPCC Fifth Assessment Report; academic research; national, sub-national or local assessments and studies associated with projects; international databases such as CRED[a] or insurance industry databases[b]
Statement of long-term goals or vision	Help guide further adaptation planning and action, if such a goal or vision exists	National planning documents; records of planning meetings, including stakeholder consultation processes
Statement of current and near-term planning and action	Identify current efforts that an INDC can build upon	National planning documents; national policies, regulations, or procedural guidelines; national or sectoral databases of projects and programs; subnational (for example, city, state, county, province, district) records of activities and investments
Summary of support	Understand existing support that can be used for implementation	National records; national databases or studies such as Climate Public Expenditure and Institutional Reviews (CPEIRs), and numerous international databases
Statement of gaps, barriers, and needs	Understand resources needed to execute near-term action or planning	National assessment; subnational (sector, location, etc.) assessments; adaptation project reports or evaluations
Monitoring plans	Identify existing monitoring systems that can be used to track the goals and/or activities that may be included in the INDC	National assessment and/or stakeholder consultation processes; project/program monitoring and evaluation data; national census data or other national statistical bureau resources; environmental monitoring systems, including satellite data

Notes:
[a] Centre for Research on the Epidemiology of Disasters EM-DAT database, available at www.emdat.be/.
[b] For example Munich Re, available at www.munichre.com/natcatservice.

BOX 3.1 THE USE OF DATA AND ANALYSIS IN COLOMBIA'S INDC PREPARATION PROCESS

To inform the INDC, the Colombian Ministry of Environment has compiled existing analysis on sectoral composition of emissions, projected GHG emissions through 2040, sectoral mitigation actions in the sectoral plans, mitigation cost curves by sector, the current NAMA portfolio, and possible co-benefits, among other issues. Based on this analysis, Colombia is prioritizing additional data needs in the agriculture and land use, land-use change and forestry (LULUCF) sectors, which have not yet been addressed. The government will then use all the data to build an economy-wide business-as-usual scenario as well as to assess various mitigation scenarios and their impacts in the INDC design process.

Once the relevant data and analysis have been collected, they can be used to inform INDC design. Data and analysis can advance understanding of:

- *What the INDC should target and prioritize:* The national GHG inventory and projections, as well as an understanding of national objectives and priorities, can help Parties understand which sectors and greenhouse gases to target in the INDC. For example, information on the current emissions profile of the country, as well as the past and projected rate of change of emissions in various sectors, can help Parties identify which sectors and greenhouse gases contribute most to current emissions, are growing most rapidly over time, and have sufficient data available for inclusion in an INDC. Information on climate change trends, impacts, and vulnerabilities can help a Party identify vulnerable groups and sectors within the country that can be targeted and prioritized by adaptation planning and action.

BOX 3.2 THE USE OF DATA AND ANALYSIS IN SOUTH AFRICA'S INDC PREPARATION PROCESS

South Africa is not starting from scratch as the country develops the mitigation component of its INDC. In 2006, a national dialogue began on Long-Term Mitigation Scenarios, which provides information on mitigation potential, costs, and benefits. The Long-Term Mitigation Scenarios helped inform the development of the 2011 National Climate Change Response Policy. In 2013, South Africa conducted an updated mitigation potential analysis. These key analyses, among others, will help inform the South African INDC.

- *How to design an INDC that is realistic and achievable:* Parties should consider discrete mitigation actions, policies, or technologies that are technically and economically feasible and could realistically be implemented, by sector. Knowledge of mitigation potential in key sectors (such as renewable energy potential), costs and co-benefits of mitigation, political feasibility, and national circumstances and objectives, can help Parties identify the focus of the INDC and ensure that it is achievable. Information on mitigation potential may already be available from existing studies, and these should be relied upon if time is short. If time allows, projections can be developed through the use of models. Expert judgment can be used if information is scarce or unreliable, or as a means of verifying or strengthening the analysis. If a mitigation assessment is conducted, it should be undertaken in an open and transparent manner that engages relevant stakeholders and includes public review and comment periods as far as practicable in the timeframe available. For mitigation or if an adaptation component is included in the INDC, identification of existing support, as well as resource gaps, barriers, and needs, can help assess what planning and actions are realistic and achievable.

- *How to design a fair and ambitious INDC that contributes to achieving the objective of the Convention:* The Lima Call for Climate Action references developing fair and ambitious INDCs that contribute to achieving the objective of the Convention. Data and analysis can help Parties develop a contribution that meets these criteria. The fairness and ambition of an INDC will be a value judgment; each Party will need to reflect on how it perceives fairness and ambition for itself and others, and how it will measure fairness and ambition. Information on the future level of emissions if the INDC is achieved, as well as emissions reductions that would result from implementing the INDC, can be helpful for evaluating the INDC against these criteria. For those Parties including adaptation in their INDC, data and analysis on vulnerable communities and sectors can help identify priorities, and information on long-term goals and vision can help situate action in a broader sustainable development context. See Box 3.3 for considerations in assessing an INDC's fairness, ambition, and contribution to achieving the objective of the Convention.

BOX 3.3 CONSIDERATIONS IN ASSESSING WHETHER AN INDC IS FAIR, AMBITIOUS, AND CONTRIBUTES TO ACHIEVING THE OBJECTIVE OF THE CONVENTION

- **Fair:** Assessing whether a contribution is fair can be based on multiple indicators, such as emissions responsibility (for example, historical, current, or projected future emissions per capita or total emissions); economic capacity and development indicators (for example, GDP per capita, indicators related to health, energy access, etc.); vulnerability and capacity to adapt to physical and social impacts of climate change; relative costs of action and mitigation potential; benefits of action (co-benefits); or other factors.
- **Ambitious:** An ambitious INDC can be seen as one that reduces emissions substantially below the business-as-usual emissions trajectory (where business-as-usual takes into account currently implemented and adopted mitigation policies) and realizes the country's mitigation potential to the greatest extent possible. Comparison of emissions reductions with mitigation potential indicates the extent to which the target captures mitigation opportunities that are considered technically and economically feasible (Höhne et al 2014).[a] Ambition in this sense depends on a country's economic development level, resource endowment, and other factors. An ambitious INDC should also drive long-term transformation in sectors. Ambition can also be assessed in other ways, such as an increase in a country's annual rate of decarbonization; comparison to benchmarks for various decarbonization indicators (such as CO_2 per kilometer travelled by vehicles, CO_2 per megawatt hour of electricity production, or GHG per ton of cement or steel produced); or comparison to a good practice policy package (Höhne et al. 2014).
- **Contributes to achieving the objective of the Convention:** Parties can better align their target with the level of global reductions needed to meet the 2°C goal and achieve the objective of the Convention by considering the need to limit cumulative emissions over time, phase out global GHG emissions to zero or below by 2100, and ensure a feasible rate of decarbonization during the period between emissions peaking and the long-term phase out of emissions (Box A.2 in Annex A provides more information).[b, c] To have a likely chance of limiting warming to 2°C, emissions in all regions peak by 2020.[d] While not all countries will have to peak by this year, keeping the timing of global emissions peak in mind when designing the INDC can help ensure that global emissions peak in time. The IPCC also notes that all major emitting regions must make "substantial reductions" below their projected baseline emissions over the century to have a likely chance of limiting warming to 2°C.

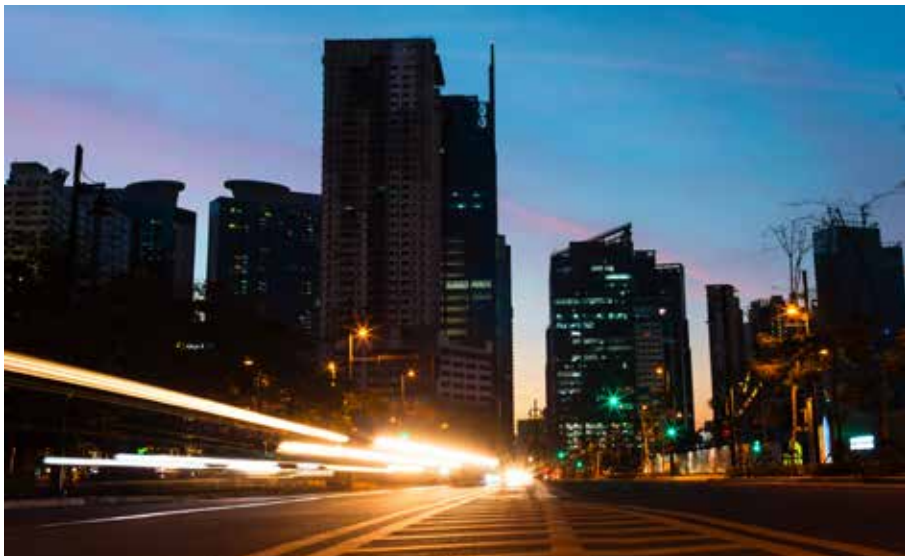
Notes:

[a] Ambition in this sense depends on a country's economic development level, resource endowment, and other factors.

[b] See Table 6.4 in IPCC 2014a.

[c] This is for a likely chance of limiting warming to 2°C under a least-cost scenario. Following these broad principles does not guarantee that necessary global emission reductions will be achieved. A global assessment should be conducted regularly to ensure that national emissions trajectories are consistent with the necessary global emission reductions.

[d] See Table 6.4 in IPCC 2014a.



CHAPTER 4

WHAT FORM CAN THE INDC TAKE?

There are several options for designing an INDC, and it will be up to each Party to decide what to include in its contribution. This chapter focuses on the broad options for the form of the INDC.

This chapter focuses mainly on the form that a mitigation contribution can take. Chapter 6 in Part II further describes steps related to INDC design for mitigation, including the choice of sectors and greenhouse gases covered, the choice of timeframe, and how to quantify the GHG emissions reductions associated with the INDC.

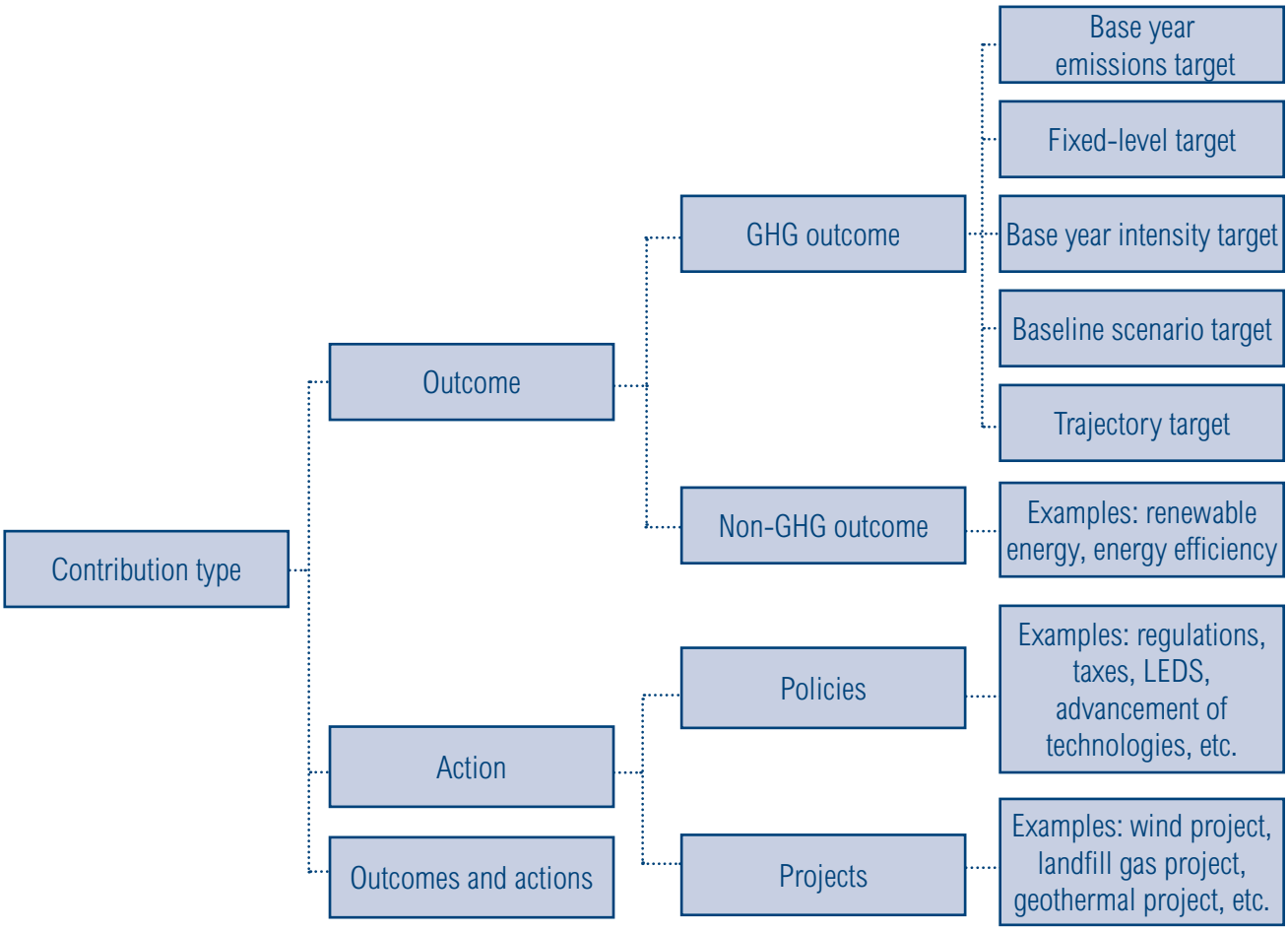
The choice of whether to include an adaptation component in the INDC is another important design consideration. Chapter 7 in Part II describes rationales articulated by Parties when discussing their interest in including an adaptation component, and introduces categories of information to include in the adaptation component. A Party's rationale for including adaptation, along with the status of adaptation planning in the country, will shape the focus and information content of the adaptation component. Annex F also provides options for shaping national adaptation goals and objectives.

In general, a mitigation contribution can take the form of actions, outcomes (GHG or non-GHG outcomes), or a combination of actions and outcomes.

- *Actions* are an intention to implement specific means, such as policies or projects, of achieving GHG reductions.
- *Outcomes* are an intention to achieve a specific result, for example, to reduce GHG emissions to a specific level (a GHG outcome) or increase energy efficiency to a specific level (a non-GHG outcome).

See Figure 4.1 for a representation of various types of mitigation contributions.

Figure 4.1 | **Types of Mitigation Contributions**



A Party may package its existing, planned, and/or potential future mitigation actions, and present these actions in its INDC. Actions provide clarity on specific means of achieving GHG reductions and offer implementing Parties more certainty that the contribution will be achieved, because they represent a commitment to implementation rather than to a particular outcome that might not be supported by specific policies or projects. However, actions pose challenges to estimating aggregate GHG reductions across Parties' contributions because the contribution might not be stated in terms of GHG emissions.

A Party could go one step further and assess the collective impacts of possible actions and put forward outcomes. Outcomes can be framed as GHG outcomes—a commitment to reduce GHG emissions by a certain quantity by a certain date—or non-GHG outcomes—a commitment to achieve non-GHG outcomes, such as quantity of renewable energy generated or share of electricity generated with renewable sources.

Non-GHG outcomes can provide flexibility on how to achieve a certain outcome—as opposed to specifying particular actions. However, they may restrict mitigation activities to a certain sector (for example, energy efficiency or renewable energy generation). Tracking the progress of non-GHG outcomes is relatively simple by tracking key performance indicators, such as the energy efficiency of sectors and the level of renewable energy generation. Likewise, communicating non-GHG outcomes to stakeholders is fairly simple. However, non-GHG outcomes pose challenges to aggregating GHG reductions across Parties' contributions, unless the GHG impacts of non-GHG outcomes are also communicated.

GHG outcomes offer the most flexibility on how to achieve GHG reductions—without necessarily specifying which actions will drive emissions reductions. Tracking progress of GHG outcomes is easier than tracking progress of actions because GHG targets can typically be monitored through the national GHG inventory, rather than through more detailed sector-level data.[10] GHG outcomes are also better suited to aggregation of GHG reductions across Parties' contributions. Contributions with GHG outcomes can be framed in several different ways, including as a base year emissions target, a fixed-level target, a base year intensity target, a baseline scenario target, or a trajectory target. Section 6.2 in Part II explains these options in greater detail.

Where possible, Parties should commit to quantified outcomes, which can provide a better understanding of future emissions reductions and emissions levels associated with the contributions and which, when aggregated, facilitate an assessment of future global emissions.[11] Quantified outcomes also enable progress in achieving the INDC to be tracked, offer more credibility when securing finance and access to markets, and enhance comparability among Parties' INDCs. It is also simpler to estimate the GHG effects of quantified outcomes than of actions.

During the pre-2020 period, Parties put forward project- and policy-level actions, as well as non-GHG and GHG outcomes (including base year emissions targets, fixed level targets, base year intensity targets, and baseline scenario targets) as shown in Table 4.1. It remains to

Table 4.1 | **Diversity of Pre-2020 Mitigation Interventions**

EXAMPLES OF ACTIONS	
PROJECT-LEVEL ACTIONS	
Ethiopia	Hydropower capacity; wind projects
Ghana	Reductions in methane emissions due to improvement of waste management at landfill sites
POLICY-LEVEL ACTIONS	
Chad	Promotion of the use of biofuels in the transportation sector
Madagascar	REDD+ policy
EXAMPLES OF OUTCOMES	
NON-GHG OUTCOMES	
Cook Islands	100 percent renewable energy by 2020
GHG OUTCOMES	
Base year emissions targets	
European Union	20-30 percent reduction below 1990 levels
Russia	15-25 percent reduction below 1990 levels
Fixed-level targets	
Costa Rica	Carbon neutrality by 2021
Maldives	Carbon neutrality by 2020
Base year intensity targets	
China	40-45 percent reduction in intensity by 2020 compared to 2005 levels
India	20-25 percent reduction in intensity by 2020 compared to 2005 levels
Baseline scenario targets	
Republic of Korea	30 percent reduction from business-as-usual emissions by 2020
South Africa	34 percent deviation below business-as-usual emissions by 2020
EXAMPLE OF OUTCOME AND ACTIONS	
Brazil	Between 36.1 percent and 38.9 percent below projected emissions in 2020 and actions that will lead to emissions reductions consistent with achieving this goal

be seen what types of interventions will be put forward for the INDCs.

Parties that put forward individual actions as INDCs could also communicate the expected outcomes associated with specific actions, where possible, either in terms of estimated GHG reductions or in terms of non-GHG outcomes.[12] For example, Brazil's pre-2020 pledge contains various mitigation actions along with the estimated GHG reductions associated with each action, which collectively lead to a national goal of reducing emissions 36.1 to 38.9 percent below baseline scenario emissions in 2020 (UNFCCC 2013). This quantified information can help other Parties understand the ambition and fairness of the contribution and enable aggregation of global effort across Parties' INDCs.

Conversely, Parties that put forward INDCs in the form of outcomes could also communicate a list of key policies and actions to indicate specific ways in which they intend to implement the target(s). This information helps other Parties to understand how the contribution will be implemented and achieved. In this case, the actions may be viewed as a means toward achieving the contribution but perhaps not as the primary contribution itself.

Parties may also choose to put forward both outcome(s) and action(s) as part of their INDCs, either within the same sectors or in different sectors. For example, a Party could put forward an outcome for the energy sector and a series of actions for the forestry sector. Chile's draft INDC includes a base year emissions intensity goal, as well as a commitment to restore about 100,000 hectares of degraded land, reaching an area of at least 100,000 hectares of managed native forest by 2035.

In addition to deciding the broad form of the INDC, there are numerous design choices relating to the greenhouse gases and sectors that will be covered, the specific types of action or outcome, the target level that will be established (if applicable), and the use of market mechanisms, among others. These choices are detailed in Part II in Chapter 6.


United Nations
Climate Change Conference
Bonn, Germany

CHAPTER 5

HOW CAN PARTIES COMMUNICATE THEIR INDC TRANSPARENTLY?

Once the INDC is developed, the next step is to communicate it to the UN Climate Change Secretariat and, in so doing, to the broader international community. In designing the INDC, Parties will already have considered much of the information required for transparent communication of their INDC. Therefore, transparent communication should not create additional burdens to Parties' preparation.

The purposes of communicating an INDC include facilitating the clarity, transparency, and understanding of the intended contributions. Information about the INDC is also critical to understanding individual and aggregate impacts of Parties' INDCs, and to enable an assessment of whether global emissions after 2020 will be in line with the goal to hold the increase in global average temperature below 2°C. Comparing the collective impact of all Parties' INDCs to the global 2°C goal requires an understanding of the assumptions and methodologies that underpin the INDCs, in particular Parties' accounting assumptions related to international market mechanisms and the land sector.[13] Providing more detailed information can also enhance domestic implementation by clarifying assumptions underlying the actions needed to implement the contribution and communicating those assumptions to domestic stakeholders.[14] Communication can also promote international understanding of what is fair and ambitious and can situate climate action in the broader context of sustainable development (see Box 5.1). Communicating an INDC might also help to build an evidence-based case for potential finance, if relevant.

Paragraph 14 of the Lima Call for Climate Action specifies the information that Parties can put forward to facilitate the clarity, transparency, and understanding of their INDCs. It states:

> *The Conference of the Parties . . . Agrees that the information to be provided by Parties communicating their intended nationally determined contributions, in order to facilitate clarity, transparency and understanding, may include, as appropriate, inter alia, quantifiable information on the reference point (including, as appropriate, a base year), time frames and/or periods for implementation, scope and coverage, planning processes, assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals, and how the Party considers that its intended nationally determined contribution is fair and ambitious, in light of its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2.*

BOX 5.1 CONSIDERATIONS WHEN DESCRIBING THE INDC'S FAIRNESS, AMBITION, AND CONTRIBUTION TO THE ACHIEVEMENT OF THE CONVENTION'S OBJECTIVE

When considering whether an INDC is fair and ambitious, in light of national circumstances, and to what extent it contributes to the achievement of the Convention's objective, Parties may want to keep in mind some broader considerations that can assist in framing their INDC and in providing important context about their national circumstances.

A fair and ambitious contribution identifies and prioritizes climate action that places the Party on an equitable, long-term, low-carbon, and climate-resilient pathway that contributes to limiting warming to 2°C. The description of fairness and ambition can place climate action, including both adaptation and mitigation, in the context of broader sustainable development objectives.

In addition, for those Parties including undertakings in adaptation planning or an adaptation component in their INDC, the description on fairness, ambition and alignment with the objective of the Convention provides an opportunity to address their capacity to adapt and to describe how the INDC addresses particularly vulnerable communities or sectors. In a sustainable development context, it can also highlight efforts to pursue synergies that provide both mitigation and adaptation benefits.

This chapter provides further detail to assist Parties in fulfilling the Lima Call for Climate Action. Below we list the information elements from the Lima Call for Climate Action and provide further detail and clarification that can help Parties identify what information should be provided under each element in order to ensure clarity, transparency, and understanding.

The more detailed bulleted list is informed by two international GHG accounting and reporting standards developed by the Greenhouse Gas Protocol: the *Mitigation Goal Standard* and *Policy and Action Standard* (available at www.ghghprotocol.org).

If included, Parties can structure the adaptation component of the INDC in multiple ways. Chapter 7 describes several options for doing so.

Only a subset of the information elements will be relevant or applicable to a given Party's INDC. Before providing the information outlined below, Parties may choose to begin with a high-level summary of the INDC, as well as any additional context to frame the INDC.

1. The reference point (including, as appropriate, a base year)

- Base year(s)/period, if relevant (for example, 2005)
- Base year/period emissions, base year/period emissions intensity, or projected baseline scenario emissions, as relevant (for example, base year emissions of 500,000 $MtCO_2e$ in 2005)

2. Time frames and/or periods for implementation

- For targets/outcomes: target year(s)/period and peaking year (if applicable) (for example, 2025 or 2030 for a single year target; 2021-2030 for a multi-year target)
- For actions: date actions come into effect and date of completion (if applicable) (for example, 2020 with no end date)

3. Scope and coverage

- Sectors covered (for example, all IPCC sectors covered in national GHG inventory, or all economic sectors as defined by national sector classification)
- Greenhouse gases covered (for example, CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3)
- Geographical coverage (for example, 100 percent, consistent with the national GHG inventory)
- Percentage of national emissions covered, as reflected in the most recent national greenhouse gas inventory (for example, 100 percent)

4. Planning processes

- Planning processes for preparation of the INDC, such as stakeholder engagement and public consultation, data and analysis for prioritizing sectors and actions, and decision-making processes
- If known, planning processes for implementation of the INDC, such as government processes to plan and implement actions and, if known, a list of existing or planned actions that will be implemented to achieve the INDC, their legal status, and the implementing entity/entities
- If known, planning processes for tracking implementation of the INDC, such as any domestic measurement, reporting, and verification (MRV) systems in place or planned

5. Assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals

- Assumed IPCC inventory methodologies and global warming potential (GWP) values to be used to track progress (for example, 2006 IPCC *Guidelines for National Greenhouse Gas Inventories*; AR4 GWP values)
- Related to international market mechanisms:
  - Whether the Party intends to use or sell/transfer units from international market mechanisms
  - If units are to be used, any limit on the percentage of emission reductions that may be achieved through the use of units from international market mechanisms
  - If units are to be used, the assumed types and years of units to be applied, if known

- Whether and how any units purchased/acquired or sold/transferred abroad will ensure environmental integrity (for example, through specific quality principles) and avoid double counting

- Related to accounting assumptions for emissions and removals from the land sector:
  - Treatment of land sector (included as part of the broader target, treated as a separate sectoral target, used to offset emissions within the target boundary, or not included in a target)
  - If the land sector is included, coverage of the land sector (net emissions and removals from land-use activities and/or categories) as compared to total net emissions from the land sector, as a percentage if known
  - If the land sector is included, assumed accounting approach (activity-based or land-based) and accounting method[15] for the land sector and the level against which emissions and removals from the land sector are accounted, if known, including policy assumptions and methodologies employed
  - Any assumed use of methodologies to quantify and account for natural disturbances and legacy effects
  - Any other relevant accounting approaches, assumptions or methodologies[16]

- For GHG reduction targets relative to a projected baseline scenario:
  - Whether the baseline scenario is static (will be fixed over the period) or dynamic (will change over the period)
  - The cut-off year for policies included in the baseline scenario, and any significant policies excluded from the baseline scenario
  - Projection method (for example, name and type of models)
  - Emissions drivers included and assumptions and data sources for key drivers
  - For dynamic baseline scenario targets, under what conditions will the baseline be recalculated and, if applicable, any significance threshold used to determine whether changes in emissions drivers are significant enough to warrant recalculation of the scenario
  - Total emissions projected in baseline scenario in the target year(s)

- For GHG reduction targets relative to emissions intensity:
  - Level of output (for example, GDP) in the base year, projected level of output in the target year/period (and an uncertainty range, if available), and units and data sources used

- For INDCs that include actions:
  - Estimated impact on GHG emissions and/or non-GHG indicators
  - Methodologies used to estimate impacts, including the baseline scenario and other assumptions
  - Uncertainty of estimated impacts (estimate or description)
  - Information on potential interactions with other policies/actions

6. How the Party considers that its intended nationally determined contribution is fair and ambitious, in light of its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2

- Comparison of the contribution to multiple indicators related to fairness. Factors that Parties may want to consider include:
  - Emissions (for example, past, current, or projected future emissions, emissions per capita, emissions intensity, or emissions as a percentage of global emissions); economic and development indicators (for example, GDP, GDP per capita, indicators related to health, energy access, energy prices, education, housing, etc.); national circumstances; vulnerability and capacity to adapt to climate change impacts; costs or relative costs of action; mitigation potential (for example, renewable energy potential); benefits of action (for example, co-benefits); or other factors

- Comparison of the contribution to multiple indicators related to ambition. Factors that Parties may want to consider include:
  - Projected business-as-usual emissions, recent historical emission trends, total mitigation potential based on mitigation opportunities determined to be technically and economically feasible, benchmarks for the annual rate of emissions reductions, or other factors
- Comparison of the contribution to multiple indicators related to achieving the objective of the Convention as set out in its Article 2. Factors that Parties may want to consider include:
  - Anticipated national emissions in the target year/period if the contribution is achieved, the quantified GHG impact of the contribution, the intended peaking year and peaking emissions level (if known), the annual rate of emissions reductions and/or expected emissions trajectory over time, deviation from business-as-usual emissions, any long-term mitigation goals, plans to limit cumulative emissions over time, or other factors

7. Other information

- For outcomes, type of target and target level (if not provided elsewhere in the INDC)
- For actions, name or title of actions, legal status, implementing entity(ies), or other relevant information (if not provided elsewhere in the INDC)
- Additional action that could be achieved if certain conditions were met, such as action by other Parties, the receipt of support, or other factors, if applicable
- Description of Party's long-term target(s), if applicable
- Elaboration on national circumstances (for example, emissions profile, mitigation potential)
- Additional information on adaptation not captured elsewhere, if relevant[17]
- Additional information, explanation, or context as relevant

Annex B provides the above information with references to sections of this document that may be helpful when providing the information. Annex C and Annex D offer illustrative examples of providing information for two hypothetical INDCs.


压力表
MPa
DDZ-III

PART II: TECHNICAL GUIDANCE

CHAPTER 6

WHAT OPTIONS EXIST FOR THE DESIGN OF AN INDC FOR MITIGATION?

As described in Chapter 4, INDCs can be put forward in the form of actions, including policies and projects, and in the form of outcomes, including non-GHG and GHG outcomes. This chapter describes further design choices for each type of contribution. The design choices should be informed by the data and analysis described in Chapter 3.

Section 6.1 outlines the design choices regarding actions, while Section 6.2 describes the design choices regarding outcomes. Sections 6.1 and 6.2 are structured similarly, describing for both actions and outcomes:

- How to choose the sectors and greenhouse gases to be targeted;
- How to choose specific actions or the way of expressing the outcome;
- How to choose the timeframe; and
- How to choose the target level of reductions and quantify the GHG impact.

Before beginning the INDC design process, Parties should first consider their internationally communicated GHG reduction plans for 2020. In the Lima Call for Climate Action, the Conference of the Parties "agrees that each Party's intended nationally determined contribution towards achieving the objective of the Convention as set out in its Article 2 will represent a progression beyond the current undertaking of that Party" (paragraph 10). Also, when designing the INDC, Parties may choose to consider what emissions reductions can be achieved with available resources and what additional actions could be put forward if additional resources were available (discussed in Chapter 8).

6.1 Actions Put Forward as Contributions

Actions are an intention to implement specific means, such as policies or projects, of achieving GHG reductions within a given timeframe. A Party may decide to put forward actions as contributions by compiling a set of policies or projects that deliver mitigation benefits. The contribution could be to establish new actions, implement planned ones, or ensure that existing ones deliver mitigation benefits. The actions could be designed primarily to achieve benefits other than climate change mitigation (such as those presented in Annex E), but that also achieve emission reductions.

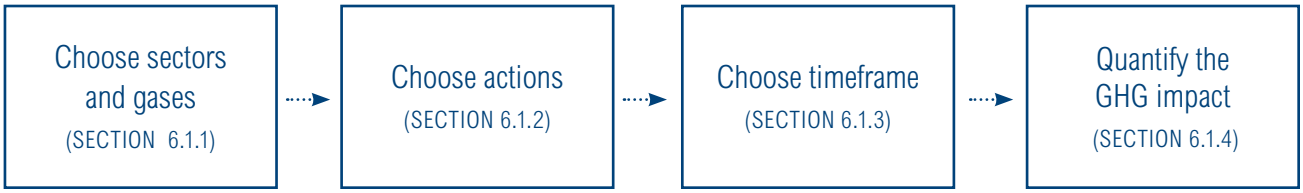
Parties that choose to put forward specific actions as their INDC should consider several decisions, outlined in Figure 6.1. The guidance in this section is adapted from the GHG Protocol *Policy and Action Standard* (WRI 2014b).

6.1.1 Choose sectors and gases to be targeted

First, it is important to consider which sectors and subsectors are targeted by the one or more actions to be put forward. Sectors and subsectors may be based on national sector classifications or the most recent IPCC *Guidelines for National Greenhouse Gas Inventories*. The IPCC *2006 Guidelines for National Greenhouse Gas Inventories* group GHG emissions and removals into five main sectors: (1) energy; (2) industrial processes and product use (IPPU); (3) agriculture, forestry and other land use (AFOLU); (4) waste; and (5) other. National sector classifications are likely to differ from IPCC sector categories. It may be useful first to prioritize sectors based on national classifications, and then determine how they translate to the IPCC sector categories.

If applicable, Parties should also determine which greenhouse gases the actions aim to control. Seven greenhouse gases are covered under the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Figure 6.1 | **Overview of Steps for Actions Put Forward as Contributions**



In general, Parties should prioritize those sectors and gases that contribute most to the national GHG inventory and/or are expected to contribute most in the future, in the context of national circumstances and development priorities. Multiple actions may be selected, each targeting a different priority sector.

6.1.2 Choose actions

Next is the choice of the specific actions to be included in the INDC. Actions may include policies, projects, and/or strategies or plans. Projects are typically implemented at a single site (such as an individual solar photovoltaic installation), while policies are implemented at a broader scale (such as a renewable energy subsidy at the sectoral or jurisdiction level). Box 6.1 provides examples of possible actions.

Table 6.1 provides categories of policy instruments that may be useful when identifying actions.

The IEA policy database provides specific examples of policies and measures, including climate change, renewable energy, and energy efficiency policies and measures.[18] Additional sources of policies that can be pursued to reduce emissions while achieving social and economic benefits include the New Climate Economy Report, *Better Growth Better Climate*,[19] and its Global Action Plan,[20] as well as the UNEP Emissions Gap Report.[21]

Various criteria may be used to select actions. For examples of criteria, see Box 6.2.

When selecting actions, Parties should consider the principles described in Chapter 3—that an INDC should be realistic and achievable, while being ambitious, fair, and contributing to achieving the objective of the Convention. These qualities can be reflected both in the number of actions Parties include in the INDC and in the extent of mitigation associated with the actions. See Box 3.3 for more information on these principles. Parties would need to balance tradeoffs between these factors based on national circumstances.

When choosing a set of actions, Parties should take into account both national considerations (such as the mitigation technologies, policies, or actions that can realistically be implemented, and the collective GHG reductions associated with that set of actions) as well as global considerations (such as the level of national GHG reductions that would represent an ambitious and fair contribution to the global 2°C goal). Considering both national feasibility as well as global GHG reduction needs is helpful for developing an INDC that is both realistic and robust.

After selecting actions to be undertaken by a Party using its own resources, developing country Parties may choose to identify additional actions that can be undertaken with additional financing (see Section 6.3).

BOX 6.1 ILLUSTRATIVE EXAMPLES OF POSSIBLE ACTIONS

Examples of actions may include:

- Reduction or phase-out of fossil fuel subsidies
- Feed-in tariffs or minimum requirements for renewable energy generation
- Energy-efficiency standards for vehicles, appliances, or buildings
- Limit or phase out unabated coal-fired power generation
- Reduce incentives for urban sprawl and increase incentives for compact urban development
- Sustainable management of forests and lands
- Reduced deforestation and forest degradation
- Restoration of degraded agricultural lands, forests, and other lands
- Programs to reduce emissions in industry sectors (for example, cement, iron and steel)
- Low emissions development strategies (LEDS)
- Carbon pricing through carbon taxes or emissions trading programs

Table 6.1 | **Types of Policy Instruments**

TYPE OF POLICY INSTRUMENT	DESCRIPTION
Regulations and standards	Regulations or standards that specify abatement technologies (technology standard) or minimum requirements for energy efficiency, pollution output, or other activities (performance standard). They typically include penalties for noncompliance.
Taxes and charges	A levy imposed on each unit of activity by a source, such as a fuel tax, carbon tax, traffic congestion charge, or import or export tax.
Subsidies and incentives	Direct payments, tax reductions, or price supports from a government for implementing a specified practice or performing a specified action.
Emissions trading programs	A program that establishes a limit on aggregate emissions from specified sources, requires sources to hold permits, allowances, or other units equal to their actual emissions, and allows permits to be traded among sources. These programs may be referred to as emissions trading systems (ETS) or cap-and-trade programs.
Voluntary agreements or measures	An agreement, commitment, or measure undertaken voluntarily by public or private sector actors, either unilaterally or jointly in a negotiated agreement. Some voluntary agreements include rewards or penalties associated with participating in the agreement or achieving the commitments.
Information instruments	Requirements for public disclosure of information. These include labeling programs, emissions reporting programs, rating and certification systems, benchmarking, and information or education campaigns aimed at changing behavior by increasing awareness.
Research, development, and deployment (RD&D) policies	Policies aimed at supporting technological advancement, through direct government funding or investment, or facilitation of investment, in technology research, development, demonstration, and deployment activities.
Public procurement policies	Policies requiring that specific attributes (such as GHG emissions) are considered as part of public procurement processes.
Infrastructure programs	Provision of (or granting a government permit for) infrastructure, such as roads, water, urban services, and high-speed rail.
Implementation of new technologies, processes, or practices	Implementation of new technologies, processes, or practices at a broad scale (for example, those that reduce emissions compared to existing technologies, processes, or practices).
Financing and investment	Public sector grants or private sector grants or loans (for example, those supporting development strategies or policies).

Source: Adapted from IPCC 2007.

As part of selecting the actions, Parties should consider identifying:

- The names or titles of the actions
- The types of actions (such as those presented in Table 6.1)
- The specific intervention(s) carried out as part of the actions
- The implementing entity or entities, including the role of local, subnational, national, international, or any other entities
- Their legal status
- The jurisdiction(s) or geographic area where the actions are implemented or enforced
- The objective(s) or benefit(s) they intend to achieve (for example, the purpose stated in the legislation or regulation)
- Other related policies or projects that may interact with the specified actions

BOX 6.2 CRITERIA FOR SELECTING ACTIONS

The choice of actions should be based on national priorities and criteria. Possible criteria include:[a]

GHG reduction potential

- Facilitate transformational impacts (that is, long-term, significant changes) that enable a shift to a low-emissions economy over the long term
- Achieve significant GHG reductions relative to a baseline scenario (Section 6.2.4 provides guidance on estimating GHG reductions)
- Target high-emitting or fast-growing sectors and gases (based on the national GHG inventory)
- Target reductions in key decarbonization metrics, such as CO_2 per kilometer travelled by vehicles, CO_2 per megawatt hour of electricity production, or GHG per ton of cement or steel produced (Höhne et al. 2014)
- Eliminate key barriers to GHG reduction

Feasibility

- Be aligned with national economic and development priorities and objectives
- Be feasible to implement and enforce, given current and anticipated political, legal, and regulatory context
- Have stakeholder support

Benefits and costs

- Deliver multiple benefits, including GHG reduction and various economic, social, and environmental benefits outlined in Annex E (such as reduced energy costs, improved air quality, improved public health and reduced health care costs, job creation in new sectors, reduced traffic congestion, etc.)
- Deliver a positive economic return (for example, through financial savings from reduced energy costs, reduced costs of energy subsidies, job growth through new industries, productivity gains that increase GDP and create jobs, reduced health care costs from air pollution)[b]
- Be cost-effective in reducing GHG emissions and achieving other benefits for a given amount of resources (for example, as determined through GHG abatement cost curves or MAC curves)
- Leverage private sector investment in low-carbon development/technologies

Other

- Have been shown to be effective in other jurisdictions
- Be measurable, in order to enable monitoring and evaluation of their performance over time
- Be expected to have a fair distribution of impacts across society, for example, the distribution of costs and benefits across different geographic regions, income groups, or industry sectors
- Be expected to expand and entrench support from domestic constituencies and lock in low-emissions technologies and behavior

Notes:
[a] Adapted from U.S. EPA 2014.
[b] For examples of mitigation policies that have a positive economic return, see Global Commission on the Economy and Climate 2014.

6.1.3 Choose timeframe

Both for planning purposes and when communicating the INDC, Parties should identify the timeframe of the actions. This involves multiple elements:

- The current status of the actions (whether they are planned, adopted, or implemented)
- If they are not yet adopted or implemented, the date the actions are expected to be adopted (such as the date that any supporting laws are enacted), the date the actions are expected to be implemented (the date they are expected to come into effect), and the date the actions are expected to begin achieving emissions reductions
- If applicable, the date the action ceases, such as the date when a tax is no longer levied or the end date of an incentive scheme with a limited duration

Table 6.2 defines three possible stages of implementation.

Table 6.2 | **Definitions of Implemented, Adopted, and Planned Actions**

STATUS	DEFINITION
Implemented	Actions that are currently in effect, as evidenced by one or more of the following: (a) relevant legislation or regulation is in force, (b) one or more voluntary agreements have been established and are in force, (c) financial resources have been allocated, or (d) human resources have been mobilized.
Adopted	Actions for which an official government decision has been made and there is a clear commitment to proceed with implementation, but that have not yet begun to be implemented (for example, a law has been passed, but regulations to implement the law have not yet been established or are not being enforced).
Planned	Action options that are under discussion and have a realistic chance of being adopted and implemented in the future, but that have not yet been adopted.

Source: Adapted from UNFCCC 2000.

6.1.4 Quantify the GHG impact

Quantifying the GHG impact of the action, such that future emissions and emissions reductions associated with the INDC can be determined, offers several benefits. It can help inform the design of the INDC and aid understanding of the extent to which the proposed actions are realistic and achievable. Quantifying emissions and reductions can also help Parties and stakeholders to understand the fairness and ambition of the INDC. Quantifying GHG impacts enables comparisons between Parties' INDCs by translating diverse INDCs into a common metric (that is, tons of CO_2e).

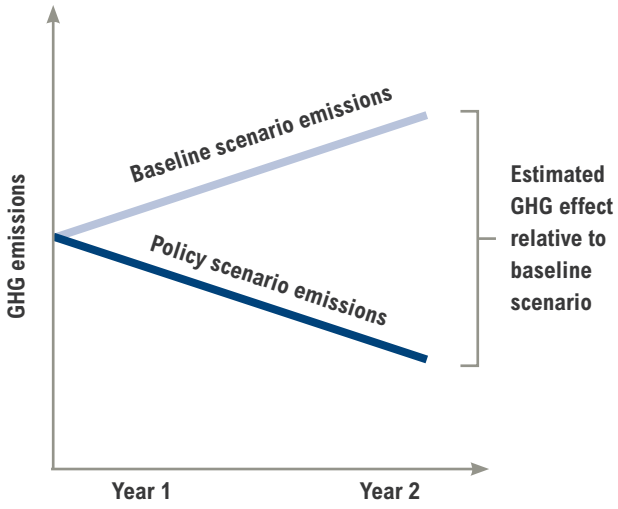
Two separate quantities can be calculated:

- *Emissions reductions associated with implementing the actions*, which is useful to understand feasibility, ambition, and fairness.
- *Expected national emissions in the future if the actions are implemented*, which is useful to understand the extent to which the INDC contributes to achieving the objective of the Convention. Calculation of this quantity is necessary to enable global aggregation of emissions in relation to the 2°C goal. If all Parties calculate their expected national emissions in a future year (for example, 2025) then, assuming their contribution is achieved, total global emissions in that year can be aggregated across countries[22] and compared to the global emissions reductions needed in that year to be on an emissions pathway consistent with limiting warming to below 2°C, as determined by the IPCC.

Quantifying emission reductions associated with implementing the actions involves calculating the expected future GHG reductions (ex-ante) from actions relative to a baseline scenario. The GHG Protocol *Policy and Action Standard* (WRI 2014b) provides guidance on how to estimate the GHG effects of policies and actions (available at www.ghgprotocol.org). The main steps are:

1. Define the action to be assessed
2. Map the causal chain of the action to identify all potential GHG effects, including intended and unintended effects, and define the GHG assessment boundary around significant effects
3. Define the baseline scenario—the events or conditions most likely to occur in the absence of the action being assessed—and estimate baseline emissions for all affected source/sink categories included in the assessment boundary
4. Define the policy scenario—the events or conditions most likely to occur in the presence of the action being assessed—and estimate policy scenario emissions for the same set of source/sink categories
5. Subtract baseline emissions from policy scenario emissions to estimate the net GHG effect of the action (see Figure 6.2)

Figure 6.2 | **Estimating the GHG Effect of an Action Relative to a Baseline Scenario**



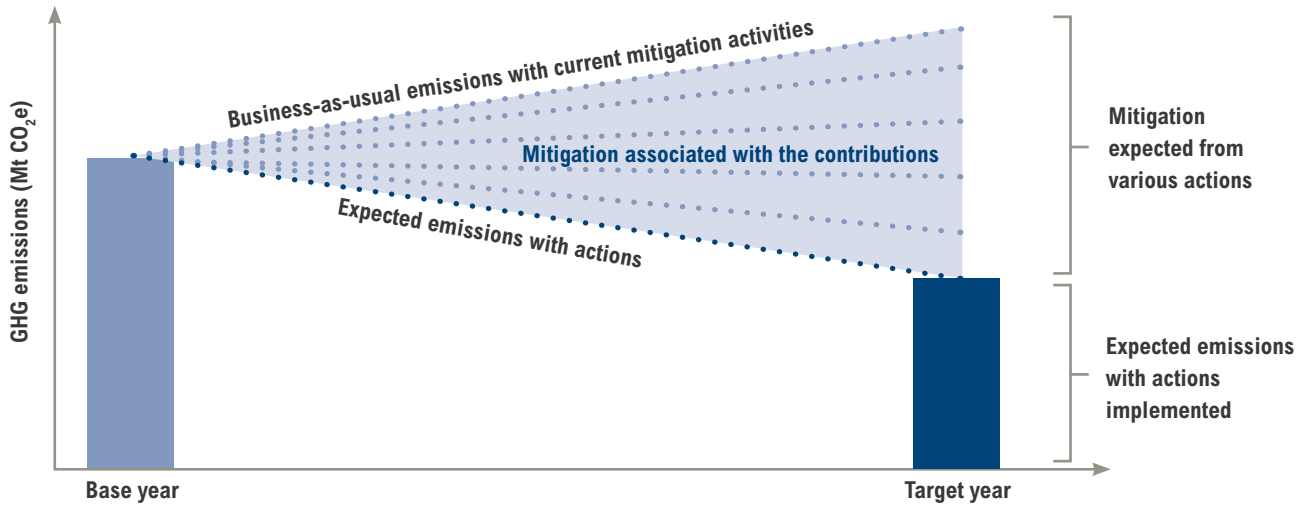
Some types of actions are more difficult to assess than others, because the causal relationship between implementation of the policy and its GHG effects may be less direct. For example, information instruments and research, development, and deployment (RD&D) policies may have less direct and measurable effects than regulations and standards. To assess the effects of broad strategies or plans, such as LEDS, Parties should first define the individual policy instruments, technologies, processes or practices that will be implemented to achieve the strategy or plan. Broad strategies or plans can be difficult to assess because the level of detail needed to estimate the GHG effects might not be available without further specificity.

If the collective GHG impact of the proposed set of actions is not expected to achieve the desired level of GHG reductions, the set of actions proposed should be reconsidered in light of national circumstances and objectives.

Parties can then estimate expected national emissions in a future year (for example, 2025) if the actions are implemented as planned by subtracting expected GHG reductions resulting from the group of actions from projected national emissions under a business-as-usual (BAU) scenario, if available. When doing so, Parties should ensure consistent baseline assumptions and methodologies between the action assessment and the national projection, where possible. If multiple actions affect the same sector (such as renewable energy and energy efficiency policies), any overlaps or interactions between the actions should be accounted for, such that total GHG reductions are not over- or underestimated, and double counting is avoided.

Figure 6.3 illustrates the concept of determining expected national emissions in a future year if the actions are implemented, relative to a business-as-usual emissions trajectory.

Figure 6.3 | **Determining Expected National Emissions in a Future Year If the Actions Are Implemented**



6.2 Outcomes Put Forward as Contributions

Outcomes are an intention to achieve a specific result, such as reducing GHG emissions to a specific level (a GHG outcome) or increasing energy efficiency to a specific level (a non-GHG outcome). A Party may decide to present its INDC as an outcome by putting forward a quantified target it intends to achieve. Parties that choose to put forward outcomes as their INDC should consider several decisions, outlined in Figure 6.4. The guidance in this section is adapted from the GHG Protocol *Mitigation Goal Standard* (WRI 2014a).

6.2.1 Choose type of outcome(s)

The first step is for the Party to consider the type of outcome(s) it wishes to put forward. As mentioned in Chapter 4, outcomes are a commitment to reduce GHG emissions by a certain amount or to achieve other specific results. They may include national greenhouse gas reduction targets, energy targets (such as energy efficiency targets or renewable energy targets), or other non-GHG targets. See Box 6.3 for examples.

This first step entails deciding whether a GHG outcome or non-GHG outcome (and if so, what kind of non-GHG outcome) is being targeted. (Section 6.2.3 further describes choices related to the form of the contribution.)

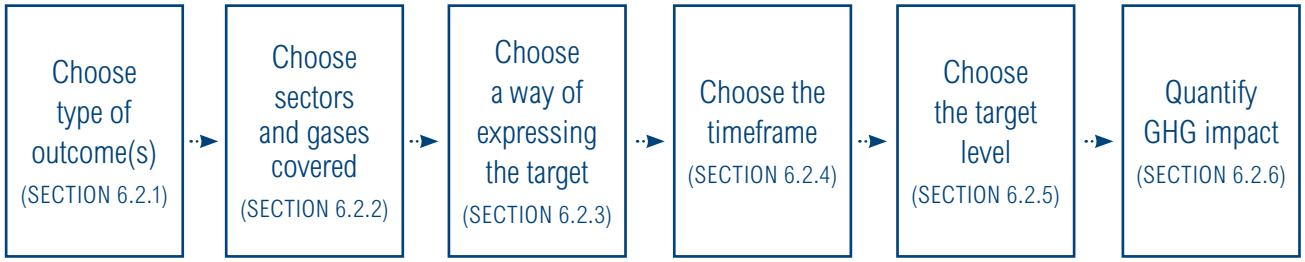
6.2.2 Choose sectors and gases to be covered

The second step is to consider which sectors and greenhouse gases will be covered by the contribution.

6.2.2.1 Choose sectors

When choosing sectors, Parties should identify the sectors that generate the majority of national emissions. The IPCC *2006 Guidelines for National Greenhouse Gas Inventories* (IPCC 2006) groups GHG emissions and removals into five main sectors: (1) energy; (2) industrial processes and product use (IPPU); (3) agriculture, forestry and other land use (AFOLU); (4) waste; and (5) other. See Section 6.2.2.2 for further guidance on the land sector. National sector classifications are likely to differ from IPCC sector categories. It may be useful to first prioritize sectors based on national classifications, and then determine how they translate to the IPCC sector categories.

Figure 6.4 | **Overview of Steps for Outcomes Put Forward as Contributions**



In general, Parties seeking to set a comprehensive GHG reduction target should consider setting an economy-wide target by including all sectors within the target. Incomplete sectoral coverage may compromise the emissions reductions by excluding significant emissions sources and may cause leakage, whereby activities implemented to meet the target cause an increase in emissions from sectors not included in the target boundary.

Parties may instead choose to set a target covering multiple key sectors, or separate targets for separate sectors, rather than one target covering all sectors. Setting a target that covers high-emitting sectors but excludes minor sectors may be preferable if some sectors dominate the national GHG inventory (or are expected to in the future) and if data limitations in smaller sectors make regular monitoring through the national inventory difficult.

Parties adopting non-GHG targets can adopt one or more sectoral targets. Renewable energy targets and energy efficiency targets apply to the energy sector only. Forest-cover targets apply to the AFOLU sector only.

6.2.2.2 Choose approach for the land sector[23]

Parties may choose to treat the land sector differently from other sectors because of the land sector's unique characteristics. The significance of natural-disturbance-related emissions and the size and arbitrariness of legacy effects (where past management has an effect on emissions even in the presence of sustainable management) might require an accounting approach that differs from national and subnational GHG inventory accounting methods.

BOX 6.3 EXAMPLES OF OUTCOMES

An example of a greenhouse gas target is a reduction of emissions by 30 percent below 2000 levels by 2030. An example of a renewable energy target is a commitment to generate 25 percent of electricity from renewable sources by 2025 and 100 percent from renewable sources by 2050. An example of an energy efficiency target is a commitment to increase national energy efficiency by 30 percent by 2030 compared to 2010 levels. An example of a forest cover target is a commitment to increase forest coverage by five million hectares and forest stock volume by 100 million cubic meters by 2020 compared with 2005 levels.

The land sector refers to the following land-use categories: forest land, cropland, grassland, wetlands, and settlements, and includes emissions and removals from land in agricultural production and grazing lands/grasslands (IPCC 2006). These categories are collectively referred to as LULUCF in the 2003 IPCC *Good Practice Guidance*. Parties including AFOLU in the target should separately report agriculture and land use because of the special accounting rules that may apply to the latter.

Benefits of including the land sector in the target boundary include: (1) maximizing mitigation opportunities by ensuring that land sector emissions and removals are included in economy-wide mitigation strategies; and (2) minimizing the potential for leakage of emissions from covered

sectors to the land-use sector (such as the use of biomass for energy production).

How Parties treat the land sector can have significant implications for the target coverage, the emissions reductions they achieve by implementing the target, and their ability to meet the target. Parties may treat emissions and removals from the land sector in one of four ways:

- *Include in the target boundary:* The land sector is included in the target boundary, like other sectors. Emissions and removals in the sector are accounted for in a manner consistent with the target type.
- *Sectoral target:* A sectoral target for the land sector is separately designed and assessed, apart from any other mitigation targets. If the land sector is treated as a sectoral target, only emissions and removals in the land sector are included within the sectoral target boundary.
- *Offset:* The land sector is not included in the target boundary. Instead, net land sector emissions are added to emissions from sectors included in the target boundary. If net land sector emissions are negative (removal) then this value will offset emissions from sectors within the target boundary. (The use of the term "offset" here does not refer to using project-level accounting methods to generate offset credits, but instead refers to applying the total change in net land sector emissions over the target period to emissions in other sectors.)
- *Not included:* The land sector is not included in the target boundary or used to offset other sectors' emissions. Mitigation in the land sector could, however, be achieved through specific actions without having a target for the sector.

The way in which land-use sector emissions and removals are treated can have a significant impact on the emissions reductions generated under the target. Table 6.3 outlines advantages and disadvantages of each approach.

Parties with base year intensity targets based on a unit of economic output should consider removing the land sector from the target boundary, accounting and reporting progress separately using a more appropriate metric, such as emissions per hectare of land.

Accounting assumptions for the land sector

After deciding on the treatment of emissions and removals from the land sector, Parties will need to account for them. It remains to be seen whether there will be accounting rules or principles to guide such accounting. When communicating the INDC (see Chapter 5), it is important for the Party to inform others of the accounting assumptions so that the GHG effects of the target can be better understood.

The two broad options for accounting are a land-based accounting approach or an activity-based approach. Land-based accounting assesses net emissions (emissions + removals) of select land-use categories, while an activity-based accounting approach assesses net emissions of select land-use activities. See Box 6.4.

Most importantly, Parties should strive for comprehensive coverage of all anthropogenic emissions and removals within each elected land-use category or suite of activities. If necessary, Parties may adopt a stepwise approach to accounting for additional land-use categories or activities based on data availability and capacity, as well as the contribution of additional categories to total emissions and trends. For example, the guidance adopted for REDD+ encourages a stepwise approach where, if necessary, a country may pursue reduced deforestation as a first activity and then later, with data improvements, may incorporate reduced forest degradation and/or other REDD+ activities.

In addition to specifying assumptions regarding activity-based accounting and land-based accounting, it will be helpful to articulate the assumed land sector accounting methods used to assess changes in net emissions (emissions + removals) within each land-use category or activity. It remains to be seen whether there will be accounting rules or principles guiding such accounting but, when communicating the INDC (see Chapter 5), it is important for the Party to inform others of the assumed accounting method. The choice of method can have a significant impact on the assessment of target progress and target achievement. There are three land sector accounting methods: (1) accounting relative to base year/period emissions (also known as net-net), (2) accounting

Table 6.3 | **Advantages and Disadvantages of Ways to Treat the Land Sector in a Mitigation Target**

TREATMENT OF LAND SECTOR	ADVANTAGES	DISADVANTAGES
Included in the target boundary	■ Consistent with other sectors covered by the target ■ Provides a signal to reduce land sector emissions ■ May lead to a more efficient distribution of mitigation effort across sectors	■ May require additional land sector data ■ Provides less flexibility to design a specialized target for the land sector, unless special rules are applied
Sectoral target	■ Provides flexibility to treat the land sector differently ■ Provides a signal to reduce land sector emissions ■ Enables Parties to design a specialized target for the land sector ■ Special circumstances of the sector may be easier to explain	■ May require additional land sector data ■ Having multiple targets (one for the land sector, and one for other sectors) may be difficult to communicate to stakeholders ■ May reduce efficiency of mitigation across sectors
Offset	■ Provides flexibility to treat the land-use sector differently from other sectors covered by the target ■ Allows for greater flexibility in achieving the target	■ May not provide a signal to reduce land sector emissions ■ Can lead to reduced ambition in covered sectors ■ Depending on accounting approach chosen, may account for emissions reductions or enhanced removals that would have occurred in the absence of the target, which would enable the target to be met without additional effort ■ May require additional land sector data
Not included	■ Appropriate for Parties with insignificant land sector emissions	■ Does not provide a signal to reduce land sector emissions, unless mitigation actions are taken in the sector in the absence of a target ■ GHG mitigation potential in the sector is not fully realized, which is especially problematic in countries where the land sector may be significant ■ If insufficient data exist, may need to rely on international sources

BOX 6.4 ACCOUNTING APPROACHES FOR THE LAND SECTOR

The land-based accounting approach determines the scope of accounting based on six land-use categories: forestland, cropland, grassland, wetland, settlement, and other land. The categories used for land-based accounting should correspond to the reporting categories in a jurisdiction's GHG inventory. The managed land proxy identifies areas of land that are "unmanaged" and excludes them from the target boundary based on the assumption that any fluxes occurring on those lands are not directly attributable to human influence (IPCC 2003, Chap. 3). If a managed land proxy is used, Parties should ensure that they include all lands subject to direct human intervention in the scope of land covered by the INDC, as well as lands on which any identifiable portion of emissions or removals result from anthropogenic activity.

The activity-based accounting approach bases the accounting on a predetermined set of land-use practices. For example, the activity "grazing land management" includes those emissions affected by livestock ranching, fire prevention, and activities related to savanna restoration. Activity definitions are jurisdiction-specific. In order to uphold the environmental integrity of land-use accounting, if activity-based accounting is chosen, Parties should include all anthropogenic activities that result in changes in carbon pools or fluxes and emissions resulting from land-use change activities within the selected land-use category or categories included in the INDC.

without reference to base year/period or baseline scenario emissions (also known as gross-net); and (3) accounting relative to a forward-looking baseline (see Table 6.4).

If the land sector is included in the target boundary, the accounting method should be consistent with accounting for the goal, depending on the chosen target type.

- *Base year emissions target:* Account relative to base year/period emissions (also known as net-net accounting)
- *Fixed-level and trajectory targets:* Account in the target year/period, without reference to base year/period or baseline scenario emissions (also known as gross-net accounting)
- *Base year intensity target:* Account for emissions intensity relative to a base year/period (also known as net-net accounting)
- *Baseline scenario target:* Use forward-looking baseline accounting method

Lastly, accounting for the land sector may include special accounting for natural disturbances for individual categories or activities or for the land sector as a whole. Natural disturbances are non-anthropogenic events or circumstances such as fire, severe drought, and windstorms that cause significant emissions and are beyond the control of, and not materially influenced by, the jurisdiction. When natural disturbances have the potential to significantly impact net emissions from the land sector, the associated emissions and removals may be removed from accounting. Removing emissions and removals associated with natural disturbances can be a highly complex and data-intensive process. While accounting rules might be developed in the future, it is helpful for Parties to communicate their assumed approach to accounting for natural disturbances.

6.2.2.3 Choose greenhouse gases

Parties seeking to set a comprehensive target should consider including all seven greenhouse gases covered under the Kyoto Protocol—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). Parties may include fewer greenhouse gases depending on objectives, data quality, mitigation opportunities, and capacity to accurately measure and monitor each greenhouse gas. At a minimum, Parties should include the gases that contribute most to the national GHG inventory.

Table 6.4 | **Land Sector Accounting Methods**

ACCOUNTING METHOD	DESCRIPTION
Relative to base year/ period emissions	■ Compares net emissions in the target year(s) with net emissions in the base year/base period. The difference between the two values is applied toward target achievement. ■ Accounting under this approach reflects changes in emissions relative to past performance.
Without reference to base year/period or baseline scenario emissions	■ Applies the total quantity of net land sector emissions in the target year(s) toward the goal. ■ Unlike the other two methods, this type of accounting does not compare net emissions in the target year(s) to any reference case (either historical base year emissions or baseline emissions).
Forward-looking baseline	■ Compares net emissions in the target year(s) with a projection of net baseline scenario emissions in the target year(s).[a] The difference between the two values is applied toward target achievement. ■ Accounting under this approach reflects changes in emissions relative to a reference case that represents the net emissions levels most likely to occur in the absence of activities taken to meet the mitigation goal.

Notes:
[a] Forward-looking baseline accounting is also a form of net-net accounting, but it is distinguished here by its use of a baseline scenario projection as the basis of comparison, rather than a base year or period.

Non-CO_2 gases (CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3) require metrics to convert gases to common units. Global warming potential (GWP) is a metric for comparing the radiative forcing of one unit of a given greenhouse gas to one unit of carbon dioxide. Parties should communicate their assumed accounting methods when putting forward their INDCs.

Non-GHG outcomes may not directly target any specific greenhouse gases.

6.2.2.4 Choose geographic area

Parties should also consider the geographical territory covered by the target. In many cases, the geographic coverage will be the same as the Party's geopolitical boundary. However, in some cases, certain parts of the jurisdiction's territory may be excluded from the target because of lack of data or other factors.

6.2.3 Choose a way of expressing the target

A GHG reduction target can be expressed in multiple ways, including the five listed in Table 6.5. Figures 6.5-6.9 illustrate these different approaches to framing a target. Renewable energy targets are typically in the form of a base year target. Energy efficiency targets are typically in the form of a base year intensity target.

The ways of expressing the target are interrelated. Most targets can be converted into other types of targets by using simple equations. For example, a base year emissions target could be converted to a fixed-level target by calculating the target level of emissions in the target year, then framing the target in terms of the target level of emissions to be achieved, rather than in reference to historical emissions. Similarly, static baseline scenario targets fix the target level of emissions in the target year, so a static baseline scenario target could be reframed either as a base year emissions target, fixed-level target, or base year intensity target,[24] using simple equations. Section 6.2.6 provides equations for calculating the target level of emissions in the target year.

Table 6.5 | **Five Ways to Express a GHG Reduction Target**

TYPE OF TARGET	DESCRIPTION	REDUCTIONS IN WHAT?	REDUCTIONS RELATIVE TO WHAT?
Base year emissions target	A commitment to reduce, or control the increase of, emissions by a specified quantity relative to a historical base year. For example, a 25 percent reduction from 1990 levels by 2020. These are sometimes referred to as "absolute" targets. Example: United States' pledge to reduce emissions 17 percent below 2005 levels by 2020	Emissions	Historical base year
Fixed-level target	A commitment to reduce, or control the increase of, emissions to a specified emissions quantity in a target year/period. Fixed-level target include carbon-neutrality targets or phase-out targets, which aim to reach zero net emissions by a specified date. For example, zero net emissions by 2050. Example: Costa Rica's pledge of 'long-term economy-wide transformational effort to enable carbon-neutrality'	Emissions	No reference level
Base year intensity target	A commitment to reduce emissions intensity (emissions per unit of another variable, typically GDP) by a specified quantity relative to a historical base year. For example, a 40 percent reduction below 1990 base year intensity by 2020. Example: China's pledge to reduce CO_2 emissions per unit of GDP 40-45 percent by 2020 compared with the 2005 level	Emissions intensity	Historical base year
Baseline scenario target	A commitment to reduce emissions by a specified quantity relative to a projected emissions baseline scenario. A baseline scenario is a reference case that represents future events or conditions most likely to occur in the absence of activities taken to meet the mitigation target. For example, a 30 percent reduction from baseline scenario emissions in 2020. These are sometimes referred to as business-as-usual or BAU targets.[a] Example: Brazil's pledge to reduce emissions 36.1 percent to 38.9 percent below projected emissions in 2020	Emissions	Projected baseline scenario
Trajectory target[b]	A commitment to reduce, or control the increase of, emissions to specified emissions quantities in multiple target years or periods over a long time period (such as targets for 2020, 2030, and 2040 over the period 2020-2050). Trajectory targets also include "peak-and-decline" targets, such as emissions peaking at a specified level in 2025 and declining thereafter, or a "peak, plateau, and decline" target which additionally specifies that emissions will remain constant for a period after peaking and before declining.[c]	Emissions	No reference level

Notes:

[a] The term business-as-usual (BAU) scenario is often used to refer to a type of baseline scenario that includes already implemented and adopted policies. Section 6.2.3 provides more information on including policies in the baseline scenario.

[b] For more information, see MAPS 2014.

[c] A type of trajectory could be a target that specifies when emissions will peak, without specifying the intended emissions pathway. For these targets, specifying the intended emissions level (or range) is necessary to assess its impact on aggregate emissions. For more information, see Section 6.2.6.

Figure 6.5 | **Example of a Base Year Emissions Target**

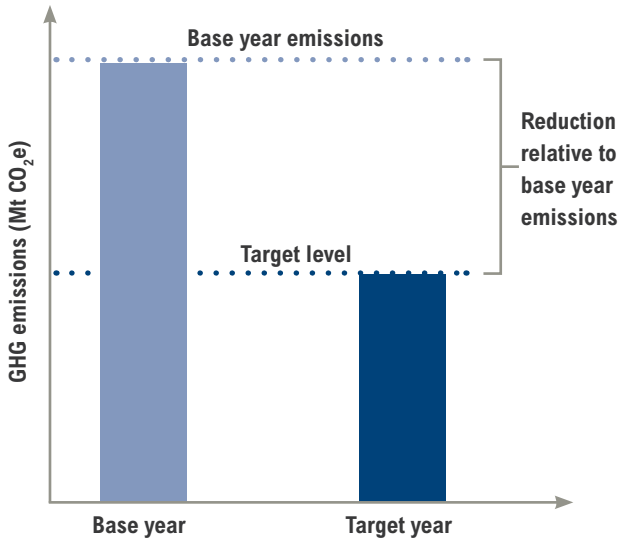


Figure 6.6 | **Example of a Fixed-Level Target**

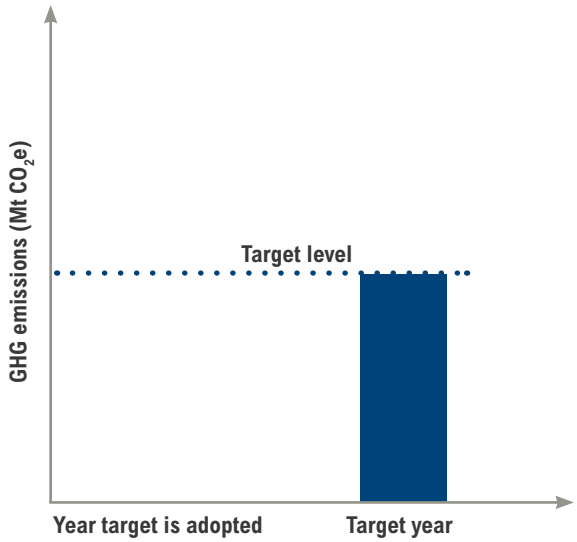


Figure 6.7 | **Example of a Base Year Intensity Target**

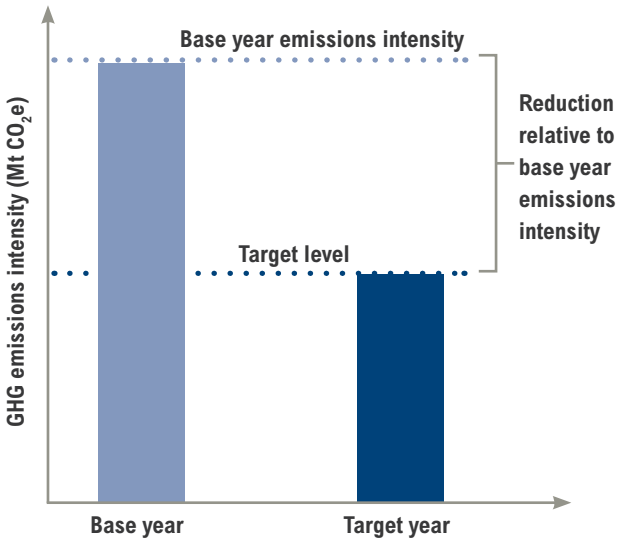


Figure 6.8 | **Example of a Baseline Scenario Target**

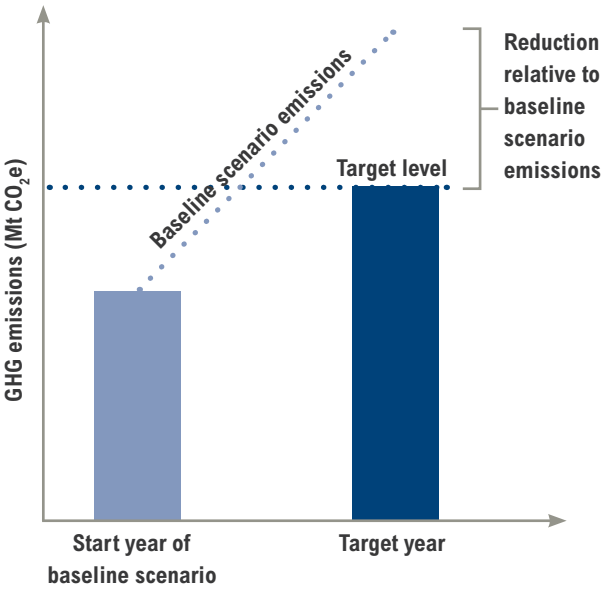
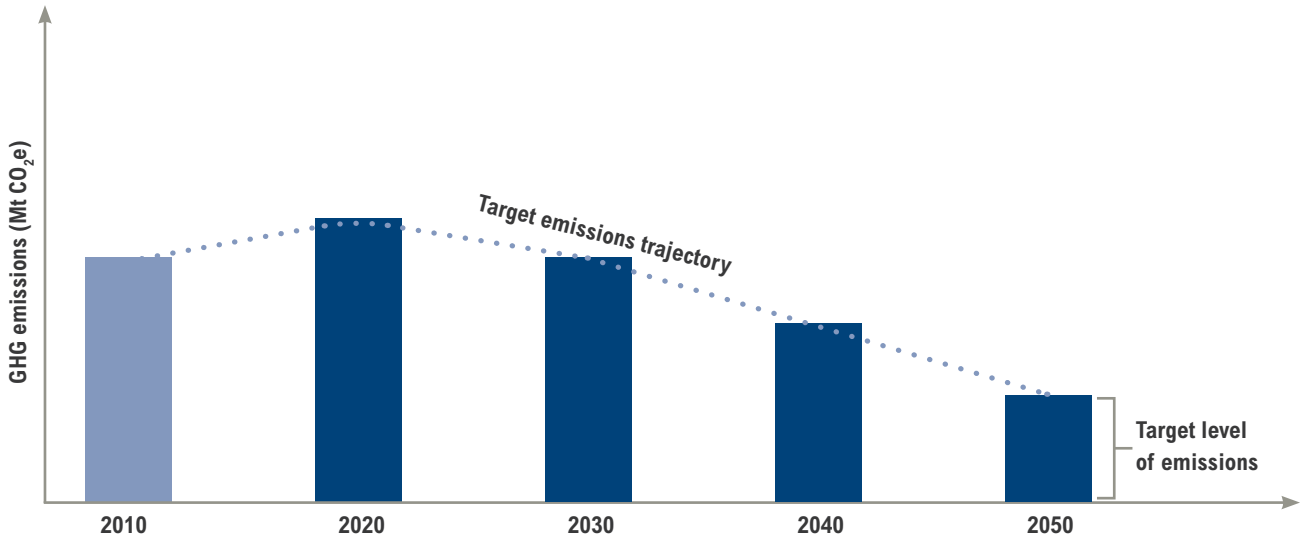


Figure 6.9 | **Example of a Trajectory Target**



6.2.3.1 Guidance for choosing a way of expressing the target

How a target is expressed is independent of the target's level of effort or ambition, or the extent of GHG reductions associated with the target. A single target could be expressed in any of the five ways explained in Table 6.4. Any of the types of targets could lead to emissions increases or decreases over the target period. The choice may be based on a variety of factors such as practicality, simplicity, transparency, and flexibility.

Base year emissions targets and fixed-level targets are simpler to account for and track progress. They are more certain and more transparent than base year intensity targets and baseline scenario targets, because expected emissions in the target year(s) can easily be calculated at the beginning of the target period. This provides clarity for domestic planning and increases transparency. Tracking progress towards base year emissions targets and fixed-level targets can be done using the GHG inventory alone, without the need for additional models, socioeconomic data, or assumptions, which makes these target types the most practical and least resource-intensive to track progress toward.

Parties seeking to accommodate short-term emissions increases should consider adopting base year emissions targets or fixed-level targets that are framed as a controlled increase in emissions from a base year (for example, limiting emissions in 2025 to 5 percent above 2010 emissions). Parties that adopt controlled-increase targets could still communicate that the target represents a reduction in emissions intensity or a reduction relative to business-as-usual emissions.

Base year intensity targets introduce uncertainty because expected emissions in the target year are unknown, which hinders both transparency and domestic planning. To estimate future emissions levels associated with intensity targets, projections are needed regarding the level of output (such as GDP) in the target year, which are very uncertain. From a transparency perspective, it may be difficult to determine whether a reduction in emissions intensity translates to an increase or decrease in absolute GHG emissions, and by how much, given that the level of output is not fixed.

Baseline scenario targets are the most difficult to implement and assess. They introduce many practical challenges and are the most resource-intensive to implement. Developing baseline scenarios requires a large amount of data, advanced modeling techniques, specialized technical capacity, and assumptions about the

likely development of various emissions drivers. In addition, projections of the future are inherently uncertain and can vary widely based on underlying methods, models, and assumptions. If the baseline scenario is dynamic and changing over the target period, the expected emissions level in the target year is difficult to determine, which can hinder domestic planning and decision-making. It may be difficult to determine whether a reduction relative to a baseline scenario translates to an increase or decrease in absolute emissions. It may also be difficult to determine whether baseline scenario emissions are overestimated, which would compromise the environmental integrity of the target. This also compromises transparency for stakeholders and the international community, including the UNFCCC Secretariat when it attempts to aggregate the effect of INDCs. These targets should specify the projected emissions in the target year against which the deviation is being measured.

Given the challenges with baseline scenario targets, Parties considering baseline scenario targets should consider reframing them as another type of target, such as a base year emissions target that allows for a controlled increase in emissions relative to a historical base year. Parties wishing to adopt a target that is independent of changes in output (such as GDP or population) should consider adopting a base year intensity target rather than a baseline scenario target, given the practical challenges involved in accounting for baseline scenario targets.

Parties that need to accommodate short-term increases in emissions could adopt a trajectory target such as a "peak-and-decline" target, which specifies a target year in which emissions peak and a subsequent target year in which emission decline. To facilitate planning and transparency, Parties with a trajectory target should specify the target years and associated emissions levels for each milestone, such as the intended emissions levels in the peak year and long-term target year. A "peak-plateau-and-decline" target can also be designed in which peak year emissions are held for several years before declining.

See Box 6.5 for a case study on how Chile chose to express its target.

BOX 6.5 CASE STUDY: CHILE CHOOSES A WAY OF EXPRESSING ITS TARGET

When designing its INDC, Chile considered three ways of expressing its economy-wide GHG target: (1) a carbon intensity target, (2) a deviation below the business-as-usual scenario specified ex ante (or static baseline scenario target), and (3) a trajectory target.

Chile currently has a static baseline scenario target for 2020. The government decided to discard this option for its INDC for the post-2020 period because of the methodological difficulty of developing and agreeing to a fixed BAU scenario against which to measure progress, given the unpredictable nature of forecasting a future baseline scenario. The government also considered a trajectory target, noting that this option has greater environmental integrity, but discarded the option because it was seen as less flexible. It would have committed the country to a specific emissions path over time, including when emissions should peak by a given year, which was not possible to identify before 2030.

The government ultimately chose a carbon intensity target; it is flexible and adaptable to changes in economic performance because it is an indicator of emissions intensity rather than absolute emissions. Carbon intensity also focuses on the effort to decouple economic growth from GHG emissions. The government's analysis suggested that the ambition of a target to reduce emissions is not related to the form of commitment but to the scale of the mitigation effort. Monitoring, reporting, and verification of the carbon intensity target was also seen as practical since because it depends on statistics that are already calculated regularly in the country: national GHG emissions provided every two years through the biennial update report and annual GDP statistics.

Source:
Ministry of Environment of Chile 2014.

6.2.3.2 Additional guidance on baseline scenario targets

For Parties that adopt baseline scenario targets, baseline scenarios may either be static or dynamic:

- A *static baseline scenario* is fixed at the start of the target period and not recalculated over time, so that the target level of emissions in the target year remains fixed.
- A *dynamic baseline scenario* is recalculated regularly during the target period based on changes in emissions drivers such as GDP or energy prices, so that the target level of emissions in the target year changes over time.

To have greater certainty and transparency regarding intended future emissions levels, Parties should consider choosing static baseline scenario targets, since they represent a fixed point against which to calculate expected emissions in the target year(s) and assess progress. In comparison, dynamic baseline scenario targets represent a "moving target" where emissions in the target year are unknown ahead of time, which poses significant transparency and clarity challenges. The lack of a fixed target level makes developing interim milestones difficult, which can hinder planning and decision-making. Static baseline scenario targets also introduce fewer practical challenges related to tracking progress than dynamic baseline scenario targets, which are more resource-intensive because of the need to recalculate baseline emissions periodically. See Table 6.6 for an outline of advantages and disadvantages of static and dynamic baseline scenario targets.

Parties adopting either static or dynamic targets should provide the projected value of baseline emissions in the target year (against which the contribution is being measured), as well as assumptions and methodologies, as part of the information provided with the INDC in order to provide transparency on future intended emissions.

Regardless of whether the baseline scenario target is dynamic or static, baseline scenarios are based on assumptions about future changes in emissions drivers. Emissions drivers are socioeconomic and technological parameters that cause emissions to increase or decline. It will be critical to identify and transparently communicate key emissions drivers—emissions drivers that significantly affect baseline scenario emissions—for each sector and gas included in the target, based on the input requirements of the chosen model. Once emissions drivers

Table 6.6 | **Advantages and Disadvantages of Static and Dynamic Baseline Scenario Targets**

	ADVANTAGES	DISADVANTAGES
Static baseline scenario target	■ The emissions level to be achieved by the target year is fixed, which offers decision makers more certainty on the target and offers stakeholders more transparency about the target level of emissions to be achieved ■ Easier to implement, since recalculation is not necessary	■ Compared to dynamic baseline scenario targets, cannot easily isolate the level of effort associated with meeting the target.[a] For example, it combines changes in emissions due to mitigation efforts with those resulting from changes in emissions drivers such as GDP or energy prices (assuming these drivers are not directly affected by mitigation policies).
Dynamic baseline scenario target	■ Can more easily isolate the level of effort associated with meeting a target, since it is recalculated to account for changes in exogenous drivers ■ Can accommodate unforeseen changes in exogenous factors through recalculation	■ The intended emissions level in the target year is more uncertain, as it is subject to change, which creates more uncertainty for decision makers and less transparency for stakeholders and other Parties ■ The UNFCCC Secretariat would have difficulty assessing the effect of such contributions ■ More challenging and resource-intensive to implement, given the need to recalculate emissions for changes in drivers

Note:
[a] This is also true of the other target types.

have been identified, the next step is to define assumptions about how each driver is most likely to change during the baseline scenario timeframe. Likewise, it will be important to communicate transparently assumptions concerning key emissions drivers included in the baseline scenario.

Parties with dynamic baseline scenario targets should develop and report a baseline scenario recalculation policy at the start of the target period and apply it consistently. The policy should specify which exogenous drivers—emissions drivers that are unaffected by mitigation policies or actions implemented to meet the target—will trigger a recalculation.

The existing policies and actions that are selected for inclusion in the baseline scenario can have a significant effect on the estimate of baseline scenario emissions. For both static and dynamic baseline scenario targets, the baseline scenario should be developed by including the effects of all currently implemented and adopted policies and actions that have a significant effect on GHG emissions, whether by increasing or decreasing them. Parties should identify the cut-off year after which no new policies or actions are included in the baseline scenario (WRI 2014a).

6.2.4 Choose timeframe

The choice of the timeframe involves several elements, including:

- The base year for the contribution (for Parties with base year emissions targets and base year intensity targets)
- Whether to adopt a single-year or multi-year target
- The end date of the contribution—that is, the target year or period
- Whether to set a long-term target in addition to a short-term target

6.2.4.1 The base year for the contribution

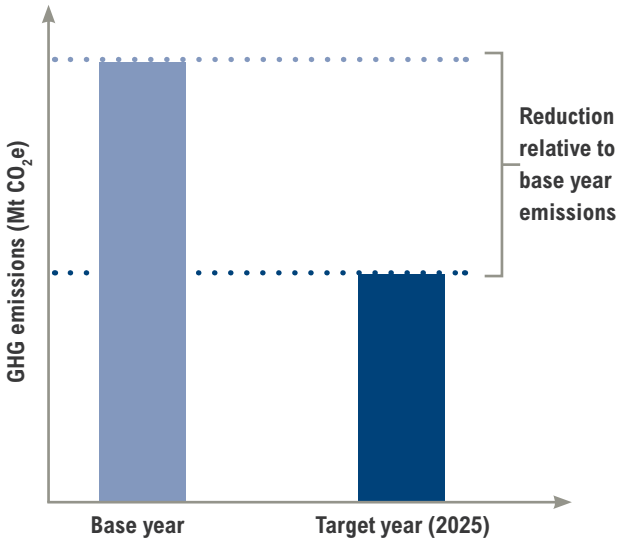
A base year is a year of historical emissions (or emissions intensity) data with which current emissions (or emissions intensity) can be compared. Base years are needed for base year emissions targets and base year intensity targets. Base years are not needed for fixed-level targets and baseline scenario targets. Examples of base years are 1990 and 2005.

A base period should be chosen if emissions fluctuate significantly from year to year in order to smooth out fluctuations and track progress against a more representative emissions level. Parties should avoid picking a year or years with uncharacteristically high or low emissions. A base year or base period for which representative, reliable, and verifiable emissions data are available enables comprehensive and consistent tracking of emissions over time.

6.2.4.2 Whether to adopt a single-year or multi-year target

Single-year targets aim to reduce emissions by a single target year, while multi-year targets aim to reduce emissions over a defined target period in consecutive years. For example, a single-year target might aim to reduce emissions by 2025, whereas a multi-year target would aim to reduce emissions over the five-year period from 2021-25. See Figures 6.10 and 6.11.

Figure 6.10 | **Example of a Single-Year Target**



Multi-year targets provide more clarity about the expected future emissions pathway, rather than emissions in only a single year. Several recent studies have shown that climate change is closely related to the total cumulative amount of CO_2 emissions released over a time period, rather than the timing of those emissions (Allen et al. 2009; Matthews et al. 2009; Meinshausen et al. 2009; and Zickfeld et al. 2009).[25] Unless milestones are established with a single-year target, multi-year targets have a better chance of limiting cumulative emissions over the target period, as emissions may fluctuate more with single year targets over the target period. See Figure 6.12.

By limiting emissions across multiple years, multi-year targets can also better facilitate long-term domestic mitigation efforts, as opposed to single-year targets, which carry a risk that emissions could be reduced only in the target year through the purchase of transferable emissions units without making necessary transformations domestically.[26]

If a multi-year target is selected, it may be defined as an average, annual, or cumulative multi-year target. An average multi-year target is a commitment to reduce, or control the increase of, annual emissions (or emissions intensity) by an

Figure 6.11 | **Example of a Multi-Year Target**

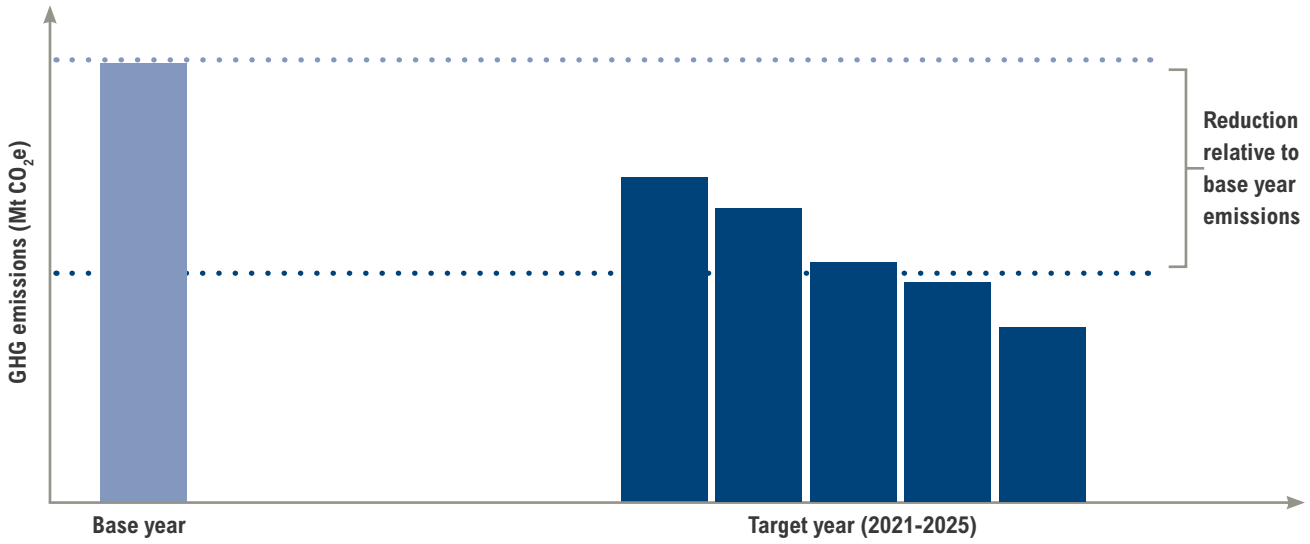
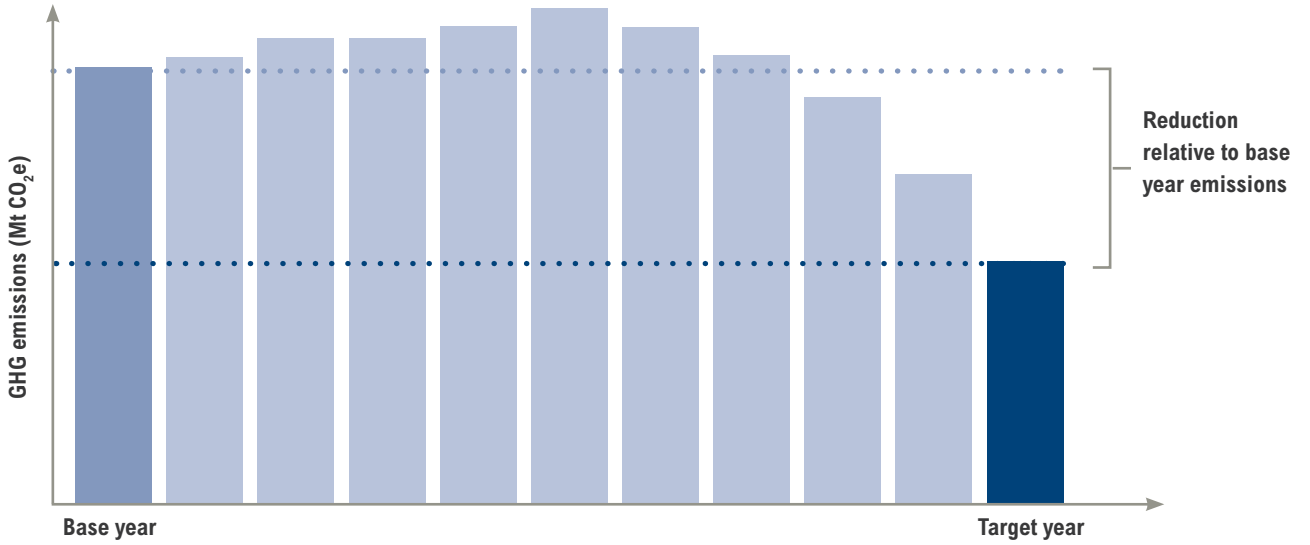


Figure 6.12 | **Risk of Cumulative Emissions Growth Over the Target Period with Single-year Target**



average amount over a target period. An annual multi-year target is a commitment to reduce, or control the increase of, annual emissions (or emissions intensity) by a specific amount each year over a target period. A cumulative multi-year target is a commitment to reduce, or control the increase of, cumulative emissions over a target period to a fixed absolute quantity.

Box 6.6 provides an example of a cumulative multi-year target in the United Kingdom.

6.2.4.3 Choosing the end date of the contribution (target year or period)

Target years or periods are needed for all types of targets. A target year (or period) represents the year (or consecutive years over a period) by which a

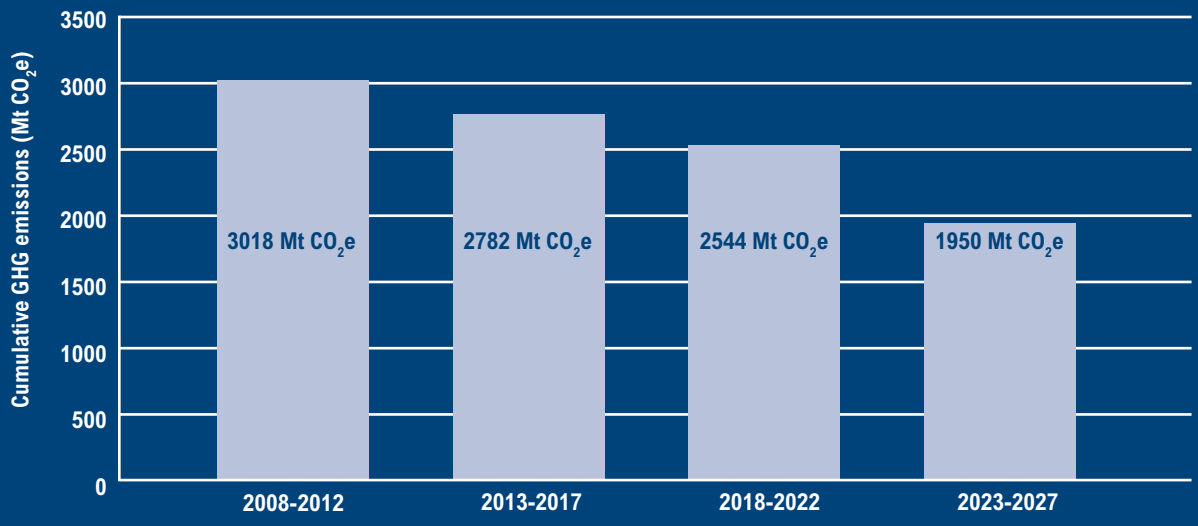
BOX 6.6 THE UNITED KINGDOM'S FIXED-LEVEL, CUMULATIVE MULTI-YEAR TARGETS

The United Kingdom has adopted a series of fixed-level, cumulative multi-year targets. These targets, referred to as carbon budgets, are required under the UK Climate Change Act 2008 and have been developed in an effort to meet a long-term target of reducing emissions by at least 80 percent below 1990 levels by 2050. This long-term target was chosen based on the most recent climate science and was determined to constitute a fair contribution toward the global emissions reductions necessary to limit warming to 2°C above pre-industrial levels (CCC 2008).

The first multi-year target has a target period of 2008-12, with expected emissions during the target period of 3,018 Mt CO_2e (equivalent to average annual emissions of 603.6 Mt CO_2e). The second has a target period of 2013–17, with expected emissions during the target period of 2,782 Mt CO_2e (equivalent to average annual emissions of 556.4 Mt CO_2e). The third has a target period of 2018-22, with expected emissions during the target period of 2,544 Mt CO_2e (equivalent to average annual emissions of 508.8 Mt CO_2e). Last, the fourth target period runs from 2023-27, with expected emissions during the target period of 1,950 Mt CO_2e (equivalent to average annual emissions of 390 Mt CO_2e). Figure 6.13 shows the cumulative emissions targets for each target period.

The UK has designed the series of targets so that it can gradually reduce emissions to meet its long-term target in 2050. The use of multi-year targets was preferred over single-year targets since they are designed to limit cumulative emissions over time and allow some year-to-year flexibility.

Figure 6.13 | **Cumulative Emissions Targets for Each Target Period**



Party commits to achieving the target. Examples of target years are 2025, 2030, and 2050. Examples of target periods are 2021-2025 and 2026-2030.

A decision has not yet been made under the UNFCCC on whether commitment periods will be established and, if they are, what length they will be. For the time being, Parties can decide on their own timeframes but, in the longer term, timeframes might be agreed under the UNFCCC.

Parties should consider which timeframe is best aligned with domestic policy and planning processes, which is most likely to lead to effective implementation consistent with reaching long-term GHG reduction targets, which provides the right signals to implementers, which will lead to the greatest policy stability, and which provides time for planning the next set of contributions, among other considerations.

6.2.4.4 Whether to set a long-term target in addition to a short-term target

In addition to setting a short-term target, Parties may choose also to set long-term targets. Short-term targets tend to be more concrete and are achieved in the near term (for example, by 2025). Long-term targets tend to be more aspirational or visionary and may take the form of reducing emissions by, for example, 85 percent by 2050 relative to 1990 levels, or phasing out net greenhouse gas emissions over the long term. Long-term targets can facilitate long-term mitigation planning and investment. For example, a longer term target may provide signals for capital investments spanning many decades and provide greater certainty for businesses and other stakeholders about the longer-term policy and investment context if supporting policies are put in place. Long-term targets provide long-term direction, while short-term targets enable countries to achieve the vision by way of regular milestones.

There can be benefits to adopting a combination of short-term targets (e.g., 2025) and long-term targets (e.g., 2050). An example of setting multiple targets over time might be a 20 percent reduction from 1990 base year emissions by 2020, followed by a 30 percent reduction from 1990 base year emissions by 2025, followed by a 40 percent reduction from 1990 base year emissions by 2030. Coupled short-term and long-term targets provide more clarity for long-term planning and better ensure a decreasing emissions pathway over time until the long-term target is achieved. Coupled targets can also reveal realistic and cost-effective emissions-reduction pathways by defining regular and plausible milestones on a path toward a long-term target. See Box 6.6 for an example of coupled targets adopted by the United Kingdom.

6.2.5 Choose the target level

Defining the target level is the final step in the target design process. The target level represents a quantity of emissions reductions or other outcome to which the Party is committed. The target level will be defined according to the type of target selected (see Table 6.7).

Table 6.7 | **Definition of Target Level, by Target Type (for GHG Reduction Targets)**

TYPE OF TARGET	WHAT THE TARGET LEVEL REPRESENTS
Base year emissions target	The percentage reduction or controlled increase in emissions to be achieved relative to base year emissions
Fixed-level target	The absolute quantity of emissions and removals to be achieved in the target year or period
Base year intensity target	The percentage reduction or controlled increase in emissions intensity to be achieved relative to base year emissions intensity
Baseline scenario target	The percentage reduction or controlled increase in emissions to be achieved relative to baseline scenario emissions
Trajectory target	The absolute quantities of emissions and removals to be achieved in multiple target years or periods (such as targets for 2020, 2030, and 2040 over the period 2020-2050)

For renewable energy targets the target level may represent the percentage or quantity of renewable energy generation in the target year. For energy intensity targets the target level may represent the percentage reduction in energy intensity of the economy to be achieved relative to base year energy intensity.

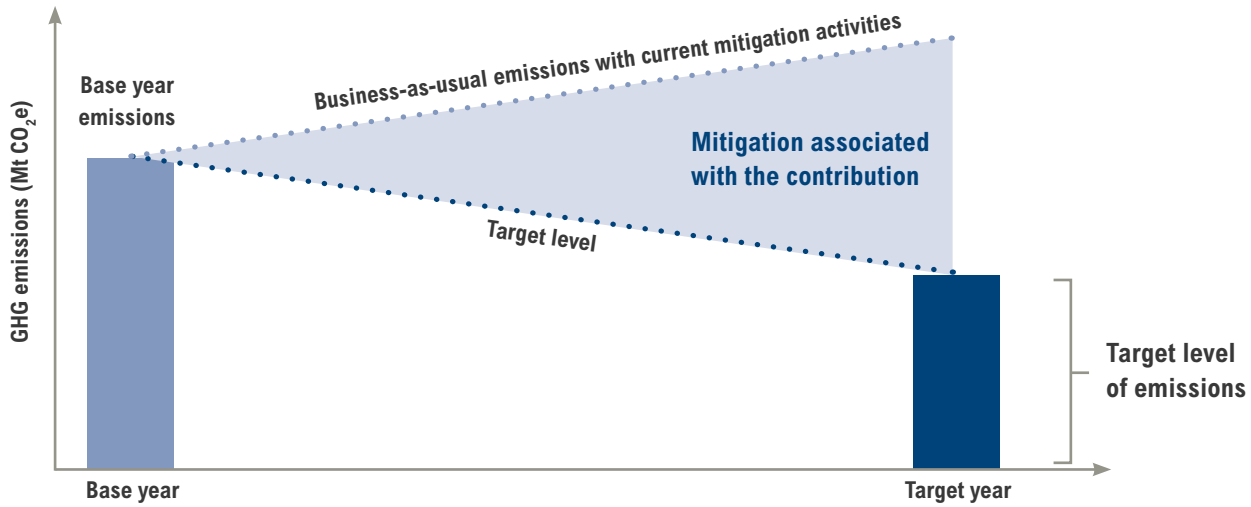
Figure 6.14 illustrates setting the GHG target level.

Parties should seek to develop a contribution that is realistic and achievable, while also being fair, ambitious, and contributing to achieving the objective of the Convention and the global 2°C goal. See Box 3.3 for more information on considering these principles when defining the target level. Parties will need to balance tradeoffs between these factors, based on national circumstances, when defining the target level.

To ensure that the target level is realistic and achievable, it should take account of the feasibility of emission reductions, based on an assessment of mitigation potential in key sectors (such as renewable energy potential), costs, co-benefits of mitigation (outlined in Annex E), political feasibility, and national circumstances and objectives. The following four steps can help Parties identify a realistic and achievable target level:

- Step 1: Identify currently implemented, adopted, and planned mitigation actions and commitments (such as current laws, plans, policies, NAMAs, LEDS, CDM or voluntary market offset projects, energy efficiency targets, and renewable energy targets), by sector.
- Step 2: Identify and prioritize additional mitigation technologies, policies, and actions that are technically and economically feasible and could be implemented, by sector. During this step, developing country Parties can determine which mitigation options are technically and economically feasible with domestic resources. In addition, developing country Parties can determine which additional mitigation options would be technically and economically feasible with additional financing (see Section 6.3).
- Step 3: Assess the aggregate mitigation potential from mitigation actions and options identified in steps (1) and (2) to determine a feasible level of GHG reductions to be achieved by the target year or period. Figure 6.3 provides an illustration.
- Step 4: Set the GHG target level at a level determined to be ambitious but realistic and achievable.[27]

Figure 6.14 | **Setting the GHG Target Level**



When choosing the target level, Parties should consider both national circumstances (such as the mitigation technologies, policies, or actions that realistically can be implemented, and the collective GHG reductions associated with those options) and global considerations (such as the level of GHG reductions that would represent an ambitious and fair contribution to the global 2°C goal). Considering both national feasibility as well as global GHG reduction needs is helpful for developing an INDC that is both realistic and contributes to the objective of the Convention.

An example of an INDC that gives weight to global GHG reduction needs would set a long-term target such as zero net emissions in the second half of the century or an 80 percent reduction in emissions by 2050 below 1990 levels, and short-term targets for 2025 or 2030 along that emissions pathway. Such milestones could include a short-term target that specifies a peak year and a peak level of emissions in that year. For an example of short-term targets along a longer-term emissions pathway, see the United Kingdom's GHG targets (Box 6.6).

After defining a target level to be achieved by a Party using its own resources, developing country Parties may choose to define a separate target level to be undertaken with additional financing (discussed in Chapter 8).

6.2.5.1 Decide on participation in international transfer of emissions units

When setting the target level, Parties should also decide whether or not to engage in international transfers of emissions units from international market mechanisms, because this can impact achievement of a Party's target. Transferable emissions units include offset credits generated from GHG reduction projects and emissions allowances from emissions trading programs.

Parties should consider whether they plan to purchase units as a means of meeting emissions reduction targets. Parties should also decide whether all of their domestic emissions reductions will support compliance with their own INDC targets, or whether some of the emissions reductions will instead be sold as offsets to support compliance elsewhere (and not be counted towards their own targets). A Party that sells units will need to deduct any units that have been sold from its own target, because these units might be used towards other Parties' targets.

Transfers of units can occur not only between Parties, but also can involve the private sector. A significant number of transfers can involve private sector entities engaging in voluntary transfers, with Parties responsible for the final accounting of units towards their targets.

The future accounting rules for transferable emissions units remain to be determined. In the meantime, it is critical that Parties are transparent about their assumptions. If transferable emissions units are to be purchased, Parties should consider the expected quantity of units to be applied toward the target, including any limits on their use, and the types and quality of units to be used, including how they ensure environmental integrity. Parties should also determine the approaches they assume they will take to track transfers of units and prevent double counting of units sold to and or purchased from other Parties.

Any future rules under the 2015 agreement may dictate which units can be applied toward targets for compliance purposes and how double counting of units is to be avoided. However, in the absence of such rules, the following sections provide some guidance on the quantity, quality, vintages of units, and means for avoiding double counting, which can help guide Parties' assumptions about the use of units.

Assumed quantity of units for purchase and sale

For sellers, the sale of units can bring additional public and private finance and catalyze emissions reductions. However, in order to avoid double counting, a selling Party will have to engage in additional mitigation to meet its target because sold units will no longer count towards the seller's target. The emissions reductions from any sold offsets will automatically be reflected in a seller's emissions inventory and any sold credits will need to be added back to the seller's emissions inventory.

For purchasers, using transferable emissions units to achieve a mitigation target has both advantages and disadvantages. Using units enables access to a wider pool of emissions reduction opportunities that might lead to an increased target level, more cost-effective mitigation efforts, involve the private sector in mitigation, provide flexibility, increase

technology transfer, provide benefits for sustainable development, and build technical capacity in jurisdictions where emissions reductions for offset credits are generated. On the other hand, relying on transferable emissions units, especially from outside the jurisdiction, to achieve mitigation targets might remove the incentive for domestic action. This might limit the co-benefits of GHG mitigation that would otherwise accrue. To meet long-term targets, it may be more cost-effective to take early domestic mitigation action, rather than rely on purchased units in later years, because prices can be volatile and lead to higher costs overall. In addition, if the units used toward the target are of low quality, and do not represent additional emission reductions, their use would compromise the environmental integrity of the target and could lead to net global emissions increases.

Assumed types and quality of units

A range of units currently exists,[28] and it is possible that new mechanisms could be introduced that would generate new types of units in the future. Accounting rules may be developed in the future to safeguard environmental integrity and ensure that transferable emissions units applied toward the target are equivalent to emissions reductions that would have been undertaken within the target boundary. To demonstrate this equivalency, offset credits applied toward the target should be real, additional, permanent, transparent, verified, owned unambiguously, and address leakage. Allowances applied toward the target should come from emissions trading systems with rigorous monitoring and verification protocols, transparent tracking and reporting of units, and stringent caps.

Parties should also consider the vintage, or year, of units that they assume will be used to meet the target. The vintage of a unit refers to the year in which the unit is generated. For example, a unit that is generated in 2014 has a 2014 vintage. A robust approach would involve applying only target-year or target-period vintages toward the target to maximize mitigation and maintain consistent accounting.

Assumed approach for accounting and preventing double counting of units

Double counting of transferable emissions units occurs when the same transferable emissions unit is counted toward the mitigation target of more than one Party. Double counting of units undermines the environmental integrity of mitigation targets because it allows the same mitigation activity to be counted in full towards compliance in more than one jurisdiction. As a result, emissions accounts would no longer align with the actual global emissions released.

Reliance on national inventories alone will not be able to account adequately for the use of units toward a target. Emissions reductions from any sold offsets will automatically appear as reductions in a seller's emissions inventory, but to avoid double counting, these reductions cannot count towards the achievement of the target. Thus, the most robust way to avoid double counting is to maintain a separate account for tracking holdings and transactions of units. The following mechanisms for tracking of units between buyers and sellers can be implemented to prevent double counting:

- A registry that lists the individual serial numbers of the units; the quantity; status (canceled, retired, or banked); ownership; location and origin of transferable emissions units held by a jurisdiction; and whether the selling Party has formally agreed not to take credit for the reductions
- Agreements between buyers and sellers (if not built into the registries), that specify which party has the exclusive right to claim each unit and specifies what percentage, if any, is shared
- Legal mandates that disallow double counting and employ penalty and enforcement systems
- Information sharing among trading programs to identify units that are already registered in other programs

An international transaction log can also record the details of each transaction between registry accounts, including the issuance and retirement of transferable emissions units. Additionally, accounting rules may be established in the future to ensure that double counting does not occur. It should be noted that Parties selling emissions reductions will have to engage in additional mitigation to meet their own targets, to ensure that the reductions are not double counted.

6.2.6 Quantify the expected GHG impact of outcomes

Quantifying the GHG impact of the target, so that future emissions and emission reductions associated with the target can be determined, offers several benefits. Identifying the target level of emissions and the quantity of reductions to be achieved in a given period can help Parties determine whether the proposed target is realistic and achievable. The quantity of reductions can be converted to an annual rate of decarbonization, which can be compared to past rates of decarbonization to understand both the ambition and feasibility of the proposed target. Quantifying emissions and reductions can also help Parties and stakeholders understand the fairness and ambition of the INDC by translating diverse INDCs into a common metric (namely, tons of CO_2e), which enables comparisons between Parties' INDCs.

Two quantities can be calculated:

- Expected emissions in the target year or period if the target is achieved
- Emission reductions associated with achieving the target

The following sections explain how to calculate each quantity, based on the GHG Protocol *Mitigation Goal Standard* (WRI 2014a).

6.2.6.1 Calculating expected emissions in the target year or period if the target is achieved

Calculating expected emissions in the target year(s) is necessary to understand to what extent an INDC contributes to achieving the objective of the Convention. It is also necessary to enable a global assessment of the collective impact of all Parties' INDCs. If all Parties calculate their expected national emissions in the target year (for example, 2025) then—assuming their contribution is achieved—total global emissions in that year can be aggregated across countries.[29] The aggregated emissions can then be compared to the global emissions reductions that will be required in that year that is consistent with an emissions pathway that has a likely chance of limiting warming below 2°C, as determined by the IPCC.

Figures 6.15 and 6.16 illustrate the calculation of emissions in the target year for a base year emissions target and a static baseline scenario target, respectively.

Figure 6.15 | **Calculating Expected Emissions in the Target Year for a Single-year Base Year Emissions Target**

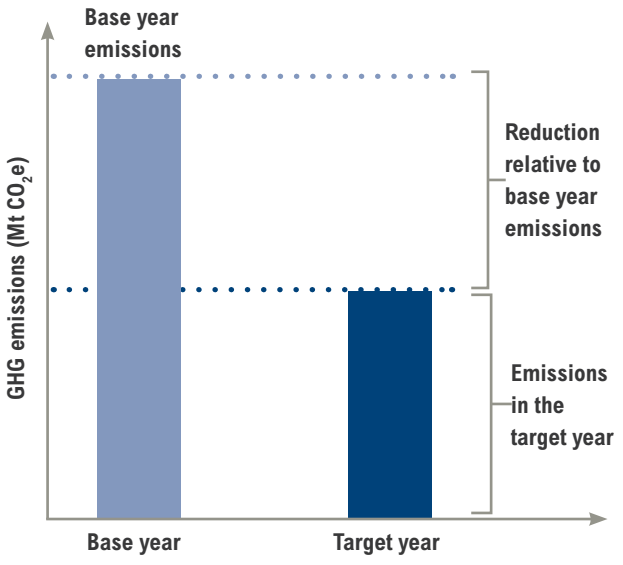
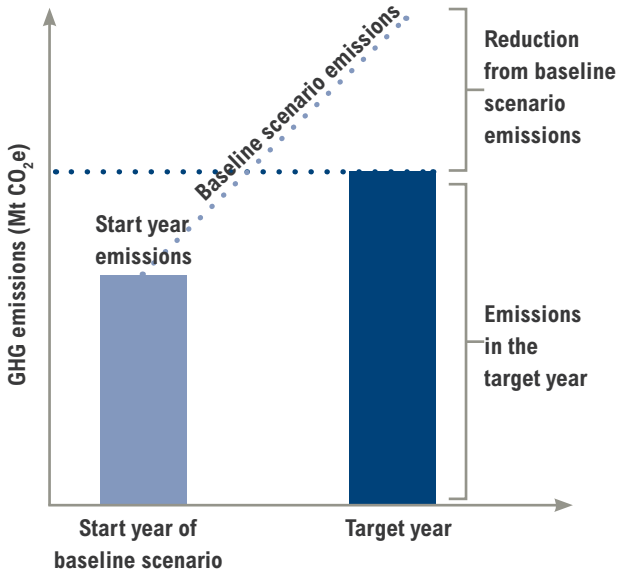


Figure 6.16 | **Calculating Expected Emissions in the Target Year for a Single-year Baseline Scenario Target**



Expected emissions in the target year(s) are straightforward to calculate for base year emissions targets, fixed-level targets, and static baseline scenario targets. It can also be done with a trajectory target insofar as the emissions levels for various milestones—including the peak emissions level for any trajectory targets that include an emissions peak—are specified. Expected emissions in the target year cannot be calculated for dynamic baseline scenario targets, because emissions in the target year(s) are likely to change due to unexpected changes in emissions drivers over the target period. Emissions in the target year(s) are also not possible to calculate with any certainty for intensity targets, because future levels of output (such as GDP) are not known.[30] Non-GHG targets (such as energy efficiency or renewable energy) also require additional steps to translate into expected emissions in the target year(s).

For single-year targets, Equation 6.1 can be used to calculate expected emissions in the target year for the relevant type of target. For trajectory targets and multi-year targets, Equation 6.1 can be used to calculate expected emissions for each year of the target period.

6.2.6.2 Calculating emissions reductions associated with achieving the target

In addition to calculating expected emissions in the target year(s), Parties may also want to calculate the emissions reductions associated with achieving the target. See Figure 6.14 for an illustration of GHG reductions associated with achieving a target.

Equation 6.2 provides an equation for calculating emissions reductions associated with achieving the target, relative to projected baseline scenario emissions in the target year(s). Parties with multi-year targets can use Equation 6.2 to calculate emission reductions associated with achieving the target for each year of the target period.

Emissions reductions associated with achieving the target can also be calculated relative to a historical base year. In this case, emissions reductions are the difference between emissions in the base year (or first year of the target period) and expected emissions in the target year or period.

6.2.6.3 Assumed accounting approaches

Part of quantifying the GHG impact of the INDC involves identifying the assumed accounting approaches that will be used to track progress toward the INDC, given the absence of agreed accounting rules under the UNFCCC. Accounting options may change in the future through decisions under the UNFCCC. In the meantime, understanding Parties' assumed accounting approaches is necessary to quantify the impacts of INDCs and determine whether they collectively align with the global 2°C goal. For a list of accounting assumptions that should be communicated along with the INDC, see Chapter 5.

Equation 6.1 | Calculating Expected Emissions in the Target Year

TYPE OF TARGET	CALCULATION METHOD
Base year emissions target	**Expected emissions in the target year (Mt CO_2e) =** Base year emissions (Mt CO_2e) – [Base year emissions (Mt CO_2e) x Percent reduction]
Fixed-level target	**Expected emissions in the target year (Mt CO_2e) =** Absolute quantity of emissions specified by the target level (Mt CO_2e)
Base year intensity target[a]	**Estimated expected emissions in the target year (Mt CO_2e) =** [Base year emissions intensity (Mt CO_2e/level of output) – Base year emissions intensity (Mt CO_2e/level of output) x Percent reduction] x Projected level of output in the target year
Baseline scenario target[b]	**Expected emissions in the target year (Mt CO_2e) =** Projected baseline scenario emissions in the target year (Mt CO_2e) – [Projected baseline scenario emissions in the target year (Mt CO_2e) x Percent reduction]
Trajectory target	**Expected emissions in the target year (Mt CO_2e) =** Absolute quantity of emissions specified by the target level (Mt CO_2e) (insofar as emissions levels for various milestones along the emissions trajectory have been defined; for trajectory targets that include an emissions peak, the level of emissions at the peak would need to be specified)

Notes:

[a] Calculating expected emissions for base year intensity targets requires forecasting the level of output in the target year(s). Projections of output metrics should be gathered from official data sources in order to enhance transparency and consistency of reporting. For example, GDP projections should be based on data from national government bodies or international sources such as the International Monetary Fund (IMF), World Bank, or OECD. Unlike other types of targets, expected emissions in the target year(s) for base year intensity targets represents an estimate only, since it requires forecasts of the level of output in the target year(s), which are likely to change over time and are unlikely to accurately represent the actual value in the target year(s).

[b] For dynamic baseline scenario targets, emissions will be subject to change due to baseline scenario recalculations.

Equation 6.12 | Calculating Emissions Reductions Associated with Achieving the Target

Annual emissions reductions in the target year (t CO_2e) =
Projected baseline scenario emissions in the target year (t CO_2e) – Expected emissions in the target year (t CO_2e)


TOYOTA
ฌก 1818
กรุงเทพมหานคร

CHAPTER 7

WHAT OPTIONS EXIST FOR THE DESIGN OF AN INDC FOR ADAPTATION?

In the course of 2014, many Parties expressed interest in preparing INDCs that include a component on adaptation. In response to this need, the Lima Call for Climate Action invited "all Parties to consider communicating their undertakings in adaptation planning or consider including an adaptation component in their intended nationally determined contributions" (1/CP.20, para 12). Many Parties are now considering which elements of their adaptation efforts might constitute an adaptation component of an INDC, and have requested guidance in how to develop such a component.

The Lima decision makes it clear that the inclusion of an adaptation component in INDCs is optional. Moreover, the Lima decision explicitly gives a great deal of flexibility to Parties that wish to communicate about adaptation. In addition to inviting them to consider including an adaptation component in their INDC, it invites them to consider communicating their "undertakings" in adaptation planning without regard to vehicle or format.

The function of INDCs within the UNFCCC and elsewhere on the international stage remains to be clarified, especially when it comes to adaptation. To date, negotiators have not determined exactly how the international community will use adaptation components of INDCs once communicated, whether they will undergo a particular form of review, how they might inform the Adaptation Committee or decisions by the UNFCCC more broadly, or whether they will carry particular weight with the Green Climate Fund or other funding bodies. It is unlikely to be clear until COP21 or later whether the Parties will create a cycle for future INDCs (or a similar process), and whether such cycles will include an adaptation component. In this context, Parties must interpret the function of their INDC's adaptation component as they see fit.

This chapter is relevant to Parties that are considering whether or how to include an adaptation component in their INDCs. The chapter presents a set of practical options for Parties to consider regarding the rationale, approach, and information to include in an adaptation component of their INDCs. This options approach aims to assist Parties in crafting an adaptation component of the INDC that is appropriate to their national circumstances and priorities. Parties need a high degree of flexibility for developing an adaptation component of INDCs, given that they vary so widely in:

- Climate change vulnerability, risk and impacts profile
- Human and economic development status and priorities
- State of knowledge at the national level regarding climate risks, estimated adaptation costs, and overall adaptation needs
- Status of adaptation planning and implementation
- Resources available for development and communication of an INDC
- Rationale for including adaptation in their INDC

This chapter draws broadly on input from participants at the UNDP-UNFCCC Regional Technical Dialogues on INDCs, together with the adaptation project and planning experience of the authors.[31] Section 7.2 explores the rationale, principles, and key concepts of an adaptation component, and Section 7.3 presents options for information categories that governments could communicate to the UNFCCC. The chapter addresses how INDCs differ from, but can relate to, the content of adaptation planning processes currently underway in many countries. The chapter draws upon country examples from early INDC design experience and from discussions in the UNDP dialogues.

7.1 Rationales for Including an Adaptation Component

Effective adaptation can reduce vulnerabilities and inequalities both within and among countries, and, in doing so, the benefits of adaptation extend beyond the local level. Adaptation action is happening at various levels and is being promoted through many

arrangements. INDCs provide a channel for Parties to communicate internationally about their intentions in the context of this diverse body of adaptation action.

The design and content of an adaptation component will depend largely on why a Party wants to include adaptation in its INDC. (Potential benefits of communicating an INDC overall are discussed in Section 1.1.) Parties have expressed various rationales for preparing and communicating an adaptation component. Taking into account the overall rationale of INDCs (1/CP.19, para. 2 (b) and 1/CP.20 paras 12 to 14) and Party submissions, an adaptation component of an INDC can provide an opportunity to:

- Raise the profile of adaptation planning, action, and needs at the national level;
- Articulate a long-term vision of nationally appropriate climate-resilient development;
- Gain international recognition for existing national actions and investments on adaptation and progress towards achieving the long-term vision;
- Advance adaptation planning by outlining goals, objectives, targets, activities, or a timeline to achieve the vision, which may be based upon a NAP process or equivalent national planning process;
- Use the domestic political momentum associated with the INDC process to outline a process and timeline for developing a long-term vision and associated planning efforts, in cases where a process has not been established;
- Describe support (information, capacity, technology, and financial) needs for completion and implementation of the national adaptation plan and/or activities; and
- Contribute to a platform for sharing lessons learned and for addressing shared challenges.

Progress in developing a National Adaptation Plan (NAP) process, or an equivalent planning process for climate-resilient development,[32] will likely be a major determinant of how countries choose to approach the adaptation component of an INDC and their rationale for that approach.

The availability of resources (human, economic, information, time) will also shape what purpose countries may strive to achieve by including an adaptation component in their INDC. Finally, Parties may also shape their adaptation components based on elements of their UNFCCC negotiating position, or based on their expectations of the Paris outcome.

7.2 Information to Communicate in Adaptation Components of INDCs

Adaptation components of INDCs will differ from mitigation components, both because of technical differences between mitigation and adaptation, and because of differences in the rationale for, and purpose of, treating these topics in INDCs. Mitigation issues such as the reference point, the type and setting of targets, and methods of calculating emissions reductions do not translate easily to adaptation. As a result, few Parties have proposed to structure their INDCs' adaptation component using the informational elements listed for INDCs in the Lima Call for Action. This chapter therefore organizes information for the adaptation component of an INDC under six general categories that might be more familiar to adaptation planners and practitioners.

The set of categories in Table 7.1 could potentially serve as the outline for an INDC's adaptation component. The INDC information categories

Table 7.1 | **Adaptation Information Categories**

ADAPTATION INFORMATION CATEGORIES
A. Summary of climate change trends, impacts, and vulnerabilities
B. Statement of national long-term goals or vision
C. Statement of current and near-term planning and action
D. Statement of gaps, barriers, and needs
E. Summary of support
F. Description of monitoring plans

discussed are designed to be logical and user-friendly, given the current state of knowledge on adaptation planning and action, and current understanding of the function of INDCs and their adaptation components. However, as INDC drafters consider these categories of information, they might find that not all categories are equally relevant to their circumstances. Parties wishing to include an adaptation component are encouraged to use whichever information best fits their rationale for including adaptation in their INDC, as described in Section 7.2. For example, if a Party is most interested in communicating its commitment to domestic adaptation action to the international community, the INDC could emphasize the details of current planning processes or planned future adaptation action. On the other hand, if a Party is most interested in outlining the scope and scale of future climate risks and the resources needed to build adaptive capacity, the INDC could emphasize evidence of climate change trends, impacts, and vulnerabilities, and provide documentation of gaps, barriers, and needs. Meanwhile, donor countries may be interested in demonstrating their commitment to supporting resilience-building internationally, and could use the summary of support to highlight goals or pledges of support.

Given the optional nature of adaptation components in INDCs and the high degree of flexibility needed by Parties in developing adaptation components, this guide recognizes that other information category sets may be useful to Parties in addition to those proposed in Table 7.1. There are additional sets of information categories that Parties may wish to review as they consider what information to include and how to present it. For example, South Africa is considering providing information on the following categories: adaptation planning and policy analysis; (2) programs, projects and investments; (3) adaptation needs and costs; and (4) adaptation implementation (Kekana 2015). Mexico's adaptation component is structured around: (1) introductory information; (2) description of vulnerability; (3) planned adaptation actions for the period 2020-2030; and (4) needs in capacity building, technology transfer, and finance (see Box 7.1). Annex H also describes some information components based on the UNFCCC NAP Technical Guidelines process. The categories in these examples overlap substantially with the sets presented in Table 7.1 but each differs in emphasis and structural approach to the adaptation component. It seems likely that, given the flexibility available to them, Parties will take a variety of creative approaches to communicating their adaptation actions, goals, priorities, plans, and needs in their INDCs.

7.2.1 The relationship between national adaptation planning and INDCs

The decisions a Party makes regarding the information to include in the adaptation component of its INDC often will vary, depending upon the nature and extent of adaptation planning underway in the country. For Parties that have begun a NAP process or equivalent planning process, much of the information for the INDC can be drawn from those efforts. Typically, a NAP or equivalent process will synthesize a broad body of existing analysis and ongoing activity as part of the initial phase of planning. It also will take on board the interests, needs, and priorities of a range of stakeholders both inside and outside of government.

For Parties that do not have a NAP or equivalent process underway, the adaptation component of an INDC represents an opportunity to lay the groundwork for such a process. This could mean outlining a planning process, choosing a planning timeline, synthesizing existing climate vulnerability and risk analysis, reviewing adaptation activities underway in the country, or otherwise taking early steps toward planning.

Parties may choose to include information from their NAPs or equivalent planning processes in their INDCs, or they may use the INDCs as an opportunity to communicate about intended future planning processes. Thus, several approaches to the adaptation component of INDCs are related to national adaptation planning. However, an INDC is a communications process, not a planning process, so there are important differences between an INDC and a NAP process that INDC drafters should take into account (see Box 7.2).

Parties that do not have a NAP process or similar planning process underway still have many options for developing the adaptation component of their INDCs. Choices among these options will vary

BOX 7.1 INCLUSION OF ADAPTATION IN MEXICO'S INDC

The adaptation component of Mexico's INDC contains three clear adaptation goals in the body of the INDC, while an annex provides context on climate risks and vulnerabilities, specifics of planned adaptation actions, and a brief description of needs in capacity building, technology, and finance.

The adaptation component in the body of the INDC is as follows:

> "Mexico includes an Adaptation component with commitments by 2030 described in the Annex I of this document. The priority of these actions are: the protection of communities from adverse impacts of climate change, such as extreme hydro meteorological events related to global changes in temperature; as well as the increment in the resilience of strategic infrastructure and of the ecosystems that host national biodiversity. In order to reach those priorities Mexico will, inter alia, strengthen the adaptive capacity of at least by 50 percent the number of municipalities in the category of 'most vulnerable', establish early warning systems and risk management at every level of government and reach a rate of 0 percent deforestation by the year 2030. Some of the adaptation actions presented foster positive synergies with mitigation actions."

The structure of the annex provides a set of information categories that might be useful to other countries as they develop an adaptation component for their INDC. These information categories are:

- Introductory information. Key information in this section includes the national law and national/subnational plans for adaptation upon which the INDC draws.
- Description of vulnerability. The description includes: past and projected changes in temperature and rainfall; economic losses associated with hydrometeorological events; and the number of municipalities (319) that are rated as highly vulnerable to the impacts of climate change.
- Adaptation actions planned for the period 2020-2030. The annex organizes the actions by category: social sector, ecosystem-based adaptation, and adaptation of infrastructure and productive systems.
- Needs in capacity building, technology transfer, and finance. This section briefly outlines the importance of building capacity to achieve the above actions at three levels of government, academia, and civil society; identifies areas where transfer of technology could be most beneficial; and points out that international support is needed. It also highlights the importance of incorporating a gender and human rights approach into capacity building.

depending upon the availability of a number of resources, including: time, money, staffing, and existing relevant information on climate change and adaptation in the country. Given the short timeframe and limited resources faced by many Parties, a basic approach that does not require extensive new data collection and analysis can still result in a meaningful INDC. In such cases, crafting a clear, easily communicated overarching vision can provide the basis of the adaptation component of the INDC. Furthermore, countries may choose to use the INDC to outline steps they intend to take in initiating a NAP process. When the NAP or equivalent process gets underway, and more information becomes available, Parties could submit additional information at a later stage.

While many Parties might utilize the INDC process to communicate existing goals or objectives, intended actions, and plans, countries with the ability to devote greater time and resources to the INDC process might choose to undertake new efforts in data collection, analysis, goal setting, and adaptation planning. While the timeframe for communicating INDCs is relatively short, countries could conceivably undertake such new analytical efforts with a compressed work plan (see the South Africa example in Box 7.3).

In Section 7.2.2, each of the adaptation information categories listed in Table 7.1 is discussed in detail. Text boxes also provide concrete examples from INDCs submitted to date and describe progress on adaptation components presented by Parties at the UNDP-UNFCCC regional technical dialogues.

BOX 7.2 NAPS AND INDCS: DIFFERENCES, SIMILARITIES, AND LINKAGES

The UNFCCC National Adaptation Plan (NAP) process was established by the Parties to the UNFCCC in Durban in 2011, with two agreed objectives: (a) to reduce vulnerability of developing countries to the impacts of climate change by building adaptive capacity and resilience; and (b) to facilitate the integration of adaptation into existing policies, programs and activities, and in particular into development planning (1/CP.16). The NAP process was designed, first of all, to enable least developed countries (LDCs) to build on the short-term needs identified in their National Adaptation Programs of Action through an integrated approach to medium- and long-term adaptation planning. The LDC Expert Group has developed detailed technical guidance for the NAP process (Least Developed Countries Expert Group 2012). The COP also invited non-LDCs to undertake NAPs, and many have launched "NAP equivalent" processes that follow the spirit of the UNFCCC NAP guidance, if not all of its specific steps.

The concept of INDCs originated two years later in Warsaw, when the COP invited all Parties to "initiate or intensify domestic preparations for their intended nationally determined contributions" (1/CP.19, para. 2 (b)). The scope of these contributions was not specified by that decision but, in the course of 2014, many Parties expressed interest in including adaptation components in INDCs. In response, the Lima Call for Climate Action invited "all Parties to consider communicating their undertakings in adaptation planning or consider including an adaptation component in their intended nationally determined contributions" (1/CP.20, para 12).

How do INDCs differ from NAPs?

- INDCs are a vehicle to communicate intentions, whereas NAPs are a planning process
- INDCs are primarily for international communications, whereas NAPs are primarily for domestic planning purposes
- INDCs are expected to be communicated prior to the Paris COP in December 2015; NAPs, on the other hand, have no international deadline
- NAPs are intended to be iterative and ongoing processes; INDCs might or might not become iterative, depending on the 2015 Paris outcome
- INDCs may focus more on providing general information about planning and implementation objectives and processes, while NAPs are likely to provide greater detail and information, particularly about specific policies or activities

How are they similar?

- Both are very flexible, with no prescribed elements that countries must include
- Both should be country-driven and participatory and reflect nationally identified priorities
- Both benefit from a compilation or synthesis of adaptation-related analyses, policies, and activities across the country and across government

How are they linked?

- Both INDCs and NAPs are likely to be most effective if they are based on a long-term vision for dealing with the impacts of climate change
- Parties that already have established a NAP or similar planning process will be able to draw a great deal of information for their INDC's adaptation component from their NAP process and its outputs
- Parties that have not yet launched a NAP or similar planning process may use their INDCs to draw attention to the need for a NAP or to outline their vision, intended process or timeline for a NAP

7.2.2 INDC adaptation information categories and options

This section introduces each of the information categories listed above, which may be included in the adaptation component of an INDC, and provides a set of options regarding the presentation of each element. Table 7.2 suggests how treatment of the element might vary depending upon whether or not the country has a NAP process or equivalent planning process. Parties likely will find variability across the elements in the quality and availability of relevant data and information, and may choose to include some elements and not others. Potential data sources for each element are suggested in Table 7.2, though they will vary substantially from country to country.

A. **Summary of climate change trends, impacts, and vulnerabilities**: The INDC can provide a brief summary of the current and projected climate change threats and impacts and their effects on vulnerable groups and sectors within the country. This summary is

BOX 7.3 SOUTH AFRICA: INCLUDING NEW ANALYTICAL EFFORTS IN THE ADAPTATION COMPONENT

South Africa is preparing an adaptation component based on existing measures, along with new data collection and analysis of adaptation needs and costs.

The INDC will be built on:

- Existing policy, strategy, and implementation processes
- Mapping of governance arrangements required for adaptation
- Aspirational goals for adaptation in development planning
- Adaptation needs and costs based on priority adaptation sectors and selected weather scenarios
- Programs and projects, including those necessary for 2020-2030
- Quantified adaptation investments in the last five years

The work is undertaken in four stages:

1. Data collection and analysis (identify existing efforts, institutions, governance arrangements, goals, needs, priority sectors, costs, and past adaptation investments) (January-March 2015)
2. Stakeholder consultations (April-May 2015)
3. Finalization of INDCs (June-July 2015)
4. Governmental consultation and submission (August-September 2015)

Source:
Kekana 2015.

likely to be necessary to provide context for the other information in the adaptation component (B-F below). Given the overall emphasis of INDCs on communicating intended climate actions, this section is likely to be most effective if it genuinely provides a summary, rather than a detailed repetition of findings in national assessments, National Communications to the UNFCCC, or other sources.

B. **Statement of national long-term goals or vision:** An adaptation component can include an outline and justification of the national vision for reducing the identified threats and impacts, including a description of the nationally determined needs, options, and priorities for increasing the resilience of vulnerable communities, regions, or sectors. Given the nature of adaptation action, the timeframe for long-term goals in this case may differ from the timeframe for long-term goals for mitigation. There are many ways of expressing the vision, and the goals may focus on outcomes, process or needs (Annex F). They can be tracked though quantitative or qualitative indicators, or by progressing through recognized steps or checklists (Annex G). In cases where countries have not yet established evidence-based goals, a clear vision statement can help to guide further adaptation planning and action. The Mexican INDC provides an example of how national adaptation goals can be expressed in an INDC (see Box 7.4).

BOX 7.4 MEXICO: EXAMPLES OF ADAPTATION GOALS IN AN INDC[33]

The Mexican INDC includes two outcomes-based adaptation goals and one process-based goal:

- Reduce by 50 percent the number of "most vulnerable" municipalities and ensure that no new municipality falls in this category (outcome-based)
- Reach a zero percent deforestation rate by 2030, as a means to ensure that biodiversity and ecosystem services serve as key mechanisms for coping with the adverse effects of climate change (outcome-based)
- Develop effective early warning systems and risk management actions at the three levels of government (federal, state and municipal) (process-based)

In cases where Parties have not yet established specific adaptation goals, a clear vision statement or broad description of priorities can help to guide further adaptation planning and action. A vision, for example, could be a society living sustainably with moderate and acceptable risks from climate. Examples of priorities could be protecting people and providing sustainable livelihoods in the face of increasing storm surge and sea level rise, or expanding water supply and restructuring water management to allow for the achievement of nationally agreed development plans. The Gabon INDC, for example, highlights adaptation of the country's coastal zone as a key priority, drawing upon the National Adaptation Strategy and national development planning (see Box 7.5). Parties may find complementarity among two or three of the above types of goals, and may consider using them in combination. Further information for understanding adaptation goals, objectives, and targets is provided in Annexes G and H.

C. **Statement of current and near-term planning and action:** The INDC provides an opportunity for countries to demonstrate the scale of their domestic engagement in building resilience to changing climates. Domestic engagement includes ongoing and planned actions (changes in institutions, modified policies and measures, major projects/programs, planning processes, and financial investments) using international or domestic resources. The statement of current and near-term planning and action can include a description of recently completed, ongoing, and planned domestic adaptation efforts and national investments, as well as other contributions to their implementation. The description can also include domestic support for regional activities that enhance climate resilience. See Box 7.6 for a NAP-based INDC from Chile.

D. **Statement of gaps, barriers and needs:** This can include a description of any gaps in information or access to technology, barriers to adaptation action, and needs for capacity support to execute near-term action or planning, including support needed to expedite the

BOX 7.5 GABON HIGHLIGHTS COASTAL PRIORITIES[34]

The adaptation component of Gabon's INDC builds on the country's national development strategy and national adaptation strategy. The main focus of adaptation activities in the INDC is coastal zone management, including: coastal protection of Libreville and Port-Gentil; other activities in coastal cities; income-generating activities in coastal areas; protection of mangroves, turtles, and other species; waste management; and the creation of a coastal and marine observatory.

preparation of a NAP or equivalent (UNEP 2014b). The statement can also extend to requirements for long-term action or planning, including an assessment of the needs (information, capacity, technology, and financial) to carry out planned actions to achieve the integration of adaptation in development planning. In cases where the statement includes an assessment of financial costs for specific activities, Parties may wish to include a brief description of the core assumptions and methods used to identify, prioritize, and cost various options for action. Cross-referencing the statement with other categories of information (for example, B and C above) might also be useful.

E. **Summary of support:** A summary of recent support can cover the amount and type of support (such as knowledge sharing, capacity development, grants, loans, guarantees), along with the source of support (such as global funds, other Parties, multi-lateral agencies and NGOs, private investors, or domestic sources).

Information in this category may not differ substantially between countries with a NAP and those without, though the level of detail reported can vary widely and is at the country's discretion. Several studies have found that accurately measuring support for adaptation can be difficult, given the wide variety of sources and the integration of many adaptation activities into other development activities (Wilkinson, et al. 2014). In the case of donor countries, a brief description of the amount and goals of their international assistance for adaptation and resilience efforts (both bilateral and multilateral) could be included. Potential data sources include national records; national databases or studies such as Climate Public Expenditure and Institutional Reviews (CPEIRs), and numerous international databases.[35] For more information, see Section 8.3.

Information in the summary of support may be structured with reference to other information categories, such as C and D above. Several Parties have expressed interest in indicating which planning and implementation activities may be covered by which sources of support.

BOX 7.6 CHILE: AN EXAMPLE OF A NAP-BASED INDC

Chile currently has in place a national adaptation plan and two sectoral plans. Seven sectoral plans are being prepared. These plans will serve as the basis of the adaptation component of Chile's INDC, which aims, by 2018, to have in place at least: (1) nine sectoral adaptation plans for priority sectors; (2) sources of finance for those plans; (3) concrete actions to increase the resilience of the country; (4) methodologies and indicators for vulnerability, adaptive capacity, and resilience; (5) identification of four key stages on adaptation efforts.

For example, Mexico's INDC states that the private sector and financial actors such as the insurance markets are expected to play a pivotal role in improving the country's disaster risk reduction systems. Parties may also wish to include an assessment of which actions can be achieved with existing resources, and which will require additional support (for more information, see Chapter 8).

F. **Description of monitoring plans:** Because adaptation planning is an iterative process, gradually growing in scope and learning from the monitoring and review of ongoing adaptation actions, a description of how adaptation progress will be nationally monitored, reviewed, updated, and reported can be an important element. Annex G provides an overview of some options for measuring progress.

7.2.3 Additional considerations in communicating an adaptation component in INDCs

Parties have also begun to grapple with several additional issues that deserve further consideration when developing the adaptation component of INDCs:

- Links to levels of mitigation ambition. Failure to limit global temperature increase to 2°C (or 1.5°C) will lead to more severe climate impacts and higher costs for adaptation and residual losses and damages (IPCC 2014b). Some countries may be in a position to explore how a range of temperature scenarios might affect

Table 7.2 | **Summary of Adaptation Information Categories and Data Sources**

INFORMATION CATEGORIES	FOR PARTIES WITH A NAP OR EQUIVALENT ADAPTATION PLANNING PROCESS	FOR PARTIES WITHOUT A NAP OR EQUIVALENT	POTENTIAL DATA SOURCES
A. Summary of climate change trends, impacts, and vulnerabilities	In developing the NAP, analysis of trends, impacts, and vulnerable sectors and groups has likely taken place. The INDC adaptation component could summarize this existing analysis or emphasize specific findings from it	If detailed data on specific trends, impacts, and vulnerabilities has not yet been collected, countries can draw on regional or international sources to provide general information	Planning documents; National Communications to the UNFCCC; reports by national, multinational and civil society organizations; IPCC Fifth Assessment Report; academic research; national, sub-national or local assessments and studies associated with projects; international databases such as CRED[a] or insurance industry databases[b]
B. Statement of national long-term goals or vision	The NAP will likely include vision statement and/or sectoral goals and objectives. These can be included as presented in the NAP, or could be further refined/prioritized in the specific context of the country's rationale for the adaptation component of the INDC	If a country is intending to develop a NAP or sectoral/regional adaptation plans, the goal included in the INDC could be a process-oriented goal that outlines the country's aspirations to develop a NAP	National planning documents; legislation, policy, or regulation; records of planning meetings, including stakeholder consultation processes
C. Statement of current and near-term planning and action	Can draw on activities underway within the NAP process, highlighting major planning milestones, expected outputs, and major programs or projects planned or under implementation. Where planning is advanced, this section can cite significant investments, innovations, and successes, including examples where adaptation has been mainstreamed into budget cycles or government processes	Can articulate elements of an intended planning process, including timeline, focal areas, ministries and stakeholders to engage, and an outline of the process. Could also include a review of sub-national, sectoral, or project-level activities taking place outside the context of national planning, or a review of gaps and needs of the enabling environment for the NAP process. Alternatively, this category could include a description of more general development activities underway that are expected to reduce climate risks/vulnerabilities	National planning documents; national policies, regulations, or procedural guidelines; national or sectoral databases of projects and programs; subnational (city, state, county, province, district) records of activities and investments
D. Statement of gaps, barriers, and needs	This information might already be included in NAP documents; it could also be enhanced/elaborated through stakeholder engagement/interviews	Countries may choose not to include this element, or the absence of a plan itself could be described as a gap. Specific gaps might also have been identified in partial analyses (for example, sector-, project- or location-specific studies)	National assessment; subnational (sector, location, etc.) assessments; adaptation project reports or evaluations
E. Summary of support	Information in this category may not differ substantially between countries with a NAP and those without, though the level of detail reported can vary widely and is at the country's discretion		National records; studies such as Climate Public Expenditure and Institutional Reviews (CPEIRs)[c]; national and international[d] databases

Table 7.2 | **Summary of Adaptation Information Categories and Data Sources (continued)**

INFORMATION CATEGORIES	FOR PARTIES WITH A NAP OR EQUIVALENT ADAPTATION PLANNING PROCESS	FOR PARTIES WITHOUT A NAP OR EQUIVALENT	POTENTIAL DATA SOURCES
F. Description of monitoring plans	Information about monitoring may already be included in the NAP. A monitoring plan also could be tailored specifically to the information communicated in the INDC	Countries may describe a basic plan for monitoring progress toward the goal/vision outlined in the INDC, such as identification of key milestones in the future NAP process. They could also link to other monitoring or reporting mechanisms, such as the UNFCCC National Communications, or tracking systems for the Sustainable Development Goals or other development initiatives	National assessment and/or stakeholder consultation processes; project/program monitoring and evaluation data; national census data or other national statistical bureau resources; environmental monitoring systems, including satellite data

Notes:

[a] Centre for Research on the Epidemiology of Disasters EM-DAT database, available at http://www.emdat.be/.

[b] For example, Munich Re, available at http://www.munichre.com/natcatservice.

[c] Available at http://www.aideffectiveness.org/CPEIR.

[d] Such as global data from Climate Funds Update supported by the Overseas Development Institute and the Heinrich Boell Foundation at http://www.climatefundsupdate.org/data; Climate Finance Tracker at http://www.climatefinanceoptions.org/cfo/node/189; UNFCCC at Climate Finance portal at http://www3.unfccc.int/pls/apex/f?p=116:1:3035736490735681; the GEF at http://www.thegef.org/gef/gef_projects_funding, or by particular agencies such as World Bank at http://www.worldbank.org/projects/.

long-term adaptation planning, which would help inform the wider discussion of INDCs.

- Options for measuring progress towards national adaptation goals and objectives. A set of goals, objectives, or targets describing medium- to long-term steps in moving from existing efforts to achieving a national vision for climate-resilient development will assist in communicating national efforts in the adaptation component of an INDC. Annex F elaborates further on options for setting national adaptation goals. The challenge of how to track progress in adaptation, and how to develop appropriate metrics for that purpose, has confounded many a project developer, national planner, and investment portfolio manager. Annex G highlights key aspects of this challenge and reflects on some experience that may be relevant for presenting trackable goals and objectives in INDCs.
- Opportunities to prioritize mitigation-adaptation synergies and co-benefits. Mitigation and adaptation are mutually supportive in that effective mitigation will reduce the need to adapt, reduce damages related to climate change, and allow developing countries to focus on their development priorities. Effective adaptation will help put communities on more resilient development pathways, which, in turn, will assist Parties to better contribute to mitigation activities. More concretely, the INDC creates an opportunity to quantify the mitigation potential of adaptation activities, or to identify the ways in which mitigation activities might support (or hinder) longer-term climate resilience. For example, conserving water could result in farmers having to pump or desalinate less water, which could translate into energy savings and GHG reductions; combatting desertification as an adaptation effort could include the planting of trees, which could increase carbon sinks. However, it is important to note that the details of specific activities need to be assessed to ensure synergy; it is possible that some adaptation activities could have negative mitigation implications, or that mitigation activities could undermine climate resilience. Other Parties may choose to focus on multiple-benefit activities such as integrated landscape management, which can produce both adaptation and mitigation outcomes.

CHAPTER 8

WHAT MEANS CAN PARTIES USE TO IMPLEMENT THE INDC?

Parties should consider what resources they will need to undertake the INDC. For developing country Parties, in addition to a combination of domestic resources (private and public), this may also include international support in the form of technology, capacity building and finance. Implementing the INDC will require enhancing the effectiveness and efficiency of existing domestic and international sources, leveraging new sources, and establishing appropriate enabling environments to attract international investment.

This chapter describes some of the tools and methods Parties might consider using for assessing three categories of means of implementation: technology, capacity building, and finance.

BOX 8.1 MEXICO'S INDC: ADDITIONAL ACTION THAT COULD BE ACHIEVED

With its own resources, Mexico has committed to reducing its greenhouse gases and short-lived climate pollutants 25 percent below baseline scenario emissions by 2030. This implies a reduction of greenhouse gases 22 percent below baseline scenario emissions by 2030 and a reduction of black carbon 51 percent below baseline scenario emissions by 2030.

If a global agreement is secured that includes an international carbon price, border carbon adjustments, technical cooperation, access to low-cost financial resources and technology transfer, at scale commensurate to the climate change challenge, Mexico could reduce its greenhouse gases and short-lived climate pollutants up to 40 percent below baseline scenario emissions by 2030 (implying up to 36 percent greenhouse gas reductions and 70 percent black carbon reductions from baseline scenario emissions).

Mitigation assessment (mentioned in Chapter 3) can shed light on the mitigation options that are technically and economically feasible. It can also help Parties understand how mobilizing resources in the form of technology (Section 8.1), capacity building, (Section 8.2) and financing (Section 8.3) can help in implementing the INDC and realizing greater emissions reductions.

For adaptation, national adaptation planning typically provides the basis for understanding resource needs, including technology, information, capacity building and finance. Many least developed countries (LDCs) have a National Adaptation Programme of Action that includes a costed list of projects that can inform an INDC and highlight needs for implementation. However, many countries will draw upon more comprehensive, longer term planning processes when they develop an adaptation component for their INDC. "NAP or equivalent processes" can provide information on the capacity needed to fully integrate adaptation into development planning, as well as the costs of specific activities to support adaptation.

In their INDCs, Parties may choose to indicate the gap between resources needed to achieve their mitigation target or national adaptation goals/objectives and those currently available. For developing country Parties that seek to put forward more ambitious INDCs than can be achieved with existing

means of implementation, the Party's communication should clearly distinguish the additional action that can be achieved with additional support from the action that can be achieved unilaterally, and if possible, specify the amount and type of support needed. Ideally Parties can also communicate any methods used to estimate resource needs. See Box 8.1 for a description of how Mexico communicated the additional action it could take if additional resources were available.

8.1 Technology

The UNFCCC has developed a number of tools to help countries identify their technology needs and find solutions to their specific problems. A Technology Needs Assessment (TNA) is the starting point for identifying technology needs. The TNA can be the basis for identifying a portfolio of environmentally sustainable technology (EST) projects and programs.[36] Under the auspices of the Expert Group on Technology Transfer and in cooperation with the Climate Technology Initiative, UNDP and UNFCCC have developed a handbook to help countries make informed technology decisions (UNDP and UNFCCC, 2010). It offers a systematic approach for conducting TNAs in order to identify, evaluate, and prioritize technological means for both mitigation and adaptation.[37] It also provides processes and methodologies for uncovering gaps in enabling frameworks and capacities, and for formulating a national action plan to overcome them.

A complement to the TNA handbook is the technology information clearinghouse (TT:CLEAR),[38] which aims to provide information about ongoing technology-transfer activities under the Convention, as well as reliable technical, economic, environmental, and regulatory information relating to the development and transfer of environmentally sound technologies.

The most recent development under the UNFCCC is the initiation of the Technology Mechanism,[39] which represents a step toward a more dynamic arrangement geared toward fostering public-private partnerships, promoting innovation, catalyzing the use of technology road maps or action plans, responding to developing country Party requests on matters related to technology transfer; and facilitating joint R&D activities. The Climate Technology Centre and Network (CTCN) is one element of this mechanism.

These types of tools can help Parties identify and manage their technology needs, including international support in advancing technologies if needed.

8.2 Capacity Building

Many countries lack the domestic resources to support projects and innovations that would, for example, help ease the transition to a clean-energy economy or reduce climate risks to agricultural productivity. Capacity building is therefore crucial to help advance the objective of the Convention and can assist in furthering an INDC. Capacity building under the Convention takes place on three levels:

- Individual level: developing educational, training, and awareness-raising activities;
- Institutional level: fostering cooperation among organizations and sectors, as well as the development of organizations and institutions, including their missions, mandates, cultures, structures, competencies, and human and financial resources;
- Systemic level: creating enabling environments through economic and regulatory policies and the accountability frameworks in which institutions and individuals operate.[40]

The Nairobi Work Programme (NWP), established at COP 11 in 2005, also provides a platform for development and dissemination of information and knowledge to inform and support adaptation actions in countries. The NWP website[41] lists a number of tools and methods that help countries decide on appropriate technologies. The Least Developed Countries Expert Group (LEG) provides specific guidance to LDCs on the implementation of adaptation strategies including the identification of adaptation needs.

Capacity building can be undertaken directly through specialized workshops, training, and educational programs, or as part of projects that aim to develop policies or implement emissions-reduction technologies. There is no "one size fits all" formula for capacity building. It must always be country-driven, addressing the specific needs and conditions of countries and reflecting sustainable development strategies, priorities, and initiatives.

8.3 Finance

Three pieces of information are needed to determine how to finance an INDC:

- An estimate of the total cost of the INDC[42]
- An assessment of the domestic expenditures (public and private) that are or will be available to implement the INDC
- A determination of the finances that are available from international sources

Conceptually subtracting the last two (the amount of domestic and international resources that are known to be available now or in the future) from the first (the total cost of the INDC) should reveal the additional domestic finance or international support needed to achieve a particular goal, assuming that all the existing domestic and international climate finance could be utilized to finance the INDC implementation. The finance gap may be filled from a combination of public and private sources.

This section provides information on how to assess domestic expenditures that are or will be available to implement the INDC, as well as determine the finances that are available from international sources. An assessment of available finance could include finance that is available for use now or is known to be available for future periods. For a relatively simple INDC, this information would offer insights about the resources that might be available to the country, as well as the additional resources that may be needed, to shift from a "brown" (business-as-usual) option to a "green" INDC. However, determining the difference in investment cost needed to shift an entire economy from brown to green would be quite complex.[43]

There is no single way to estimate how additional resources can be used to further implementation.[44] First, as determined by the Climate Policy Initiative (Buchner et al. 2013), most climate finance is mobilized in the country where it is deployed.[45] Second, the financing of any given intervention is usually accomplished by blending a combination of loans (and loan guarantees), grants from governments budgets and international institutions, domestic banks, international banks and credit agencies, as no single source wants to assume the entire risk of a project.[46] Furthermore, information on private finance for adaptation purposes is still very limited. There is, therefore, no simple formula for estimating the amount and type of finance needed to implement an INDC or for determining where domestic funding stops and international finance begins. Instead, Parties should be as transparent as possible in identifying assumptions and methodologies that determine their estimates of finance needed to achieve different goals (Illman et al. 2014). That said, the initiatives described below provide methodological references. It should be noted that gathering the requisite data could take considerable time. (Also see Tables 3.1 and 3.2 for sources of data related to resource-mobilization strategies.)

8.3.1 Methods to determine domestic climate finance

The UNFCCC Standing Committee on Finance has surveyed the methods used by international institutions to estimate and report on finance provided to developing countries (UNFCCC 2014a). The same approaches can be applied to estimating domestic public expenditures in developing countries and developing a strategy to access finance. The main methods for estimating and reporting climate finance are those provided by the multilateral development banks (MDBs),[47] International Development Finance Club (IDFC 2013), and the OECD (OECD 2011). Of those, the MDBs and IDFC methods can be applied by developing countries to classify their domestic expenditures.[48]

The MDB and IDFC approaches to estimating mitigation expenditures provide a list of activities that could be classified as mitigation finance and provide some examples of how to calculate what proportion of infrastructure projects qualifies as climate mitigation finance. It is therefore relatively easy for countries to determine whether their domestic or international finance counts as climate finance; a project is either on the list or it is not.[49]

The MDB approach to estimating adaptation expenditures is different. It does not use a "positive" list approach but instead identifies a number of key steps that need to be taken in order for a specific project or activity to be counted as adaptation finance. The steps are:

1. Setting out the context of climate vulnerability of the project

2. Making an explicit statement of intent to address climate vulnerability as part of the project

3. Articulating a clear and direct link between the climate vulnerability context and the specific project activities

Only projects that are clearly linked to the climate vulnerability context are counted as adaptation finance when this methodology is applied. Because this methodology does not use a positive list of activities, a deeper analysis of the context and specific activities needs to be made. It is, therefore, not the nature of the project that determines whether a specific activity is adaptation relevant but the rationale and the decision-making process.

The Climate Public Expenditure and Institutional Review (CPEIR) process has also been used in a number of developing countries to estimate domestic budgetary expenditures for mitigation and adaptation. It aims to help Parties review how national climate change policies are reflected in public expenditures and how institutions need to adjust to ensure that financing a response to climate change is delivered in a coherent way across government. CPEIRs have been undertaken in Nepal in 2011 with support from UNDP, UNEP, and others, and additional studies have followed in Bangladesh, Thailand, Samoa, Cambodia, Indonesia, Morocco, and the Philippines.

The CPEIR requires Parties to identify climate change expenditures within the national budget so that the most important aspects of public spending can be analyzed. It also requires that information about planned and actual spending on climate change-related activities is disaggregated to expenditure codes across the whole of government. In addition to a review of the central government expenditures, the financial analysis may examine local government spending. Other sources of public expenditure, including international support, that lie outside the national budget are also identified. The CPEIR is intended to facilitate the national response to climate change by identifying those actions that are needed to respond to climate change and to help prioritize and guide public investment (UNDP/ODI 2012). In determining domestic funding, care should be taken to count national trust funds (for example, Amazon Fund) established by the country and national development banks (for example, China Development Bank). The best place to start the search for data is likely to be the national budget office, usually in the finance ministry. (For more information, see Lütken 2014).

8.3.2 Methods to determine international climate finance

As with domestic finance, the use of a list of technologies and activities will help to determine whether a project or a component from an international source qualifies as a climate finance project. There are several possible starting points to collect such data.[50] Depending on the country, this may vary depending on whether the data are for loans and grants, for bilateral and multilateral activities, or for specific sectoral programs. Examples of institutions that could be sources for data include:

- A national climate change coordinating committee or council may be responsible for approving all external support provided to the country for climate change
- The individual office(s), usually in the Ministry of Finance, may be responsible for reviewing and approving all grants and loans
- The Ministry of Foreign Affairs or the Ministry of Planning may be responsible for approving all or some forms of international finance
- A donor coordination committee or council, responsible for exchanging information with prospective donors on development assistance priorities, may have the information
- Individual ministries may have offices responsible for international cooperation on specific technologies and sector programs

As mentioned, in the case of adaptation it is not possible to have a positive list of activities without considering the local climate vulnerability context. When identifying international adaptation finance flows, Parties will be dependent on the information provided by international organizations about their adaptation finance. Peterson, Carvalho and Terpstra (2015), describe a methodology and list a number of websites and sources that can be used to identify adaptation finance flows. As with domestic finance, understanding the decision-making process underlying the design of the activity is important to determine whether an activity contributes to adaptation or not. There are known issues with coding of international adaptation finance flows (see Michaelowa and Michaelowa 2011; Terpstra et al 2014) and involving donor organizations at the national level is a key step in understanding current and future adaptation finance flows in a country.

8.3.3 Methods to estimate private sector finance

Given the complexity of estimating private sector expenditures, developing country Parties may choose not to undertake such an effort until better methods are available. This section is based mainly on the experience of G20 countries and is indicative. Most Parties will need to adapt the information to their circumstances or gather original data. This is especially important because most private sector finance estimates to date have focused on mitigation finance only. Very limited information is available on private finance for adaptation. This does not mean, however, that the private sector is not investing in adaptation measures. A number of reports highlight the trends, needs, and opportunities for private investment in adaptation (for example, UN Global Compact 2011; Trabacchi and Stadelmann 2013; IFC and EBRD 2013; and PwC 2013). However, there is no coherent and comprehensive methodology to identify, report, and track private investments in adaptation.

The Frankfurt School-UNEP Centre and Bloomberg New Energy Finance (BNEF) use data to produce an annual report on Global Trends in Renewable Energy Investment.[51] The GTREI provides historical data from 2004 through 2013 and disaggregates the estimate by renewable energy technology and to a limited extent energy efficiency data for both private and public investments. The BNEF gathers information, using an in-house team of analysts, on financial flows from venture capital, private equity, mergers and acquisitions, public markets, asset finance and carbon credits. BNEF focuses mainly on G20 countries and covers only clean energy: renewable energy, energy efficiency, smart grid, power storage and other new energy technologies. Its data are proprietary.

The IEA also undertakes an annual survey of energy use by sector (transport, industry, power and residential) to determine the annual energy demand and types of equipment purchased in developed countries and BRICS countries. The IEA

also conducts a survey to determine the cost of technologies in these countries.

Estimating domestic private expenditures by banks, industry, and consumers at the national level is complex. As in the case of BNEF and the IEA, it will usually require a survey of expenditures on technologies by industry or on household goods, such as electrical appliances, by consumers. The capacity and data available in each country will determine what might be feasible. In many countries, energy development projects can be either solely funded or co-funded with private industry. The Ministry of Energy or the Ministry of Transport might therefore be the best places to look for data. If the country has a national electricity company, information on investments in the power sector, both public and private, might be obtained from that source. One complicating factor is likely to be that investments in large energy projects are often made over several years and in some cases will be confidential.

Parties wishing to consider methods to mobilize private sector finance might also be interested in additional references. For more information, see See Polycarp et al. 2013; Venugopal et al. 2012; Illman et al. 2014; and Jachnick et al. 2015.

ANNEX A. BACKGROUND ON NECESSARY EMISSIONS REDUCTIONS TO LIMIT WARMING TO 2°C

Human-induced annual greenhouse gas (GHG) emissions are now higher than ever before in human history, reaching 49 $GtCO_2e$/year by 2010 (IPCC 2014c). Current atmospheric concentrations of carbon dioxide are the highest they have ever been for at least the last 800,000 years, and more than 40 percent higher than at the beginning of the industrial revolution (Global Carbon Project 2014).

It is extremely likely that the observed increase in warming since 1951 has been due to human activities leading to increased concentrations of greenhouse gas emissions. Just in that timeframe, 0.6-0.7°C of warming has occurred. And over the past few decades, human-induced warming has contributed to heat waves, significant Arctic sea ice loss, retreat of glaciers, reductions of spring snow cover in the Northern Hemisphere, increase in global sea level rise, among other impacts (IPCC 2013b).

The UNFCCC has adopted a goal of limiting warming to 2°C. This temperature rise will still present significant risks (see Box A.1) but it avoids some of the most catastrophic impacts that are likely to manifest themselves at even warmer temperatures.

Scientists have devoted considerable effort to understanding the magnitude of emissions reductions necessary to limit warming to 2°C (see Box A.2). However, the global community is not yet on track to meet the 2°C goal; there is a gap of 8-10 $GtCO_2e$ between our current emissions pathway and one that is aligned with the 2°C goal (UNEP 2014c). Even if all countries follow through on their current emissions reduction pledges, projections of global emissions are far from the least-cost pathway for limiting global average temperature rise to 2°C above pre-industrial levels. The IPCC Fifth Assessment Report finds that, as a result of this emissions gap, in the absence of efforts beyond those already in place, global mean surface warming would be 3.7-4.8°C above pre-industrial levels by 2100.[52] This level of warming would bring disastrous impacts.

BOX A.1 CLIMATE IMPACTS IN A 2°C WORLD

Climate change impacts to date have been widespread and have affected both natural and human systems on all continents and across the oceans.[a] The world faces increasingly dangerous climate change impacts with every additional degree of warming. With warming greater than 2°C, we are expected to see:[b]

- Roughly 0.79 meters (2.6 feet) of sea level rise above 1980-99 levels by the end of the century
- Average annual runoff decreasing 20-40 percent in the Danube, Mississippi, Amazon and Murray Darling river basins
- Average annual runoff increasing about 20 percent in the Nile and Ganges basins
- Forest fires almost doubling by 2050 in Amazonia with temperature rise of 1.5°C to 2°C above pre-industrial levels
- The risk of reaching tipping points in the Earth system (for example, West Antarctic ice sheet disintegration and Amazon dieback) increases
- The frequency of bleaching events exceeds ability of coral reefs to recover
- A high risk of abrupt and irreversible changes to ecosystems like forests, which would lead to "substantial additional climate change" considering that trees sequester significant amounts of carbon dioxide[c]

Notes:
[a] http://ipcc-wg2.gov/AR5/images/uploads/WG2AR5_SPM_FINAL.pdf
[b] http://www.worldbank.org/en/topic/climatechange
[c] IPCC AR5 WG II

BOX A.2 LEVEL OF EMISSIONS REDUCTIONS CONSISTENT WITH A LIKELY CHANCE OF LIMITING WARMING TO 2°C AND AVOIDING DANGEROUS CLIMATE CHANGE

According to the IPCC, to have a likely chance of limiting warming to 2°C, greenhouse gas emissions are reduced to 41-72 percent below 2010 levels by 2050.[a] In the long term, the IPCC Fifth Assessment Report finds that for a likely chance of limiting warming to 2°C, GHG emissions are zero or below zero[b] by 2100, requiring a phase-out of greenhouse gas emissions.

While there is a range of emissions levels in 2020 and 2030 that could be consistent with these longer term goals, emissions above a certain level in the short term would require unprecedented rates of decline later on, and a greater reliance upon negative emissions, which remain unproven as they have yet to be tested at scale. In addition to reaching periodic milestones, the build-up of carbon dioxide, year after year, will also need to be limited. The IPCC AR5 summarizes the scientific literature and estimates that cumulative carbon dioxide emissions related to human activities since the beginning of the industrial revolution need to be limited to 790 PgC if we are to have a likely chance of limiting warming to 2°C. The first two thirds of the entire global carbon budget have already been exhausted, and the remaining one third of the budget is expected to be used up in only about two decades if emissions growth continues without further mitigation action.[c]

Notes:

[a] See Table 6.3 in IPCC 2014a.

[b] Negative emissions could be realized through carbon dioxide removal (CDR) technologies. The report notes significant risks associated with CDR, such as, with regard to bioenergy with carbon, capture and storage (BECCS), the lack of available land, the potential to store such significant amounts of carbon, and the lack of BECCS plants that have been built and tested at scale. Recent research has also called into question whether bioenergy can lead to emissions reductions at the necessary scale (Searchinger and Heimlich 2015).

[c] Assumes RCP 8.5 scenario.

ANNEX B. RECOMMENDED LIST OF INFORMATION TO BE PROVIDED WITH THE INDC, WITH SECTION REFERENCES

INFORMATION ELEMENT	SECTION REFERENCE
The reference point (including, as appropriate, a base year)	
■ Base year(s)/period, if relevant (for example, 2005) ■ Base year/period emissions, base year/period emissions intensity, or projected baseline scenario emissions, as relevant (for example, base year emissions of 500,000 $MtCO_2e$ in 2005)	Section 6.2.4
Time frames and/or periods for implementation	
■ For targets/outcomes: target year(s)/period and peaking year (if applicable) (for example, 2025 or 2030 for a single year target; 2021-2030 for a multi-year target) ■ For actions: date actions comes into effect and date of completion (if applicable) (for example, 2020 with no end date)	Section 6.1.3 or 6.2.3
Scope and coverage	
■ Sectors covered (for example, all IPCC sectors covered in national GHG inventory, or all economic sectors as defined by national sector classification) ■ Greenhouse gases covered (for example, CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3) ■ Geographical coverage (for example, 100 percent, consistent with the national GHG inventory) ■ Percentage of national emissions covered, as reflected in the most recent national greenhouse gas inventory (for example, 100 percent)	Section 6.1.1 or 6.2.2
Planning processes	
■ Planning processes for preparation of the INDC[a] ■ If known, planning processes for implementation of the INDC[b] ■ If known, planning processes for tracking implementation of the INDC[c]	Chapter 6
Assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	
■ Assumed IPCC inventory methodologies and GWP values to be used to track progress (for example, 2006 IPCC *Guidelines for National Greenhouse Gas Inventories*; AR4 GWP values)	
■ Related to international market mechanisms: ☐ Whether the Party intends to use or sell/transfer units from international market mechanisms ☐ If units are to be used, any limit on the percentage of emission reductions that may be achieved through the use of units from international market mechanisms ☐ If units are to be used, the assumed types and years of units to be applied, if known ☐ Whether and how any units purchased/acquired or sold/transferred abroad will ensure environmental integrity (for example, through specific quality principles) and avoid double counting	Section 6.2.5
■ Related to accounting assumptions for emissions and removals from the land sector: ☐ Treatment of land sector (included as part of the broader target; treated as a separate sectoral target; used to offset emissions within the target boundary; or not included in a target) ☐ If the land sector is included, coverage of the land sector (net emissions and removals from land-use activities and/or categories) as compared to total net emissions from the land sector, as a percentage if known ☐ If the land sector is included, assumed accounting approach (activity-based or land-based) and accounting method[d] for the land sector and the level against which emissions and removals from the land sector are accounted, if known, including policy assumptions and methodologies employed ☐ Any assumed use of methodologies to quantify and account for natural disturbances and legacy effects ☐ Any other relevant accounting approaches, assumptions or methodologies[e]	Section 6.2.2
■ For GHG reduction targets relative to a projected baseline scenario: ☐ Whether the baseline scenario is static (will be fixed over the period) or dynamic (will change over the period) ☐ The cut-off year for policies included in the baseline scenario, and any significant policies excluded from the baseline scenario ☐ Projection method (for example, name and type of models) ☐ Emissions drivers included and assumptions and data sources for key drivers ☐ For dynamic baseline scenario targets, under what conditions will the baseline be recalculated and if applicable, any significance threshold used to determine whether changes in emissions drivers are significant enough to warrant recalculation of the scenario ☐ Total emissions projected in baseline scenario in the target year(s)	Section 6.2.3

INFORMATION ELEMENT	SECTION REFERENCE
■ For GHG reduction targets relative to emissions intensity: □ Level of output (for example, GDP) in the base year, projected level of output in the target year/period (and an uncertainty range, if available), and units and data sources used	Section 6.2.3
■ For INDCs that include actions: □ Estimated impact on GHG emissions and/or non-GHG indicators □ Methodologies used to estimate impacts, including the baseline scenario and other assumptions □ Uncertainty of estimated impacts (estimate or description) □ Information on potential interactions with other policies/actions	Sections 6.1.4
How the party considers that its intended nationally determined contribution is fair and ambitious, in light of its national circumstances, and how it contributes towards achieving the objective of the convention as set out in its Article 2	
Comparison of the contribution to multiple indicators related to fairness. Factors Parties may want to consider include: emissions (for example, past, current, or projected future emissions, emissions per capita, emissions intensity, or emissions as a percentage of global emissions), economic and development indicators (for example, GDP, GDP per capita, indicators related to health, energy access, energy prices, education, housing, etc.), national circumstances, vulnerability and capacity to adapt to climate change impacts, costs or relative costs of action, mitigation potential (for example, renewable energy potential), benefits of action (for example, co-benefits), or other factors	Section 6.1 or 6.2
Comparison of the contribution to multiple indicators related to ambition. Factors Parties may want to consider include: projected business-as-usual emissions, recent historical emission trends, total mitigation potential based on mitigation opportunities determined to be technically and economically feasible, benchmarks for the annual rate of emissions reductions, or other factors	Section 6.1 or 6.2
Comparison of the contribution to multiple indicators related to achieving the objective of the Convention as set out in its Article 2. Factors Parties may want to consider include: anticipated national emissions in the target year/period if the contribution is achieved, the quantified GHG impact of the contribution, the intended peaking year and peaking emissions level (if known), the annual rate of emissions reductions and/or expected emissions trajectory over time, deviation from business-as-usual emissions, any long-term mitigation goals, plans to limit cumulative emissions over time, or other factors	Section 6.1 or 6.2
Other information	
For outcomes, type of target and target level[f]	Sections 6.2.3 and 6.2.5
For actions, name or title of actions, legal status, implementing entity(ies), or other relevant information[g]	Section 6.1.2
Additional action that could be achieved if certain conditions were met, such as action by other Parties, the receipt of support, or other factors, if applicable	Chapter 8
Description of Party's long-term target(s), if applicable	Section 6.2.4.4
Elaboration on national circumstances (for example, emissions profile, mitigation potential)	Chapter 3
Additional information on adaptation not captured elsewhere, if relevant[h]	Chapter 7
Additional information, explanation, or context as relevant	

Notes:

[a] Such as stakeholder engagement and public consultation; process, data, and analysis for prioritizing sectors, actions, etc.; and decision-making processes.

[b] Such as government processes to plan and implement actions, and if known, a list of existing or planned actions that will be implemented to achieve the INDC, their legal status, and the implementing entity/entities.

[c] Such as any domestic MRV systems in place or planned.

[d] Options include: accounting relative to a historical base year/period (net-net), accounting relative to a projection of net emissions in the target year (forward-looking baseline), or without reference to base year or baseline scenario emissions (gross-net).

[e] Such as relevant IPCC guidance, the Party's forest definition, definition of managed land, list of land-use activities and/or categories included and their definitions, or others.

[f] If this information is not provided elsewhere in the INDC.

[g] If this information is not provided elsewhere in the INDC.

[h] Such as related to climate change trends, impacts, and vulnerabilities; statement of long-term goals or vision; statement of current and near-term action; statement of gaps, barriers and needs; summary of support; description of monitoring plans, or other information.

ANNEX C. ILLUSTRATIVE EXAMPLE OF PROVIDING INFORMATION FOR AN ECONOMY-WIDE GHG REDUCTION TARGET

INFORMATION ELEMENT	EXAMPLE
The reference point (including, as appropriate, a base year)	■ The base year is 1990. Base year emissions are 500 $MtCO_2e$.
Time frames and/ or periods for implementation	■ Target period: 2021-2030 (cumulative multi-year target) ■ Long-term target for 2050
Scope and coverage	■ *Sectors covered:* economy-wide (all IPCC sectors) ■ *Greenhouse gases covered:* all seven Kyoto gases ■ *Geographical coverage:* 100 percent geographical coverage ■ *Percentage of emissions from national GHG inventory covered, as reflected in the most recent national greenhouse gas inventory:* 100 percent of emissions in most recent national inventory covered by the target
Planning processes	■ To implement the target the Ministry of Environment is advancing an emissions trading program found in law X (see www.abc.gov), which is legally binding. The Ministry of Energy is also advancing a renewable energy target (see www.xyz.gov), which is legally binding.
Assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	■ *Assumed inventory methodologies and GWP values to be used to track progress:* 2006 IPCC guidelines; AR4 GWP values ■ *Related to international market mechanisms:* No more than 10 percent of emissions reductions will be achieved by acquiring transferable emissions units. Types and years: CDM units, vintages restricted to target period (2025–30). All credits will be real, additional, permanent, transparent, verified, owned unambiguously, address leakage. Double counting will be avoided by tracking units in domestic registry (see 2008 emissions trading system decree, found at www.ets.gov); participation in international transaction log; agreement between buyer and seller (can be provided upon request) ■ *Related to accounting assumptions for emissions and removals from the land sector:* The land sector will be included in the target boundary based on an activity-based accounting approach. Covered categories/activities: forest management (afforestation, deforestation), cropland management (soil carbon management, agroforestry), grassland management. Accounting will be relative to a historical base year with emissions levels of X. No use of natural disturbance mechanism.
How the Party considers that its intended nationally determined contribution is fair and ambitious, in light of its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2	■ *Fairness:* We have judged the fairness of our target based on the following indicators: capability (GDP per capita; Human Development Index), and cumulative emissions from 1850–2010. We have performed a study of the fairness of our contribution, based on our select indicators; more information can be found at [URL]. ■ *Ambition:* Our INDC maximizes our mitigation potential according to study Y found at [URL] and constitutes a 30 percent deviation from business-as-usual emissions. ■ *How it contributes towards achieving the objective of the Convention:* The 2014 UNEP Emissions Gap Report suggests that global emissions need to decline from 50 $GtCO_2e$ in 2010 to 42 $GtCO_2e$ in 2030 to have a likely chance of limiting warming to 2°C. This constitutes a 14 percent reduction in emissions from 2010 levels. Our target is a 30 percent reduction from 2010 emissions levels by 2030, going above and beyond average global requirements given our level of development and abatement potential. Emissions peaked by 2005, and our target implies a decarbonization rate of X, given our 2050 target. We also have adopted a multi-year target, limiting cumulative emissions.
Other information	■ *Description of target:* The INDC is a target to reduce emissions 30 percent below 1990 levels by 2030 and to limit cumulative emissions to X $MtCO_2e$ over the period 2021-2030. We also have a long-term target to achieve an 80 percent reduction below 1990 levels by 2050.

ANNEX D. ILLUSTRATIVE EXAMPLE OF PROVIDING INFORMATION FOR A TARGET TO INCREASE SHARE OF RENEWABLE ENERGY GENERATION IN THE NATIONAL ELECTRICITY MIX TO 25 PERCENT BY 2025

INFORMATION ELEMENT	EXAMPLE
The reference point (including, as appropriate, a base year)	■ The current share of renewable energy in the national electricity mix is 10 percent (based on 2013 data)
Time frames and/or periods for implementation	■ The share of renewable energy in the electricity mix will be gradually increased between 2015 and 2025
Scope and coverage	■ *Sectors covered:* Electricity generation ■ *Greenhouse gases covered:* Emissions of CO_2, CH_4, and N_2O will be avoided by increasing the share of renewable energy, which will displace fossil fuels ■ *Geographical coverage:* The target applies to the entire country ■ *Percentage of emissions from national GHG inventory covered:* The electricity generation sector accounts for 40 percent of national emissions, so the target will affect approximately 10 percent of national emissions in the most current inventory (25 percent of 40 percent)
Planning processes	■ New regulations will be advanced to promote renewable energy generation, including a feed-in tariff. The regulations will be legally binding and implemented by the Ministry of Energy.
Assumptions and methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals	■ *Assumed inventory methodology and GWP values:* 2006 IPCC guidelines; AR4 GWP values. However, progress toward the target will be tracked using national electricity generation statistics.
How the Party considers that its intended nationally determined contribution is fair and ambitious, in light of its national circumstances, and how it contributes towards achieving the objective of the Convention as set out in its Article 2	■ *Fairness:* We have judged the fairness of our target based on the following indicators: capability (GDP per capita) and historical and current GHG emissions per capita. We have performed a study of the fairness of our contribution, based on our select indicators; more information can be found at [URL]. ■ *Ambition:* The current share of renewable energy generation in the electricity mix is 10 percent. Current BAU projections show the RE share increasing to 15 percent by 2025 (due to market factors) in the absence of further efforts to promote RE. The annual increase in renewable energy generation needed to achieve the target (20 percent per year) would be unprecedented compared to past rates (which have averaged five percent per year). Achieving a 40 percent share of RE generation by 2025 is considered technically and economically feasible but would require additional support. ■ *How it contributes towards achieving the objective of the Convention:* National emissions are currently 300 $MtCO_2e$ and projected to grow to 500 $MtCO_2e$ by 2025 under a BAU scenario. With the target achieved, national emissions are expected to be 450 $MtCO_2e$ in 2025. (The target is expected to reduce annual emissions by 50 $MtCO_2e$ in 2025 relative to the BAU scenario).
Other information	■ *Description of target:* The INDC is a target to increase the share of renewable energy generation in the national electricity mix to 25 percent by 2025. ■ Additional action that could be achieved with the receipt of support: With international support, the share of renewable energy in the national electricity mix could be increased to 40 percent by 2025.

ANNEX E. EXAMPLES OF CO-BENEFITS OR NON-GHG IMPACTS

Policymakers will design their INDC within a broader context that takes into account various impacts in addition to those on greenhouse gas emissions, including social, economic, and environmental impacts. Table E.1 provides a list of impacts that may be relevant depending on national circumstances. Each can be considered in terms of both positive and/or negative change, depending on objectives.

Table E.1 | **Examples of Environmental, Social, and Economic Impacts**

CATEGORY	EXAMPLES OF CO-BENEFITS OR NON-GHG EFFECTS
Environmental effects	■ Air quality and air pollution, such as particulate matter, ozone, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxide (NO_x), lead, and mercury ■ Water quality, water pollution, and water scarcity ■ Ozone depletion ■ Waste ■ Toxic chemicals/pollutants ■ Biodiversity/wildlife ■ Ecosystem services ■ Deforestation and forest degradation ■ Extent of top soil ■ Quantity and quality of natural resources ■ Energy use
Social effects	■ Public health ■ Quality of life ■ Gender equality ■ Traffic congestion ■ Road safety ■ Walkability ■ Access to energy, thermal comfort, fuel poverty ■ Stakeholder participation in policy-making processes
Economic effects	■ Employment ■ Productivity (such as agricultural yield) ■ Prices of goods and services (such as energy prices) ■ Costs (such as fuel costs) ■ Overall economic activity (such as GDP) ■ Household income ■ Extent of poverty ■ New business/investment opportunities ■ Energy security/independence ■ Imports and exports ■ Inflation ■ Budget surplus/deficit

ANNEX F. OPTIONS FOR FRAMING NATIONAL ADAPTATION GOALS AND OBJECTIVES[53]

As discussed in Chapter 7, Parties may structure their national adaptation goals in a number of ways. These different approaches lead to different challenges with measuring progress (see Annex G). In addition, Parties might wish to consider whether and how their national goals link to resilience-related targets under global goals, such as the SDGs, goals within the new Framework for Disaster Risk Reduction, or a potential adaptation goal agreed under the UNFCCC. Different goal designs would fill different functions and would face different measurement and implementation challenges. This annex describes a typology of goal options and hypothetical examples for the national level.[54]

Outcome-based goals: These are goals linked to the ultimate objective of the Convention (Art. 2)[55] and national priorities. Such goals may be qualitative or quantitative. In some cases, a goal might be expressed as an aspirational or visionary ambition or, in other cases, as an initial step toward a more concrete, measurable target. Examples could include:

- All communities increase their climate resilience
- All communities develop sufficient resilience to achieve and maintain sustainable development
- National measures of impacts and damage from climate hazards show year-on-year improvements
- No net loss of the area or functioning of natural ecosystems or of their biodiversity due to extreme climate events
- Reduce the population living in areas identified as high risk to climate hazards by X percent by year Y with greater reductions in informal settlements
- Identify areas at high risk to climate hazards and increase infrastructure spending by X percent by year Y

Process-based goals: These are goals that focus on enhancing adaptation planning, strengthening governance, building systems that support adaptive capacity, and mainstreaming climate risk management into broader development activities. Process-based goals are easier to track than many outcome-based goals and can be used to provide more immediate feedback. Examples could include:

- The country has a NAP or equivalent process in place by year Y
- Selected national government agencies incorporate climate risk screening into their standard procedures by Year Y
- Adaptation activities identified by the NAP process are fully resourced and under implementation by year Y
- Decision-making around climate change adaptation uses transparent and inclusive mechanisms of social participation, designed with a gender and human rights approach
- All levels of government (national, state, local) have instituted disaster risk management systems by year Y
- Establish a national climate fund to allow the most effective use of public, private and international funds by year Y

Needs-based goals: These are goals based on obtaining or accessing sufficient resources (information, capacity, technology, and finance) to fully support identified adaptation needs. Such goals would probably require a provision requiring that they are reviewed and adjusted periodically in light of aggregate mitigation commitments, projected emission pathways, and other factors likely to lead to shifting estimates of need over time. Examples could include:

- A fully functional hydrometeorological reporting service, meeting WMO standards, is established by year Y, and all citizens have timely access to hydrometeorological information by year Z
- A climate-related university training program is in place by year X, and Y students have graduated by year Z
- Full funding is obtained for the cost of the first five years of the NAP process
- 75 percent of identified NAPA projects are funded by year X
- X percent of gaps identified through the CPEIR process are filled by year Y

Combination goals: These goals are a combination of outcome-, process-, and needs-based goals. For example, an over-arching qualitative goal around outcomes could be accompanied by a time-bound measurable set of national objectives around results, process, and needs.

ANNEX G. TRACKING PROGRESS TOWARDS ADAPTATION GOALS AND OBJECTIVES[56]

Finding appropriate ways to measure the effectiveness of adaptation efforts is a challenge, both for developing an adaptation component of an INDC and tracking progress toward its implementation. Chapter 14 of IPCC AR5 WG II listed 21 criteria for identifying a good indicator for adaptation;[57] clearly, no single indicator is likely to meet all of these criteria. The current consensus among the scientific and technical community is that the most appropriate effectiveness measures are specific to particular adaptation actions and contexts, and focused more on short-term monitoring of processes and outputs than on longer-term outcomes. Such an approach could offer a practical way for many countries to track progress on adaptation components of their INDCs.

Adopting this approach, some of the larger adaptation funds use measures of project/program value, effective implementation, and the overall impact of the fund. The Green Climate Fund, for example, is currently engaged in a comprehensive analysis of its options for tracking results management, and may provide a useful model for approaching similar challenges in developing an adaptation component in the INDC. Recent Green Climate Fund (GCF) Board documents[58] draw upon input from scientific monitoring and evaluation (M&E) specialists and upon experience from other adaptation funds to devise the list of tracking options under consideration. The suggested core measures are the "total number of direct and indirect beneficiaries" and the "number of beneficiaries relative to total population," which are taken as proxies for increasing the target population's adaptive capacity and resilience to climate change. Most of the additional 14 supporting indicators are based on counting outputs assumed to be consistent with greater resilience, such as the number of livelihoods diversified or the number of health measures implemented.

As with most efforts to measure adaptation effectiveness, the GCF indicators face challenges associated with the difficulty of attributing specific outcomes to climate change adaptation and the long time horizons associated with adaptation-specific outcomes. For example, some indicators (such as "number of people with year-round access to reliable and safe water supply despite climate shocks and stresses") will be strongly tied into wider development efforts. Others will not be reliably confirmed for decades (for example *"change in expected losses of lives and economic assets (US$) due to the impact of extreme climate-related disasters in the geographic area of the GCF intervention"*). Some have difficult methodological issues (for example *"value (US$) of ecosystem services generated or protected in response to climate change"*). However, the GCF work shows that while a perfect system is not possible, an adequate system may be agreed upon.

Table G.1 summarizes the wide range of approaches to measuring progress in adaptation, and categorizes them according to the three categories of measurements: outcome, process, and needs. The adopted measures can build upon existing work, such as that of the GCF, and should be compatible with ongoing work on the SDGs. As with the GCF example above, agreement on a domestic process to track adaptation progress will probably require countries to accept that the search for the perfect should not be the enemy of the good.

Table G.1 | **Summary of Approaches to Tracking Progress in Adaptation**[59]

TRACKING APPROACH	DESCRIPTION
OUTCOME MEASUREMENT	
Use direct measures of the impacts of climate-related disasters on human populations	Three examples of direct measures of impacts are people killed, people affected, and money lost (such as the EM-DAT database provided by the Centre for Research on the Epidemiology of Disasters). Each of these three indicators conveys some information, but there are problems with how this information is interpreted or reported. Within a given country, disasters fortunately are relatively rare, which makes it difficult to use them to track climate change impacts. Also, such measures largely miss the effects of less extreme but more frequent events (for example short droughts early in the growing season, heavy rains that damage crops and disrupt travel and communication) that can have significant cumulative effects on livelihoods. Additionally, there is a wide gap between non-Annex I countries and OECD countries, with the average person in some groups of non-Annex I countries currently having a four- to ten-fold higher chance of being affected by a climate disaster than the average person in OECD countries. Thus, there is clearly room for tracking measurable improvement, but attributing that improvement to adaptation rather than other development actions will prove difficult. Despite the drawbacks, direct measures of impact have value as long-term indicators at a national level (for example comparing 1996–2015 with 2031–2050) and can also be compared across groups of countries (for example LDCs and SIDS) to find trends over shorter terms.
Track a basket of indicators of vulnerability or resilience appropriate to national circumstances and priorities	The indicators in the basket can be selected from a range of sectors that track outcomes in adaptation and climate resilience as they relate to development, to determine whether adaptation strategies or investments are meeting their objectives. Guidance in making such selections is becoming more readily available (GIZ and IISD 2014). If the basket of indicators approach is taken it should, wherever possible, be consistent with existing national data collection. Drawing from a time series stretching back a decade or so would be useful for providing early evidence of the effectiveness of adaptation actions.[60] Similarly, it would be efficient if indicators in the basket were to remain consistent with the new SDG indicators.
Develop more complex measures based on multiple indicators	Under this approach, the indicators and methodology may be difficult to agree upon, and the resultant measures, which average many indicators, tend to be slow and muted in their response. A number of multi-indicator measures of vulnerability and capacity already exist, but their results vary widely (IPCC AR5 WGII Chap. 14).
Develop simple measures equivalent to the Human Development Index (HDI) (UNEP 2014a)	The problem is that a simple measure focuses on only a few indicators and is often strongly correlated with wealth (for example, GDP/capita). Thus, the measure will convey little more information than, and is confounded with, information that is already available in many development indicators.
PROCESS MEASUREMENT	
Use a checklist approach	The Hyogo Framework Agreement (UNISDR 2011) uses a score based on the number of agreed steps and achievements in developing responses to climate risk. The checklist includes policy and legislative actions, institutional arrangements, budget and planning processes, and accountability (UNISDR 2014). A similar checklist could be created for adaptation planning or climate-resilient development.
Set benchmarks for future progress	Under this approach, a country would set a pathway with targeted future achievements identified as benchmarks or milestones in the adaptation process. These benchmarks could be outcome- or needs-based, making this approach a combination approach. Setting benchmarks requires consideration of possible future scenarios and explicit treatment of assumptions about conditions that affect the identified adaptation pathway.
NEEDS MEASUREMENT	
Assess needs or gaps with regard to information, capacity, and technology	Again, a checklist approach may be useful. For example, information needs may include upgrading the hydrometeorological reporting systems through a number of steps, gaining regular access to global hydrometeorological data systems, etc.
Use finance/monetary measures to determine the extent of financial needs and the resources available to meet those needs	As described in IPCC AR5 WGII Chapter 17 and UNEP 2014b, estimates of the costs of adaptation, as well as actual expenditures, are subject to considerable differences in the methodologies used and the sectors included. In addition, the interpretation of what constitutes expenditure on adaptation is difficult; many local expenditures are not captured and adaptation expenditures remain difficult to distinguish from other development expenditures.

ANNEX H. ADAPTATION INFORMATION CATEGORIES BASED ON UNFCCC NAP TECHNICAL GUIDELINES PROGRESS REPORTING STRUCTURE[61]

The context

- A summary of relevant information about national circumstances, as appropriate
- A description of national development priorities, objectives and circumstances, which provided the basis for the development of the NAP
- Information on vulnerability to the adverse effects of climate change, including an identification of vulnerable areas that are most critical
- Information on features of geography, climate and economy which might affect the country's ability to make progress in the NAP process, as well as information regarding specific needs and concerns arising from the adverse effects of climate change
- A description of existing institutional arrangements relevant to the NAP process

Steps in the NAP process

- A general description of steps taken or envisaged under the NAP
- A description of approaches, methodologies, and tools used, as well as any uncertainties or challenges faced in using them
- Information on and, to the extent possible, an evaluation of, the strategies and measures undertaken under the NAP process. Those strategies and measures with the highest priority should be highlighted
- A report on the use of other policy frameworks, projects and/or programs for developing and implementing adaptation strategies and measures in the country, and how these have interacted with the NAP process
- Any other information considered relevant to the process and suitable for inclusion in the report

Outcomes of the NAP process

- Information on how the NAP process has progressed toward meeting specific needs and concerns arising from the adverse effects of climate change
- Information on how the NAP process has progressed toward integrating climate change adaptation concerns into national development planning

GLOSSARY

Activity-based accounting: Land-use accounting approach that assesses land-use emissions and removals based on select land-use activities.

Allowance: Generated by emissions trading programs and issued to emitting entities to be traded or used to comply with emissions obligation.

Base period: An average of multiple years of historical data against which emissions are compared over time.

Base year: A specific year of historical data against which emissions are compared over time.

Base year emissions target: Mitigation target that aims to reduce, or control the increase of, emissions relative to an emissions level in a historical base year.

Base year intensity target: Mitigation target that aims to reduce emissions intensity (emissions per unit of another variable, typically GDP) by a specified quantity relative to a historical base year.

Baseline scenario: A reference case that represents future events or conditions most likely to occur in the absence of activities taken to meet the mitigation target.

Baseline scenario emissions: An estimate of GHG emissions or removals associated with a baseline scenario.

Baseline scenario target: Mitigation target that aims to reduce emissions by a specified quantity relative to projected baseline scenario emissions.

Business-as-usual (BAU) scenario: A reference case that represents future events or conditions most likely to occur as a result of implemented and adopted policies and actions.

CO_2 equivalent (CO_2e): The universal unit of measurement to indicate the global warming potential (GWP) of each greenhouse gas, expressed in terms of the GWP of 1 unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.

Cumulative emissions: Sum of annual emissions over a defined time period.

Double counting: Occurs when the same transferable emissions unit is counted toward the mitigation target of more than one jurisdiction. Double counting includes double claiming, double selling, and double issuance of units.

Dynamic baseline scenario: Baseline scenario that is recalculated during the target period based on changes in emissions drivers.

Dynamic baseline scenario target: Mitigation target that aims to reduce, or control the increase of, emissions relative to a dynamic baseline scenario.

Emission reduction: Reduction in greenhouse emissions relative to a base year or baseline scenario.

Emissions: The release of greenhouse gases into the atmosphere. For simplicity, this standard often uses the term "emissions" as shorthand for "emissions and removals."

Emissions drivers: Socioeconomic parameters that cause emissions to grow or decline, such as economic activity, population, and energy prices.

Emissions intensity: Greenhouse gas emissions per unit of another variable, such as economic output (GDP), energy (MWh), or population.

Emissions source: Any process, activity or mechanism that releases a greenhouse gas into the atmosphere.

Fixed-level target: A mitigation target that aims to reduce, or limit the increase of, emissions to an absolute emissions level in a target year.

Flux: Includes both transfers of carbon from one carbon pool to another and non-CO_2 emissions arising from activities such as prescribed burning and manure management.

Geographic boundary: The physical territory covered by the target.

Global warming potential (GWP): A factor describing the radiative forcing impact (degree of harm to the atmosphere) of 1 unit of a given GHG relative to 1 unit of CO_2.

Greenhouse gases (GHGs): For the purposes of this standard, GHGs are the seven gases covered by the Kyoto Protocol: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen triflouride (NF_3).

Greenhouse gas inventory: A quantified list of a jurisdiction's GHG emissions and removals by source, sector, and gas.

Impact: The effects on natural and human systems of extreme weather and climate events and of climate change.

Intended nationally determined contribution: Post-2020 climate actions that Parties intend to take under the 2015 Agreement to contribute to the ultimate objective of the Convention and that have been communicated to the UN Climate Change Secretariat.

Land-based accounting: Land-use accounting approach that assesses land sector emissions and removals based on select land-use categories.

Land sector: Refers to the following land-use categories: forestland, cropland, grassland, wetland, and settlement, consistent with Volume 4 of the IPCC *Guidelines for National Greenhouse Gas Inventories* (2006). It includes emissions and removals from land in agricultural production and grazing lands/grasslands. However, it does not cover accounting for GHG fluxes from on-farm agricultural activities, such as manure management or fossil fuel–based emissions from on-farm use of electricity, heat, or vehicles.

Land sector accounting approach: The way land sector emissions and removals are accounted for toward the target—from either select land-use categories or select land-use activities. There are two accounting approaches for the land sector: land-based accounting and activity-based accounting.

Land sector accounting method: Used to assess emissions and removals within each selected land-use category or activity. Land-use accounting methods include the net-net (accounting relative to base year/period emissions), forward-looking baseline, and gross-net methods (accounting without reference to base year/period or baseline scenario emissions).

Leakage: Increase in emissions outside of the target boundary that occur as a consequence of activities, such as policies, actions, and projects, implemented to meet the target.

Legacy effect: The effect of past management practices on carbon stocks, which causes stocks to vary even in the presence of sustainable management.

Managed land proxy: Estimates of emissions and removals on managed lands that are used as a proxy to remove non-anthropogenic fluxes as part of the land-based accounting approach.

Mitigation target: Commitment to reduce, or limit the increase of, GHG emissions or emissions intensity by a specified quantity, to be achieved by a future date.

Multi-year target: A target designed to achieve emission reductions or reductions in intensity over several years of a target period.

National adaptation plan (NAP): A process established under the Cancun Adaptation Framework (CAF) to enable least developed country Parties (LDCs) to formulate and implement national adaptation plans as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programs to address those needs. Other developing countries were also invited under the CAF to develop NAPs.

National adaptation programme of action (NAPA): A process established to provide the least developed country Parties (LDCs) the opportunity to identify priority activities that respond to their urgent and immediate needs to adapt to climate change—those for which further delay would increase vulnerability and/or costs at a later stage.

Net GHG emissions: The aggregation of GHG emissions and removals.

Offset credit: Represents the reduction, removal, or avoidance of GHG emissions from a specific project that is used to compensate for GHG emissions occurring elsewhere. One offset credit represents 1 tonne of CO_2 equivalent.

Policy and action: Interventions taken or mandated by a government, institution, or other entity, which can include laws, regulations, and standards; taxes, charges, subsidies and incentives; information instruments; voluntary agreements; implementation of new technologies, processes, or practices; and public or private sector financing and investment, among others.

Removal: Removal of GHG emissions from the atmosphere through sequestration or absorption; for example, the absorption of carbon dioxide by forests and other vegetation during photosynthesis.

Retired: Refers to a unit used by the purchaser and no longer valid for future sale.

Single-year target: A target designed to achieve reduction in emissions or emissions intensity by a single target year.

Static baseline scenario: A baseline scenario fixed throughout the target period and not recalculated based on changes in emissions drivers.

Static baseline scenario target: Mitigation target that aims to reduce, or control the increase of, emissions relative to a static baseline scenario.

Target boundary: The greenhouse gases, sectors, and geographic area covered by a target.

Target level: The quantity of emission reductions or emissions and removals within the target boundary in the target year or period that the Party commits to achieving.

Target year: The year by which the target is to be met.

Target year emissions: Emissions and removals in the target year(s) for all gases and sectors included in the target boundary.

Trajectory target: A commitment to reduce, or control the increase of, emissions to specified emissions quantities in multiple target years or periods over a long time period (such as targets for 2020, 2030, and 2040 over the period 2020-2050).

Transferable emissions units: Emissions allowances and offset credits from market mechanisms outside the target boundary that are used toward meeting a mitigation target or are sold to other jurisdictions.

Vulnerability: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

ACRONYMS

AAU	Assigned Amount Units
ADP	Ad Hoc Working Group on the Durban Platform for Enhanced Action
AFOLU	Agriculture, forestry and other land use
AR4	Fourth Assessment Report
AR5	Fifth Assessment Report
BAU	Business-as-usual
BECCS	Bioenergy with carbon capture and storage
BNEF	Bloomberg New Energy Finance
CDM	Clean Development Mechanism
CDR	Carbon dioxide removal
CER	Certified Emission Reductions
CH_4	Methane
CLIMACAP	Integrated Climate Modeling and Capacity Building Project in Latin America
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of the Parties
CPEIR	Climate Public Expenditure and Institutional Review
CREDC	Centre for Research on the Epidemiology of Disasters
CTCN	Climate Technology Centre and Network
EIA	U.S. Energy Information Administration
ERU	Emission reduction units
EST	Environmentally sustainable technology
ETS	Emissions trading system
EU ETS	European Union Emission Trading System
EUA	European Union Allowances
GDP	Gross domestic product
GHG	Greenhouse gas
Gt	Gigatonne
GTREI	Global Trends in Renewable Energy Investment
GWP	Global warming potential
HFCs	Hydrofluorocarbons
IDFC	International Development Finance Club
IEA	International Energy Agency
IMCCC	Singapore's Inter-Ministerial Committee on Climate Change
INDC	Intended nationally determined contribution
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial processes and product use
JI	Joint Implementation
LDCs	Least developed countries
LEDS	Low emission development strategies
LULUCF	Land use, land-use change, and forestry
LWG	Singapore's Long-term Emissions and Mitigation Working Group
MAC	Marginal abatement cost
MAPS	Mitigation Action Plans and Scenarios
MDBs	Multilateral development banks
Mt CO_2e	Million tonnes of carbon dioxide equivalent
N_2O	Nitrous oxide
NAMA	Nationally appropriate mitigation action

NAP	National adaptation plan
NAPA	National adaptation programme of action
NF_3	Nitrogen trifluoride
NO_x	Nitrogen oxide
OECD	Organisation for Economic Cooperation and Development
PFCs	Perfluorocarbons
PgC	Petagrams of carbon
RD&D	Research, development, and deployment
RE	Renewable energy
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SF_6	Sulfur hexafluoride
SO_2	Sulfur dioxide
TNA	Technology needs assessments
TT:CLEAR	Technology Information Clearing House
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified emission reductions
WRI	World Resources Institute

REFERENCES

Allen, M., D. Frame, C. Huntingford, C. Jones, J. Lowe, M. Meinshausen, and N. Meinshausen. 2009. "Warming Caused by Cumulative Carbon Emissions towards the Trillionth Tonne." *Nature* 458: 1163–66. Accessible at http://www.nature.com/nature/journal/v458/n7242/full/nature08019.html.

Buchner, B., A. Falconer, M. Hervé-Mignucci, and C. Trabacchi. 2013. *The Landscape of Climate Finance 2012*. Climate Policy Initiative, Venice, Italy. Accessible at: http://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2013/.

Centre for Research on the Epidemiology of Disasters EM-DAT Database at www.emdat.be/

CCC (Committee on Climate Change). 2008. "Building a Low-Carbon Economy—The UK's Contribution to Tackling Climate Change." London: H.M. Stationary Office. Accessible at http://archive.theccc.org.uk/aws3/TSO-ClimateChange.pdf.

CPEIR (Climate Public Expenditure and Institutional Review) Accessible at: http://www.aideffectiveness.org/CPEIR

Ellis, K., A. Cambray and A. Lemma. 2013. "Drivers and Challenges for Climate Compatible Development." Climate and Development Knowledge Network (CDKN) Working Paper. Accessible at: http://cdkn.org/wp-content/uploads/2013/02/CDKN_Working_Paper-Climate_Compatible_Development_final.pdf.

GGBP (Green Grown Best Practice). 2014. "Green Growth in Practice: Lessons from Country Experiences." Accessible at: http://www.ggbp.org/report/green-growth-practice-lessons-country-experiences.

GIZ and IISD (International Institute for Sustainable Development). 2014. "Repository of Adaptation Indicators: Real Case Examples from National Monitoring and Evaluation Systems". Accessible at: https://gc21.giz.de/ibt/var/app/wp342deP/1443/wp-content/uploads/filebase/me/me-guides-manuals-reports/giz2014-en-climate-adaptation-indicator-repository.pdf.

Global Carbon Project. 2014. "Global Carbon Budget: Highlights." Accessible at: http://www.globalcarbonproject.org/carbonbudget/14/hl-full.htm.

Global Commission on the Economy and Climate. 2014. "Better Growth, Better Climate: The New Climate Economy Report. Synthesis Report." Accessible at: http://static.newclimateeconomy.report/TheNewClimateEconomyReport.pdf.

Government of Mexico (2015). "Intended Nationally Determined Contribution." Accessible at http://www4.unfccc.int/submissions/INDC/Published%20Documents/Mexico/1/MEXICO%20INDC%2003.30.2015.pdf.

Höhne, N., C. Ellermann and H. Fekete. 2014. "Process guidance for Intended Nationally Determined Contributions (INDCs)." International Partnership on Mitigation and MRV. Accessible at: http://mitigationpartnership.net/sites/default/files/ipmm_2014_process_guidance_for_intended_nationally_determined_contributions_indcs.pdf.

IDFC. 2013. "Mapping of Green Finance Delivered by IDFC Members in 2012." International Development Finance Club (IDFC). Accessible at: http://www.idfc.org/Downloads/Publications/01_green_finance_mappings/IDFC_Green_Finance_Mapping_Report_2013_11-01-13.pdf.

IFC and EBRD (International Finance Corporation and European Bank for Reconstruction and Development). 2013. "Climate Risk Case Study—Pilot Climate Change Adaptation Market Study: Turkey. Washington, D.C.: IFC and IBRD.

Illman, J. et al. 2014. "Practical Methods for Assessing Private Climate Finance Flows." Nordic Council of Ministers, Nordic Council of Ministers Secretariat.

IPCC (Intergovernmental Panel on Climate Change). 2003. "Good Practice Guidance for Land Use, Land-Use Change and Forestry." Accessible at http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html.

IPCC. 2006. "Guidelines for National Greenhouse Gas Inventories." Accessible at: http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC (Gupta, S., D. Tirpak, N. Burger, J. Gupta, N. Höhne, A. Boncheva, G. Kanoan, C. Kolstad, J. A. Kruger, A. Michaelowa, S. Murase, J. Pershing, T. Saijo, and A. Sari). 2007. "Policies, Instruments, and Co-operative Arrangements." In *Climate Change 2007: Mitigation of Climate Change*. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. [B. Metz, O. Davidson, P. Bosch, R. Dave, and L. Meyer, eds.] Cambridge: Cambridge University Press. Accessible at: http://www.ipcc.ch/pdf/ assessment-report/ar4/wg3/ar4-wg3-chapter13.pdf.

IPCC. 2013a. "*Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*." Accessible at http://www.ipcc-nggip.iges.or.jp/home/2013KPSupplementaryGuidance_inv.html.

IPCC. 2013b. "Summary for Policymakers." In *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. [T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley, eds.] Cambridge: Cambridge University Press. Accessible at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf.

IPCC (L. Clarke, K. Jiang, K. Akimoto, M. Babiker, G. Blanford, K. Fisher-Vanden, J.-C. Hourcade, V. Krey, E. Kriegler, A. Löschel, D. McCollum, S. Paltsev, S. Rose, P.R. Shukla, M. Tavoni, B.C.C. van der Zwaan, and D.P. van Vuuren). 2014a. "Assessing Transformation Pathways." In: *Climate Change 2014: Mitigation of Climate Change.* Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press. Accessible at: http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter6.pdf.

IPCC. 2014b. "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects". Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [C.B. Field, V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White, eds]. Cambridge and New York: Cambridge University Press. Accessible at: https://ipcc-wg2.gov/AR5/images/uploads/WGIIAR5-PartA_FINAL.pdf.

IPCC (G. Blanco, R. Gerlagh, S. Suh, J. Barrett, H. C. de Coninck, C. F. Diaz Morejon, R. Mathur, N. Nakicenovic, A. Ofosu Ahenkora, J. Pan, H. Pathak, J. Rice, R. Richels, S. J. Smith, D. I. Stern, F. L. Toth, and P. Zhou). 2014c. "Drivers, Trends and Mitigation." In: *Climate Change 2014: Mitigation of Climate Change.* Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press. Accessible at: http://report.mitigation2014.org/drafts/final-draft-postplenary/ipcc_wg3_ar5_final-draft_postplenary_chapter5.pdf.

Jachnik, R., R. Caruso and A. Srivastava. 2015. "Estimating Mobilised Private Climate Finance: Methodological Approaches, Options and Trade-offs." OECD Environment Working Papers, No. 83, Paris: OECD Publishing. http://dx.doi.org/10.1787/5js4x001rqf8-en.

Kekana, M. J. 2015. "Progress Report on South Africa's Plan for INDC Process." Presentation at 2nd African Regional Technical Dialogue on Intended Nationally Determined Contributions. 27-29 January, 2015, Addis Ababa, Ethiopia. Accessible at: http://www.lowemissiondevelopment.org/docs/Maesela_Kekana_South_Africa_-_Country_Progress_on_INDC_Preparation.pdf.

Lazarus, M., A. Kollmuss, and L. Schneider. 2014. "Single-year mitigation targets: unchartered territory for emissions trading and unit transfers." Stockholm: Stockholm Environment Institute.

LECB (Low Emission Capacity Building Progamme). 2014. "Report on Sources of Support for the Preparation of Intended Nationally Determined Contributions (INDCs): Revised Technical Note." Accessible at: http://www.lowemissiondevelopment.org/docs/Support_for_INDC_Preparation.pdf.

Least Developed Countries Expert Group. 2012. "National Adaptation Plans: technical guidelines for the national adaptation plan process." Bonn: UNFCCC secretariat. December 2012. Accessible at: http://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high__res.pdf.

Lütken, S. E. 2014. "Partnership Financing Nationally Appropriate Mitigation Actions: A primer on the financial engineering of NAMAs." UNEP DTU Partnership, Copenhagen, September 2014.

MAPS (Mitigation Action Plans and Scenarios). 2014. "Thoughts on the choice of form of an INDC." Working Paper, Issue 27. Available at: http://www.mapsprogramme.org/wp-content/uploads/Paper_Thoughts-choice-of-INDC-1.pdf.

Matthews, H. D., N. Gillett, P. Stott, and K. Zickfeld. 2009. "The Proportionality of Global Warming to Cumulative Carbon Emissions." *Nature* 459: 829–32. Accessible at: http://www.nature.com/nature/journal/v459/n7248/full/nature08047.html.

Meinshausen, M., N. Meinshausen, W. Hare, S. Raper, K. Frieler, R. Knutti, D. Frame, and M. Allen. 2009. "Greenhouse gas Emission Targets for Limiting Global Warming to 2°C." *Nature* 458: 1158–62. Accessible at: http://www.nature.com/nature/journal/v458/n7242/full/nature08017.html.

Michaelowa, A., and K. Michaelowa. 2011. "Coding Error or Statistical Embellishment? The Political Economy of Reporting Climate Aid." *World Development* vol. 39, no. 11.

Ministry of Environment and Forests. 2008. "Bangladesh Climate Change Strategy and Action Plan 2008". Government of the People's Republic of Bangladesh, Dhaka, Bangladesh. Accessible at: http://www.sdnbd.org/moef.pdf.

Ministry of Environment of Chile (Office of Climate Change). 2014. "Antecedentes para la Contribución Nacional Tentativa de Chile (Mitigación) ante la Convención Marco de Naciones Unidas de Cambio Climático: Resumen para Tomadores de Decisiones."

Ministry of Tourism, Environment and Natural Resources. 2010. "Zambia's National Climate Change Response Strategy." Government of Republic of Zambia. Accessible at: http://www.undp-alm.org/sites/default/files/downloads/zambia-climate_change_response_strategy.pdf.

Miola, A. and C. Simonet. 2014. "Concepts and Metrics for Climate Change Risk and—Towards an Index for Climate-Resilient Development." European Commission Joint Research Centre (EC JRC) Science and Policy Reports. Accessible at: https://ec.europa.eu/jrc/sites/default/files/lb-na-26587-en-n.pdf.

National Research Council of the National Academies. 2010. "Adapting to the Impacts of Climate Change: America's Climate Choices." Panel on Adapting to the Impacts of Climate Change and Board on Atmospheric Sciences and Climate. Washington, DC: National Academies Press. Accessible at: http://books.nap.edu/openbook.php?record_id=12783&page=R1.

OECD (Organization for Economic Co-operation and Development). 2009. "Focus on Citizens: Public Engagement for Better Policy and Service. Multilingual Summaries." Paris: OECD Rights and Translation unit (PAC). Accessible at: http://www.oecd.org/dataoecd/20/3/42658029.pdf.

OECD. 2011. Handbook on OECD-DAC Climate Markers. Available at: http://www.oecd.org/dac/stats/48785310.pdf.

OECD. Emissions Accounting under the UNFCCC." Climate Change Expert Group Paper No. 2013 (1). Paris: Organisation for Economic Co-operation and Development. Accessible at: http://www.oecd.org/env/cc/Made%20to% 20Measure_Final.pdf.

Okereke, C., P. Baral, and Y. Dagnet. 2014. "Options for Adaptation and Loss & Damage in a 2015 Climate Agreement." ACT 2015 Working Paper. Avaliable at: http://act2015.org/ACT_2015_Options_for_Adaptation_and_Loss_&_Damage.pdf.

Peterson, A.C. and P. Terpstra. 2015. "Tracking Adaptation Finance: An Approach for Civil Society Organizations to Improve Accountability for Climate Change Adaptation." Oxford: Oxfam.

Polycarp, C., L.H. Brown, and X. Fu-Bertaux. 2013. "Mobilizing Climate Investment: The Role of International Climate Finance in Creating Readiness for Scaled-Up, Low-Carbon Energy." Washington, D.C.: World Resources Institute.

Prag, A., C. Hood, and P. Martins Barata. 2013. "Made to Measure: Options for Emissions Accounting under the UNFCCC." Climate Change Expert Group Paper No. 2013 (1). Paris: Organisation for Economic Co-operation and Development. Accessible at: http://www.oecd.org/env/cc/Made%20to% 20Measure_Final.pdf.

République Gabonaise." 2015. "Contribution prévue déterminée au niveau national – Conférence des Parties 21." Accessible at: http://www4.unfccc.int/submissions/INDC/Published%20Documents/Gabon/1/20150331%20INDC%20Gabon.pdf.

PwC (PricewaterhouseCoopers) 2013. "Stimulating private sector engagement and investment in building disaster resilience and climate change adaptation—Recommendations for public finance support." London: PricewaterhouseCoopers LLP.

Searchinger, T., and R. Heimlich. 2015. "Avoiding Bioenergy Competition for Food Crops and Land." Washington, D.C.: World Resources Institute. Accessible at: http://www.wri.org/publication/avoiding-bioenergy-competition-food-crops-and-land. Working Paper.

Terpstra, P.Q., A. Peterson Carvalho, and E. Wilkinson. 2013. "The Plumbing of Adaptation Finance: Accountability, Transparency and Accessibility at the Local Level." Washington, D.C.: World Resources Institute. Working Paper. Accessible at: www.wri.org/publication/ the-plumbing-of-adaptation-finance.

Trabacchi, C. and M. Stadelmann. 2013. "Making Adaptation a Private Sector Business: Insights from the Pilot Program for Climate Resilience in Nepal." San Giorgio Group Case Study. Climate Policy Initiative. Accessible at http://climatepolicyinitiative.org/wp-content/uploads/2013/12/SGG-Case-Study-Pilot-Program-for-Climate-Resilience-in-Nepal.pdf.

UNDP (United Nations Development Programme) and UNFCCC (United Nations Framework Convention on Climate Change). 2010. "Handbook for Conducting Technology Needs Assessment for Climate Change." New York: United Nations Development Programme.

UNDP (United Nations Development Programme), UNEP (United Nations Environment Programme), The World Bank, and World Resources Institute. 2011. "World Resources 2010-2011: Decision-Making in a Changing Climate." Accessible at: http://www.wri.org/publication/world-resources-report-2010-2011.

UNEP (United Nations Environment Programme). 2013. "The Emissions Gap Report 2013." Nairobi: United Nations Environment Programme. Accessible at: http://www.unep.org/pdf/UNEPEmissionsGapReport2013.pdf.

UNEP. 2014a. "Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience." Nairobi: United Nations Environment Programme. Accessible at: http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf.

UNEP. 2014b. "The Adaptation Gap Report 2014." Nairobi: United Nations Environment Programme. Accessible at: http://www.unep.org/climatechange/adaptation/gapreport2014/portals/50270/pdf/AGR_FULL_REPORT.pdf.

UNEP. 2014c. "The Emissions Gap Report 2014." Nairobi: United Nations Environment Programme. Accessible at: http://www.unep.org/publications/ebooks/emissionsgapreport2014/.

UNISDR (United Nations International Strategy for Disaster Reduction). 2011. "Hyogo Framework for Action 2005-2015. Building the Resilience of Nations and Communities to Disasters." Mid-term Review 2010-2011. Geneva: UNISDR. Accessible at: http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf.

UNISDR. 2014: "Post-2015 Framework for Disaster Risk Reduction: a proposal for monitoring progress." Accessible at: http://www.wcdrr.org/documents/wcdrr/prepcom1/Indicator%20system%20for%20Post%202015%20Framework%20June%202015_v2.pdf.

UNFCCC. 1992. United Nations Framework Convention on Climate Change. Accessible at: http://unfccc.int/files/essential_background/convention/background/application/pdf/convention_text_with_annexes_english_for_posting.pdf.

UNFCCC. 2000. "UNFCCC Guidelines on Reporting and Review." FCCC/CP/1999/7. Accessible at: http://unfccc.int/files/national_reports/annex_i_ natcom/_guidelines_for_ai_nat_comm/application/ pdf/01_unfccc_reporting_guidelines_pg_80–100.pdf.

UNFCCC. 2013. "Compilation of information on nationally appropriate mitigation actions to be implemented by developing country Parties." 28 May 2013. FCCC/SBI/2013/Inf.12/Rev.2 at http://unfccc.int/resource/docs/2013/sbi/eng/inf12r02.pdf.

UNFCCC. 2014a. UNFCCC Standing Committee on Finance. "2014 Biennial Assessment and Overview of Climate Finance Flows Report." Accessible at: http://unfccc.int/files/cooperation_and_support/financial_mechanism/standing_committee/application/pdf/2014_biennial_assessment_and_overview_of_climate_finance_flows_report_web.pdf.

UNFCCC. 2014b. "What are the technology needs of developing countries?" Accessible at: http://unfccc.int/ttclear/templates/ttclear/misc_/StaticFiles/gnwoerk_static/HOME_carousel/ff36315120154f119f19b295f348e700/329ae298f41f40708df6344b0618d39c.pdf.

UN Global Compact. 2011. "Adapting for a Green Economy: Companies, Communities and Climate Change. A Caring for Climate Report." UN Global Compact, UN Environment Programme, Oxfam and the World Resources Institute.

U.S. EPA (U.S. Environmental Protection Agency). 2014. "Identifying and Evaluating Policy and Program Options." Washington, D.C.: U.S. EPA. Accessible at: http://www.epa.gov/statelocalclimate/local/activities/policy-options.html.

Venugopal, S., and A. Srivastava. 2012. "Moving the Fulcrum: A Primer on Public Climate Financing Instruments Used to Leverage Private Capital." Washington, D.C.: World Resources Institute.

Wilkinson, E., A. Caravani, N.C. Trujillo, S. Nakhooda, P. Terpstra, and A.P. Carvalho. 2014. "Going in the right direction? Tracking adaptation finance at the subnational level." Overseas Development Institute, Oxfam, World Resources Institute. Accessible at: http://www.wri.org/sites/default/files/Going_in_the_right_direction.pdf.

WRI (World Resources Institute) in collaboration with United Nations Development Programme, United Nations Environment Programme, and World Bank. 2011. "World Resources 2010–2011: Decision Making in a Changing Climate—Adaptation Challenges and Choices". Washington, D.C.: World Resources Institute.

WRI. 2014a. "GHG Protocol Mitigation Goal Standard." Washington, D.C.: World Resources Institute. Accessible at: http://ghgprotocol.org/mitigation-goal-standard.

WRI. 2014b. "GHG Protocol Policy and Action Standard." Washington, D.C.: World Resources Institute. Accessible at: http://ghgprotocol.org/policy-and-action-standard.

Zickfeld, K., M. Eby, H.D. Matthews, A. Weaver, and H.J. Schellnhuber. 2009. "Setting Cumulative Emissions Targets to Reduce the Risk of Dangerous Climate Change." *Proceedings of the National Academy of Sciences of the United States of America* 106 (38):16129–34. Accessible at http://www.pnas.org/content/106/38/16129.

ENDNOTES

1 In the absence of accounting rules, given differences in data and methodologies, accurate aggregation of the effects of Parties' INDCs may be challenging.

2 See Decision 1/CP.17.

3 See paragraph 1 of FCCC/CP/2009/L.7 and paragraph 4 of FCCC/CP/2010/7/Add.1.

4 With a possible strengthening of the long-term global goal to 1.5°C pending the outcomes of a scientific review under the Convention being held from 2013 to 2015 (http://unfccc.int/science/workstreams/the_2013-2015_review/items/6998.php).

5 There is also a process to review this goal in the context of the overall objective of the Convention, with the consideration of adoption of a 1.5°C goal.

6 Stabilization of greenhouse gas concentrations at 430-480 ppm CO_2e allows for a likely chance of limiting warming to 2°C. See Chapter 6, and Table 6.3 in Chapter 6, in IPCC 2014a.

7 This list is drawn from the regional INDC dialogues, as well as UNDP et al. 2011; Ellis et al. 2013; GGBP 2014; and IPCC 2014a.

8 Yet many countries lack inter-ministerial committees and/or leadership at the highest level. For example, a 2010 survey of 45 countries by UNDP found that only 46 percent had inter-ministerial committees or councils to manage climate issues, and many of these inter-ministerial committees lacked high-level political support. Of the countries with inter-ministerial committees, 52 percent of these committees sit under the ministry of environment, 43 percent under the president, premier or prime minister's office, and five percent under the ministry of planning and development (WRI 2011).

9 For Parties that have a NAP or equivalent planning process, NAP-related documents will likely be a very good source of information and data for many of these categories. Typically, an early step in national adaptation planning will be a synthesis of available information on climate risk, vulnerability, and adaptation activities. Chapter 7 addresses in more detail the opportunity for INDCs to draw upon national adaptation planning processes, whatever stage they may be in.

10 Baseline scenario targets and base year intensity targets require additional data, explained in Section 6.2.3. Actions require detailed sector-specific data.

11 In the absence of accounting rules, given differences in data and methodologies, accurate aggregation of the effects of Parties' INDCs may be challenging.

12 For example, a Party that proposes to implement a feed-in tariff as part of its policy package might communicate that the policy is expected to lead to the construction of a certain quantity of wind turbines, which is expected to lead to a certain quantity of renewable energy generation, which is expected to lead to a certain quantity of GHG reductions by a given year as wind generation displaces fossil fuel generation.

13 This section is not intended to prejudge the outcome of negotiations related to accounting rules. If there is a common approach to accounting in the land sector, for example, the need for some of the information requirements regarding treatment of the sector will no longer be relevant because Parties will be using the same approach. Indeed, accounting rules would eliminate the need for many information requirements because there would be less divergence among Parties' assessment of emissions reductions.

14 Providing information, especially before a contribution has been finalized, enables national decision-makers to consider, ex-ante, each of the parameters that define their target (for example, base year, target year, use of transferable emissions units). Without domestic clarity on these parameters, it would be difficult for policymakers to plan, design, and implement the mitigation strategies needed to achieve the goal.

15 Options include: accounting relative to a historical base year/period (net-net), accounting relative to a projection of net emissions in the target year (forward-looking baseline), or without reference to base year or baseline scenario emissions (gross-net).

16 Such as relevant IPCC guidance, the Party's forest definition, definition of managed land, list of land-use activities and/or categories included and their definitions, or others.

17 Such as information related to climate change trends, impacts, and vulnerabilities; statement of long-term goals or vision; statement of current and near-term action; statement of gaps, barriers and needs; summary of support; description of monitoring plans, or other information.

18 Available at http://www.iea.org/policiesandmeasures/.

19 Available at http://newclimateeconomy.report.

20 Available at http://newclimateeconomy.report/global-action-plan.

21 The 2013 report focuses on agriculture policies (available at http://www.unep.org/publications/ebooks/emissions-gapreport2013/), while the 2014 report focuses on energy efficiency policies (available at http://www.unep.org/publications/ebooks/emissionsgapreport2014/).

22 This exercise will require addressing any possible double counting of emissions reductions across countries.

23 This section draws on progress made by the UNFCCC under the mechanism for reducing emissions from deforestation and forest degradation, including forest conservation, sustainable forest management and the enhancement of carbon stocks (REDD+), as well as Kyoto Protocol mechanisms, but it is not necessarily bound by these mechanisms. It is also drawn from the GHG Protocol Mitigation Goal Standard. Parties may find it helpful to review other detailed guidance on land sector accounting, such as IPCC 2006, IPCC 2003, or IPCC 2013a.

24 Using projections for the unit of output from the baseline scenario target.

25 The IPCC Fifth Assessment Report (AR5) summarizes the scientific literature and estimates that cumulative carbon dioxide emissions related to human activities need to be limited to 790 PgC since the beginning of the industrial revolution in order to have a likely chance of limiting warming to 2°C (IPCC 2013b).

26 Single-year targets present a risk that purchasers of units could collect offset credits from multiple years during the target period and retire them only in the target year(s) in an effort to meet the target. This could lead to a Party engaging in very minimal mitigation within its borders by choosing instead to retire a large volume of units in the target year. This risk can be mitigated by applying only target-year or target-period vintages towards a target. For further explanation, see Lazarus, Kollmuss, and Schneider 2014; and Prag, Hood, and Martins Barata 2013.

27 To inform this decision, it can be useful to quantify the emissions reductions to be achieved in a given period (described in Section 6.2.6). This quantity can be converted to an annual rate of decarbonization, which can be compared to past rates of decarbonization to understand both the ambition and feasibility of the proposed target.

28 Types of existing credits include Certified Emission Reductions (CER) from the Clean Development Mechanism (CDM), Emission Reduction Units (ERU) from the Joint Implementation (JI) program, Gold Standard Voluntary Emissions Reductions (VERs), or Verified Emission Reductions (VER) from the Verified Carbon Standard, among others. Types of existing allowances include European Union Allowances (EUA) from the European Union Emission Trading System (EU ETS) and Assigned Amount Units (AAU) from the Kyoto Protocol International Emissions Trading program, among others.

29 This exercise will require addressing any possible double counting of emissions reductions across countries.

30 Emissions in the target year(s) can be estimated based on projected level of output in the target year(s).

31 Two rounds of the UNDP-UNFCCC regional technical dialogues on INDCs were held in three regions: Latin American and Caribbean, Africa, and Asia Pacific and Eastern Europe (six workshops in total) between April 2014 and Feb 2015. This chapter is also informed by other informal discussions on INDCs, such as informal consultations by the Peruvian COP Presidency, and the informal meeting on the INDCs held on 10 February 2015 during ADP 2.8.

32 This guidance document uses the phrase "NAP or equivalent process," and the term "NAP" for short, to refer to any national planning process that a) looks at mid-to-long-term adaptation needs and b) aims to integrate climate change adaptation into development. Some countries are using, or planning to use, the UNFCCC NAP guidelines developed by the Least Developed Countries Expert Group (Least Developed Countries Expert Group 2012). Meanwhile, many countries have already created processes for adaptation planning without the use of these guidelines. Examples of such "NAP equivalent" processes include the Bangladesh Climate Change Strategy and Action Plan 2008 at http://www.sndb.org/moef.pdf and Zambia's National Climate Change Response Strategy of 2010 at http://www.undp-alm.org/resources/naps-least-developed-countries-ldcs/zambia%E2%80%99s-national-climate-change-response-strategy-%E2%80%93. National Communications to the UNFCCC, on the other hand, are unlikely to qualify as a "NAP equivalent," because they typically focus on international communications rather than national planning.

33 See Mexico's INDC submission at http://www.semarnat.gob.mx/sites/default/files/documentos/mexico_indc.pdf.

34 This text box is based on Gabon's INDC submission at http://www4.unfccc.int/submissions/INDC/Published%20Documents/Gabon/1/20150331%20INDC%20Gabon.pdf.

35 For example, global data from Climate Funds Update supported by the Overseas Development Institute and the Heinrich Boell Foundation at http://www.climatefundsupdate.org/data; Climate Finance Tracker at http://www.climatefinanceoptions.org/cfo/node/189; UNFCCC at Climate Finance portal at http://www3.unfccc.int/pls/apex/f?p=116:1:3035736490735681; the GEF at http://www.thegef.org/gef/gef_projects_funding: OECD DAC data at http://oe.cd/RioMarkers, or by particular agencies such as World Bank at http://www.worldbank.org/projects/.

36 Available at http://unfccc.int/ttclear/templates/render_cms_page?TNA_home.

37 Recent experiences are documented in UNFCCC 2014b.

38 Available at http://unfccc.int/ttclear/pages/home.html.

39 Available at http://unfccc.int/ttclear/templates/render_cms_page?TEM_home.

40 Available at http://unfccc.int/cooperation_and_support/capacity_building/items/7061.php.

41 Available at https://www3.unfccc.int/pls/apex/f?p=333:1:1563530982038989.

42 The models described in Table 3.1 can help estimate cost for mitigation action.

43 Among other assessments, it would require estimating how much a country is currently expending on coal, oil, and gas exploration, development, transport, processing, and conversion and how much is likely to be spent by both the government and the private sector in the future.

44 For example, assistance may be required to help incorporate climate change objectives into private and government bank loan criteria, develop a legal framework to encourage investing in perceived higher risk renewable projects, develop the institutional framework for fiscal and tax reforms and other measures to allocate capital efficiently, create and issue green bonds, build a venture capital community for emerging mitigation technologies or assess the feasibility of a climate change bank or trust fund.

45 The CPI estimates that of approximately $359 billion in total global finance, most climate finance ($273 billion = 76 percent) is mobilized and deployed in the same country; this is the case for both developed (80 percent of funds deployed) and developing (71 percent of funds deployed) countries. A small amount of climate finance (less than $1 billion) flows from developing to developed countries.

46 Also see the section on market mechanisms (Section 6.2.5).

47 Joint Report on MDB Climate Finance 2013, available at: http://www.eib.org/projects/documents/joint-report-on-mdb-climate-finance-2013.htm.

48 These institutions use relatively simple definitions of climate finance for mitigation and adaptation which incorporate elements that are nearly the same, in essence: "climate finance is that which aims to support measures that reduce emissions and enhance sinks of greenhouse gases and that which aims to reduce vulnerability of, and to enhance the resilience of, human and ecological systems to climate change impacts."

49 Given the lack of a formal definition of climate finance within the UNFCCC, these resources should be interpreted as guidance and should not be taken as a definitive categorization of what should and should not count as mitigation finance.

50 The approach used to classify domestic expenditures (that is the MDB and IDFC approach) can also be applied to classify international support.

51 Available at http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2015. There are some differences between the reports. GTREI, for example, includes an estimate for small-scale renewables, such as roof-top PV units, not tracked by BNEF.

52 With a full range of 2.5-7.8°C when uncertainty is taken into account.

53 A version of this annex was originally published as a WRI Commentary at COP20 in Lima, 2014.

54 This typology draws substantially on analysis done for the ACT2015 consortium on options for adaptation and loss and damage. See Okereke et al. 2014.

55 Specifically, to "allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".

56 This annex draws upon the discussions in preparing UNEP 2014b, in particular Box 2.3.

57 Table 14.3 in IPCC 2014b.

58 GCF/B.08/07: Further Development of the Initial Results Management Framework, available at: http://www.gcfund.org/fileadmin/00_customer/documents/MOB201410-8th/GCF_B.08_07_Further_Development_Initial_Results_ManagementFramework_fin_20141006.pdf.

59 Based on UNEP 2014b.

60 For example, the ND-GAIN Index at http://index.gain.org.

61 Least Developed Countries Expert Group 2012.

ACKNOWLEDGMENTS

We would like to thank the following individuals and institutions for reviewing an earlier draft of this document:

Alexa Kleysteuber, AILAC

Australian Government

Diana Avalos, British Embassy in Mexico City

Stacey Davis, Center for Clean Air Policy

Paolo Cozzi, Center for Clean Air Policy

Lixin Zhang, China Quality Certification Center

Sidi Mohamed El Wavi, Climate Change Coordination Unit and UNFCCC Focal Point, Mauritania

Marion Vieweg, Current Future

Maesela John Kekana, Department of Environmental Affairs, Republic of South Africa

Baptiste Chatre, Ecofys

Evans Njewa, Environmental Affairs Department, Malawi

European Commission

Nele Bünner, GIZ

Julia Olivier, GIZ

Inga Zachow, GIZ

Heiner von Luepke, GIZ

Eduardo Sanhueza, Government of Chile

Marcela Bonilla, Mining and Energy Planning Unit, UPME, Colombia

Carlos García, Mining and Energy Planning Unit, UPME, Colombia

Komi Tomyeba, Ministère de l'Environnement et des Ressources Forestières, TOGO - Lomé

Jose Antonio Prado, Ministerio de Agricultura, Chile

Akiko Urakami, Ministry of Environment, Japan

Benazza Latifa, Ministry of Foreign Affairs, Algeria

Henok Gizachew, Ministry of Industry, Ethiopia

Sarah Baashan, Ministry of Petroleum and Mineral Resources, Saudi Arabia

Annette Rattigan-Leo, Ministry of Sustainable Development, Energy, Science & Technology, Saint Lucia

Gervais Ludovic Itsoua Madzous, Ministry of Tourism and Environment, Republic of Congo

Ann Gan, National Climate Change Secretariat, Prime Minister's Office, Singapore

Moises Alvarez, National Council for Climate Change and Clean Development Mechanism, Dominican Republic

Lisa Horrocks, Ricardo-AEA

Juan Hoffmaister, Independent

Neil Beauchamp, United Kingdom Foreign and Commonwealth Office

Rebecca Carman, United Nations Development Programme

Stephen Gold, United Nations Development Programme

Kim Todd, United Nations Development Programme

Allison Towle, United Nations Development Programme

Damiano Borgogno , UNDP Costa Rica

Daniela Carrington, UNDP Istanbul Regional Hub, Turkey

George Manful, UNEP

Claudio Forner, UNFCCC Secretariat

Matti Goldberg, UNFCCC Secretariat

Olga Pilifosova, UNFCCC Secretariat

United Kingdom Government

United States Department of State

Hana Biru, World Resources Institute

Pankaj Bhatia, World Resources Institute

Yamide Dagnet, World Resources Institute

Thomas Damassa, World Resources Institute

Taryn Fransen, World Resources Institute

Laura Malaguzzi Valeri, World Resources Institute

Jennifer Morgan, World Resources Institute

Eliza Northrop, World Resources Institute

Viviane Romeiro, World Resources Institute

Ranping Song, World Resources Institute

Fred Stolle, World Resources Institute

Pieter Terpstra, World Resources Institute

Joe Thwaites, World Resources Institute

Michael Westphal, World Resources Institute

We are also very grateful for the support from the following individuals from WRI during the editing and publication process: Hyacinth Billings, Courtney Durham, Carni Klirs, Yukti Malhotra, Allison Meyer, Elyse Myrans, and Ben Soltoff, as well as Alston Taggart of Studio Red Design.

This publication was developed in close collaboration with the GIZ and the NewClimate Institute. The "Process Guidance for INDCs" (Höhne et al. 2014) and this document were developed in parallel and complement each other.

This report was generously supported by the United Kingdom Foreign & Commonwealth Office and the German Federal Ministry for Economic Cooperation and Development, as well as the following governments that supported the regional dialogues on INDCs: Australia, Austria, Belgium, the European Commission, France, Germany, Japan, Norway, the United Kingdom, and the United States.

ABOUT THE WORLD RESOURCES INSTITUTE

World Resources Institute is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity and human well-being.

Our Challenge
Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our Vision
We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our Approach

COUNT IT
We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT
We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT
We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.

ABOUT THE UNITED NATIONS DEVELOPMENT PROGRAMME

UNDP works in more than 170 countries and territories, helping to achieve the eradication of poverty, and the reduction of inequalities and exclusion. We help countries to develop policies, leadership skills, partnering abilities, institutional capabilities and build resilience in order to sustain development results.

World leaders have pledged to achieve the Millennium Development Goals, including the overarching goal of cutting poverty in half by 2015. UNDP's network links and coordinates global and national efforts to reach these Goals.

We focus on helping countries build and share solutions in three main areas:
- Sustainable development
- Democratic governance and peacebuilding
- Climate and disaster resilience

In all our activities, we encourage the protection of human rights and the empowerment of women, minorities and the poorest and most vulnerable.

PHOTO CREDITS

Cover photo Federico Rostagno; table of contents ssguy; pg. ii oxygen64; pg. 2 CreativeNature R.Zwerver; pg. 6 ssuaphoto; pg. 10-11 The Danish Wind Industry Association/ Vindmølleindustrien; pg. 12 Cafe Racer; pg. 16, 19, 21 Pavel L Photo and Video/Shutterstock.com; pg. 22 emel82; pg. 27, 51 Asian Development Bank; pg. 28, 55 World Bank Photo Collection; pg. 28-29 Paolo Bona/Shutterstock.com; pg. 29 KieferPix; pg. 30 Viappy/Shutterstock.com; pg. 33 Tolga TEZCAN; pg. 35 (left) Michael Zysman, (right) Pi-Lens; pg. 36 Jake Schmidt; pg. 41 (left) Drop of Light/Shutterstock.com, (right) Jonathan Ernst/World Bank; pg. 42-43 Den Jia; pg. 44 Caroline Eibl; pg. 57 sarapinas; pg. 63 (left) Joel_420/Shutterstock.com, (right) Radu Bercan/ Shutterstock.com; pg. 64 worradirek; pg. 72 akiyoko; pg. 72-73 William Perugini; pg. 73 Meryll; pg. 74 Thor Jorgen Udvang/ Shutterstock.com; pg. 76 Curt Carnemark/World Bank; pg. 82 (left) ronfromyork, (right) kojoku/Shutterstock.com; pg. 86 Nickondr; pg. 88 atm2003; pg. 91 Gyuszko-Photo; pg. 93 Juergen Faelchle.

Each World Resources Institute report represents a timely, scholarly treatment of a subject of public concern. WRI takes responsibility for choosing the study topics and guaranteeing its authors and researchers freedom of inquiry. It also solicits and responds to the guidance of advisory panels and expert reviewers. The views and recommendations in this publication are those of the authors and do not necessarily represent those of WRI, UNDP, the United Nations or its Member States, nor do they necessarily represent those of its funders.

WORLD
RESOURCES
INSTITUTE

10 G STREET NE
SUITE 800
WASHINGTON, DC 20002, USA
+1 (202) 729-7600
WWW.WRI.ORG

ISBN 978-1-56973-862-7