



United Nations  
Climate Change

Katowice  
Committee  
on Impacts



Enhancing the capacity and understanding of Parties, through collaboration and input from stakeholders, on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition

Technical paper by the Katowice Committee on Impacts

# Enhancing the capacity and understanding of Parties, through collaboration and input from stakeholders, on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition

Technical paper by the Katowice Committee on Impacts

© 2022 UNFCCC  
United Nations Framework Convention on Climate Change, the  
Kyoto Protocol and the Paris Agreement

All rights reserved.

This publication is issued solely for public information purposes, including any references to the Convention, the Kyoto Protocol and the Paris Agreement, and any relevant decisions with respect thereto. No liability is assumed for the accuracy or uses of information provided.

#### Creative Commons License

This publication is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License. Excerpts from this publication may be freely quoted and reproduced provided that i) the source is acknowledged, ii) the material is not used for commercial purposes, and iii) any adaptations of the material are distributed under the same license.

All images remain the sole property of their source and may not be used for any purpose without written permission of the source.

#### UNFCCC Logo

Use and display of the UNFCCC logo, including its emblem, is highly restricted and essentially limited to the organization's activities. You may not use any official emblem, flag or logo of the UNFCCC, or any of its other means of promotion or publicity, to represent or imply an association or affiliation with the UNFCCC or its secretariat without the UNFCCC secretariat's prior written consent.

#### For further information contact:

##### Main office

UNFCCC secretariat  
UN Campus  
Platz der Vereinten Nationen 1  
53113 Bonn  
Germany

Telephone +49. 228. 815-10 00  
Telefax +49. 228. 815-19 99

Email: [secretariat@unfccc.int](mailto:secretariat@unfccc.int)  
Website: <https://unfccc.int>

**Katowice Committee of Experts on the Impacts of the Implementation of Response Measures**, is a constituted body which was established in Katowice December 2018 to support the work programme of the forum on the impact of the implementation of response measures

**The Katowice Committee on Impacts may be contacted through the UNFCCC secretariat:**

Platz der Vereinten Nationen 1,  
53113 Bonn  
Germany

Email: [KCI@unfccc.int](mailto:KCI@unfccc.int)  
Website: <https://unfccc.int/process-and-meetings/bodies/constituted-bodies/KCI>

# FOREWORD

by Ovais Sarmad, Deputy  
Executive Secretary, UNFCCC

In three decades since the adoption of the Framework Convention on Climate Change and the establishment of UNFCCC, Parties have consistently made efforts to enhance ambition and accelerate climate action. Evidence-based policy planning and implementation are crucial for a sustainable just transition towards carbon neutrality.

Acknowledging the Parties' needs to better understand the impacts of the implementation of response measures and to enhance the Parties' capacity to use the latest available science for this purpose, the Katowice Committee of Experts on the Impacts of the Implementation of Response Measures (KCI) has been providing technical support since its establishment in 2018.

It gives me great pleasure to present this publication which provides ways to shed light on how climate policy interacts with the economy and translates into social, economic and environmental impacts. The overarching objectives of this report

are three-fold: first, to analyse the impacts of mitigation policies and facilitate next steps for the economic diversification and just transition, second, to identify potential collaborations between Parties and relevant international organizations, and third, to build capacity of Parties for taking appropriate action.

I am confident that this technical paper will be useful to Parties in enhancing their understanding of the impacts of response measures implementation, thus facilitating the undertaking of economic diversification and transformation, and thus contributing to a just transition.

I extend my sincere thanks to Parties, Co-Chairs and experts of the Katowice Committee of Experts on the Impacts of the Implementation of Response Measures (KCI), and secretariat staff for their valuable contribution, without which this publication would not have been possible.



**Ovais Sarmad**  
Deputy Executive  
Secretary, UNFCCC

# FOREWORD

by Peter Govindasamy and Catherine Goldberg, KCI Co-chairs

Parties have identified economic diversification and transformation, and just transition of the workforce and the creation of decent work and quality jobs, as the two main strategies to mitigate the potential impacts of response measures, while enhancing access to the opportunities that emerge from the low carbon transition. There is also a shared view that the assessment and analysis of the economic and social impacts of the implementation of mitigation measures is crucial to facilitate the undertaking of economic diversification and transformation, and just transition.

This technical paper prepared pursuant to Activity 4 of the workplan of the forum and its KCI responds to this need. The paper:

provides information about the ways of assessing and analyzing the impacts of the implementation of response measures;

- identifies possible means to enhance the capacity and understanding of Parties in the assessment and analysis of these impacts; and
- draws on the work of identified organizations, and highlights the scope for further collaboration with those stakeholders.

Notably, the paper posits that the assessment and analysis of the impacts of implementation of response measures can be performed using qualitative and quantitative methods and that these methodological approaches complement each other. It also presents detailed steps for the assessment and analyses of these impacts for the purpose of facilitating the undertaking of economic diversification and transformation and just transition.

We believe that this paper is useful for all Parties and serve as an additional tool to support our collective efforts to take forward the work on assessing and analyzing the impact of Response Measures.



**Peter Govindasamy**  
Co-chair, KCI



**Catherine Goldberg**  
Co-chair, KCI

---

# Abbreviations and acronyms

AC	Adaptation Committee
APAN	Asia-Pacific Adaptation Network
BINGO	business and industry non-governmental organization
CGE	Consultative Group of Experts
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO <sub>2</sub>	carbon dioxide
COP	Conference of the Parties
COVID-19	coronavirus disease 2019
CTCN	Climate Technology Centre and Network
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ENGO	environmental non-governmental organization
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FWG	Facilitative Working Group
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GTAP	Global Trade Analysis Project
ICAT	Initiative for Climate Action Transparency
IDB	Inter-American Development Bank
IEA	International Energy Agency
IETA	International Emissions Trading Association
ILO	International Labour Organization
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
KCI	Katowice Committee of Experts on the Impacts of the Implementation of Response Measures
LCIPP	Local Communities and Indigenous Peoples Platform
LDC	least developed country
LDC work programme	least developed countries work programme
LEG	Least Developed Countries Expert Group
MDB	multilateral development bank
NAP	national adaptation plan
NAP Global Network	National Adaptation Plan Global Network
NDC	nationally determined contribution
NDE	national designated entity
NWP	Nairobi work programme on impacts, vulnerability and adaptation to climate change
OECD	Organisation for Economic Co-operation and Development
PCCB	Paris Committee on Capacity-building
PSP	Poznan strategic programme on technology transfer
RINGO	research and independent non-governmental organization
SAM	social accounting matrix
SBSTA	Subsidiary Body for Scientific and Technological Advice
SCF	Standing Committee on Finance
SDG	Sustainable Development Goal
SIDS	small island developing State(s)
SIDS DOCK	Small island developing States Sustainable Energy and Climate Resilience Organization
TEC	Technology Executive Committee
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WIM	Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts
YOUNGO	youth non-governmental organization

# Contents

Foreword 1 .....	1
Foreword 2 .....	2
Abbreviations and acronyms .....	3
<b>1. Executive summary .....</b>	<b>5</b>
<b>2. Introduction .....</b>	<b>7</b>
A. Background .....	7
B. Objectives of the paper .....	8
<b>3. Ways of assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition .....</b>	<b>9</b>
A. Understanding mitigation policies and actions .....	9
B. Understanding the social, environmental and economic impacts of the implementation of mitigation policies and actions .....	12
C. Overview of methodologies used by Parties and stakeholders for assessing and analysing the impacts that can facilitate economic diversification and just transition .....	20
<b>4. Possible actions and means to enhance the capacity and understanding of Parties, including collaboration with identified organizations, on assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition .....</b>	<b>23</b>
A. Mapping of relevant stakeholders and their work, including organizations working to develop relevant tools, build capacity on assessment methods and collect data .....	23
B. Possible collaboration with stakeholders to enhance capacity on assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition .....	28
<b>5. Conclusions .....</b>	<b>31</b>
<b>Annex I</b>	
Guidance on key features of existing tools for assessing and analysing the impacts of the implementation of response measures .....	32
<b>Annex II</b>	
Collaboration of constituted bodies under the Convention, the Kyoto Protocol and the Paris Agreement with stakeholders .....	35
<b>Annex III</b>	
References .....	40



## EXECUTIVE SUMMARY

Response measures are policies and actions taken to respond to climate change. Under the Convention, the term “response measures” is usually associated with the social, economic and environmental impacts of implementing climate change mitigation policies.

Implementation of mitigation policies and actions can have direct and/or indirect, intended and/or unintended, short-, medium- and/or long-term impacts. These impacts can be felt in the implementing and/or other countries (cross-border impacts).

In this context, Parties to the Convention have identified economic diversification and transformation, as well as just transition of the workforce and the creation of decent quality jobs, as the two main strategies to be implemented in order to mitigate the potential impacts of response measures, while enhancing access to the opportunities that emerge from the transition.

To facilitate just transition and economic diversification and transformation, assessment and analysis of the socioeconomic impacts of the implementation of mitigation policies and actions is crucial.

This technical paper provides information on ways of assessing and analysing the impacts of the implementation of response measures and identifies possible actions and means to enhance the capacity and understanding of Parties, including

collaboration with identified organizations, in the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition.

The assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition can be performed using qualitative and quantitative methodologies which complement each other. The steps for assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition may include:

- a. Identification of key stakeholders and collaborators who can support and provide inputs for carrying out the assessment and the analysis and subsequently contribute to reviewing the results;
- b. Identification of the indicators of relevance to facilitate the undertaking of just transition and economic diversification and transformation;
- c. Identification of the causal relationships and hypothesizing the potential direct and indirect national and cross-border impacts;
- d. Identification of suitable impact assessment methodologies;

- e. Implementation of customization of methods (such as data updates, development of interview questions) that might be required;
- f. Completion of the assessment, as well as analysis of the results relevant to the undertaking of just transition and economic diversification and transformation;
- g. Completion of a report (including the methodology used, results, discussion to analyse the results and conclusions).

Stakeholders of strategic relevance for facilitating the undertaking of just transition and economic diversification and transformation are those that:

- a. Support relevant data generation and maintain databases related to the indicators used to perform the policy assessments;
- b. Are involved in developing methodologies and tools;

- c. Generate knowledge through empirical studies, case studies and assessment guidance documents;
- d. Offer learning opportunities and hands-on trainings.

Various organizations and stakeholders are engaged in a diverse range of activities linked to the assessment and analysis of impacts. The full range of capacities for assessment and analysis and the development of tools and methodologies do not reside within one single institution or stakeholder group.

Several guidance documents are available on undertaking impact assessments; however, none of them provide specific guidance on assessing social and economic impacts with a view to undertaking economic diversification and transformation and/or just transition. Therefore, building the capacity of Parties and enhancing collaboration with stakeholders in this area is essential.



© Photo by Frederik Sørensen/Pexels



# 2



## INTRODUCTION

### A. Background

Response measures are policies and actions taken to respond to climate change. Under the Convention, the term “response measures” is usually associated with the social, economic and environmental impacts of implementing climate change mitigation policies.

To facilitate Parties’ discussions on this issue, the forum on the impact of the implementation of response measures was established under the Convention at COP 16. The forum continues to serve the Paris Agreement. At COP 24, Parties also established the KCI to provide technical support for the work of the forum. The forum and the KCI cover the work of the COP, the CMP and the CMA<sup>1</sup> on all matters relating to the impact of the implementation of response measures.

One of the functions of the forum is to provide concrete examples, case studies and practices to enhance the capacity of Parties, in particular developing country Parties, to deal with the impact of the implementation of response measures.<sup>2</sup> COP 25 mandated the KCI to prepare a technical

paper to enhance the capacity and understanding of Parties, through collaboration and input from stakeholders, on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition.<sup>3</sup>

Under the Paris Agreement, all Parties agreed to aim to reach global peaking of GHG emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid emission reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of this century, on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty. This implies a transformation of all Parties to low-emission societies.

In discussions on response measures, economic diversification and transformation is regarded as one of the strategies to be implemented by countries and regions that are dependent on a

<sup>1</sup> Decision 7/CMA.1, para. 3, decision 7/CP.24, para. 3 and decision 3/CMP. 14, para. 3

<sup>2</sup> Decision 7/CMA.1, annex, para. 1(c).

<sup>3</sup> Decision 4/CP.25.

narrow range of products for which there is clear evidence that they are impacted by measures taken to respond to climate change. To facilitate economic diversification and transformation, countries introduce, for example, regulations and fiscal measures to promote the development of alternative low-emission sectors, green technologies, and so on, while transitioning to low-emission economies (UNFCCC, 2017).

Another strategy that Parties have implemented is just transition of the workforce and creation of decent and quality jobs, often referred to as 'just transition'. Just transition refers to a set of policies and measures put in place by countries to safeguard jobs and livelihoods along with the implementation of actions to combat climate change. Although the concept of just transition is more often linked to the workforce and was included in the Paris Agreement to take into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities, it has wider application. Just transition seeks to enable mitigation measures and mitigate the potential impacts of these on workers and communities, while enhancing access to the jobs, markets and other opportunities that emerge from the transition. It is also applicable to firms, businesses and sectors and their employees and communities that need to change their ways of operating and living as a result of stringent climate change policies. It is a concept that addresses issues concerning communities, including local communities and indigenous peoples, that are specifically impacted during the transition process.

This technical paper builds on previous work done by the forum, such as the existing guidance document on the assessment of the impacts of response measures (UNFCCC, 2016). In addition, it draws on existing work from academic and other research papers, including

on good practices and case studies. It presents information on how assessment and analysis can be undertaken to understand impacts arising from the implementation of response measures with a view to facilitating economic diversification and transformation and just transition. It also explains how the capacity of Parties can be increased in this area through collaboration and inputs from stakeholders.

## **B. Objectives of the paper**

The objectives of the paper are to:

- a. Understand ways of assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition;
- b. Understand the work and role of relevant international organizations in assessing the impacts of mitigation policies to facilitate the undertaking of economic diversification and transformation and just transition and identify organizations that are actively involved in providing capacity-building in this area;
- c. Summarize the methodologies being used by Parties and other stakeholders to assess the impacts of mitigation policies to facilitate the undertaking of economic diversification and transformation and just transition;
- d. Identify possible actions and means to enhance the capacity and understanding of Parties, including collaboration with identified organizations, in the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition.

# 3



## WAYS OF ASSESSING AND ANALYSING THE IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES TO FACILITATE THE UNDERTAKING OF ECONOMIC DIVERSIFICATION AND TRANSFORMATION AND JUST TRANSITION

To facilitate the assessment and analysis of the impacts of the implementation of mitigation policies and actions that can inform the undertaking of economic diversification and transformation, two important and related aspects need to be examined, namely:

- a. Mitigation policies and actions. This section of the paper will describe the types of mitigation policies and actions and map their possible social, environmental and economic impacts and links with just transition and economic diversification and transformation;
- b. The different methodologies used by Parties and non-Party stakeholders for assessing and analysing the impacts of the implementation of response measures that can facilitate economic diversification and transformation and just transition.

### **A. Understanding mitigation policies and actions**

All measures taken by humans to limit and prevent the release of GHG emissions to the atmosphere and/or to remove GHG emissions from the

atmosphere are referred to as mitigation policies and actions (IPCC, 2018). Policy instruments are most commonly classified as being market-based and non-market-based. Market-based policies are also referred to as economic instruments or fiscal policies because they increase prices in order to incentivize polluters to reduce the level of pollution (Hofmann, 2016; Stavins, 1998). These policies include a range of taxes, subsidy reforms and emissions trading schemes. Taxes and subsidies are known as price instruments since they do not directly target quantities of emissions, while emissions trading schemes, especially cap-and-trade schemes, are known as quantity instruments. Government spending and investments (e.g. green bonds, guarantees and concessional loans) can be also classified as price instruments.

Non-market-based policies and measures impose non-monetary incentives to achieve the desired behavioural changes. These include regulatory and information policies, voluntary approaches and government provisions for public goods and services. Examples include standards and labelling.

Generally, a mix of market- and non-market-based instruments are implemented for a particular sector and can be classified as sectoral policies,

such as for the energy, agriculture, forestry and land use, transport, and industry sectors. For example, energy sector policies may include energy efficiency policies for buildings and energy generation, feed-in tariffs, renewable energy deployment policies, or switching to the use of low-carbon fuels. Waste sector policies may include waste management or flue gas regulation, while transport sector policies may include vehicle energy efficiency improvements, vehicle emission regulations, or switching to the use of electric and fuel cell vehicles.

When policies are designed with a geographical or territorial focus in mind, they are also classified as global, bilateral, multilateral, regional, national and local policies (Heidrich et al., 2016) (see figure 1).

In addressing the impacts of the implementation of response measures, consideration is often given to mitigation policies and actions that have potential positive or negative consequences.

It is important to note that although this classification simplifies the understanding of policy

instruments, each policy type could include an element of another type and, as a consequence, most countries implement a mix of these policies in order to, among other things, enhance their appeal among the general public, lower their cost and increase their environmental effectiveness.

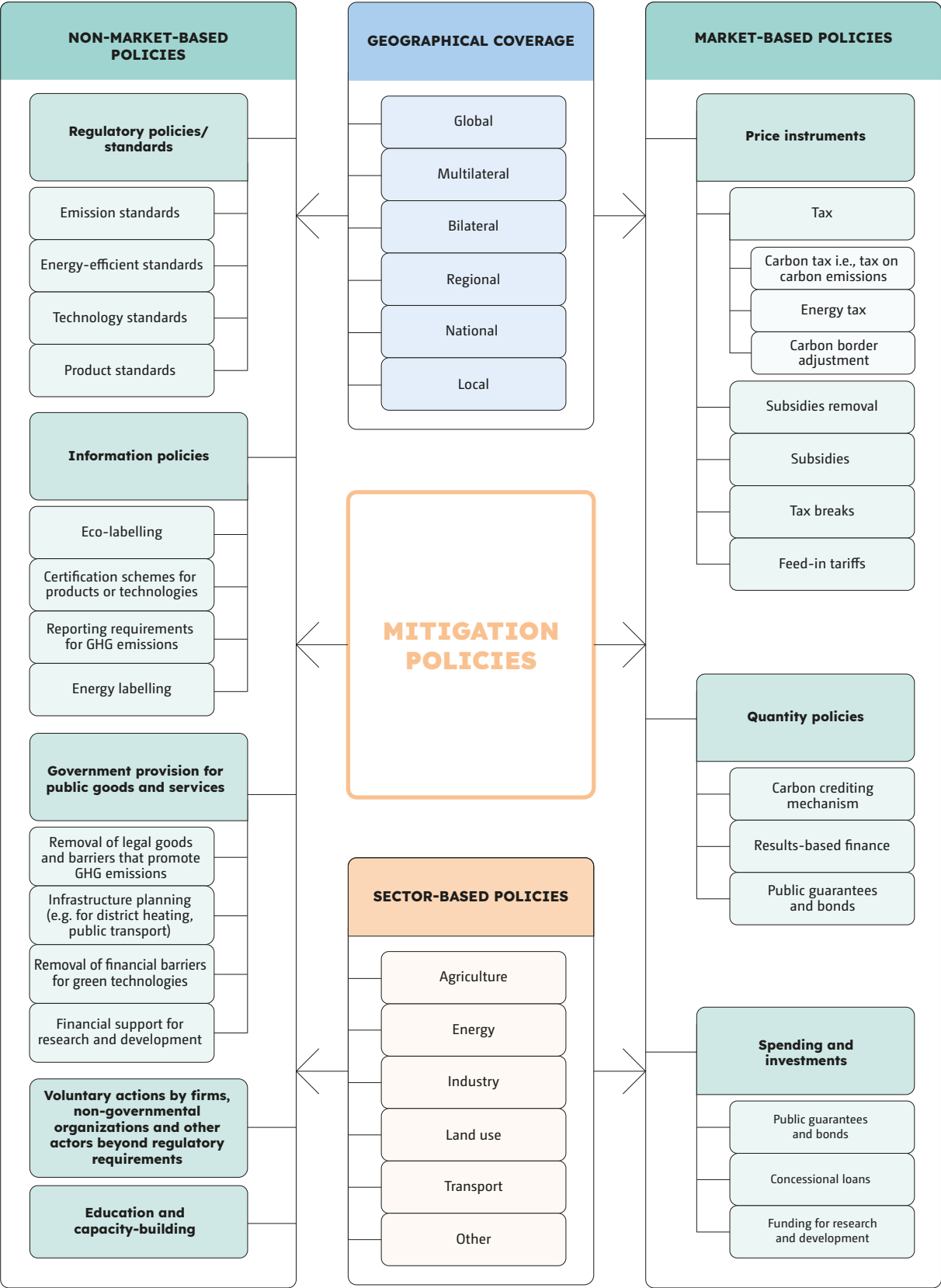
Under the Convention, Parties report the following types of policy actions and measures: regulatory, economic, fiscal, research, information and education instruments and voluntary agreements. Over the four reporting cycles for biennial reports (2014–2019), the clear focus, when taking into account both the total number of measures and the number of measures with a reported quantified impact, has been on economic, fiscal and regulatory instruments, voluntary agreements, or combinations thereof (UNFCCC, 2020).

Just transition and economic diversification and transition measures seek to enable the climate policies discussed above by creating opportunities of economic development and mitigating the potential negative impacts of the low-carbon transition.



© Photo by Mikhail Nilov/Pexels

**FIGURE 1**  
Schematic representation of different types of mitigation policies



Source: Adapted by the authors from UNFCCC (2009).

## **B. Understanding the social, environmental and economic impacts of the implementation of mitigation policies and actions**

Response measures are implemented with the objective of mitigating GHG emissions in a country or region, or for a specific sector. These can result in social, economic, political and environmental impacts. These impacts can be direct and/or indirect, intended and/or unintended, and short, medium and/or long term. They can be felt in the implementing and/or other countries (cross-border impacts).

Social impacts include changes in equality levels between men and women, impacts on social relationships, health, education, ethnic minorities and social groups, indigenous peoples and access to rights. Economic impacts include national or regional impacts on GDP, employment, consumption, production and the income of workers (wages) and their families/households. Environmental impacts include changes in pollution levels (i.e. soil, water and air) and biodiversity impacts.

The impacts of the implementation of response measures can be positive and/or negative and are also related to the achievement of the SDGs (Markkanen and Anger-Kraavi, 2019). Therefore, to effectively measure, assess, analyse and understand these impacts, a holistic approach is required that covers and analyses as wide a range of impacts as possible and establishes measures to address potential negative impacts and enhance potential positive impacts of the implementation of response measures.

The extent and magnitude of the potential negative and positive impacts arising from the implementation of response measures varies between regions and countries, although they can be particularly pronounced for developing countries (UNFCCC, 2008).

When planning and implementing mitigation policies and actions, it is good practice to take steps to ensure that an integrated and coherent approach is applied that is consistent with SDGs to enable countries to achieve their climate and other

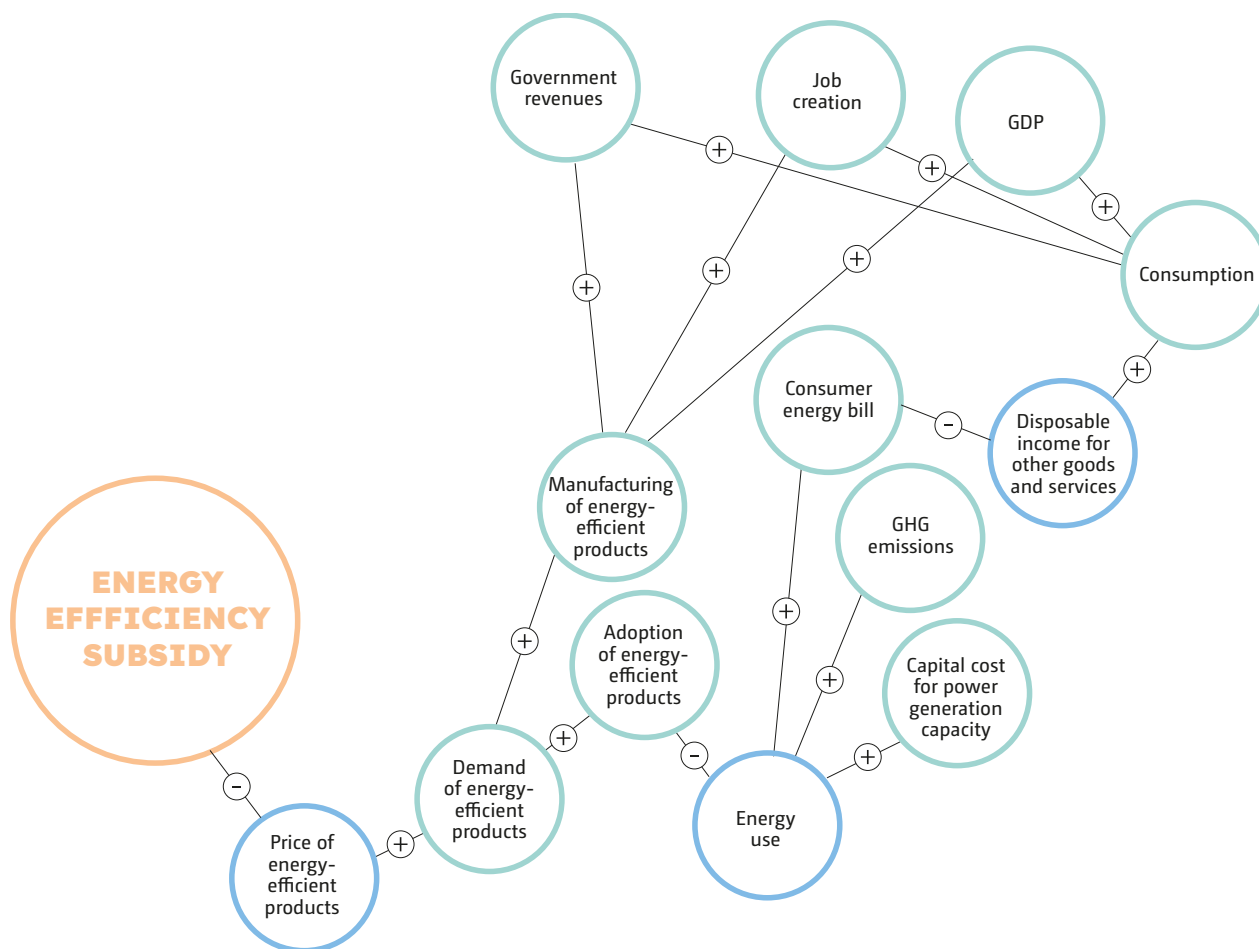
sustainable development objectives efficiently and jointly. In other words, mitigation policies must achieve their primary environmental objective, while at the same time considering measures to minimize or eliminate any adverse socioeconomic impacts, for example giving due consideration to any concerns regarding the well-being of the communities arising from the mitigation policy or action, and enhancing positive impacts.

The COVID-19 pandemic has helped increase understanding and appreciation of the linkages and connections between climate change mitigation policies and actions and their social and economic impacts, both at the national and international level. Social impacts are, for example, changes in peoples' living conditions, whether positive or negative, that occur in conjunction with the implementation of a new policy, programme or project and are experienced or felt at an individual, family or household, or institutional, communal or societal level. Economic impacts are effects of policies or actions on the level of economic activity in a given area and may be measured in terms of measurable output such as GDP, value added, wealth, personal income (wages), public income and expenditure, or employment level (Weisbrod Burton, 1997). Environmental impacts are the changes that a policy or action creates in the environment regarding all three of its dimensions (i.e. soil, water and air).

The changes due to policy implementation are in addition to all other already existing factors and are viewed by those affected as significant social or economic events (Marvin E. Olsen, 1978; Vanclay F, 2002). In complex networks of interlinked policies and economic structures, it is often very difficult to fully attribute the effects, impacts or changes as being the direct outcome of a particular policy. Therefore, to understand the impacts of a policy, it is important to understand how the policy interacts within the economy and translates to social, economic and environmental impacts through its cause-effect chain. Figure 2 shows an example of a causal loop analysis of the introduction of an energy subsidy policy. After implementation, the policy starts a cause-effect chain or results chain affecting business activities, people and the environment. The effects deepen with every link in the chain and need to be measured and managed.

**FIGURE 2**

Cause-effect chain (causal loop) analysis of the introduction of an energy subsidy policy



Note: A link marked positive indicates a positive correlation and a link marked negative indicates a negative correlation between two nodes (variables). It does not indicate the sign of the impact of one variable on another variable that also depends on many other contextual factors.

Environmental, social and economic impacts are assessed and analysed using specific methodologies. However, the impacts are complementary and sometimes overlapping and are usually assessed together with a focus on a specific area (Commonwealth of Australia, 2005). For example, the economic impact of a climate policy that results in changes to jobs or wages may lead to social impacts, such as migration and increasing inequality. It should also be noted that impacts on the workforce, including on job opportunities and wages, are often viewed as social impacts.

Other indicators that can be used for climate policy assessments include impacts on energy security, diversification of energy supply, job opportunities and their distribution, wages (individual or

family income), income inequality, poverty, economic opportunities for rural areas, cultural heritage, air quality, noise, gender inequality and disparity, impacts on indigenous peoples and local communities, as well as changes in the landscape, technological changes and potential displacement of communities. It is also important to note that indicators for a specific study on the impacts of a policy are usually designed and decided on the basis of the policy or specific issue being assessed and the objective or scope of the study (e.g. indicators to assess the impacts of a policy on a rural population will be very different from those to assess the impacts on firms and businesses).

Table 1 provides examples of SDG indicators that can be used to measure and assess the social and economic impacts of a climate policy.

**TABLE 1**

SDG indicators that can be used to measure and assess the social and economic impacts of climate policies

SDG	Indicator
Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.1.1 Annual growth rate of real GDP per capita
	8.2.1 Annual growth rate of real GDP per employed person
	8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate
Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.2.1 Manufacturing value added as a proportion of GDP and per capita
	9.2.2 Manufacturing employment as a proportion of total employment
	9.4.1 CO <sub>2</sub> emission per unit of value added
	9.b.1 Proportion of medium and high-tech industry value added in total value added
Goal 10: Reduce inequality within and among countries	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population
	10.2.1 Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities
	10.4.1 Labour share of GDP, comprising wages and social protection transfers
	10.7.1 Recruitment cost borne by employee as a proportion of yearly income earned in country of destination

Source: Compiled by the authors on the basis of Scott McDonald (2020).

Table 2 lists possible impact areas of selected climate mitigation policies, such as removal of subsidies from carbon-intensive goods and

services, subsidies for low-carbon goods and services, carbon trading, green tariffs and carbon border adjustment.



**TABLE 2**

Possible areas impacted by climate change mitigation policies

Policy	Macroeconomy	Businesses	Households	Health	Environment
Removal of a subsidy for the domestic production of a carbon-intensive good or service	<ul style="list-style-type: none"> <li>•Fiscal savings (direct)</li> <li>•Employment (direct)</li> <li>•Inflation (indirect)</li> <li>•GDP (indirect)</li> <li>•Exports/imports (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Production levels or profit (direct)</li> <li>•Use of capital or labour (direct)</li> <li>•Passing on the cost to consumer prices (indirect)</li> <li>•Competitiveness (indirect/cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Consumption (direct)</li> <li>•Poverty rate and equality (direct)</li> <li>•Employment and wages, including for women and vulnerable communities (indirect)</li> <li>•Demand for imported goods (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Heart diseases and cancer associated with air pollution, asthma, allergies and other respiratory diseases (indirect)</li> <li>•Premature death (indirect)</li> <li>•Road fatalities (indirect)</li> </ul>	<ul style="list-style-type: none"> <li>•GHG emissions (direct)</li> <li>•Air (soil and water) quality (indirect)</li> <li>•Impacts on biodiversity (indirect)</li> </ul>
Subsidy for the domestic production of a low-carbon good or service	<ul style="list-style-type: none"> <li>•Fiscal expenditure, if paid by the government (direct)</li> <li>•Employment (direct)</li> <li>•Short-term and/or long-term GDP (indirect)</li> <li>•Exports/imports (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Production levels (direct)</li> <li>•Use of capital or labour (direct)</li> <li>•Export of subsidized good (cross-border)</li> <li>•Competitiveness (indirect/cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Consumption (direct)</li> <li>•Cost of living (indirect)</li> <li>•Employment and wages, including for women and vulnerable communities (indirect)</li> <li>•Impacts on cross-border consumers (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Heart diseases and cancer associated with air pollution, asthma, allergies and other respiratory diseases (indirect)</li> <li>•Premature death (indirect)</li> <li>•Road fatalities (indirect)</li> </ul>	<ul style="list-style-type: none"> <li>•GHG emissions (direct)</li> <li>•Air (soil and water) quality (indirect)</li> <li>•Impacts on biodiversity (indirect)</li> </ul>
Carbon prices generated as a result of the emissions cap associated with the introduction of a carbon trading scheme	<ul style="list-style-type: none"> <li>•Tax revenue (direct)</li> <li>•Inflation (indirect)</li> <li>•GDP (indirect)</li> <li>•Imports/exports (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Production cost (direct)</li> <li>•Investment in energy efficiency (indirect)</li> <li>•Use of labour and capital (indirect)</li> <li>•Competitiveness (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Consumption (direct)</li> <li>•Cost of living (direct)</li> <li>•Poverty rate and equality (direct)</li> <li>•Employment and wages (indirect)</li> <li>•Consumption of foreign equivalent goods or substitution (indirect/cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Heart diseases and cancer associated with air pollution, asthma, allergies and other respiratory diseases (indirect)</li> <li>•Premature death (indirect)</li> <li>•Road fatalities (indirect)</li> </ul>	<ul style="list-style-type: none"> <li>•GHG emissions (direct)</li> <li>•Air (soil and water) quality (indirect)</li> <li>•Impacts on biodiversity (indirect)</li> </ul>
Green tariff (i.e. reduction of tariff on imported clean energy products)	<ul style="list-style-type: none"> <li>•Opportunity cost of tariff revenues (direct)</li> <li>•GDP (indirect)</li> <li>•Imports/exports (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Market share of clean energy versus conventional energy (direct)</li> <li>•Profits (indirect)</li> <li>•Impacts on exporting companies (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Consumption (direct)</li> <li>•Employment and wages (indirect/cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Heart diseases and cancer associated with air pollution, asthma, allergies and other respiratory diseases (indirect)</li> <li>•Premature death (indirect)</li> <li>•Road fatalities (indirect)</li> </ul>	<ul style="list-style-type: none"> <li>•GHG emissions (direct)</li> <li>•Air (soil and water) quality (indirect)</li> <li>•Impacts on biodiversity (indirect)</li> </ul>
Introduction of carbon border adjustment measures on imported goods	<ul style="list-style-type: none"> <li>•Tax revenues (direct)</li> <li>•GDP (indirect)</li> <li>•Competitiveness (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Production and profits (direct)</li> <li>•Demand for intermediate goods (direct)</li> <li>•Changes in capital or labour (indirect)</li> <li>•Production of and employment within exporting businesses (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Consumption (direct)</li> <li>•Poverty rate and equality (direct)</li> <li>•Employment and wages (indirect)</li> <li>•Availability of local goods (cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•Heart diseases and cancer associated with air pollution, asthma, allergies and other respiratory diseases (indirect/cross-border)</li> <li>•Premature death (indirect/cross-border)</li> <li>•Road fatalities (indirect/cross-border)</li> </ul>	<ul style="list-style-type: none"> <li>•GHG emissions (direct/cross-border)</li> <li>•Air (soil and water) quality (indirect/cross-border)</li> <li>•Impacts on biodiversity (indirect/cross-border)</li> </ul>

**Removal of subsidies from carbon-intensive goods and services** is used to discourage consumption of such goods and services with the intention of reducing GHG emissions. Studies (e.g. Burniaux, Château and Sauvage, 2011) indicate that the removal of consumer subsidies for the use of carbon-intensive fuels in countries that are net energy importers decreases the demand for the product (direct impact) owing to the price increase, which ultimately leads to a decrease in imports (cross-border impact) and a decrease in domestic and global emissions (domestic and cross-border environmental impact). However, the removal of consumer subsidies in countries that are net energy exporters can result in an increase in exports owing to reduced domestic demand for the domestic product (Manzoor, 2012). Ouyang and Lin (2014) concluded that when a fossil fuel subsidy is removed at the same time as a renewable energy subsidy is introduced, the economic benefits per unit of renewable energy subsidy can be larger than the removal of the fossil fuel subsidy alone if the economic value of energy conservation and GHG emission reductions are included.

The removal or reduction of subsidies for both net energy importers and exporters can have positive domestic impacts on reducing GHG emissions and creating fiscal savings (assuming that the subsidies are covered by the government budget). The fiscal savings made by the government can be used for other priority development sectors, leading to indirect social impacts. For example, the reduction of energy subsidies in Indonesia from 3.3 per cent of GDP on average in 2012–2014 to an average of 0.9 per cent in 2015–2018 created fiscal savings which enabled the Government of Indonesia to enhance the share of expenditure on health, infrastructure and social services (IEA, 2016; World Bank, 2019b). In Egypt, a reduction in fossil fuel subsidies from 7 per cent of GDP in 2014 to 2.7 per cent in 2017 and 0.5 per cent in 2019 enabled the Government of Egypt to use the revenue towards national priorities, including health, education and social protection (Goopu, 2018).

**Subsidies for production of low-carbon goods or services.** The aim of introducing or increasing subsidies for renewable energy and energy efficiency technologies for retail consumers is to shift demand without changing the production costs. As the increase in demand replaces the carbon-intensive good or service, the GHG

emissions decrease (environmental impact). An increase in demand for renewable energy and energy-efficient products may lead to more investment in renewable energy resources, as well as technology research and development (Ouyang and Lin, 2014) and encourage firms to innovate to reduce their costs over time. It could also boost jobs in the renewable energy sector, increase imports of renewable energy products (if imported) and reduce electricity blackouts. However, such policies also need to address the investment in transmission networks that may be required to sustain a high penetration level of renewable energy technologies (Myojo and Ohashi, 2018). Such subsidies in one country increase the long-term adoption of renewable energy in other countries because they increase international firms' investment in innovation (Todd Gerarden, 2018).

**Carbon trading.** A number of jurisdictions have piloted or implemented carbon trading, either subnationally (e.g. the Regional Greenhouse Gas Initiative in the United States of America), nationally (e.g. China and the Republic of Korea), regionally (the EU) or cross-jurisdictionally (California, Quebec and Ontario under the Western Climate Initiative). Typically, carbon trading only applies to a subsection of economic activity. Upstream, this often includes the oil and gas sector, whereas downstream, it often includes manufacturing, construction and transportation. Emissions are capped at a desired level and allowances (usually, one allowance gives the right to emit one tonne of CO<sub>2</sub> equivalent) are distributed (often auctioned) to companies covered by the scheme. Emission-intensive and trade-exposed industries, such as cement, iron and steel production, are allocated free emission allowances in the first years of implementation in order to mitigate any impacts on competitiveness, and provide an opportunity to invest in energy efficiency and other improvements in production processes. The cap on emissions can be reduced over a phased implementation period (IETA, 2015).

In order to estimate the impacts of carbon trading, it is necessary to determine the carbon prices that will be generated as a result of the emissions cap. If permits are auctioned, carbon trading schemes generate government revenue. In such cases, the scale of expected revenue and expectations of how it will be used (e.g. investments in clean

technology) should be identified for inclusion in any impact assessment. Generated carbon price can alter the costs of production and final goods, incentivizing reductions in the carbon-intensity of production and shifts in consumption patterns. Cross-border impacts depend on how supply and demand changes can influence exports and imports. All of these changes can lead to changes in GDP. In addition, reallocation of any revenues may stimulate economic activity.

**Green tariffs.** Reduced tariffs for clean energy products and services are typically considered to constitute a tariff reduction compared with a previous tariff baseline with the objective of increasing consumption of clean energy (i.e. reducing GHG emissions), increasing investments and driving down technology costs through economies of scale. The impacts of tariffs for clean energy products will vary depending on a number of factors relating to:

- a. The specific characteristics of the sector in which the tariffs are imposed (e.g. its trade exposure and production costs, the market structure and transportation costs);
- b. Whether a country is an exporter or importer of the technology or has directly competing technologies;
- c. The design of the regulation, including whether a country will need to develop more differentiated tariffs to ensure that tariffs are only reduced on targeted goods;
- d. The extent to which a country is well-placed to capture a share of any growing international market for the good in question (Tamiotti et al., 2009; Vossenaar, 2016)

A green tariff on low-carbon goods can lower their prices in the domestic market and incentivize consumption. The tariff reduction can alter the prices paid for clean energy, and in turn the domestic supply and demand for the good (direct effect) and any substitute goods (indirect effect). Tariff reductions can increase demand for imported clean energy goods or services, which, if significant, can increase prices in international markets. The potential for cost reductions and the pace at which they may take place can vary significantly depending on whether a technology is

fully mature or in the early stages of development. A reduction in the demand for energy sources that are replaced by clean energy, if significant, may also depress prices in international markets. Where tariff reductions help to drive technological changes, there may be net benefits on GDP in the long term because energy prices may fall and create economic benefits (Cirera, 2011).

**A carbon border adjustment** measure is a mechanism used to adjust the price of traded products to reflect “the costs they would have incurred had they been regulated under the destination market’s greenhouse gas emissions regime” (Cosbey, 2012; Sakai and Barrett, 2016). Hence, the aim is to discourage the use of carbon-intensive goods and services and incentivize producers to adopt cleaner technologies. In order to understand the related impacts, a key variable to consider is whether the measure takes the form of a levy for selected imported goods and services, a rebate for selected exported goods and services, or both, as this will determine the broad pathways through which the impacts might flow. If domestic carbon pricing has existed for many years and a carbon border adjustment policy is introduced, there can be a shift in relative prices of domestic and foreign goods. However, if domestic carbon pricing and a carbon border adjustment measure are introduced simultaneously then the relative shift in prices between domestic and foreign goods can be smaller and dependent on each country’s carbon intensity of production (Cosbey, 2012).

If the revenues from a carbon border adjustment measure are invested in making domestic industry less carbon-intensive, this could create a medium-term advantage for domestic industries. If they are used to supplement general government revenues, this might lead to impacts on demand that ultimately affect imports and exports. These impacts depend on the amount of revenues created. A carbon border adjustment levy on imported goods and services increases the price of an imported good or service in the implementing jurisdiction. Demand changes are driven by the relative scale of price shifts, the price elasticity of demand and the cross-price elasticity between domestic goods and imported goods. Unless the price elasticity is perfectly inelastic, increased prices result in decreased demand, and demand is likely to shift if one category of goods becomes relatively more expensive than another. Demand for goods

not covered by the policy may change if these are substitutes for covered goods or if consumers must cut expenditure. It can be expected, for example, that clean energy technologies will be in higher demand if high-carbon energy technologies become more expensive. As the substitutes may be sourced from domestic or foreign markets, the final impact depends on their supply. Shifts in consumption patterns and competitiveness can affect GDP in the long term and in turn the supply of exports to foreign markets and the demand for imports. These impacts, both on the importing and exporting countries, cannot easily be projected and the related dynamics are likely to change over time.

The reduction in demand caused by the introduction of a carbon tariff can reduce imports of goods covered by the measure and may reduce or increase imports of non-covered goods, depending on how consumption patterns adjust. For exporting countries, this could lower quantities of goods sold for export, and thus prices, leading

to lower production and revenues generated by producers of covered goods and lower revenues for governments in producing countries. Nonetheless, a carbon border adjustment policy may provide an incentive to improve energy efficiency. Under this scenario, the competitiveness of production in exporting countries would increase, leading to higher exports and generating positive outcomes for employment, economic performance and climate change mitigation.

To facilitate just transition and economic diversification and transformation, the impacts of the implementation of climate change response measures that should be assessed are mostly socioeconomic (see table 3 for examples of relevant indicators). These impacts can differ depending on the region or country analysed. Understanding the extent and magnitude of these impacts can facilitate the choice of just transition measures and needs for economic diversification and transformation.

**TABLE 3**

Examples of indicators that can facilitate the undertaking of economic diversification and transformation and just transition

Type of economic indicator (disaggregated by gender, ethnic group and age)	Indicators for just transition	Indicators for economic diversification and transformation
Economic	Jobs created Jobs lost Changes in income	Sectoral structure of regional or/and national economy Sectoral (including exports) income National (including exports) income and green growth <sup>a</sup>
Social	Skills and training of the workforce Income inequalities Social security Changes in occurrence and severity of pollution-related diseases and mental health conditions	Skills and training of the workforce Income inequalities Social security

<sup>a</sup> According to OECD (2011) green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must catalyse investment and innovation which will underpin sustained growth and give rise to new economic opportunities.

## C. Overview of methodologies used by Parties and stakeholders for assessing and analysing the impacts that can facilitate economic diversification and just transition

The assessment and analysis of the impacts of the implementation of response measures that can facilitate economic diversification and transformation and just transition can be carried out using qualitative and quantitative methodologies.

The indicators described in table 3 can help stakeholders select which methodologies work best for assessing and analysing impacts.

### 1. TYPES OF METHODOLOGIES

**A qualitative methodology** produces in many cases descriptive results and is used for understanding issues such as impacts on livelihoods for a particular group of society or behavioural changes resulting from the implementation of a specific policy. Qualitative methodologies rely on information collected in the form of words or descriptions and/or in figures and numbers. The results can be expressed descriptively, for example in terms of the perceived likelihood, magnitude and direction of the impact (positive or negative). Qualitative assessment tools (methodologies) include observations, surveys, interviews and focus group discussions. Desk reviews of published information are also used. Results of qualitative research are often reported as a narrative (story).

**A quantitative methodology** produces numeric information on indicators that are relevant for assessing the impacts of a policy using empirical modelling tools (methodologies) such as input–output analyses, as well as partial equilibrium, computable general equilibrium, macroeconometric, system dynamics and agent-based models. These models are mostly built on secondary data collected by national and regional statistical offices or other agencies and companies.

The elements of approaches to assessing impacts, including modelling tools used by Parties and non-Party stakeholders, have been compiled by the secretariat with a view to providing guidance to developing country Parties (UNFCCC, 2016). The KCI also prepared a technical paper<sup>4</sup> updating this information and the existing database<sup>5</sup> of assessment methodologies.

### 2. SELECTION OF METHODOLOGY

Both the qualitative and quantitative methodologies have advantages and disadvantages. Both types of methodology can be used for exploring the impacts of the implementation of response measures on indicators that are relevant for taking decisions about the need for implementing just transition measures or diversifying and transforming the economy. Most of the time, it is adequate to combine the two types methodologies as they complement each other. The box below provides some examples where qualitative and quantitative methodologies were used to assess the impacts of mitigation policies and actions.

4 See document KCI/2021/5/5

5 <https://unfccc.int/topics/mitigation/workstreams/response-measures/modelling-tools-to-assess-the-impact-of-the-implementation-of-response-measures>

## BOX 1

Examples of studies to assess the impacts of mitigation policies and actions using qualitative and quantitative methodologies

Most studies focus on assessing the potential impacts of a policy within the country implementing the policy.

Some studies to assess impacts are carried out using qualitative methodologies, such as:

Extensive literature and portfolio reviews, surveys, qualitative focus group discussions and interviews to assess the implications of policies and projects on gender equality (Orlando, 2018; Climate Investment Fund, 2018; Kuriakose, 2017);

(2) Interviews to assess the implications of hydro projects on community displacement and the challenges faced by communities during the resettlement process (Delang and Toro, 2011);

(3) Focus group discussions and interviews along with calculations using national household survey data, electricity company data on household electricity consumption and a database on welfare impacts to assess the implications of policies on expenditure share and income distribution (Walker et al., 2016);

(4) The public perception of the policy design and the policy implementation process;

(5) A survey to assess the impacts of retrofitting homes to increase energy efficiency

on energy savings (Lauren Giandomenico, 2020).

A large body of literature exists on using various quantitative methodologies to quantify social and economic impacts, such as:

(1) An input–output analysis to assess impacts on green jobs (ILO, 2017b; ILO, IDB, 2020), clean energy investment (Markaki, 2013), GHG emission reductions, GDP and employment, and the impacts of feed-in tariffs (Behrens et al., 2016);

(2) A cost–benefit analysis to assess the benefits of improving air quality (Alistair Hunt, 2016; Heger, 2018; Narain, 2016);

(3) An econometric analysis to assess the effects of carbon taxes on employment (Yamazaki, 2017) and industry competitiveness (Dechezleprêtre and Sato, 2017);

(6) A global computable general equilibrium model to assess the cross-border impacts of mitigation actions implemented by other countries on the economy of Taiwan Province of China (Chai, 2019);

(8) An energy systems model and macroeconometric model to assess the short- and long-term impacts of energy subsidy reform on GDP, the consumer price index, household income distribution and CO<sub>2</sub> emissions (ADB, 2016);

(9) An integrated assessment model to quantify the impacts of global mitigation actions on food security (Hasegawa et al., 2018) and water demand for food and energy (Mouratiadou et al., 2016).

A hybrid approach combining both a qualitative and quantitative assessment has been used to quantify the impacts of energy transition on gender equality in the EU (European Union, 2019), the gender-related aspects of renewable energy policies and projects (IRENA, 2019) and the social and environmental impacts of policies and projects (Orlando, 2018; World Bank ESMAP Olivier, 2018).

### 3. PROCESS FOR ASSESSING THE IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES THAT ARE RELEVANT FOR FACILITATING THE UNDERTAKING OF ECONOMIC DIVERSIFICATION AND TRANSFORMATION AND JUST TRANSITION

Implementation of a mitigation policy or action triggers a cause–effect chain resulting in intended and/or unintended social, environmental and economic benefits and negative consequences. It is important to assess and understand the type and extent of these impacts. [ICAT \(2020\)](#) provides guidance for conducting impact assessments.

Assessments of the domestic and cross-border impacts of the implementation of response measures that are relevant for facilitating the undertaking of economic diversification and transformation and just transition can be carried out following a step-by-step approach. Stakeholder engagement (including decision makers) is important in each of the following seven steps:

- a. Identify key stakeholders and collaborators who can support and provide inputs for carrying out the analysis and subsequently contribute to reviewing the results;
- b. Identify the indicators of relevance to facilitate the undertaking of just transition and economic diversification and transformation;
- c. Identify the causal relationships and hypothesize the potential direct and indirect national and cross-border impacts;
- d. Identify suitable impact assessment methodologies;
- e. Implement any customization of methods (such as data updates, development of interview questions) that might be required;
- f. Carry out the assessment and analyse the results;
- g. Report the methodology used, present and discuss the results, and draw conclusions.

These steps can be carried out either before policy implementation (ex ante), where the goal is to anticipate the likely impacts, or during or after a policy change (ex post), where the goal is to identify impacts using empirical data.



© Photo by Ariful Haque/Pexels

# 4



## POSSIBLE ACTIONS AND MEANS TO ENHANCE THE CAPACITY AND UNDERSTANDING OF PARTIES, INCLUDING COLLABORATION WITH IDENTIFIED ORGANIZATIONS, ON ASSESSING AND ANALYSING THE IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES TO FACILITATE THE UNDERTAKING OF ECONOMIC DIVERSIFICATION AND TRANSFORMATION AND JUST TRANSITION

### **A. Mapping of relevant stakeholders and their work, including organizations working to develop relevant tools, build capacity on assessment methods and collect data**

With respect to enhancing capacity for assessing and analysing the impacts of the implementation of mitigation policies and actions geared towards undertaking economic diversification and transformation and just transition, the following stakeholders are of strategic relevance:

- a. Organizations that support data generation and maintain databases related to the indicators used to assess the impacts of policies;
- b. Organizations involved in developing methodologies and tools for impact assessment;
- c. Organizations that generate knowledge through technical or empirical studies, case studies, assessment guidance documents, good practice guides, etc.;

- d. Organizations that offer learning opportunities, including hands-on training on the assessment, analysis and use of tools to undertake assessments.

Most organizations operate in multiple dimensions and there is a huge overlap in the areas covered by any single organization. Further, there are a large number of researches, consulting and academic organizations that are actively operating in the above-mentioned areas. However, the information in this section is limited to intergovernmental organizations and their relevant work.

### **1. INITIATIVE FOR CLIMATE ACTION TRANSPARENCY**

ICAT provides policymakers around the world with tools and support to measure and assess the impacts of their climate actions. It has developed several assessment guides providing methodologies for assessing the sustainable development and transformational impacts of policies and actions in an integrated and comprehensive manner across all levels of governance (ICAT, 2021).



## **2. INTERNATIONAL ENERGY AGENCY**

IEA is an intergovernmental organization which works with member countries on energy policies. It provides extensive data and analytics, including on energy efficiency, energy prices and supply, renewables, waste and CO<sub>2</sub> emissions. IEA also provides online and in-person trainings on energy-related issues and has developed the World Energy Model to analyse various energy scenarios and their implications on different regions. IEA also regularly hosts the International Energy Workshop on energy modelling.

## **3. INTERNATIONAL LABOUR ORGANIZATION**

The ILO Green Jobs Programme creates knowledge by documenting experiences, conducting global, regional and sectoral studies, and producing flagship reports and guidelines on the linkages between labour and environmental issues.

Through its Green Jobs Assessment Institutions Network, ILO assists its constituents in undertaking green jobs assessments on the basis of national macroeconomic models. For this purpose, ILO has developed a standardized methodology to analyse labour market implications under various policies and investment scenarios. In order to enhance capacity for using the methodology, ILO organizes a series of webinars and has established a network training hub in Africa for face-to-face training (ILO, 2017a).

## **4. INTERNATIONAL MONETARY FUND**

IMF is an intergovernmental organization which focuses on providing support to countries in developing, assessing and building capacity in relation to fiscal policies. It provides advisory services to countries and in-country and online trainings, and undertakes technical studies on the impacts of fiscal policies, including mitigation policies, including in collaboration with other organizations such as the World Bank (Farid et al., 2016; IMF, 2015, 2017, 2018, 2019a; I. Parry, Mylonas, & Vernon, 2018; I. Parry et al, 2016; Ter-Martirosyan, 2016). IMF recently analysed the impacts of carbon pricing policies (IMF, 2019b), including the impacts of carbon taxes, emissions trading systems, fuel taxes and various energy efficiency incentives on emissions, local air pollution, mortality rates, fiscal revenues and economic welfare across countries.

## **5. INTERNATIONAL RENEWABLE ENERGY AGENCY**

IRENA is an intergovernmental sustainable energy organization which develops policy, technology, data and knowledge products on renewable energy to promote widespread adoption of renewable energy technologies. These include annual reports discussing the widespread adoption of renewable energy technologies that create employment opportunities throughout the entire supply chain. It provides the latest available estimates and figures on employment in the renewable energy sector and continues to refine and improve related data and methodologies. IRENA provides regional trainings and capacity-building on the basics of statistics; data collection, validation and estimation methods; and analysis and reporting of renewable energy statistics. Its data platform provides statistics on energy balances, finance and investment, the cost and benefits of renewable energies and related policies, renewable energy sources in NDCs, energy transition, innovation and technology, and an avoided emissions calculator.

## **6. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT**

OECD is an intergovernmental economic organization which works on economic, social and environmental issues and provides relevant data and analytical advice. It has published technical papers on fossil fuel subsidies and carbon pricing and has developed a computable general equilibrium model called “ENV-Linkages” which analyses the medium- to long-term impacts of environmental policies on macroeconomic indicators and across regions. The OECD database contains information on environmental taxes implemented in a range of sectors (OECD, 2021).

## **7. UNITED NATIONS DEVELOPMENT PROGRAMME–UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS**

UNDESA and UNDP have pioneered a series of modelling tools and provide demand-driven support to countries, in collaboration with their research partners, in devising policies for achieving sustainable development. UNDESA and UNDP use five quantitative modelling tools, mostly using open source software, namely the Climate,



© Photo by Julia Volk/Pexels

Land-use, Energy and Water Systems analysis and model, economy-wide models, socioeconomic microsimulations, energy system models and geospatial electrification access models. They provide support by building models to answer key policy questions, enhance countries' capacity to run and interpret modelling scenarios and strengthen skills to communicate key results. They also maintain an open online resource for training and outreach (United Nations, 2021).

## 8. WORLD BANK GROUP

The World Bank Group runs various initiatives relating to climate policies, including in collaboration with other organizations and partners of the United Nations system, to achieve the respective objectives of the initiatives.

In order to improve the quality of microdata to better inform development policies, the World Bank Group Living Standards Measurement Study focuses on strengthening household survey systems in its member countries (World Bank, 2021a). On the basis of experience of household

surveys gathered under the Living Standards Measurement Study over 15 years, the World Bank Group prepared detailed advice on designing multi-topic household surveys (World Bank, 2010). It also maintains an open database on a wide range of aggregate social, economic, climate change and emission data.

To strengthen social impact assessment studies, the World Bank Group issued a user guide to poverty and social impact analysis (World Bank, 2003) and prepared a collection of case studies to illustrate the spectrum of sectors and policy reforms to which the analysis can be applied (World Bank, 2006).

With support from its partners, the World Bank Group operates an Open Learning Campus which provides a large number of training opportunities through various modes of learning in cross-cutting areas (World Bank, 2021b).

The World Bank Group has also implemented various initiatives to address specific issues related to designing climate policies and their assessment, for example:

- a. The Energy Subsidy Reform Facility provides comprehensive guidance and technical support to countries in understanding, designing and implementing energy subsidy reform policies. It also provides analytical and advisory support in quantifying the amount of existing energy subsidies within the country, conducting poverty and competitiveness impact assessments, designing social protection measures to assist affected households and designing communication strategies;
- b. The Energy Subsidy Reform Assessment Framework is a comprehensive analytical toolkit and assessment framework to help countries identify and quantify energy subsidies, understand their impact and evaluate the enabling environment for reform. It contains useful practice notes to assist countries (Canpolat, 2019; Kojima, 2017);
- c. The Macroeconomics, Trade and Investment Global Practice leads dialogue and engagement with clients in the areas of macroeconomics, fiscal policy, trade, competition and investment;
- d. The Climate Action Peer Exchange provides a capacity-building forum for peer-to-peer knowledge-sharing and advisory support for finance ministries. The initiative brings together finance ministers, senior technical staff and other relevant stakeholders to design climate-smart macroeconomic policies, discuss fiscal policy measures for mitigating the impacts of climate change and develop financing strategies for implementing NDCs;
- e. The Carbon Pricing Leadership Coalition brings together government leaders, civil society, the private sector and academia to share knowledge and experience related to carbon pricing with the aim of enhancing the understanding of carbon pricing policies. The Coalition held a dialogue among business leaders to discover the evidence-based concerns of business and share experience and lessons learned in the design and implementation of carbon pricing policies in the context of competitiveness (World Bank, 2017, 2019);
- f. The Partnership for Market Readiness aims to build country capacity to understand, develop and implement carbon pricing instruments

for GHG emission reductions and the implementation of NDCs through grant funding.

## 9. EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT

In 2020, the EBRD joined the newly created international Platform Initiative in Support of Coal Regions in Transition in Western Balkans and Ukraine. This platform was developed in partnership with the EC, the World Bank and the Energy Community Secretariat. Periodic meetings will be held under the Platform to discuss progress in each of its five focus areas:

- a. Knowledge-sharing platform meetings (led by the EC);
- b. EU–Western Balkans and Ukraine coal regions twinning (fostering visits and more in-depth information-sharing);
- c. A Coal Regions Learning Academy to formally disseminate good practices and support transition (led by the College of Europe in Natolin, Poland, and the World Bank);
- d. Technical assistance for pilot coal regions to support regions undertaking transition (led by the World Bank and EBRD);
- e. Coordinating financing approaches for transition projects and programmes (led by EBRD and the EC).

## 10. THE MDB PARIS ALIGNMENT WORKING GROUP BB4

The MDB Paris Alignment Working Group BB4 is working to advance MDB support for just transition. At the United Nations Secretary General’s Climate Action Summit in 2019, the MDBs issued a high-level statement where they committed to “develop, by COP26, financing and policy strategies supporting a just transition”. Since then, the joint MDB work has included stakeholder engagement and peer learning with the objectives of developing common principles on MDB support for just transition, advancing understanding of the MDB approaches, tools and instruments that can help support just transition, and engaging relevant networks and partners, including the UNFCCC and ILO.

## **B. Possible collaboration with stakeholders to enhance capacity on assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition**

A review of the relevant work of intergovernmental organizations on assessing and analysing the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition demonstrates that most of them collaborate either with each other and/or with research or knowledge partners to create knowledge products and/or to build the capacity of developing countries. For example:

- a. The Open Learning Campus programme of the World Bank Group has nine partners: the Ministry of Finance of Australia, the Government of Canada through the Canadian International Development Agency, the Ministry of Foreign Affairs of Denmark, the Ministry of Foreign Affairs of Finland, the Ministry for Europe and Foreign Affairs of France, the Ministry of Finance of Luxembourg, the Ministry of Economy and Finance of the Republic of Korea, the Ministry of Finance of Slovakia and the Department for International Development of the United Kingdom of Great Britain and Northern Ireland;
- b. ICAT has issued various policy assessment guides in collaboration with technical working groups from a number of bodies such as the Bureau of Indian Standards, FAO, ICF International, the World Bank Group and the World Resources Institute;
- c. The World Bank Group has undertaken various technical studies in collaboration with organizations including FAO, IMF and UNDP;
- d. ILO has also developed many case studies and organized capacity-building events in collaboration with knowledge partners including the Green Jobs Assessment Institutions Network, IRENA, the Partnership for Action on Green Economy, UNFCCC and WWF.

Constituted bodies under the Convention, the Kyoto Protocol and the Paris Agreement have also collaborated with other organizations (see annex II), for instance:

- a. The CGE organizes regional hands-on training workshops in collaboration with FAO, UNDP and UNEP, which contribute to enhancing the technical knowledge of experts from Parties not included in Annex I to the Convention and enable the exchange of views, lessons learned and experience relating to the process and preparation of national communications, biennial update reports and national GHG inventories;
- b. The FWG of the LCIPP convened a partnership-building dialogue and brought together representatives from various United Nations entities, civil society organizations and other stakeholders to forge collaborative partnerships and actions. The FWG of the LCIPP has also established a partnership with the Centre for International Environmental Law to map and report on existing policies and practices for the participation of indigenous peoples and local communities in climate change related bodies and processes under and outside the Convention to deliver a technical paper;
- c. The LEG, in collaboration with the secretariat of the GCF, provides technical guidance on accessing funding from the GCF for the process of formulating and implementing NAPs;
- d. The PCCB regularly collaborates with stakeholders under and outside the Convention and the Paris Agreement to advance its work on enhancing and coordinating capacity-building, identifying and addressing capacity-building gaps and needs, and promoting awareness-raising, knowledge- and information-sharing, and stakeholder engagement. Types of collaboration include events, workshops, knowledge-sharing products such as newsletters, and technical inputs to the activities of other bodies or stakeholders;
- e. The TEC and the CTCN, in collaboration with the GEF, organized a thematic dialogue and have published technical reports and policy briefs to inform financiers and policymakers of existing opportunities for catalysing climate finance;

As a constituted body, the KCI undertakes work with relevant organizations in order to enhance the capacity and understanding of Parties, through collaboration with and input from stakeholders, on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition. Stakeholders should be engaged on the basis of the issue being dealt with by the KCI, since organizations and experts at the national and international level vary in terms of their expertise on economic

diversification, just transition, methodologies and tools to assess impacts, and capacity-building on the use of tools and methodologies, including modelling tools. Table 4 provides possible areas of collaboration for assessing and analysing the impacts of the implementation of response measures in support of just transition and economic diversification and associated capacity-building on the use of tools and methodologies under the constrained conditions of global deep decarbonization pathways to meet the goals of the Paris Agreement.

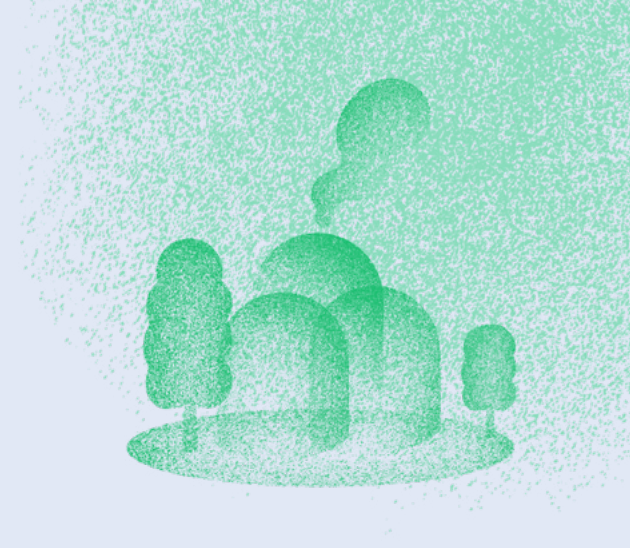


© Photo by Laker/Pexels

**TABLE 4****Possible areas of collaboration for assessing and analysing the impacts of the implementation of response measures**

Areas of collaboration	Examples of potential partners
Understanding just transition and economic diversification and preparing related guidelines and knowledge products for assessment and analysis	ICAT, ILO, UNDP, UNEP, EBRD, IEA, MDB Paris Alignment Working Group BB4 Other knowledge partners: IMF, IRENA, OECD, World Bank Group
Raising awareness of existing tools and methodologies	ILO, IMF, UNDP, UNDESA, United Nations Research Institute for Social Development, World Bank Group  Other knowledge partners: Climate Analytics, CoalExit Research Group, E3 Modelling, Energy Information Administration of the United States of America, Energy Research Institute of China, GTAP, Integrated Assessment Modelling Consortium, International Centre for Research on Environment and Development, International Institute for Applied Systems Analysis, Joint Global Change Research Institute, Massachusetts Institute of Technology, Netherlands Environmental Assessment Agency, NewClimate Institute, Potsdam Institute for Climate Impact Research, Stanford University, Technical University of Berlin, University of Maryland and Pacific Northwest National Laboratory, MDB Paris Alignment Working Group BB4
Developing modelling tools and methodologies	Cambridge Econometrics, CGEmod, IEA, ILO, IMF, UNDP, UNDESA, World Bank Group
Facilitating country-level support, including by developing a training framework and accompanying modules for country-level training programmes	EBRD, Economic Commission for Latin America and the Caribbean, ILO, IMF, UNDP, UNEP, IEA, UNECA, UNDESA, World Bank Group, MDB Paris Alignment Working Group BB4
Promoting best practices for data gathering and processing for both qualitative and quantitative assessments and analyses	GTAP, IMF, UNECA, World Bank Group  Other knowledge partners: EBRD, Enerdata, Energy Information Administration of the United States, E3 Modelling, IEA–Energy Technology Systems Analysis Program, IRENA, World Resources Institute, MDB Paris Alignment Working Group BB4
Facilitating the establishment of regional training hubs	African Development Bank, EBRD, ILO, IMF, UNDP, UNEP, World Bank Group, MDB Paris Alignment Working Group BB4
Facilitating the development and exchange of regional-, country- and/or sector-specific case studies	EBRD, IEA, ILO, IMF, IRENA, UNDP, UNDESA, UNECA, UNEP, World Bank Group  Other knowledge partners: Cambridge Econometrics, CGEmod, CoalExit Research Group, Technical University of Berlin, MDB Paris Alignment Working Group BB4

# 5



## CONCLUSIONS

The KCI is the only constituted body under the Convention and the Paris Agreement that deals with the impacts of the implementation of response measures. Together with the forum on the impact of the implementation of response measures, it has the objective of enhancing the capacity and understanding of Parties on the assessment and analysis of the impacts of the implementation of response measures to facilitate the undertaking of economic diversification and transformation and just transition.

The issue of response measures under the Convention and the Paris Agreement is one of the key areas of intergovernmental climate change negotiations which deals with the social, environmental and economic impacts, both positive and negative, of the implementation of mitigation measures. Response measures cover a range of actions, policies and programmes taken to respond to climate change; when implementing these actions, policies and programmes, it is important to consider the concerns of Parties with economies most affected by the impacts of response measures, particularly developing country Parties.

In this context, Parties have identified economic diversification and transformation (to promote low-carbon sectors and green technologies), as well as just transition of the workforce and the creation of decent quality jobs, as the two main strategies to be implemented in order to increase positive impacts and reduce any possible negative impacts of the

implementation of response measures. These two strategies also seek to enable climate mitigation measures by creating opportunities for people and the planet during the low-carbon transition.

Implementation of mitigation policies and actions can have direct and/or indirect, intended and/or unintended, short-, medium- and/or long-term impacts. These impacts can be felt in the implementing and/or other countries (cross-border impacts).

To facilitate just transition and economic diversification and transformation, assessment and analysis of the socioeconomic impacts of the implementation of mitigation policies and actions is crucial.

Several guidance documents are available on undertaking impact assessments; however, none of them provide specific guidance on assessing social and economic impacts with a view to undertaking economic diversification and/or just transition. Therefore, building the capacity of Parties and enhancing collaboration with stakeholders in this area is crucial.

At the same time, various organizations and stakeholders are engaged in a diverse range of activities linked to the assessment and analysis of impacts. The full range of capacities for assessment and analysis and the development of tools and methodologies do not reside within one single institution or stakeholder group.

# Annex I

## GUIDANCE ON KEY FEATURES OF EXISTING TOOLS FOR ASSESSING AND ANALYSING THE IMPACTS OF THE IMPLEMENTATION OF RESPONSE MEASURES

This annex provides details of several tools used for assessing and analysing response measures with a view to providing guidance to Parties on scope and data needs, as well as data availability and usage, as part of a multi-tool approach.

Method	Data source(s)	Data availability	Accessibility and typical users	Resources required	Use as part of a multi-tool approach
<b>Delphi analysis</b>	Expert practitioners and researchers	Delphi analysis is a data-collection method which requires thorough analysis of the current situation before execution	Highly accessible; the results provide an overview of expert opinions on specific questions or topics	Developing a Delphi questionnaire requires approximately 45 days; each round of questionnaires (four in total) has to be carefully prepared and analysed, as the answers from prior rounds feed into the questions for the next iteration. About two weeks are required for participants to respond	Can be used in combination with other methods (receiving and providing inputs). It provides inputs for the formulation of scenarios and identification of suitable methods. It also supports the validation of model results
<b>Decision tree</b>	Expert elicitation or case study review	Data are generally available from other studies or historical databases. Depending on the size of the decision tree, additional research may be required to carry out validation	Qualitative decision trees are easily accessible by a wide range of audiences. They concern key questions or trade-offs, and typical users are policymakers and stakeholders involved in the decision-making process	Simple decision trees are usually created within one to two days through a multi-stakeholder workshop. Depending on its size, validation of the decision tree takes approximately one month. Most of the work can be done in-house	Can be used in combination with various other methods, using inputs from other modelling exercises and providing inputs for the identification of suitable methods and models
<b>Causal loop diagram</b>	Data for causal loop diagrams can be obtained from literature and experts, or during group model-building exercises	Data for model development (e.g. information on the local context) are generally available. Both qualitative and quantitative data can be used for developing a causal loop diagram	Highly accessible; the results consist of a system map and underlying feedback loops. Typical users range from researchers to decision makers	Very low time requirement; a causal loop diagram could be created in three hours (or up to two days) with a group of 20 to 30 stakeholders. Depending on the context, a whiteboard and marker pens, or a laptop with a projector and modelling software, are sufficient	Can directly support several other methods, either to formulate scenarios, identify policy impacts, or explore the dynamics and select appropriate quantitative methods



Method	Data source(s)	Data availability	Accessibility and typical users	Resources required	Use as part of a multi-tool approach
<b>Household income and expenditure survey</b>	Primary survey	The data are generally available through respondents. The quality and accuracy of the data depend on the clarity of the survey and the participants targeted	Household income and expenditure surveys are generally accessible and typically developed and maintained by the national government (e.g. ministry of finance)	Creating a new survey, disseminating it and collecting the results takes on average between 6 and 12 months	It is the primary data source for household assessments to estimate impacts on consumption, expenditure and income. These outcomes can be used to customize and calibrate several models
<b>Sectoral input-output</b>	National and sectoral statistics	Although data from national statistics (at the country level) are generally available, sectoral data on material and energy flows may be lacking	Input-output tables are generally accessible and typically developed and maintained by the ministry of finance (for economic input-output tables), sectoral ministries (for biophysical input-output tables) and universities (for integrated and multi-country input-output tables)	Building a new input-output table is a labour- and resource-intensive process. The time required to develop a new table depends on the number of sectors considered, and can take between two months and one year	Can be used to parameterize and initialize other quantitative models. Can also provide an indication of ripple effects across sectors to understand short-term policy impacts
<b>SAM</b>	Input-output tables, system of national accounts, industrial statistics, consumption expenditure surveys and foreign trade statistics	High data requirements, but data are generally available (e.g. from the GTAP database). Multipliers need to be derived ad hoc on the basis of available data to ensure that results are obtained on the distribution of the impacts of specific policy interventions	Access is generally constrained to trained personnel, but most SAMs are developed in Excel, which reduces barriers. SAMs are commonly used for analysing how policy impacts are distributed over economic actors	Building and calibrating a new SAM is generally labour-intensive, but the time required depends on the level of detail of the SAM. The creation of a simple SAM from the system of national accounts may take one month, while a detailed SAM could require up to one year. Modifications to an existing SAM can be performed in the range of a few months (about two to four months)	SAMs are the main data input of computable general equilibrium and macroeconomic models. As a static matrix, SAMs are used to provide information on short-term impacts and complement medium- to longer-term impact assessments
<b>Partial equilibrium</b>	Sectoral data, databases with technology parameters (e.g. cost, lifetime, efficiency) and potential adoption rates	Data are generally available from national and international databases	Specialized users, with depth of knowledge at the sectoral level. Commonly used in sectoral analyses at the country and regional level. Typically developed and maintained by line ministries and academia	Building and calibrating a new partial equilibrium model requires three to six months depending on the level of detail represented	Can be used in combination with a macroeconomic model to provide more realism using a bottom-up approach
<b>Computable general equilibrium</b>	Input-output table and/or SAM	Uses data from SAMs and/or input-output tables; data are therefore often dated. Additional data disaggregation may be required to fully assess the impact of specific policy interventions (e.g. removal of subsidies for certain fuels and income classes)	Highly specialized. Generally, very limited number of operational computable general equilibrium models in a country, typically developed and maintained by the ministry of finance, central bank, academia, or MDBs	Building and calibrating a new computable general equilibrium model is a major undertaking, requiring about 12 months. Using an existing model is likely to require some changes. An experienced user would need on average three to four months	Can be used in combination with a SAM, which often has a more disaggregated data set and can be used to forecast short-term impacts. Can also be coupled with sectoral models (e.g. for the energy sector) for the addition of a bottom-up analysis (e.g. on technology)

Method	Data source(s)	Data availability	Accessibility and typical users	Resources required	Use as part of a multi-tool approach
<b>Macroecometrics</b>	Historical time series from the system of national accounts, input–output table and/or SAM	Uses data from the system of national accounts, which are available on an annual basis. It may include additional sectoral statistics (e.g. energy demand), which are also available (at a high level of aggregation) on an annual basis. SAMs and/or input–output tables can also be used to model relationships across economic actors, but data are often dated	Highly specialized. Generally, very limited number of operational macroeconomic models in a country. Often, these are developed by international organizations, universities and consulting companies for specific policy assessments. At the country level, they are typically developed and maintained by the ministry of finance	Building and calibrating a new macroeconomic model requires at least four to six months. Using an existing model is likely to require some changes to the model, which an experienced user could complete in one to two months	Can be used in combination with a SAM, especially for short-term assessments and for adding detail (e.g. disaggregation by income class). Can also be coupled with sectoral models (e.g. for the energy sector) for the addition of a bottom-up analysis (e.g. on technology)
<b>System dynamics</b>	Historical data obtained from national and international databases, or parameters can be obtained through econometric or other models	National-level data are generally available, since system dynamics models generally explore cross-sectoral linkages as opposed to sectoral detail. In the absence of quantitative data, information on causal relationships can be extracted from qualitative case studies and expert consultation	System dynamics models are developed to analyse a specific problem or policy, and the users are identified at an early stage. They are therefore easily accessible to the stakeholders that contribute to their development. Generally defined as ‘white boxes’, system dynamics models are very transparent, and users range across sectors and institutions	Building and validating a new system dynamics simulation model takes on average between one and six months, depending on the size of the model and the extent to which stakeholders are actively involved in model development	It complements other approaches with a more systemic analysis. It can therefore be used in combination with input–output tables and macroeconomic and computable general equilibrium models. In a multi-method approach, it is suited to providing strategic directions and identifying the emergence of possible side effects

# Annex II

## COLLABORATION OF CONSTITUTED BODIES UNDER THE CONVENTION, THE KYOTO PROTOCOL AND THE PARIS AGREEMENT WITH STAKEHOLDERS

Constituted body	Collaborating organization	Purpose of collaboration	Output
PCCB	Other constituted bodies, operating entities of the Financial Mechanism, Party and non-Party stakeholders	Events, workshops, knowledge-sharing products such as newsletters, technical inputs to the activities of other bodies and stakeholders, etc., to advance its work on enhancing and coordinating capacity-building, identifying and addressing capacity-building gaps and needs, and promoting awareness-raising, knowledge- and information-sharing, and stakeholder engagement	Further details on past and ongoing collaboration, including outputs, can be found in the PCCB annual reports and other documents available at <a href="https://unfccc.int/process-and-meetings/bodies/constituted-bodies/paris-committee-on-capacity-building-pccb/documents-paris-committee-on-capacity-building">https://unfccc.int/process-and-meetings/bodies/constituted-bodies/paris-committee-on-capacity-building-pccb/documents-paris-committee-on-capacity-building</a>
FWG of the LCIPP	Relevant bodies and processes under the Convention	<p><b>Dialogue:</b></p> <ul style="list-style-type: none"> <li>• Convened <b>informal open dialogues</b> in June and December 2019 to bring together representatives of constituted bodies to explore synergies and collaborative opportunities around the three functions of the LCIPP, which are knowledge, capacity for engagement, and climate change policies and actions</li> <li>• Convened a partnership-building <b>dialogue</b> in June 2019 and brought together representatives from various United Nations entities, civil society organizations and other stakeholders to forge collaborative partnerships and actions</li> </ul>	<p>Further information on the dialogues is available as follows:</p> <ul style="list-style-type: none"> <li>• The LCIPP informal open dialogue held in June 2019: <a href="https://unfccc.int/LCIPP-activities#eq-1">https://unfccc.int/LCIPP-activities#eq-1</a></li> <li>• The LCIPP informal open dialogue held in December 2019: <a href="https://unfccc.int/topics/local-communities-and-indigenous-peoples-platform/events-meetings-and-workshops/informal-open-dialogue-between-representatives-of-constituted-bodies-on-the-three-functions-of-the#eq-1">https://unfccc.int/topics/local-communities-and-indigenous-peoples-platform/events-meetings-and-workshops/informal-open-dialogue-between-representatives-of-constituted-bodies-on-the-three-functions-of-the#eq-1</a></li> <li>• The LCIPP partnership-building dialogue held in June 2019: <a href="https://unfccc.int/LCIPP-activities#eq-2">https://unfccc.int/LCIPP-activities#eq-2</a></li> </ul>
	AC, LEG and NWP	<p><b>Event:</b></p> <p>Organized a <b>joint event</b> in December 2019 to exchange experience and explore ways to enhance the integration of the knowledge of indigenous peoples and local knowledge systems into climate adaptation action</p>	<p>Information on the multi-body joint event from December 2019 is available at <a href="https://unfccc.int/topics/local-communities-and-indigenous-peoples-platform/events-meetings-and-workshops/joint-event-on-integrating-indigenous-and-local-knowledge-into-adaptation-action#eq-1">https://unfccc.int/topics/local-communities-and-indigenous-peoples-platform/events-meetings-and-workshops/joint-event-on-integrating-indigenous-and-local-knowledge-into-adaptation-action#eq-1</a></p>
	Centre for International Environmental Law	<p><b>Partnership:</b></p> <p>To map and report on existing policies and practices for the participation of indigenous peoples and local communities in climate change related bodies and processes under and outside the Convention</p>	<p>Visit <a href="#">here</a> for further information on implementation of this mapping exercise.</p> <p>The FWG, with the support of the secretariat, will publish a mandated technical paper on the results of the mapping exercise</p>
	Party representatives, indigenous peoples, local communities and other relevant stakeholders	<p>To exchange experience and best practices, build capacity for engagement, and enhance climate policy coherence through the <b>meetings</b> of the FWG, <b>calls for submissions</b> and implementation of the initial two-year <b>workplan</b> of the LCIPP</p>	<ul style="list-style-type: none"> <li>• Visit <a href="#">here</a> to learn more about the collaborative work under the LCIPP;</li> <li>• Visit <a href="#">here</a> to view information on the <b>meetings of the FWG</b>;</li> <li>• Visit <a href="#">here</a> and search for LCIPP to view and respond to outstanding <b>calls for submissions</b> related to the work under the LCIPP</li> </ul>

Constituted body	Collaborating organization	Purpose of collaboration	Output
TEC	22 organizations including representatives of BINGOs, ENGOs, RINGOs and YOUNGOs nominated by their constituencies	TEC task forces implement the TEC rolling workplan 2019–2022 under five thematic areas. Members from participating organizations have equal opportunity as TEC members to provide inputs and give direction to the particular tasks assigned to the task force.	For further information on the TEC task forces, see: <a href="https://unfccc.int/ttclear/tec/members.html#Task">https://unfccc.int/ttclear/tec/members.html#Task</a>
	CTCN – the operational arm of the Technology Mechanism	Joint annual reports to the COP and the CMA, joint activities and joint events	<a href="https://unfccc.int/ttclear/tec/documents.html">https://unfccc.int/ttclear/tec/documents.html</a> <a href="https://unfccc.int/ttclear/events/index.html">https://unfccc.int/ttclear/events/index.html</a>
	GCF	Collaboration on catalysing finance for climate technology incubators and accelerators in developing countries. The collaboration aims to inform the GCF as it develops requests for proposals on climate technology incubators and accelerators.	GCF is in the process of operationalizing a facility to support climate technology incubators and accelerators. For further information, see: <a href="https://unfccc.int/ttclear/incubators/#summary">https://unfccc.int/ttclear/incubators/#summary</a>
	United Nations Office for South–South Cooperation	Analysing the potential of South–South and triangular cooperation on climate technologies for advancing implementation of NDCs and NAPs	<a href="https://unfccc.int/ttclear/tec/brief9.html">https://unfccc.int/ttclear/tec/brief9.html</a>
	WIM Executive Committee	Technologies for averting, minimizing and addressing loss and damage in coastal zones	<a href="https://unfccc.int/ttclear/coastalzones/">https://unfccc.int/ttclear/coastalzones/</a>
	Various organizations and non-Party stakeholders collaborate in TEC events, including FAO, International Union for Conservation of Nature, Global Alliance for Climate Smart Agriculture and GlobalABC	Co-organization and active engagement during events	<a href="https://unfccc.int/ttclear/events/index.html">https://unfccc.int/ttclear/events/index.html</a>
CTCN	Women Engage for a Common Future and the UNFCCC women and gender constituency	The Gender Just Climate Solutions awards and mentoring programme aims to create awareness of women's experience of climate change and highlight the many efficient technical and transformational climate solutions implemented by women worldwide  To capture the transformative outcomes achieved by award winners and capacity-building participants, an impact review has recently been completed	<a href="https://www.ctc-n.org/sites/www.ctc-n.org/files/resources/2019_gender_just_climate_solutions_english.pdf">https://www.ctc-n.org/sites/www.ctc-n.org/files/resources/2019_gender_just_climate_solutions_english.pdf</a>  <a href="https://www.ctc-n.org/news/gender-just-climate-solutions-showcased-upscaled-through-ctcn-and-women-gender-constituency">https://www.ctc-n.org/news/gender-just-climate-solutions-showcased-upscaled-through-ctcn-and-women-gender-constituency</a>
	CTCN Network members	CTCN collaborates with a global network of more than 600 members from academia, civil society, finance, the private sector, and public and research entities in providing technical assistance, capacity-building and knowledge-sharing to developing countries	<a href="https://www.ctc-n.org/network/network-members">https://www.ctc-n.org/network/network-members</a>
	TEC	Technology Mechanism event at the UNFCCC Climate Dialogues 2020: At this virtual event, panellists discussed how the Technology Mechanism can foster innovative approaches for a faster diffusion and upscaling of climate technologies and building back better climate-resilient systems post COVID-19	<a href="https://www.ctc-n.org/news/technology-mechanism-event-un-climate-dialogues-join-us">https://www.ctc-n.org/news/technology-mechanism-event-un-climate-dialogues-join-us</a>

Constituted body	Collaborating organization	Purpose of collaboration	Output
CTCN	Adaptation Fund	<p>The Adaptation Fund has funded and established a USD 10 million small grant aggregator programme to be implemented by UNDP and UNEP working in collaboration with the CTCN</p> <p>The Adaptation Fund Climate Innovation Accelerator, or AFCIA, aims to foster innovation in climate change adaptation in developing countries. The programme targets a broad range of potential finance recipients, including governments, non-governmental organizations, community groups, entrepreneurs, young innovators and other groups</p>	<p><a href="#">Launch event for the Adaptation Fund Climate Innovation Accelerator</a></p> <p><a href="https://www.adaptation-fund.org/apply-funding/innovation-grants/adaptation-fund-climate-innovation-accelerator-afcia/">https://www.adaptation-fund.org/apply-funding/innovation-grants/adaptation-fund-climate-innovation-accelerator-afcia/</a></p>
	Adaptation Fund and PCCB	The CTCN, Adaptation Fund and PCCB jointly produce the quarterly bulletin on readiness and capacity-building support for climate change adaptation	
	YOUNGO, the UNFCCC constituency of youth non-governmental organizations	The CTCN and YOUNGO constituency have collaborated on knowledge-sharing events such as the “When Youth Creates its Own Future” event held at COP 25 and the “Youth Climate Innovation Labs”	<p><a href="https://www.ctc-n.org/calendar/events/cop25-when-youth-creates-its-own-future-focus-climate-technology">https://www.ctc-n.org/calendar/events/cop25-when-youth-creates-its-own-future-focus-climate-technology</a></p> <p><a href="https://www.ctc-n.org/news/13-startups-africa-and-asia-are-tackling-climate-change-through-cleantech-innovation">https://www.ctc-n.org/news/13-startups-africa-and-asia-are-tackling-climate-change-through-cleantech-innovation</a></p>
	GCF	Since 2017, the GCF and the CTCN have partnered under the GCF Readiness and Preparatory Support Programme through which the CTCN provides services and expertise in response to developing countries’ requests using GCF country resources	<a href="https://www.greencclimate.fund/news/gcf-and-ctcn-strengthen-cooperation-on-technology-to-support-paris-agreement">https://www.greencclimate.fund/news/gcf-and-ctcn-strengthen-cooperation-on-technology-to-support-paris-agreement</a>
	Cleantech Venture Week	CTCN at the Cleantech Venture Week: CTCN Advisory Board member Dr Henrique Schneider, who represents business and industry at the Board, made a presentation at the Cleantech Venture Week. Discussions covered current cleantech trends and issues, with the participation of sector experts, representatives of corporates, investors and entrepreneurs, followed by networking	<a href="https://www.ctc-n.org/news/ctcn-cleantech-venture-week">https://www.ctc-n.org/news/ctcn-cleantech-venture-week</a>
	TEC, CTCN and regional collaboration centres	<p>Regional technical expert meetings on mitigation: “Climate smart cooling solutions for sustainable buildings” for the respective regions.</p> <p>The meetings were held virtually and showcased viable business models and climate-friendly technology solutions for active and passive cooling systems in buildings in each region</p>	Regional technical expert meetings on mitigation for <a href="#">Latin America and the Caribbean</a> , <a href="#">Asia and the Pacific</a> , <a href="#">Africa</a> , and <a href="#">Eastern Europe and West Asia</a>
	APAN	<p>CTCN at the 7th Asia-Pacific Adaptation Forum (APAN Forum)</p> <p>The CTCN led the session on technologies and practices for the nature-based resilience stream at the 7th APAN Forum</p>	<a href="https://www.ctc-n.org/news/ctcn-7th-asia-pacific-adaptation-forum-apan-join-us">https://www.ctc-n.org/news/ctcn-7th-asia-pacific-adaptation-forum-apan-join-us</a>
	GEF, PSP pilot regional climate technology transfer and finance centres and CTCN	<p>Virtual dialogue on experience and lessons learned from the pilot regional climate technology transfer and finance centres under the PSP</p> <p>The purpose of the event was to identify lessons learned and options for continuing the work of the centres in a collaborative manner. Stakeholders agreed on the need to strengthen linkages between the CTCN and the PSP</p> <p>centres; regularly exchange information on respective project pipelines; and draw on the CTCN as a resource for the capacity-building activities of the PSP centres</p>	

Constituted body	Collaborating organization	Purpose of collaboration	Output
CTCN	UNIDO, SIDS, SIDS DOCK, CTCN and the Global Network of Regional Sustainable Energy Centers	<p><u><a href="#">Ocean Energy Technologies for Blue Economies in Small Islands and Low-lying Developing States (SIDS)</a></u>:</p> <p>The principal aim of the webinar was to contribute to the envisaged Ocean Energy Platform for Blue Economies, advocated by UNIDO and SIDS DOCK, in close coordination with the Global Network of Regional Sustainable Energy Centers. The goal of the Platform is to build a bridge between industry and research players, which need to test new solutions in various climates and contexts, and the interest of SIDS and coastal developing countries in accessing technology and expertise</p>	<u><a href="https://www.ctc-n.org/calendar/webinars/ocean-energy-technologies-blue-economies-small-islands-and-low-lying-developing">https://www.ctc-n.org/calendar/webinars/ocean-energy-technologies-blue-economies-small-islands-and-low-lying-developing</a></u>
	Global Carbon Capture and Storage Institute and CTCN	<p><u><a href="#">Bioenergy and Carbon Capture and Storage: delivering negative emissions with bioenergy, biofuels and waste-to-energy</a></u>:</p> <p>This webinar provided an overview of the use of bioenergy with carbon capture and storage, and covered a wide range of its aspects</p>	<u><a href="https://www.ctc-n.org/calendar/webinars/webinar-bioenergy-and-carbon-capture-and-storage-delivering-negative-emissions">https://www.ctc-n.org/calendar/webinars/webinar-bioenergy-and-carbon-capture-and-storage-delivering-negative-emissions</a></u>
	United Nations Economic and Social Commission for Asia and the Pacific and CTCN	<p><u><a href="#">CTCN/Ocean Accounts webinar: Introduction on Ocean Accounting – managing our impacts on the ocean</a></u></p> <p>The webinar presented the basic principles of environmental–economic accounting and how they have been applied to integrate data on the ocean. The benefit will be linking to a new community of practice on ocean accounting</p>	<u><a href="https://www.ctc-n.org/calendar/webinars/ctcn-ocean-accounts-webinar-introduction-ocean-accounting-managing-our-impacts">https://www.ctc-n.org/calendar/webinars/ctcn-ocean-accounts-webinar-introduction-ocean-accounting-managing-our-impacts</a></u>
	NDEs, Network members and climate technology stakeholders	<p>CTCN Virtual Regional NDE Meetings Series – Asia, Caribbean, Latin America, francophone Africa, Parties included in Annex I to the Convention: a series of Regional Forums to provide opportunities for NDEs, Network members and climate technology stakeholders to meet and discuss some of the key issues of the CTCN and share experience</p>	<u><a href="https://www.ctc-n.org/calendar/webinars/ctcn-virtual-regional-meetings-forum-ndes-pacific-video">https://www.ctc-n.org/calendar/webinars/ctcn-virtual-regional-meetings-forum-ndes-pacific-video</a></u>
	UNEP Regional Office for West Asia, in collaboration with the CTCN and the International Solid Waste Association	<p><u><a href="#">COVID-19: Environmentally Sound Management of Waste</a></u>: The objective of the webinar was to share information on the environmentally sound management of health care waste, with a focus on two modes of waste disposal: landfills and incineration</p>	<u><a href="https://www.ctc-n.org/calendar/webinars/covid-19-environmentally-sound-management-waste">https://www.ctc-n.org/calendar/webinars/covid-19-environmentally-sound-management-waste</a></u>
WIM Executive Committee	Different organizations engaged in the five expert groups under the WIM Executive Committee	<p>Expert groups contribute to the implementation of the activities of the <u><a href="#">five-year rolling workplan</a></u> of the WIM Executive Committee. They serve in an advisory role and report to the Executive Committee:</p> <ul style="list-style-type: none"> <li>• Expert group on <u><a href="#">slow onset events</a></u>;</li> <li>• Expert group on <u><a href="#">non-economic losses</a></u>;</li> <li>• Technical expert group on <u><a href="#">comprehensive risk management</a></u>;</li> <li>• Task force on <u><a href="#">displacement</a></u>;</li> <li>• Expert group on <u><a href="#">action and support</a></u></li> </ul>	<p>A <u><a href="#">compendium</a></u> on comprehensive risk management approaches and a <u><a href="#">policy brief</a></u>, as well as <u><a href="#">outputs</a></u> from the first phase of the task force on displacement. The recommendations arising from the first phase are contained in the annex to decision 10/CP.24</p> <p>This <u><a href="#">link</a></u> provides information on events, workshops and meetings, organized, among others, by the expert groups and associated outputs</p>

Constituted body	Collaborating organization	Purpose of collaboration	Output
AC	Party and non-Party stakeholders	Party and non-Party stakeholders collaborate on most work products and activities under the workplan of the AC. The AC regularly issues calls for submissions to receive inputs from Party and non-Party stakeholders on its work	Further details on past and ongoing collaboration, including the related outputs, can be found in the <a href="#">annual reports</a> and <a href="#">publications of the AC</a>
		After each session of the COP, the AC conducts a review of new decisions relevant to the topic of adaptation, monitors the workplans of relevant constituted bodies (examples from <a href="#">2020</a> and <a href="#">2021</a> ) and engages other bodies accordingly on specific activities in order to create synergetic outcomes and avoid duplication. Adaptation-related constituted bodies are invited to attend the official meetings of the AC	
	<b>Other organizations</b>	The SBSTA has given the AC an advisory role to the NWP with its 400+ partner organizations. The NWP provides technical knowledge support to the AC, the LEG and other constituted bodies and the AC relies on it for case studies, synthesis work and contributions to meetings and workshops	
CGE	<b>Constituted bodies and expert groups</b>	Events, workshops and webinars	Information on events, workshops, webinars and CGE reports can be found <a href="#">here</a>
	<b>International organizations</b>	The IPCC and the Global Support Programme of UNDP and UNEP are members of the CGE. As appropriate, the CGE invites the IPCC and Global Support Programme to collaborate on its activities. The CGE also invites relevant international organizations to participate in its events (workshops, webinars, informal forums, side events)	
LEG	GCF and GEF	As the operating entities of the Financial Mechanism of the Convention and the Paris Agreement, the GCF and GEF support countries in formulating and implementing NAPs and in implementing adaptation action	Events, workshops, joint papers/reports, technical guidance, outreach/conferences, webinars, direct country support
	The support programmes and networks and the United Nations organizations supporting countries in the process to formulate and implement NAPs (i.e. the NAP Global Support Programme, the NAP Global Network, the NAP Ag Support Programme and members of the <a href="#">NAP Technical Working Group</a> )		More information on the work of the LEG and its collaboration with various stakeholders and actors is available in its <a href="#">meeting reports</a> and recent <a href="#">publications</a>
	Other constituted bodies	For example, the AC, CGE, CTCN, WIM Executive Committee, PCCB, SCF and TEC, on various elements of work on adaptation and in supporting the LDC work programme	
	The LDC Parties in direct country support provided by the LEG through the Open NAPs initiative		
SCF	The SCF collaborates with a wide range of financial institutions, MDBs, bilateral agencies, operating entities of the Financial Mechanism, intergovernmental organizations, UNFCCC bodies and representatives of the UNFCCC constituencies in delivering its workstreams	Data providers and technical paper submissions as input to the SCF flagship reports.  Technical papers, case studies, resource persons for the SCF Forum	<a href="https://unfccc.int/topics/climate-finance/resources/biennial-assessment-of-climate-finance">https://unfccc.int/topics/climate-finance/resources/biennial-assessment-of-climate-finance</a>  <a href="https://unfccc.int/topics/climate-finance/workstreams/needs-report">https://unfccc.int/topics/climate-finance/workstreams/needs-report</a>  <a href="https://unfccc.int/topics/climate-finance/meetings--events/scf-forum">https://unfccc.int/topics/climate-finance/meetings--events/scf-forum</a>

# Annex III

## REFERENCES

- ADB. (2016). *Fossil fuel subsidies in Asia trends: impacts, and reforms - Integrative report*. Retrieved from
- Alistair Hunt, J. F., Fintan Hurley, Alison Searl. (2016). *Social Costs of Morbidity Impacts of Air Pollution*. Retrieved from <https://www.oecd-ilibrary.org/docserver/5jm-55j7cq0lv-en.pdf?expires=1613185208&id=id&acname=guest&checksum=0E-1022483A0059E5C2C2F4EB004C6F6>
- Canpolat, E. G., Sophia. (2019). Energy Subsidy Reform Assessment Framework (ESRAF): Incidence of Price Subsidies on Households and Distributional Impact of Reform, Qualitative Methods - Good Practice Note 4. *ESMAP*.
- Chai, H. C., Hong, W.H., Reilly, J.M., Paltsev, S. and Chen, Y.H.H. (2019). Will greenhouse gases mitigation policies abroad affect the domestic economy? The case of Taiwan. *Climate Change Economics (CCE)*, 10(04), pp.1-26.
- Climate Investment Fund, S. N. a. A. T. K. (2018). Gender and Renewable Energy: Entry points for women's livelihoods and employment.
- Commonwealth of Australia. (2005). *Socio-economic Impact Assessment Toolkit "A guide to assessing the socio-economic impacts of Marine Protected Areas in Australia"*. Retrieved from
- Dechezleprêtre, A., & Sato, M. (2017). The Impacts of Environmental Regulations on Competitiveness. *Review of Environmental Economics and Policy*, 11(2), 183-206. doi:10.1093/reqp/rev013
- Delang, C., & Toro, M. (2011). Hydropower-Induced Displacement and Resettlement in the Lao PDR. *South East Asia Research*, 19, 567-594. doi:10.5367/sear.2011.0056
- European Union, J. C., Marielle FEENSTRA. (2019). *Women, Gender Equality and the Energy Transition in the EU*. Retrieved from
- Farid, M., Keen, M., Papaioannou, M., Parry, I., Pattillo, C., & Ter-Martirosyan, A. (2016). After Paris: Fiscal, Macroeconomic and Financial Implications of Global Climate Change. *Staff Discussion Notes*, 16, 1. doi:10.5089/9781513506562.006
- Hasegawa, T., Fujimori, S., Havlik, P., Valin, H., Bodirsky, B. L., Doelman, J. C., . . . Witzke, P. (2018). Risk of increased food insecurity under stringent global climate change mitigation policy. *Nature Climate Change*, 8(8), 699-703. doi:10.1038/s41558-018-0230-x
- Heger, M. S., Maria. (2018). *Air Pollution in Tehran : Health Costs, Sources, and Policies*. *Environment and Natural Resources Global Practice Discussion Paper*; No. 6. Retrieved from
- Heidrich, O., Reckien, D., Olazabal, M., Foley, A., Salvía, M., de Gregorio Hurtado, S., . . . Dawson, R. J. (2016). National climate policies across Europe and their impacts on cities strategies. *Journal of Environmental Management*, 168, 36-45. doi:<https://doi.org/10.1016/j.jenvman.2015.11.043>
- Hofmann, A. P. E. (2016). Discussion of climate policy instrument types applied in the EU. Climate Policy Info Hub, 27 June 2016. *Scientific Knowledge for Decision-Makers: Issues & Sectors*. Retrieved from <https://climatepolicyinfohub.eu/discussion-climate-policy-instrument-types-applied-eu>
- ICAT. (2021). Policy Assessment Guides (Initiative for Climate Action Transparency). available at <https://climateactiontransparency.org/icat-toolbox/policy-assessment-guides/>.
- ILO. (2017a). *GAIN Training Guidebook: How to measure and model social and employment outcomes of climate and sustainable development policies*. *Green Jobs Assessment Institutions Network*, 2017. Retrieved from
- ILO. (2017b). *Mainstreaming green job issues into national employment policies and implementation plans: a review (Employment Working Paper No. 227)*. Retrieved from
- ILO IDB. (2020). Saget, Catherine, Vogt-Schilb, Adrien and Luu, Trang (2020). Jobs in a Net-Zero Emissions Future in Latin America and the Caribbean. Inter-American Development Bank and International Labour Organization, Washington, D.C. and Geneva.
- IMF. (2015). Angola : Technical Assistant Report - Angola: Fuel Price Subsidy Reform the Way Forward. Country Report No. 15/28
- IMF. (2017). *Reforming Energy Policy in India : Assessing the Options*. Retrieved from <https://www.elibrary.imf.org/view/IMF001/24239-9781475595734/24239-9781475595734/24239-9781475595734.xml?redirect=true>
- IMF. (2018). Belize : Climate Change Policy Assessment. IMF Country Report No. 18/329.
- IMF. (2019a). Colombia : Technical Assistance Report - Reforming Energy Pricing. Country Report No. 19/344
- IMF. (2019b). *Fiscal Monitor: How to Mitigate Climate Change*. Washington, October. Retrieved from <https://www.imf.org/en/Publications/FM/Issues/2019/10/16/Fiscal-Monitor-October-2019-How-to-Mitigate-Climate-Change-47027>
- IPCC. (2018). *Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]*. Retrieved from
- IRENA. (2019). *Renewable Energy: A Gender Perspective*. IRENA, Abu Dhabi.
- Kojima, M. (2017). GOOD PRACTICE NOTE 1: Identifying and Quantifying Energy Subsidies. *World Bank Group*.
- Kuriakose, S. N. A. T. (2017). *Gender and renewable energy: entry points for women's livelihoods and employment*. Retrieved from
- Lauren Giandomenico, Maya P., Nicholas Rivers. (2020). *A systematic review of energy efficiency home retrofit evaluation studies*. Retrieved from
- Markaki, M., Belegri-Roboli, A., Michaelides, P., Mirasgedis, S., & Lalas, D. P. (2013). The impact of clean energy investments on the Greek economy: An input-output analysis (2010-2020). *Energy Policy*, 57, 263-275. doi:10.1016/j.enpol.2013.01.047. *Energy Policy*, 57, 263-275.
- Markkanen, S., & Anger-Kraavi, A. (2019). Social impacts of climate change mitigation policies and their implications for inequality. *Climate Policy*, 19(7), 827-844. doi:10.1080/14693062.2019.1596873
- Marvin E. Olsen, M. G. C., Marjorie R. Greene, Barbara D. Melber, Donna J. Merwin. (1978). *A Social Impact Assessment and Management Methodology Using Social Indicators and Planning Strategies*. Retrieved from
- Mouratiadou, I., Biewald, A., Pehl, M., Bonsch, M., Baumstark, L., Klein, D., . . . Kriegler, E. (2016). The impact of climate change mitigation on water demand for energy and food: An integrated analysis based on the Shared Socioeconomic Pathways. *Environmental Science & Policy*, 64, 48-58. doi:<https://doi.org/10.1016/j.envsci.2016.06.007>
- Narain, U. S., Chris. (2016). *Methodology for Valuing the Health Impacts of Air Pollution : Discussion of Challenges and Proposed Solutions*. World Bank, Washington, D.C.. © World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/24440>
- OECD. (2021). The OECD Tax Database available at <http://www.oecd.org/tax/tax-policy/tax-database/>
- Orlando, Maria B. J., Vanessa Lopes; Vaidya, Pranav; Angelou, Nicolina; Zumbyte, Ieva; Adams, Norma. (2018). Getting to Gender Equality in Energy Infrastructure : Lessons from Electricity Generation, Transmission, and Distribution Projects. Energy Sector Management Assistance Program (ESMAP)



- Technical Report, no. 012/18; World Bank, Washington, D.C. © World Bank. <https://openknowledge.worldbank.org/handle/10986/29259> License: CC BY 3.0 IGO.
- Parry, I., Mylonas, V., & Vernon, N. (2018). Mitigation Policies for the Paris Agreement: An Assessment for G20 Countries. *International Monetary Fund (IMF) Research Paper Series*.
- Parry, I., Shang, B., Wingender, P., Vernon, N., & Narasimhan, T. (2016). Climate Mitigation in China: Which Policies Are Most Effective? *IMF Working Papers*, 16, 1. doi:10.5089/978147574524.001
- Scott McDonald, L. S., Karen Thierfelder, Manal Shehabi (2020). *Assessing impacts of the implementation of response measures: The case study of Senegal and Kenya*. Retrieved from
- Stavins, R. N. (1998). Significant issues for environmental policy and air regulation for the next decade. *Environmental Science & Policy*, 1998(1), 143-147.
- Ter-Martirosyan, M. M. F. M. K. M. G. P. I. W. H. P. C. A. P. A. (2016). *After Paris: Fiscal, Macroeconomic and Financial Implications of Global Climate Change*. Retrieved from <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/After-Paris-Fiscal-Macroeconomic-and-Financial-Implications-of-Global-Climate-Change-43484>
- Thomas F. Walker, E. C., Farah Khalid Khan, Adea Kryeziu. (2016). *Residential Electricity Subsidies in Pakistan: Targeting, Welfare Impacts, and Options for Reform*. *World Bank Policy Research Working Paper No. 7912*. Retrieved from
- UNFCCC. (2008). *Consideration of information on potential environmental, economic and social consequences, including spillover effects, of tools, policies, measures and methodologies available to Annex I Parties (FCCC/KP/AWG/2008/L.17)*. Retrieved from
- UNFCCC. (2016). *Guidance to assist developing country Parties to assess the impact of the implementation of response measures, including guidance on modelling tools. Technical paper by the secretariat (FCCC/TP/2016/4)*. Retrieved from
- UNFCCC. (2017). *The concept of economic diversification in the context of response measures. Technical paper*. Retrieved from
- UNFCCC. (2020). *Compilation and synthesis of fourth biennial reports of Parties included in Annex I to the Convention*. Retrieved from [https://unfccc.int/sites/default/files/resource/sbi2020\\_inf10a01.pdf](https://unfccc.int/sites/default/files/resource/sbi2020_inf10a01.pdf)
- United Nations. (2021). *Modelling Tools for Sustainable Development* available at <https://un-modelling.github.io/about/>.
- Vanclay F. (2002). Social impact assessment. *Encyclopedia of Global Environmental Change*. 387-393.
- Weisbrod Burton, Weisbrod G. (1997). *Assessing the Economic Impact of Transportation Projects*. Retrieved from
- World Bank. (2003). *A User's Guide to Poverty and Social Impact Analysis*. <http://documents1.worldbank.org/curated/en/278581468779694160/pdf/304050ENGLISH01ers0Guide01may020031.pdf>. Retrieved from
- World Bank. (2006). *Coudouel, Aline; Dani, Anis A.; Paternostro, Stefano. 2006. Poverty and Social Impact Analysis of Reform: Lessons and Examples from Implementation*. Washington, D.C.: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/7122> License: CC BY 3.0 IGO.. Retrieved from
- World Bank. (2010). *Designing household survey questionnaires for developing countries: lessons from 15 years of the Living Standards Measurement Study: Volume One*. Grosh, Margaret [ed.] Glewwe, Paul [ed.]. <https://documents.worldbank.org/en/publication/documents-reports/document-detail/452741468778781879/volume-one>. Retrieved from
- World Bank. (2017). *High-Level Commission on Carbon Prices. 2017. Report of the High-Level Commission on Carbon Prices*. Washington, D.C.: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO. Retrieved from
- World Bank. (2019). *Carbon Pricing Leadership Coalition. Report of the High-Level Commission on Carbon Pricing and Competitiveness*. Available at <https://openknowledge.worldbank.org/handle/10986/32419> Retrieved from
- World Bank. (2021a). *Living Standards Measurement Study* available at <https://www.worldbank.org/en/programs/lsms/overview>.
- World Bank. (2021b). *Open Learning Campus: Accelerating solutions through learning*. In partnership with Republic of Korea Ministry of Economy and Finance available at <https://olc.worldbank.org/wbg-academy>.
- World Bank ESMAP Olivier, A. Ruggeri L., Caterina. (2018). *Energy Subsidy Reform Assessment Framework: Analyzing the Incidence of Consumer Price Subsidies and the Impact of Reform on Households — Quantitative Analysis*. World Bank, Washington, D.C. © World Bank. <https://openknowledge.worldbank.org/handle/10986/30254> License: CC BY 3.0 IGO.. Retrieved from
- Yamazaki, A. (2017). Jobs and climate policy: Evidence from British Columbia's revenue-neutral carbon tax. *Journal of Environmental Economics and Management*, 83, 197-216. doi:<https://doi.org/10.1016/j.jeem.2017.03.003>





United Nations  
Climate Change

Katowice  
Committee  
on Impacts

**Katowice Committee of Experts on the Impacts of the Implementation of Response Measures**, is a constituted body which was established in Katowice December 2018 to support the work programme of the forum on the impact of the implementation of response measures

## CONTACT DETAILS

The **Katowice Committee on Impacts** may be contacted through the UNFCCC secretariat:

Platz der Vereinten Nationen 1,  
53113 Bonn  
Germany

Email: [KCI@unfccc.int](mailto:KCI@unfccc.int)

Website: <https://unfccc.int/process-and-meetings/bodies/constituted-bodies/KCI>

© 2022 UNFCCC

United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Paris Agreement

All rights reserved.

This publication is issued solely for public information purposes, including any references to the Convention, the Kyoto Protocol and the Paris Agreement, and any relevant decisions with respect thereto. No liability is assumed for the accuracy or uses of information provided.