1 Introduction

The unprecedented challenge of climate change requires that society undergoes a fundamental, systemic change away from carbon-intensive and unsustainable pathways of development. The urgency of a transition towards sustainable development and net zero global greenhouse gas (GHG) emissions was underlined in the special report Global Warming of 1.5°C[1] *by the Intergovernmental Panel on Climate Change (IPCC). It is crucial that climate and development policies tackle GHG emissions by avoiding further investments in fossil fuel infrastructure, promoting clean technologies and enhancing sinks of GHGs, including forests, to ensure alignment with the Paris Agreement's temperature goal and the global Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development. In this context, there is an increasing need to assess the transformational impacts of policies and actions, and understand whether they can catalyse sustained paradigm shift in economic, political, social and technical systems.*

1.1 Purpose of the methodology

Countries have committed to limit global temperature rise to 1.5–2°C under the Paris Agreement. However, climate targets in nationally determined contributions (NDCs) are currently inadequate to achieve this global goal.[2] According to the United Nations Emissions Gap Report, the gap between emissions levels under full implementation of NDCs consistent with a 2°C target is 13–15 giga-tonnes of CO_2 equivalent (GtCO_2e) in 2030. In the same year, the emissions gap for a 1.5°C target is 29–32 GtCO_2e. Pathways consistent with a 1.5°C temperature goal require rapid and deep transitions in all sectors and all parts of society away from the prevailing, carbon-intensive modes of production and consumption.[3] To achieve the temperature goals of the Paris Agreement, short-term strategies need to be aligned with long-term goals, and countries need to strengthen the mitigation ambition of NDCs and increase the effectiveness of domestic policy.

In response to this challenge, policymakers are designing long-term strategies, and developing policies and actions to fundamentally transform their energy, industrial, land, transport and other systems. The purpose of this methodology is to help users assess the expected or achieved transformational impacts of policies[4] that aim to reduce GHG emissions and contribute to widespread transition for sustainable development.

Transformational impacts can result from processes and outcomes of policies that drive structural changes in society towards climate change mitigation and sustainable development goals and targets, such as those envisaged in the Paris Agreement, NDCs, long-term low-emission strategies and the SDGs. Transformational changes can occur at international, national and subnational levels. Drivers of transformational change include changes in technology, social norms and behaviour, and economic and non-economic incentives and disincentives. When a policy's change is transformational, its impacts can alter the systemic structures of society to achieve climate and sustainable development outcomes that are large in scale and sustained over time.

This methodology has been developed with the following objectives in mind:

- to help users assess the extent of transformation expected or achieved by policies

- to help decision makers develop effective strategies for transformational change through better understanding of how policies can set in motion processes that lead to transformational outcomes

---

[1] IPCC (2018).

[2] UNEP (2018).

[3] IPCC (2018).

[4] Throughout this document, where the word "policy" is used without "action", it is used as shorthand to refer to both policies and actions. See Glossary for definition of "policy or action".

• to support transparent and consistent monitoring and reporting of transformational impacts.

Chapter 2 further explains the objectives that users may have for assessing the extent of transformation expected or achieved by policies.

This methodology is part of the series of Initiative for Climate Action Transparency (ICAT) guides for assessing the impacts of policies and actions. It is intended to be used in combination with any other ICAT documents that users choose to apply. The series of assessment guides is intended to enable users who choose to assess GHG, sustainable development and transformational impacts of a policy to do so in an integrated and consistent way within a single impact assessment process. Refer to the ICAT *Introduction to the ICAT Assessment Guides*[5] for more information about the ICAT assessment guides and how to apply them in combination.[6]

1.2 Intended users

The methodology is intended for a wide range of users, including governments, donor agencies and financial institutions, businesses, research institutions and non-governmental organizations (NGOs). Throughout the methodology, the term "user" refers to the person or entity applying the methodology.

The following examples show how different types of users can apply the methodology:

• Governments. Assess the expected impacts of policies to inform the design of transformational policies, monitor progress, and evaluate impacts of implemented policies to learn from experience.

• Donor agencies and financial institutions. Assess the impacts of financial support provided, such as grants or loans, to support transformational policies.

• Businesses. Assess the impacts of private sector actions (e.g. voluntary commitments

and implementation of new technologies), private sector financing or government policies on businesses and the economy.

• Research institutions and NGOs. Assess the extent to which policies are transformational, to generate new information to increase stakeholder awareness and support decision makers.

1.3 Scope and applicability of the methodology

This methodology provides a general approach – including principles, concepts and procedures – that users can follow when assessing the transformational impacts of a planned policy. The document also contains hypothetical examples and case studies that illustrate how to apply the methodology in practice. It covers both ex-ante (forward-looking) assessment and ex-post (backward-looking) assessment.

The methodology is concerned with transformational change for climate mitigation and sustainable development. It is applicable to all types of policies in all sectors, although it draws mostly on examples from the energy sector to explain and illustrate various steps.[7] It is limited in scope by not including a definition of transformational change for adaptation; it is limited in depth by not taking a sector-specific approach to assessing transformational impacts. This means that characteristics of transformational change are developed as broad descriptions rather than as specific transformations in a given sector or subsector. A limitation of the generic approach is that it does not provide a comprehensive list of indicators for transformational change covering the specifics of all sectors. It also does not propose a full list of quantitative metrics. Appendix A provides examples of indicators of transformational change characteristics for users to develop more specific indicators for their policy.

The methodology is intended to be flexible: it provides recommended steps rather than requirements, and is non-prescriptive to

---

https://climateactiontransparency.org/wp-content/uploads/2020/01/Introduction-to-the-ICAT-Assessment-Guides.pdf

[6] https://climateactiontransparency.org/wp-content/uploads/2020/01/Transformational-Change-Methodology-Executive-summary.pdf

[7] ICAT uses terminology that is consistent with the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* for sectors: energy; industrial processes and product use (IPPU); agriculture, forestry and other land use (AFOLU); waste; and other (e.g. indirect emissions from nitrogen deposition from non-agriculture sources). However, users can define boundaries for subsectors specific to the policy, as needed.

accommodate various national circumstances. Users should apply the methodology considering their own objectives and circumstances.

The methodology provides a qualitative approach to assessing the extent of transformation expected or achieved by policies. It provides users with an option to quantitatively monitor indicators of transformational change as the basis for qualitative assessment.

The document is organized into five parts (see Figure 1.1). Part I introduces the document and the concept of transformational change, includ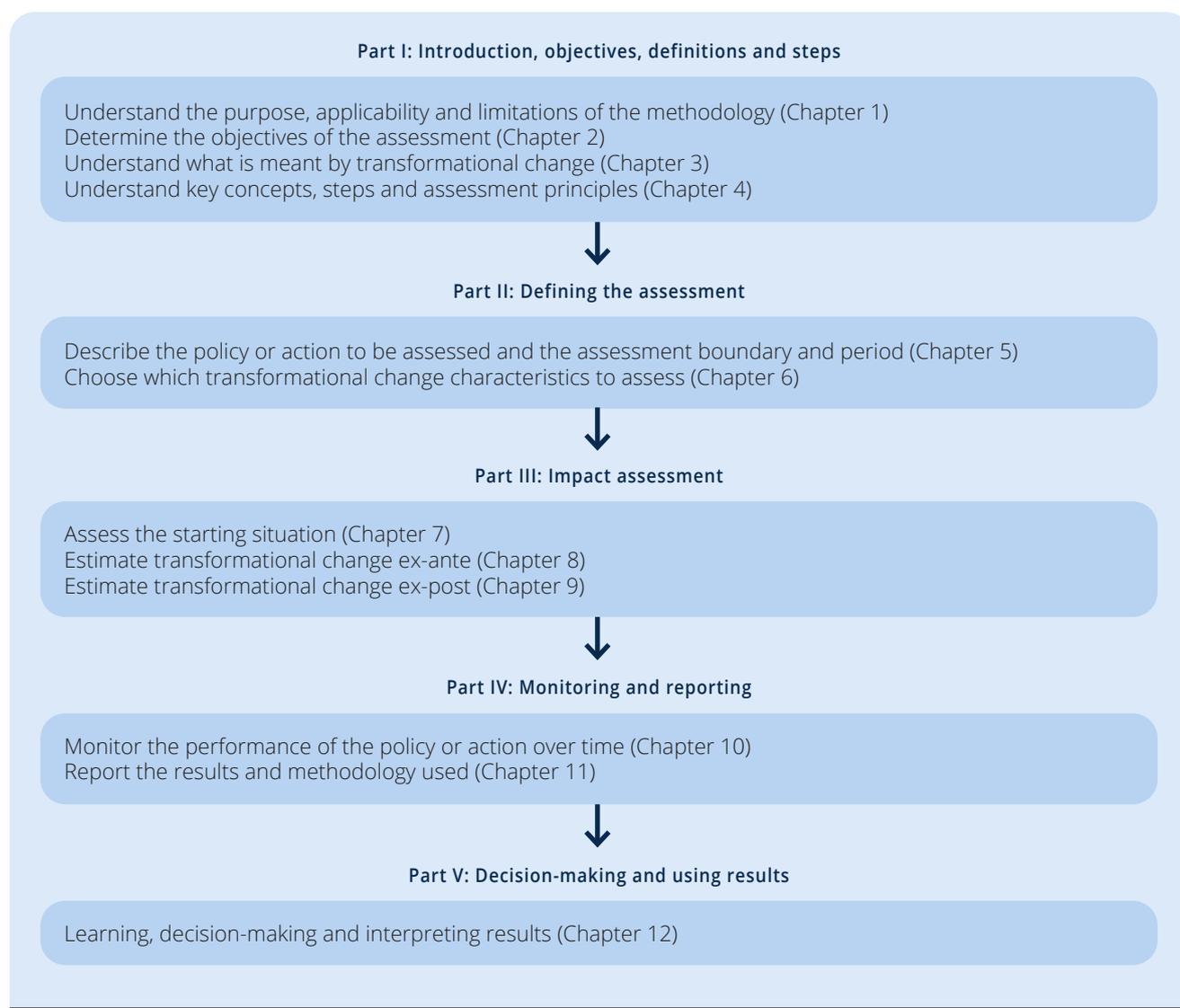ing objectives, principles and an overview of steps. Part II provides steps to define the assessment. Part III discusses ex-ante and ex-post impact assessments. Part IV covers monitoring and reporting, and Part V discusses the use of assessment results for decision-making.

1.3.1 Types of policies and actions

In this methodology, "policy or action" refers to interventions taken or mandated by a government institution or other entity, such as a private sector entity or civil society. These can include laws, directives and decrees; regulations and standards; taxes, charges, subsidies and incentives; information

FIGURE **1.1**

Overview of the methodology

Part I: Introduction, objectives, definitions and steps

Understand the purpose, applicability and limitations of the methodology (Chapter 1)
Determine the objectives of the assessment (Chapter 2)
Understand what is meant by transformational change (Chapter 3)
Understand key concepts, steps and assessment principles (Chapter 4)

↓

Part II: Defining the assessment

Describe the policy or action to be assessed and the assessment boundary and period (Chapter 5)
Choose which transformational change characteristics to assess (Chapter 6)

↓

Part III: Impact assessment

Assess the starting situation (Chapter 7)
Estimate transformational change ex-ante (Chapter 8)
Estimate transformational change ex-post (Chapter 9)

↓

Part IV: Monitoring and reporting

Monitor the performance of the policy or action over time (Chapter 10)
Report the results and methodology used (Chapter 11)

↓

Part V: Decision-making and using results

Learning, decision-making and interpreting results (Chapter 12)

instruments; voluntary agreements; introduction of technologies, processes or practices; and public or private sector financing and investments.

The terms "policy" and "action" refer to interventions at various levels of detail, from (1) broad strategies and plans that define high-level objectives or desired outcomes (e.g. 60% solar power in the grid by 2050); to (2) specific policy instruments to carry out a broad strategy or plan (e.g. a feed-in tariff for solar photovoltaic [PV] systems); to (3) implementation of technologies, processes or practices that result from policy instruments (e.g. mandating solar PV systems on rooftops of government buildings). These are illustrated in Figure 1.2, which shows the range of interventions, from more aspirational to more concrete.

This methodology is primarily designed to assess policy instruments and the implementation of technologies and processes that might influence or shape meaningful practices. Users who intend to assess the impacts of broad strategies or plans should first define the policy instruments, or technologies, processes or practices that will be implemented to achieve the strategy or plan. Broad strategies or plans can be difficult to assess, since the level of detail needed to assess impacts may not be available without further specificity. Different policies or actions can be used to achieve the same

long-term goal but have different impacts during implementation.

The methodology is applicable to policies:

- at any level of government (national, subnational, municipal) in all countries and regions

- in any sector (such as transport, energy, agriculture, forestry, industry and waste), as well as cross-sector policy instruments

- that are planned, adopted or implemented

- that are new policies; or extensions, modifications or eliminations of existing policies.

Table 1.1 presents general types of policies that may be assessed. The list is not exhaustive, and some users may have policies of other types.
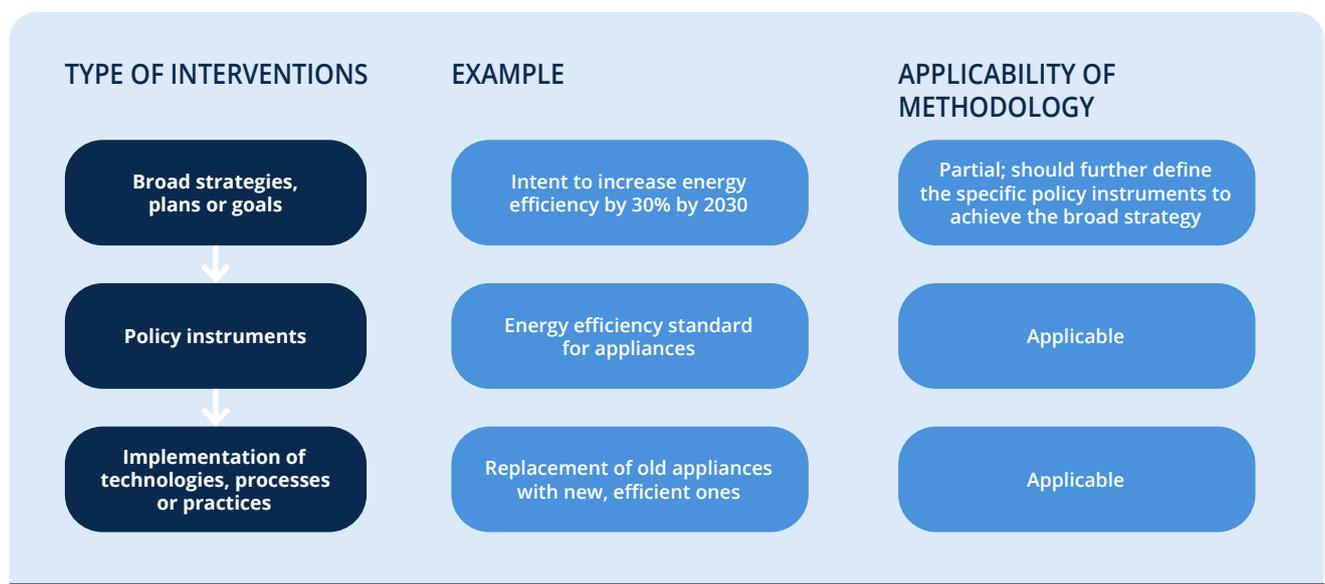
FIGURE **1.2**

Types of interventions

TYPE OF INTERVENTIONS	EXAMPLE	APPLICABILITY OF METHODOLOGY
Broad strategies, plans or goals	Intent to increase energy efficiency by 30% by 2030	Partial; should further define the specific policy instruments to achieve the broad strategy
Policy instruments	Energy efficiency standard for appliances	Applicable
Implementation of technologies, processes or practices	Replacement of old appliances with new, efficient ones	Applicable

TABLE **1.1**

Types of policies

Type of policy	Description
Regulations and standards	Regulations or standards that specify abatement technologies (technology regulation or standard), or minimum requirements for energy consumption, pollution output or other activities (performance regulation or standard). They typically include penalties for non-compliance.
Taxes and charges	A levy imposed on each unit of activity by a source – for example, a fuel tax, carbon tax, traffic congestion charge, or import or export tax.
Subsidies and incentives	Direct payments, tax reductions, price supports or the equivalent provided by government to an entity for implementing a practice or performing a specified action – for example, social protection schemes for employees, families and communities related to shifts in employment and the economy.
Voluntary agreements or actions	Agreements, commitments or actions undertaken voluntarily by public or private sector actors, either unilaterally or jointly in a negotiated agreement. Some voluntary agreements include rewards or penalties associated with participating in the agreement or achieving the commitments.
Information instruments	Requirements for public disclosure of information. They include labelling programmes, emissions reporting programmes, rating and certification systems, benchmarking, and information or education campaigns aimed at changing behaviour by increasing awareness.
Emissions trading programmes	Programmes that establish a limit on aggregate emissions of various pollutants from specified sources; require sources to hold permits, allowances or other units equal to their actual emissions; and allow permits to be traded among sources. These programmes are also referred to as emissions trading systems or cap-and-trade programmes.
Research, development and deployment policies	Policies aimed at supporting technological advances, through direct government funding or investment, or facilitation of investment, in technology research, development, demonstration and deployment activities.
Public procurement policies	Policies requiring that specific attributes (such as GHG emissions) are considered as part of public procurement processes.
Infrastructure programmes	Provision of (or granting a government permit for) infrastructure, such as roads, water, urban services, and high-speed rail; and economic revitalization programmes for areas affected by systemic transitions.
Implementation of technologies, processes or practices	Implementation of technologies, processes or practices (e.g. those that reduce emissions compared with existing technologies, processes or practices).
Financing and investment	Public or private sector grants or loans – for example, those supporting development strategies or policies (e.g. development policy loans or development policy operations such as loans, credits and grants), private sector development grants in high-risk or small markets, or direct investments in human capital (e.g. retraining, alternative skill development, education).

Source: WRI (2014); based on Gupta et al. (2007).

1.4 When to use the methodology

The methodology can be used at multiple points throughout the policy design and implementation process, including:

- **before implementation** – to assess the extent of transformation expected from a policy (through ex-ante assessment)

- **during implementation** – to assess the extent of transformation achieved to date from a policy, ongoing performance and the extent of transformation expected in the future

- **after implementation** – to assess the extent of transformation achieved as a result of a policy (through ex-post assessment).

Depending on individual objectives and when the methodology is applied, users can implement the steps related to ex-ante assessment, ex-post assessment or both. Users carrying out an ex-post assessment only can skip Chapter 8. Users carrying out an ex-ante assessment only can skip Chapters 9 and 10.

Figure 1.3 outlines a simplified sequence of steps to monitor and assess impacts at multiple stages in a policy design and implementation cycle. In the figure, the process is iterative, such that insights from previous experience inform improvements to policy design and implementation, and the development of new policies.

1.5 Key recommendations

The methodology includes key recommendations that are recommended steps to follow when assessing and reporting the extent of transformation expected or achieved. These recommendations are intended to help users produce high-quality impact assessments that are based on the principles of

FIGURE 1.3

Assessing impacts during a policy design and implementation cycle

Source: Adapted from WRI (2014).
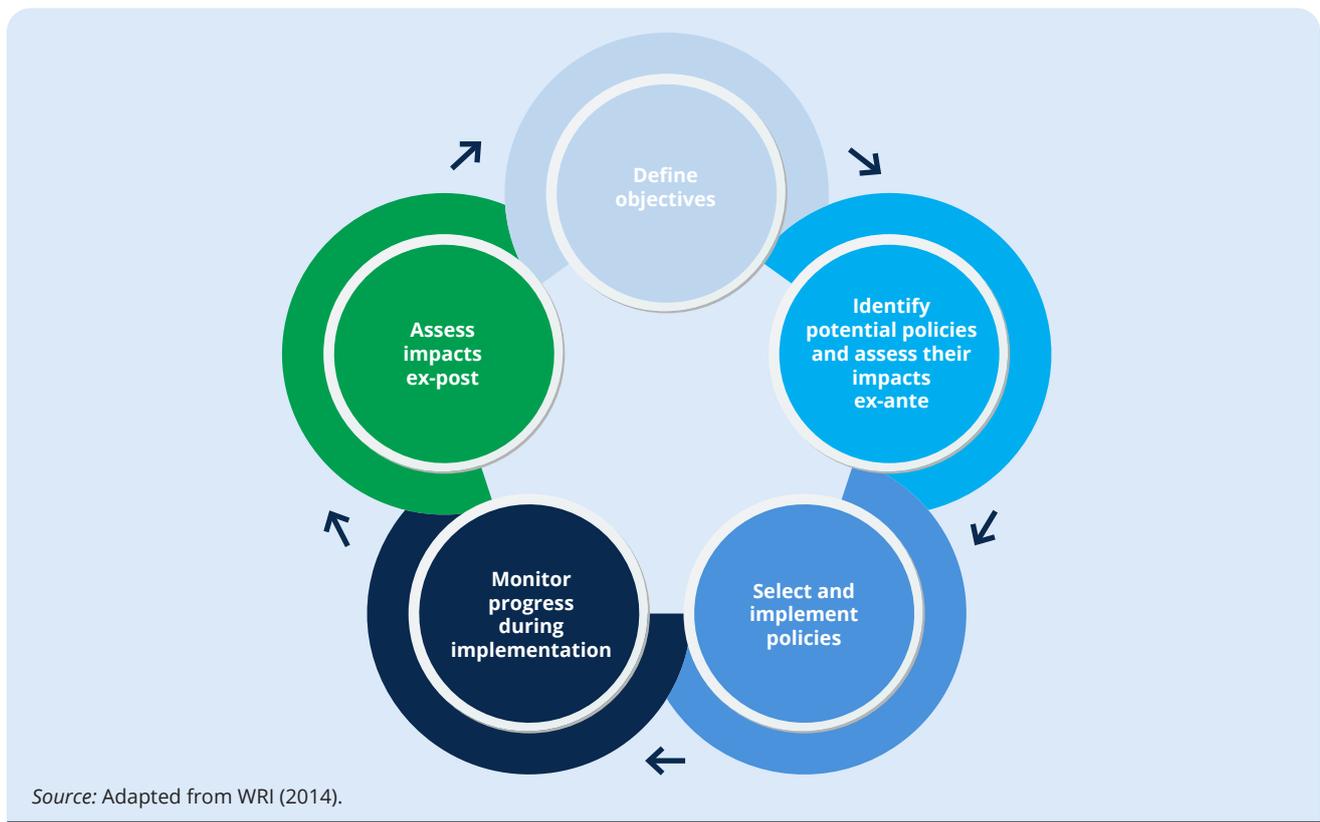
relevance, completeness, consistency, transparency, accuracy and reflection on ambition.

Key recommendations are indicated in subsequent chapters by the phrase "It is a *key recommendation to …*". All key recommendations are also compiled in a checklist at the beginning of each chapter.

Users who want to follow a more flexible approach can choose to use the methodology without adhering to the key recommendations. The *Introduction to the ICAT Assessment Guides* provides more information on how and why key recommendations are used within the ICAT methodology documents, and on following either the "flexible approach" or the "key recommendations approach" when using the methodology. Refer to the *Introduction to the ICAT Assessment Guides* before deciding which approach to follow.

1.6 Relationship to other methodologies and resources

This methodology is part of the ICAT series of guides for assessing impacts of policies and actions. It is intended to be used in combination with any other ICAT guides that users choose to apply, including:

- sector-level methodologies for assessing GHG impacts of policies in the agriculture, forestry, energy and transport sectors

- *Sustainable Development Methodology* on how to assess the environmental, social and economic impacts of policies

- *Stakeholder Participation Guide* on how to carry out effective stakeholder participation when designing, implementing and assessing policies, including when assessing transformational impacts using this guide

- *Technical Review Guide* on how to review assessment reports, including when assessing the extent of transformation expected or achieved using this guide.

For example, users assessing a renewable energy policy could follow both the ICAT *Renewable Energy Methodology* to assess the GHG impacts and this *Transformational Change Methodology* to assess transformational impacts within an integrated assessment. Refer to the *Introduction to the ICAT Assessment Guides* for more information about the ICAT guides and how to apply them in combination.

In Parts I and IV of this methodology, the basic structure and series of steps draw on the Greenhouse Gas Protocol *Policy and Action Standard*,[8] which provides guidance on estimating the GHG impacts of policies. Figures and tables adapted or reproduced from the *Policy and Action Standard* are cited, but for readability not all text taken directly or adapted from the standard is cited.

1.7 Process for developing the methodology

This methodology has been developed through an inclusive, multi-stakeholder process convened by ICAT. Development was led by UNEP DTU Partnership (lead) and the World Resources Institute (co-lead), who serve as the secretariat and guide the development process.

The first draft was developed by drafting teams, consisting of a subset of a broader Technical Working Group (TWG) and the secretariat. The TWG consists of experts and stakeholders from a range of countries identified through a public call for expressions of interest. The TWG contributed to the development of the technical content for the methodology through participation in regular meetings and written comments. A Review Group provided written feedback on the first draft.

The May 2018 version of this methodology was applied by ICAT participating countries and other non-state actors to ensure that it can be practically implemented. This version of the methodology was informed by the feedback gathered from that experience and includes case studies from those applications.

ICAT's Advisory Committee, which provides strategic advice to the initiative, reviewed the second draft. More information about the development process, including governance of the initiative and the participating countries, is available on the ICAT website.

All contributors are listed in the Contributors section.

---

[8] WRI (2014).

2 Objectives of assessing transformational change

This chapter provides an overview of the objectives users may have in assessing the extent of transformation expected or achieved by policies. Determining the assessment objectives is an important first step, since decisions made in later chapters should be guided by the stated objectives.

Checklist of key recommendations

> • Determine the objectives of the assessment at the beginning of the impact assessment process

Assessing the extent of transformation expected or achieved by policies is a key step towards developing strategies that promote climate and sustainable development goals. It enables policymakers to understand the relationship between policies and the expected or achieved transformational impacts, and supports decision-making.

It is a *key recommendation* to determine the objectives of the assessment at the beginning of the impact assessment process. Examples of objectives for assessing the transformational impacts of a policy are listed below.

2.1 General objectives

• **Understand how the policy helps achieve multiple goals** at international, national or subnational levels through structural change in a sector or across multiple sectors. The goals may include mitigation and sustainable development goals, such as those contributing to the achievement of the Paris Agreement 1.5–2°C target, or outlined as part of a country's green growth plans, long-term vision on climate action (e.g. national five-year, mid-term or long-term climate policies and plans), NDCs or SDGs.

• **Attract finance** by demonstrating how a given policy facilitates a paradigm shift to low-carbon development. Increasingly, funds such as Climate Investment Funds, the NAMA Facility and the Green Climate Fund are paying more attention to operationalizing transformational change in climate finance.

• **Report and communicate** the extent of transformation expected or achieved by policies to demonstrate results and ambition, build coalitions of support, and raise social acceptance. The assessment results can be reported domestically or internationally, including under the Paris Agreement's enhanced transparency framework for ex-ante reporting of expected impacts or ex-post reporting of achieved impacts.

2.2 Objective of assessing expected impacts before policy implementation

• **Improve policy selection and design** by gaining a better understanding of the extent of transformation expected from a given policy. The assessment can also help compare and prioritize policies based on their potential for paradigm shift. Users can use the assessment results to select the most transformational policy, or adjust current policy objectives and design to increase the potential of the policy to be transformational. The process of assessing transformational change can itself also be helpful to inform policy design – for example, by understanding the various characteristics of transformational change.

2.3 Objective of assessing impacts during or after policy implementation

• **Evaluate the transformational impact of a policy over time** to understand whether, and to what extent, it has been transformational. The assessment can also improve the likelihood of policies realizing their transformational potential when it is

conducted regularly and policies are adjusted based on its findings.

- **Inform future policy design**, including reformulation of NDCs towards enhanced ambition, and decide whether to continue current actions, enhance current actions or implement additional actions.

- **Learn from experience and ongoing monitoring** to better understand the drivers of transformational change and enhance the effectiveness of policies.

Users should identify the intended audience(s) of the assessment report. Possible audiences may include policymakers, civil society organizations, businesses, donors, financial institutions, research institutions and other stakeholders affected by, or who can influence, the policy. For more information on identifying stakeholders, refer to the ICAT *Stakeholder Participation Guide* (Chapter 5).

Subsequent chapters provide flexibility to enable users to choose how best to assess the extent of transformation expected or achieved by policies in the context of their objectives. The appropriate level of accuracy and completeness is likely to vary by objective. Users should assess the impacts of policies with a sufficient level of accuracy and completeness to meet the stated objectives of the assessment, as identified in this chapter.