ICAT Initiative for Climate Action Transparency

Introduction to the ICAT Series of Policy Assessment Guides

Assessing the Impacts of Climate Policies and Actions



ICAT series of policy assessment guides

UN environment programme | copenhagen climate centre



Contributors & Acknowledgments

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Introduction

Introduction

Intended Users | Role and structure of the introductory guide

The unprecedented challenge of climate change requires rapid and deep transformations – in virtually all sectors and all parts of society – away from the prevailing carbon-intensive, high-emission modes of production and consumption. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (Lee et al. 2023) confirms that global greenhouse gas (GHG) emissions must peak before 2025 and fall by roughly 43 per cent by 2030 to keep the Paris Agreement's 1.5 °C goal within reach. Yet the United Nations Environment Programme (UNEP) Emissions Gap Report 2025 (Olhoff et al. 2025) shows that current pledges and policies still put the world on course for a temperature rise well above 2 °C.

In this context, accelerating effective climate action and raising ambition is critical to tackle GHG emissions and ensure alignment with the Paris Agreement's temperature goal. The Paris Agreement sets out an enhanced transparency framework (ETF) for countries, to build mutual trust and confidence, and promote effective implementation. The Paris Agreement also requires countries to prepare nationally determined contributions (NDCs) and successively raise their ambition towards achieving the objectives of the Agreement. NDCs outline the policies and actions each country intends to take. Transparency through evidence-based policymaking can support effective implementation and accelerated climate action.

In this context, the Initiative for Climate Action Transparency (ICAT) helps countries assess the impacts of their policies and actions, and supports greater transparency, effectiveness, ambition and trust in climate policies – providing the strong transparency frameworks that form the basis for ambitious NDCs. ICAT brings together methodological guidance, capacity-building efforts and knowledge-sharing to enhance transparency across countries.

To support this work, ICAT has developed a comprehensive toolbox of methodologies for assessing the impacts of climate policies and actions. Figure I presents the ICAT series of policy assessment guides and shows how they are organized and related to one another. The figure gives an overview of the guides, including sector-specific GHG impact assessment guides, cross-cutting guides, and process guides that support stakeholder engagement and technical review.

Together, these guides support assessment of national-level impacts of actions on GHG emissions, sustainable development outcomes and transformational change potential, as well as the impacts of actions at the subnational level by non-state actors. By applying the guides, users can strengthen the design, implementation and monitoring of policies, understand their contributions to national climate targets and broader environmental, social and economic outcomes, and document impacts and results to help mobilize climate finance.

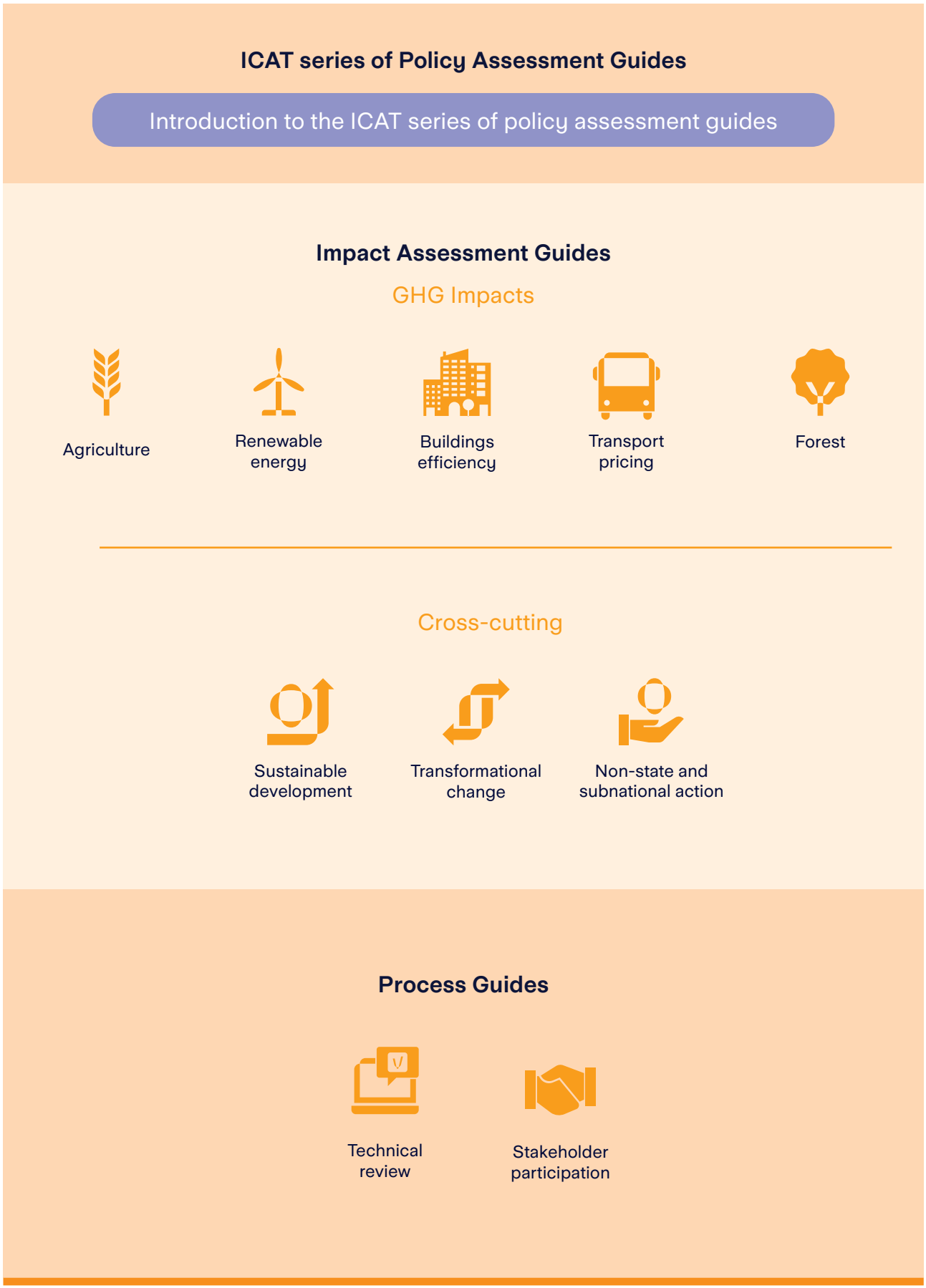
A brief description of each guide can be found in section 2.2.

Intended users

The ICAT series of policy assessment guides are intended for a wide range of organizations, institutions and individuals. Throughout the guides, the term "user" refers to the person or entity conducting the assessment.

The primary intended users are developing country Governments at all levels (national, subnational or municipal), along with their partners, who are planning or implementing policies, or assessing their impacts in the context of NDCs, low-emission development strategies and other mechanisms. Table I below provides examples of how diverse user types can apply the guides.

Figure I. ICAT series of policy assessment guides



While using the ICAT policy assessment guides, users are encouraged to form a team to carry out the assessment. The team may include subject matter (e.g. agriculture) experts, GHG inventory compilers, and representatives from government agencies, research institutions, businesses and non-governmental organizations (NGOs) which are involved in the design, implementation or evaluation of climate and development policies. Table I provides illustrative examples of how different user types apply the ICAT policy assessment guides, highlighting the flexibility of the methodologies across institutional contexts.

Table I. Examples illustrating how diverse user types apply the guides

Users	Examples
Governments	To assess the impacts of policies and actions, inform policy design, track progress during implementation, and evaluate results to learn from experience.
Donor agencies and financial institutions	To assess the impacts of financial support, such as grants or loans, including in the context of results-based financing.
Businesses	To assess the impacts of private sector initiatives (such as voluntary actions, new technologies or investments) or to evaluate how public policies affect business activities and the economy.
Research institutions and NGOs	To assess policy impacts, support decision-making, and provide independent analysis or technical assistance.
Stakeholders affected by policies and actions, such as private sector actors, industry associations, Indigenous Peoples, local communities and civil society organizations	To participate more effectively in policy design, implementation and assessment, and ensure their perspectives and needs are taken into account.

Role and structure of the Introductory Guide

This Introductory Guide provides an overview of the ICAT series of policy assessment guides and provides a shared foundation for their application. Users of any of the guides should read the Introductory Guide first, and then use it in conjunction with the other guides. Users should begin with the Introductory Guide for the general framework, and then turn to the relevant sectoral guide(s) for the detailed sector-specific methodology, data needs, parameters and calculation tools.

The Introductory Guide:

1. **Introduces each guide in the series,** describing the scope and policies covered by each guide, allowing a user to determine

which guide matches their needs and the national context.

2. **Explains the structure and relationships** between the guides in the series, clarifying how the different documents complement each other and can be combined for broader, more comprehensive assessments.
3. **Consolidates key content common to all GHG impact assessment guides,** such as the purpose and scope of assessments, intended users, guiding principles, methodological considerations, alignment with the ETF, and linkages with the Sustainable Development Goals (SDGs). This ensures a consistent and harmonized approach across sectors, and allows the sectoral guides to focus on technical methodologies.

In practice, the Introductory Guide and the GHG impact assessment guides are designed to be used together. The Introductory Guide, particularly part I, also contains valuable information to aid the understanding and use of all guides in the series, not only those focused on GHG impact assessment.

The Introductory Guide explains how to plan and structure an assessment – how to define objectives, describe the policy, identify GHG impacts, build a causal chain, select boundaries and periods, construct baseline scenarios, and design monitoring and reporting systems. These elements apply across all sectors.

The GHG impact assessment guides then provide the technical methods to carry out these steps for a specific sector – for example, how to model renewable electricity generation, estimate manure management emissions or evaluate transport elasticity responses.

Where broader impacts are also being assessed (e.g. sustainable development, transformational change or non-state actor contributions), the corresponding cross-cutting guides can be added to complement GHG impact assessment. Users can also use the cross-cutting guides on their own, not only together with a GHG impact assessment.

Finally, the process guides (Stakeholder Participation and Technical Review) support all the guides in the series by strengthening inclusiveness, transparency and credibility across the entire assessment process. They are complementary and should be used in combination with the assessment guides.

The Introductory Guide is organized into two parts:

Part I – Overview of the ICAT series of policy assessment guides (chapters 1–3)

This part describes the purpose, structure and potential uses of all guides in the series, and explains how they relate to and support objectives of the Paris Agreement, including its ETF, and the update and implementation of NDCs. It also provides advice on when and how to use the different guides.

Part II – Planning and conducting the assessment (chapters 4–8)

This part presents the common elements that apply across all GHG impact assessment guides. This includes assessment quality principles, stakeholder engagement, setting objectives, and methodological considerations such as data needs and baselines. It also provides guidance on cost estimation, monitoring, reporting and finalizing assessments.

Throughout this Introductory Guide, references and links are provided to relevant specific guides in the series allowing users to easily navigate between general and specific content.



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Part I

Overview of the ICAT series of policy assessment guides

Chapter 1: Introduction to the ICAT series of policy assessment guides

1.1 Purpose and applicability of the guides | 1.2 Relevance of the guides to support the implementation of the Paris Agreement | 1.3 Alignment of the guides with international methodologies

1.1. Purpose and applicability of the guides

The ICAT series of policy assessment guides supports users to assess the national-level impacts of policies and actions on GHG emissions, sustainable development outcomes and transformational change potential. They also enable the assessment of the impacts of actions at the subnational level by non-state actors. The guides are designed to be flexible, allowing users to apply the methodologies according to their specific objectives and national circumstances. The guides can be applied at any level of government, including national, subnational or municipal levels, across all countries and regions.

There are three main types of guide:

- **GHG impact assessment guides –** These provide sector-specific guidance for assessing GHG impacts of policies and actions in the RE, buildings, transport, agriculture and forestry sectors.
- **Cross-cutting guides –** These provide methodologies for assessing sustainable development impacts, transformational change impacts, or the contributions of non-state and subnational actors.
- **Process guides –** These provide process guidance on stakeholder participation and technical review.

The guides in the series provide consistent, transparent methodologies for evaluating the impacts of climate policies and actions. Policymakers and stakeholders can use the guides to inform policy design and decision-making by gaining clearer insights into the expected impacts, costs, and effectiveness of proposed or existing measures. The guides support both domestic policy processes and international reporting requirements under the United NationsFramework Convention on Climate Change (UNFCCC) and the Paris Agreement.

In these guides, a "policy" or "action" refers to interventions taken by Governments, institutions or other entities. A policy generally refers to a framework, strategy or instrument – such as regulations, incentives or programmes – designed to influence behaviour or outcomes. An action refers to specific measures or activities implemented to achieve or support policy objectives or targets, such as deploying technologies, implementing programmes or undertaking operational measures.

For simplicity, the term "policy" is sometimes used as shorthand for both policies and actions. Table 1.1 provides examples and definitions of different types of policies and actions used in the ICAT policy assessment guides.

As mentioned above, the guides are primarily intended to assess the impacts of specific policies or actions. Users seeking to assess broader strategies or plans should, where possible, identify the specific policies and actions expected to be implemented under those strategies. This is because broad strategies often do not provide sufficient detail for a meaningful quantitative assessment. Where such details are not yet defined, users may need to make reasonable assumptions about the likely policies and actions that would support the strategy or focus the assessment on selected representative policies. The guides are best suited for evaluating larger-scale policies and actions – such as national renewable energy (RE) support schemes, energy efficiency standards for buildings or

Table 1.1. Common types of policies and actions

Types of policy or action	Definition
Regulations and standards	Regulations or standards that specify abatement technologies (technology regulations or standards), 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	Levies 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 governments to an entity for implementing a practice or performing a specified action.
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 social or environmental benefits) are considered as part of public procurement processes.

Types of policy or action	Definition
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).

Adapted from Rich et al. (2014), based on Gupta et al. (2007).

transport pricing policies – rather than small-scale, site-specific projects, such as those implemented under Article 6.4 of the Paris Agreement. While the guides can be applied to such projects, project-level methodologies and tools may be more appropriate, such as methodologies developed under the Article 6.4 mechanism or other project-based GHG accounting approaches.

Figure 1.1 illustrates the applicability of the guides across different types of policies and actions.

While the guides can be applied to a broad range of policy types, the scope and robustness of an assessment may be constrained by factors such as limited data availability in activity data, or emission

Figure 1.1. Applicability of the ICAT policy assessment guides

Type of policies and actions	Example	Applicability of guides
Broad strategies, plans or goals	Intent to increase energy efficiency by 30% by 2030	Not applicable; 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

factors, or limited technical capacity. In such cases, users may need to apply simpler methodological approaches, rely on proxy data or expert judgement, and clearly document associated assumptions and uncertainties.

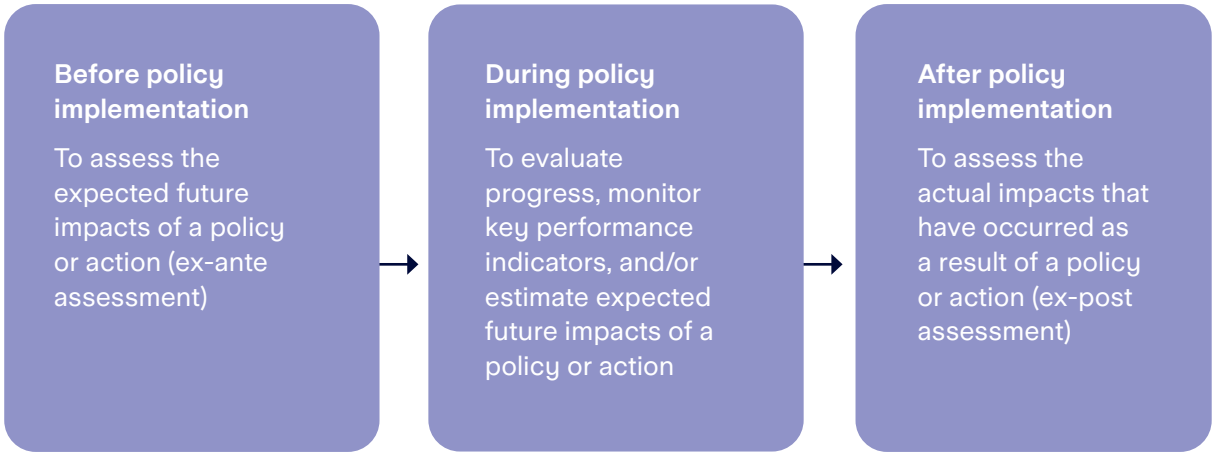
Throughout the guides, "impacts" refer to the changes that result from a policy or action:

- **GHG impacts** are changes in emissions from sources or removals by sinks.
- **Sustainable development impacts** are changes in environmental, social or economic conditions, such as employment, health, air quality or energy security.
- **Transformational impacts** are system-level changes that lead to long-term decarbonization.

The guides can be used at different stages of the policy design and implementation cycle. Figure 1.2 illustrates how the guides support assessments before, during and after policy implementation, including ex-ante (prior to implementation) assessments to inform policy design, assessments during implementation to track progress, and ex-post (after implementation) assessments to evaluate achieved impacts.

From a domestic policy process perspective, ex-ante assessment supports informed decision-making. It enables users to select appropriate policies or actions and refine their design prior to implementation. In contrast, ex-post assessment supports learning and evaluation. It helps users determine how effectively a policy or action has achieved its intended goals, while also identifying lessons learned and highlighting opportunities for future improvement.

Figure 1.2. Application of ICAT policy assessment guides at different stages of the policy design and implementation cycle



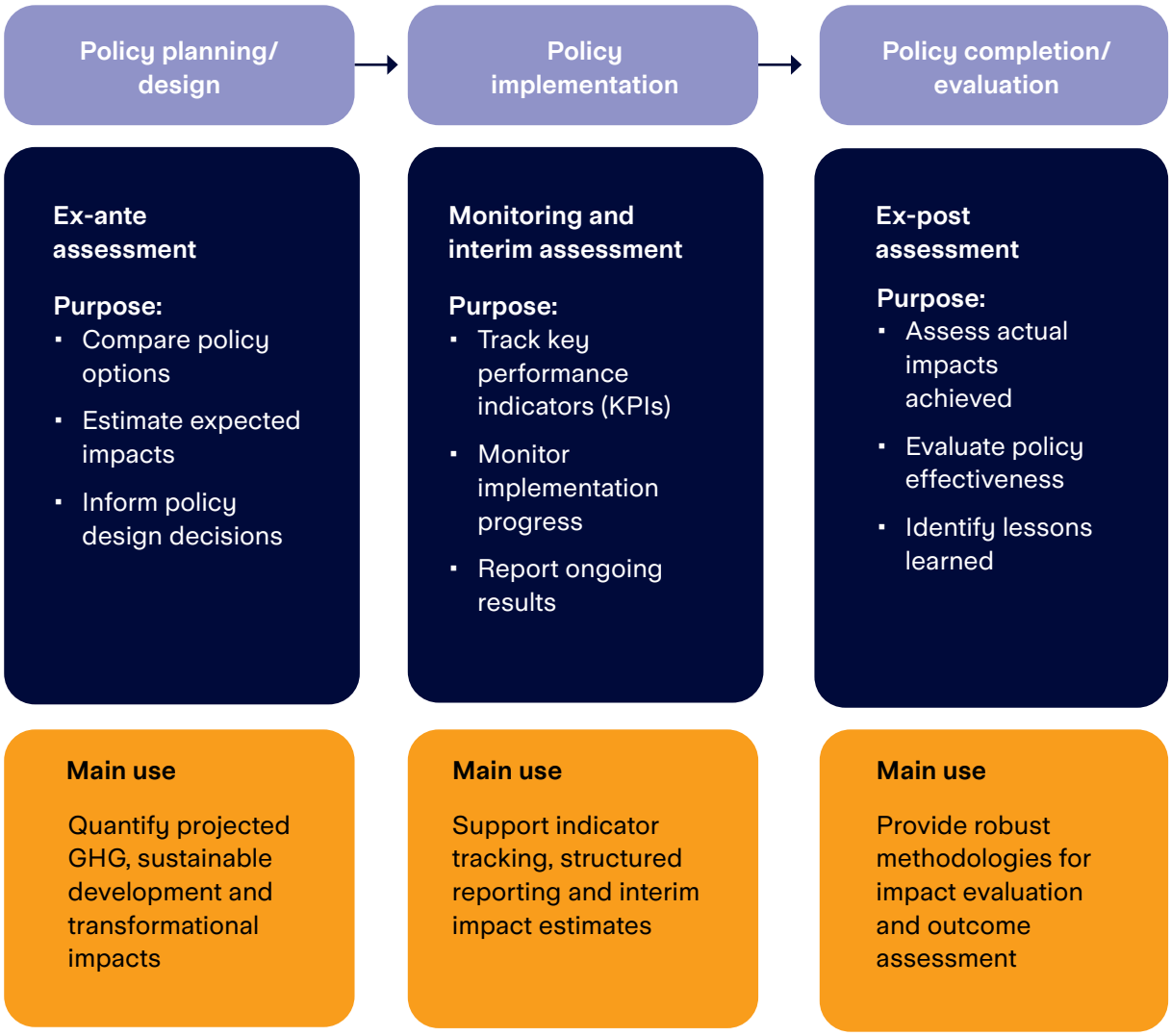
From an international reporting perspective, both ex-ante and ex-post assessments play important roles. They generate information that can support a variety of reporting needs, including informing domestic policy discussions, assessing and monitoring policy implementation and alignment, engaging donors and other stakeholders, and fulfilling international reporting obligations under relevant frameworks. Depending on the objectives and the timing of the assessment, users may apply a methodology for either ex-ante or ex-post assessment, or both. The most robust approach is to apply the methodology before implementation, at regular intervals during implementation, and after the policy or action has been implemented.

Figure 1.3 further illustrates the complementary roles of ex-ante, during implementation and ex-post assessments across the policy cycle. The figure shows how different assessment types support planning, implementation, evaluation and reporting, and highlights their role in evidence-based policymaking.

To support continuous learning, figure 1.4 presents a simplified cycle for identifying, assessing and monitoring policy impacts. The figure illustrates how assessment results feed back into policy design and refinement over time.

Each stage of the cycle shown in figure 1.4 presents an opportunity to apply the ICAT policy assessment guides, depending on the user's objectives and the timing of the assessment.

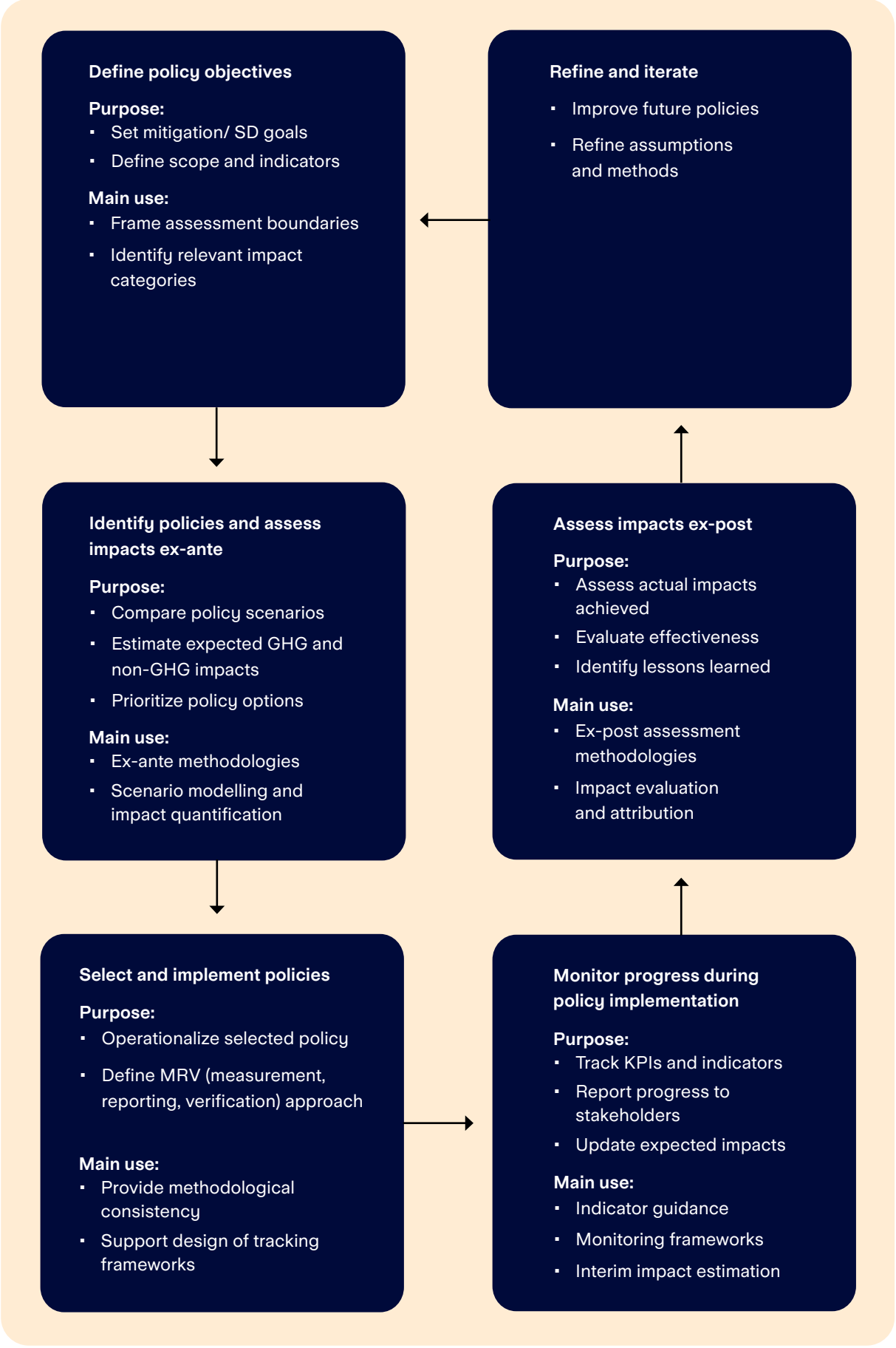
Figure 1.3. Use of ICAT policy assessment guides across policy cycle



1.2. Relevance of the guides to support the implementation of the Paris Agreement

The ICAT policy assessment guides contribute to both Article 4 and Article 13 of the Paris Agreement. Under Article 4, Parties are required to prepare, communicate and maintain successive nationally determined contributions (NDCs) that they intend to achieve, as well as pursue domestic mitigation measures, with the aim of achieving the objectives of the NDCs. Article 13 establishes an ETF for action and support. Under this framework, Parties need to provide inter alia a clear understanding of climate change action, including clarity and tracking of progress towards achieving Parties' individual NDCs

Figure 1.4. Conducting policy assessment using the ICAT policy assessment guides



under Article 4, and provide clarity on support provided and received in the context of climate change actions under Articles 4 and 13. Parties shall account for their NDCs in their biennial transparency reports (BTRs).

The NDCs and the BTRs are interrelated processes, and transparency serves both processes. Sound data are critical to ensure that NDCs encompass evidence-based climate policies and that their targets are established through science-based approach, ensuring that climate actions are both effective and aligned with global climate goals. At the same time, sound data and science-based assessments are needed to ensure that the BTRs support policy credibility and accountability by assessing the progress of NDC implementation, evaluating whether NDC targets are being achieved, and informing the preparation of the next NDC.

In this context, the guides can support the preparation of NDCs by enabling sound decision-making to identify relevant policies and actions based on the ex-ante assessment of the GHG and non-GHG potential impacts of potential policies and actions. In addition, the guides can help assess how policies and actions contribute to NDC mitigation targets and, in turn, support the establishment and refinement of those targets. They also support the preparation of BTRs by helping design indicators for tracking the implementation and achievement of specific policies and actions, as well as by informing ex-post assessments of GHG impacts to be reported in the common tabular format (CTF). In addition, the guides support transparency of support by enabling the estimation and tracking of the costs of policies and actions, as well as financial support needed and received. This helps strengthen the integration of mitigation actions with information on means of implementation, enhancing overall transparency.

The guides align with the key principles of the ETF, transparency, accuracy, consistency, comparability and completeness, as outlined in Article 13.3. The voluntary and non-prescriptive nature of the guides provides flexibility for countries to apply the methods that best fit their national context. They are intended to enhance – not duplicate – existing systems, and support improvements over time. Figure 1.5 illustrates the linkages between ICAT policy assessment guides and the ETF, highlighting how assessment outputs support national reporting and international accountability.

1.3. Alignment of the guides with international methodologies

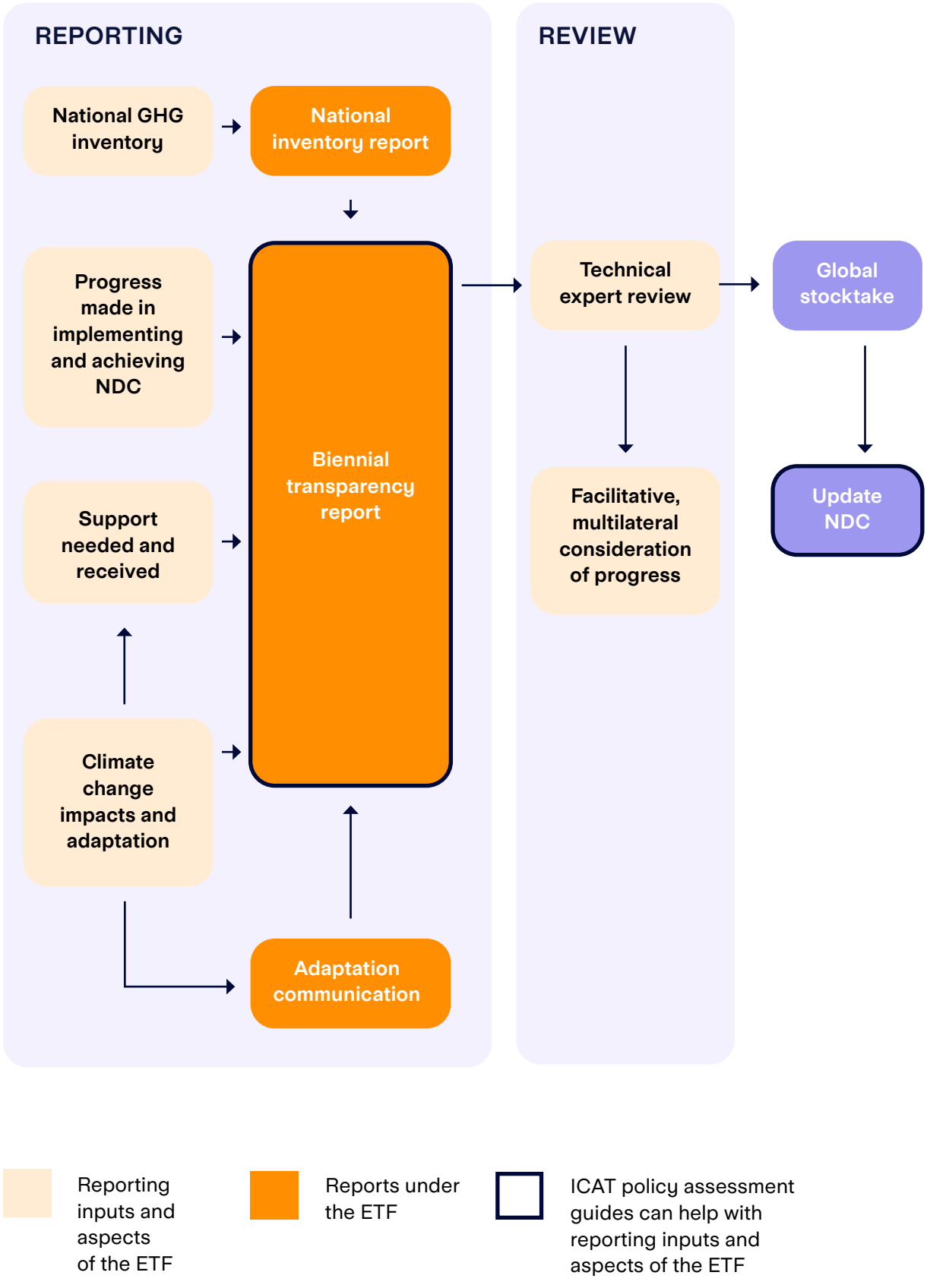
The guides in the series are designed to complement and build on internationally recognized methodologies and guidance. They follow a consistent structure and are aligned with established frameworks to ensure credibility, transparency and comparability in assessing the impacts of policies and actions.

A key reference across all guides is the World Resources Institute (WRI) Greenhouse Gas Protocol Policy and Action Standard (Rich et al. 2014), which provides comprehensive guidance on estimating the GHG impacts of policies and actions, including key accounting concepts such as baseline and policy scenarios, emissions quantification and uncertainty. The WRI Policy and Action Standard: Energy Supply Sector Guidance (Dornau et al. 2015) has also informed the development of relevant guides, particularly in the RE and buildings efficiency methodologies.

In addition, each guide draws on sector-specific references, such as:

- The **Renewable Energy Methodology,** which draws on established approaches and tools for estimating emissions from electricity generation and consumption, including methodologies developed under Article 6.4 of the Paris Agreement, as well as approaches for estimating grid emission factors (e.g. combined margin approach).
- The **Agriculture Methodology** (Lyandres et al., 2023), which builds on the Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines for National Greenhouse Gas Inventories, specifically

Figure 1.5. Linkages between the ICAT series of policy assessment guides and the enhanced transparency framework



volume 4 on agriculture, forestry and other use (AFOLU) (Paustian, Ravindranath and van Amstel 2006), and the 2019 refinement (Dong et al. 2019).

- The **Transport Pricing Methodology,** which references the GIZ Reference Document on Measurement, Reporting and Verification in the Transport Sector (Füssler et al. 2016).
- The **Buildings Efficiency Methodology,** which draws on the WRI Policy and Action Standard: Commercial and residential buildings sector guidance (Kalloz et al. 2015).
- The **Forest Methodology,** which also aligns with IPCC land-use and forestry accounting methods.

Chapter 2: Overview of the ICAT series of policy assessment guides

2.1 Overview of the series | 2.2 Overview of each guide in the series

2.1. Overview of the series

This chapter provides a concise overview of the ICAT series of policy assessment guides and presents the structure and content of each guide.

The guides are also complemented by a range of tools and templates, available on the ICAT website, to assist users in applying the methodologies in practice.

2.2. Overview of each guide in the series

Each ICAT policy assessment guide provides a structured methodology for policymakers and stakeholders assessing the impacts of a specific policy or action in a step-by-step approach. While the guides differ in scope and technical focus, they follow a common logic, and can be applied individually or in combination to produce coherent, multidimensional assessments.

The sections that follow provide an overview of each guide in the series.

Agriculture Methodology

The Agriculture Methodology provides general principles and procedures for quantitatively estimating GHG impacts from agricultural policies addressing the following major GHG sources and carbon pools in the agriculture sector:

- Livestock – Enteric fermentation and manure management practices.
- Fertilizer management – Emissions related to the application and handling of synthetic and organic fertilizers.
- Soil carbon pools – Changes in carbon stocks due to land and soil management practices.
- Rice cultivation – Methane emissions from flooded rice paddies.

Renewable Energy Methodology

The Renewable Energy Methodology outlines how policy design, financial factors and other barriers influence implementation potential, and provides methods for translating this potential expressed as added renewable capacity or generated electricity into estimated displaced GHG emissions.

The methodology focuses on policies that directly promote RE deployment. It covers five policy instruments which together form the core of most national RE policy packages – four well-established approaches, and a fifth, relatively new instrument added in response to emerging integration challenges:

- Feed-in tariffs (including feed-in premiums) – Provide fixed tariffs or premium payments for each unit of renewable electricity delivered to the grid, creating a direct financial incentive for RE deployment and offering investment certainty.
- Auctions (including tenders) – Competitive mechanisms where developers bid to supply renewable electricity, helping lower costs and ensure delivery.
- Tax incentives – Fiscal benefits such as credits or exemptions that improve the financial viability of RE investments.
- Net metering – Enable self-generators to receive credits or payments for excess renewable electricity fed into the grid, supporting distributed generation.
- Variable renewable energy (VRE) integration with grid-battery storage – Support policies for integrating VRE into the grid, including storage solutions to enhance system reliability.

Buildings Efficiency Methodology

The Buildings Efficiency Methodology presents a methodology for assessing the GHG impacts of energy efficiency policies in the buildings sector. It outlines an approach for estimating how policy design features and implementation barriers influence those impacts. While the guide is primarily oriented towards residential buildings, it can also be applied to commercial and public buildings. The methodology covers three building stock types: new buildings, existing buildings undergoing retrofit and existing buildings without retrofit.

The methodology is applicable to the following types of building policies:

- Regulatory policies (for new buildings)
  - Mandatory building codes
  - Voluntary building codes
  - Minimum energy performance standards for appliances
  - Mandatory labelling, certification and energy audits
- Financial support policies (for new and existing buildings)
  - Direct financial incentives
  - Fiscal measures

Transport Pricing Methodology

The Transport Pricing Methodology provides a methodology for assessing the GHG impacts of pricing policies in the transport sector. It sets out an approach for estimating the effects of fuel price increases using price elasticities of demand, and presents methods for evaluating the impacts of vehicle purchase incentives and road pricing measures.

The guide presents general principles, concepts and methods for estimating the GHG impacts of the following types of transport pricing measures:

- Fuel subsidy removal – The removal of subsidies that reduce the price of vehicle fuel below its fair-market cost.
- Increased fuel tax or levy – An increase in the tax imposed on each unit of vehicle fuel, which may include both general taxes that apply to many goods and special taxes specific to vehicle fuel.
- Road pricing (road tolls and congestion pricing) – The introduction of charges that motorists pay directly for driving on a particular roadway or in a specific area. Road pricing generally serves two objectives: revenue generation and congestion management.
- Vehicle purchase incentives for more-efficient vehicles – An increase in the fuel efficiency of the vehicle fleet and/or promotion of a shift to lower-carbon fuels by providing incentives for the purchase of selected vehicles. This measure is most applicable to electric, plug-in hybrid-electric, hydrogen-fuelled, and other vehicles that are not powered by gasoline or diesel. It is typically implemented by Governments through lower purchase taxes, purchase rebates, income tax credits and reduced vehicle taxes.

The Transport Pricing Methodology is complementary to the broader Compendium on Greenhouse Gas Baselines and Monitoring: Passenger and freight transport (Eichhorst et al., 2018), which covers a wider range of transport policies beyond pricing. In addition, it links with ICAT's Transport Climate Action Data Tool (TraCAD), which provides a practical platform for applying methodologies, generating baselines and comparing the impacts of various transport mitigation measures.

Forest Methodology

The Forest Methodology provides general principles, concepts and procedures for estimating the GHG impacts of forest policies that increase carbon sequestration and/or reduce GHG emissions from the following activities:

- Afforestation and/or reforestation – Increasing carbon sequestration and/or reducing emissions by establishing,

increasing or restoring vegetative cover through planting, sowing or human-assisted natural regeneration of trees.

- Sustainable forest management – Increasing carbon sequestration and/or reducing emissions on forest lands managed for wood products such as sawtimber, pulpwood and fuelwood by enhancing biomass carbon stocks through improved forest management practices.
- Avoided deforestation and/or degradation – Reducing net GHG emissions by preventing the conversion of forest lands with high carbon stocks to forest or non-forest lands with lower carbon stocks.

Sustainable Development Methodology

The Sustainable Development Methodology provides principles and procedures for assessing the broader environmental, social and economic impacts of sectoral (climate) policies and actions that are critical for decision-making at both national and local levels. These impacts may include air quality, job creation, public health, energy access, poverty reduction, ecosystem protection and gender equality – all of which need to be considered in development planning. The methodology enables policymakers and stakeholders to:

- Identify the environmental, social and economic impacts of the climate policies and actions.
- Pinpoint climate policies and actions whose impacts can advance multiple national and local priorities.
- Support the integration of climate policies into broader national development strategies.
- Evaluate whether climate policies are achieving their intended outcomes.
- Track and report progress on how climate policies contribute to NDCs and the SDGs across environmental, social and economic goals.

The methodology is applicable to all countries, sectors, and types of policies and actions.

It is also complementary to the ICAT Just Transitions Monitoring Guide (Singh et al., 2025), which provides specific guidance on monitoring the social and economic dimensions of low-carbon transitions to ensure they are inclusive and equitable.

Transformational Change Methodology

The Transformational Change Methodology provides a structured approach to assess the extent to which policies and actions drive systemic shifts that disrupt established unsustainable and carbon-intensive activities and/or leads to a sustained reduction in vulnerability, contributing to a zero-carbon, climate-resilient society. Such change resulting from the processes and outcomes of policies or actions supports the Paris Agreement's goal to limit global warming to 1.5–2°C, the global goal on adaptation and the 2030 Agenda for Sustainable Development.

Policymakers and stakeholders can use this methodology to:

- Assess the extent of transformational change expected or achieved through specific policies or actions.
- Develop effective strategies by better understanding how policies or actions can trigger processes that lead to transformational outcomes.
- Support transparent and consistent reporting of transformational impacts.

Importantly, transformational change potential is also a central criterion for some financial institutions, such as the Green Climate Fund (GCF) and Climate Investment Funds (CIF). A documented assessment of transformational change potential can therefore strengthen funding proposals and help mobilize resources for implementation.

This methodology is applicable to all countries, sectors and types of policies and actions.

It is complemented by the TC toolkit, which provides practical tools and resources to help apply the methodology in practice, and extends it to cover both mitigation and

adaptation, as well as carbon market activities and private sector investments.

Non-State and Subnational Action Methodology

The Non-State and Subnational Action Methodology provides a framework for identifying and assessing the impacts of mitigation actions taken by actors beyond national Governments, including cities, states, businesses and civil society. The methodology covers any kind of activity that reduces GHG emissions and is led by non-state and subnational actors. These actions can contribute significantly to emissions reductions and reinforcing national climate efforts. The guide helps policymakers and stakeholders to:

- Understand the impacts of climate actions at different scales and by different actors within a country.
- Integrate non-state and subnational actions into national or sectoral GHG projections and targets.
- Improve the effectiveness of strategies and policies, and develop more ambitious mitigation targets through better understanding of the contributions by non-state and subnational actors.

It is complemented by the CAAT Tool, which provides a practical platform for compiling and quantifying the impacts of actions by non-state and subnational actors.

Stakeholder Participation Methodology

The Stakeholder Participation Methodology offers practical guidance for designing and implementing effective participatory processes in both policy design and policy assessment. It provides good practice advice on inclusive engagement. Stakeholder engagement strengthens assessments by raising awareness, improving understanding, and enhancing trust and legitimacy. The guide provides recommendations on:

- Planning engagement processes and identifying relevant stakeholders.
- Establishing multi-stakeholder bodies to facilitate dialogue.
- Providing information and conducting consultations.
- Setting up grievance redress mechanisms.

This guide is designed to support the entire ICAT series of policy assessment guides. Each assessment guide highlights the importance of engaging stakeholders at relevant points, and refers to the Stakeholder Participation Guide for recommended practices.

Technical Review Methodology

The Technical Review Methodology provides principles and approaches for planning and conducting reviews of policy assessments. Technical reviews support learning, strengthen assessment quality, and enhance transparency and trust in reporting. This can be particularly important to donor agencies and financial institutions, which in turn can help policymakers and stakeholders secure funding or financing for their policies and actions, including NDC implementation. The guide covers:

- Different types of review approaches and how to select the most appropriate one.
- The key elements that define a credible review.
- Practical steps to follow when pursuing or conducting a review.

The Technical Review Methodology applies to GHG impact assessments that use the key recommendations approach (see section 3.3 below). The technical review evaluates whether the GHG assessment report has appropriately applied and documented the key recommendations from the relevant ICAT policy assessment.

Chapter 3: How to use the ICAT series of policy assessment guides

3.1 How the guides work together | 3.2 Guide wayfinding | 3.3 Key recommendations | 3.4 Approaches to using the guides | 3.5 Selecting the guides for assessment

3.1. How the guides work together

The ICAT policy assessment guides are modular by design, and can be used either individually or in combination. When applied as stand-alone tools, each guide serves a distinct purpose, including the following:

- **Introductory Guide** – Establishes the overarching concepts, quality principles, baseline considerations, assessment boundary, monitoring logic and reporting structure that apply to the series of guides.
- **GHG impact assessment guides** – Provide sector-specific methods and data requirements for quantifying GHG impacts, including Agriculture, Renewable Energy, Buildings Efficiency, Transport Pricing and Forestry.
- **Cross-cutting guides** – Support assessment of broader dimensions, such as Sustainable Development, Transformational Change, and Non-State and Subnational Action, and can be used either alongside any GHG impact assessment guide, or on its own.
- **Process guides** – The Stakeholder Participation and Technical Review guides support engagement and independent review, and accompany, but do not replace, technical methodologies.

Users may undertake an assessment by combining multiple guides, depending on the objective of the assessment. When multiple guides are used, users may prepare either a single integrated report or separate reports, provided methods and assumptions are applied consistently. For example, a user assessing the GHG impacts of a feed-in tariff (FiT) policy may apply the Renewable Energy Guide for quantitative methods, complementing it with the Sustainable Development Guide for analysing broader environmental, social and economic impacts. Additionally, the Technical Review Guide can also be applied if an independent review is planned.

The guides can also be used alongside other tools and methods. For example, while the Sustainable Development Guide outlines a GHG impact assessment process, it does not prescribe specific calculation tools, instead encouraging users to integrate appropriate models where needed.

3.2. Guide wayfinding

The guide incorporates informational graphics to enhance clarity and help users navigate the content more easily, as seen in table 3.1. The table and icons are applicable across all guides in the series.

3.3. Key recommendations

The guides in the series include key recommendations: specific steps or elements that users are encouraged to follow when assessing and reporting the impacts of policies and actions. In the guides, these are clearly marked with the phrase “It is a key recommendation to …” and the following icon:

The key recommendations provide a structured basis for conducting credible, transparent and consistent GHG impact assessments. They are grounded in principles that underpin internationally recognized climate

Table 3.1. Guide components

Symbol	Guide components
	**Key recommendations:** The guide includes a series of key recommendations. These recommendations identify steps that assist users in producing impact assessments based on the principles of transparency, accuracy, completeness, consistency and comparability (TACCC). See section 3.3 below.
	**Assessment toolkit:** The guide references tools and resources that offer more detailed guidance, databases for renewable energy statistics, or other support for estimating parameters for a policy assessment.
	**Templates:** Other guides provide users with downloadable templates for completing steps within the assessment.
	**Stakeholder engagement:** The assessment team will include staff and subject matter experts. This team will likely engage stakeholders in discussing priorities, identifying key policy activities and informing other parts of the assessment. This stakeholder engagement process is described in section 4.3 below.
	**Expert judgement:** Expert judgement is often needed due to lack of quantitative information. Considerations for using expert judgement are described in section 4.5.1 below.
	**Cross-reference:** When conducting the assessment, sections of this guide or external resources are referenced for ease of navigation.

reporting and assessment frameworks, including the 2006 IPCC Guidelines (Eggleston et al., 2006) and the UNFCCC modalities, procedures and guidelines (MPGs) for the transparency framework under Article 13 of the Paris Agreement (UNFCCC, 2019). These principles include the TACCC principles.

Many key recommendations can be assessed objectively, such as whether a step has been undertaken or documented. Others require expert judgement, especially where terms such as 'significant' are used. In such cases, users should apply clear and justified criteria that are consistent with the objectives of the assessment.

The application of key recommendations may vary depending on the purpose and timing of the assessment. For ex-ante assessments, users may focus on the most significant expected impacts where data are limited. For ex-post assessments, particularly those used for reporting under the ETF, users should aim to include all relevant GHG emissions and removals within the assessment boundary, in line with reporting requirements and available data. Any exclusions should be transparently documented and justified.

Each key recommendation is supported by accompanying methods and guidance, including suggested tools, models, options, references and examples. These are not exhaustive, and users may apply other

approaches that align with the purpose and principles of the guides. The recommendations are therefore intended to provide structure and clarity without being prescriptive, allowing users to adapt the guides to their national context, policy type and assessment objectives.

3.4. Approaches to using the guides

Users can apply the ICAT policy assessment guides through one of two approaches. To promote transparency, users are encouraged to include a statement in their assessment report describing how the guides were applied, included in the final report.

- **Flexible approach:**
  Users draw on the guides in full or in part, applying the methods and key recommendations that are useful for their context. This approach lowers barriers to entry and may be appropriate for internal assessments, early-stage analysis, capacity-building purposes or users who are new to the guides. It can also serve as a first step towards fuller application of the guides.

  However, because users are not aiming to demonstrate alignment with all applicable key recommendations, methodological choices may vary more across assessments. Readers should therefore be aware that differences in results may reflect differences in assumptions, data sources or methods, rather than differences in policy impacts alone.

  Example statement: "The ICAT agriculture and sustainable development methodologies were used as inputs for the impact assessment."

- **Key recommendations approach:**
  Users follow all key recommendations that are relevant and applicable to their assessment. Where a recommendation does not apply to the specific policy, sector or context, users should explain and justify its exclusion.

  This approach provides a more consistent, transparent and reproducible basis for assessment. It is especially relevant for assessments intended for external communication, including reporting to donors, financial institutions, stakeholders or international processes. It can strengthen the credibility, comparability and robustness of results, while still requiring users to document data limitations, methodological choices and sources of uncertainty.

  Example statement: "The ICAT transport pricing, transformational change and stakeholder participation methodologies were used as the basis for the impact assessment. The impact assessment is consistent with the key recommendations within these policy assessment guides. The key recommendations listed below were not followed, for the following reasons: [explain and justify]."

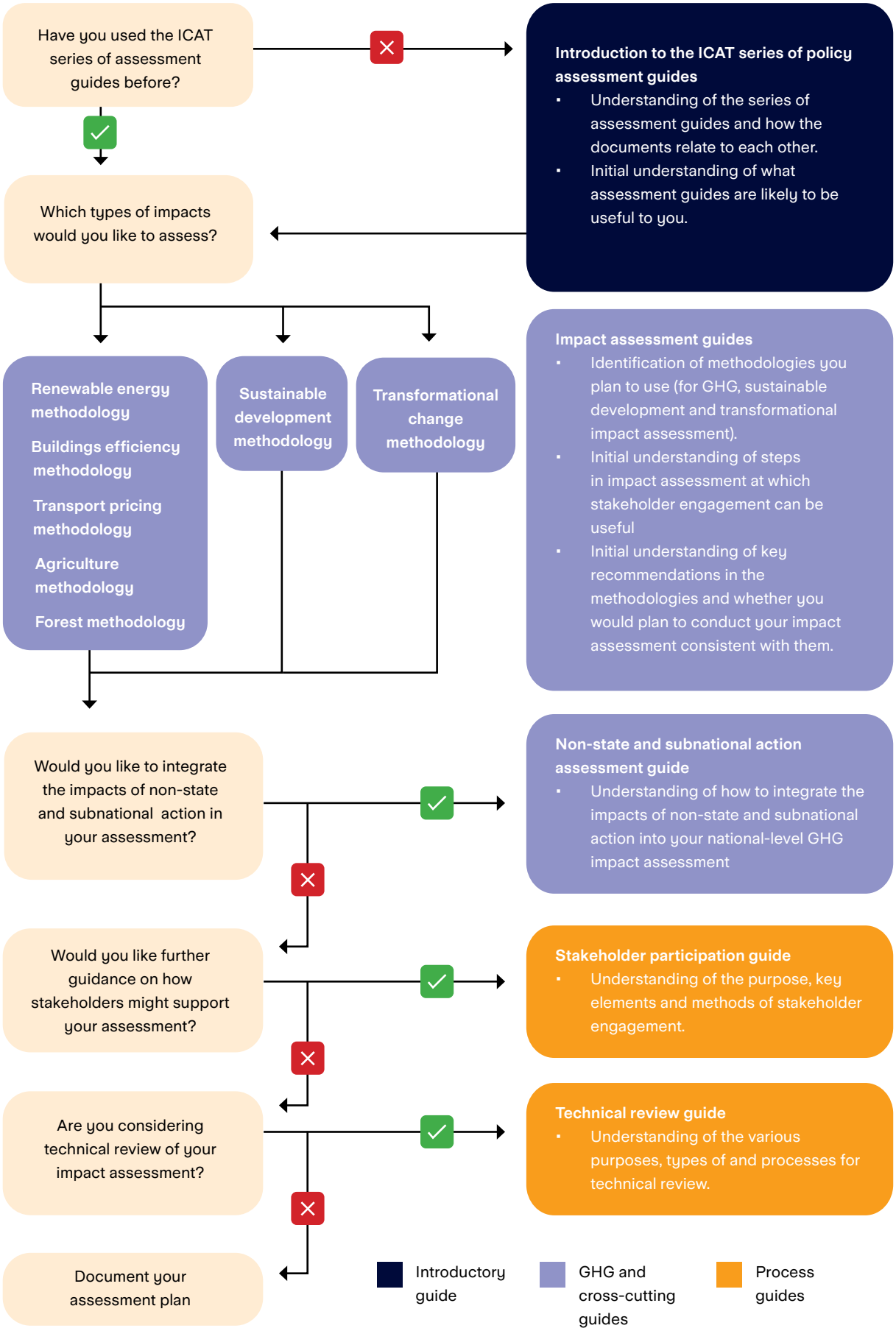
3.5. Selecting the guides for assessment

The decision tree presented in figure 3.1 is intended to support users in planning their policy impact assessments and identifying which guide in the series to apply. The series includes both GHG and non-GHG impact assessment guides and process guides, and it is important for users to become familiar with all relevant documents before initiating an assessment.

For example, the GHG impact assessment guides recommend stakeholder engagement at various stages of the assessment process. To ensure this is done effectively, it is helpful to develop a stakeholder participation plan early in the process. This requires an understanding of both the guidance on GHG impact assessment (provided in the relevant policy guide), and the recommendations provided in the Stakeholder Participation Guide.

By reviewing and understanding the relevant guides in advance, users can ensure a more coordinated, efficient and transparent assessment process.

Figure 3.1. Decision tool for using the ICAT series of policy assessment guides



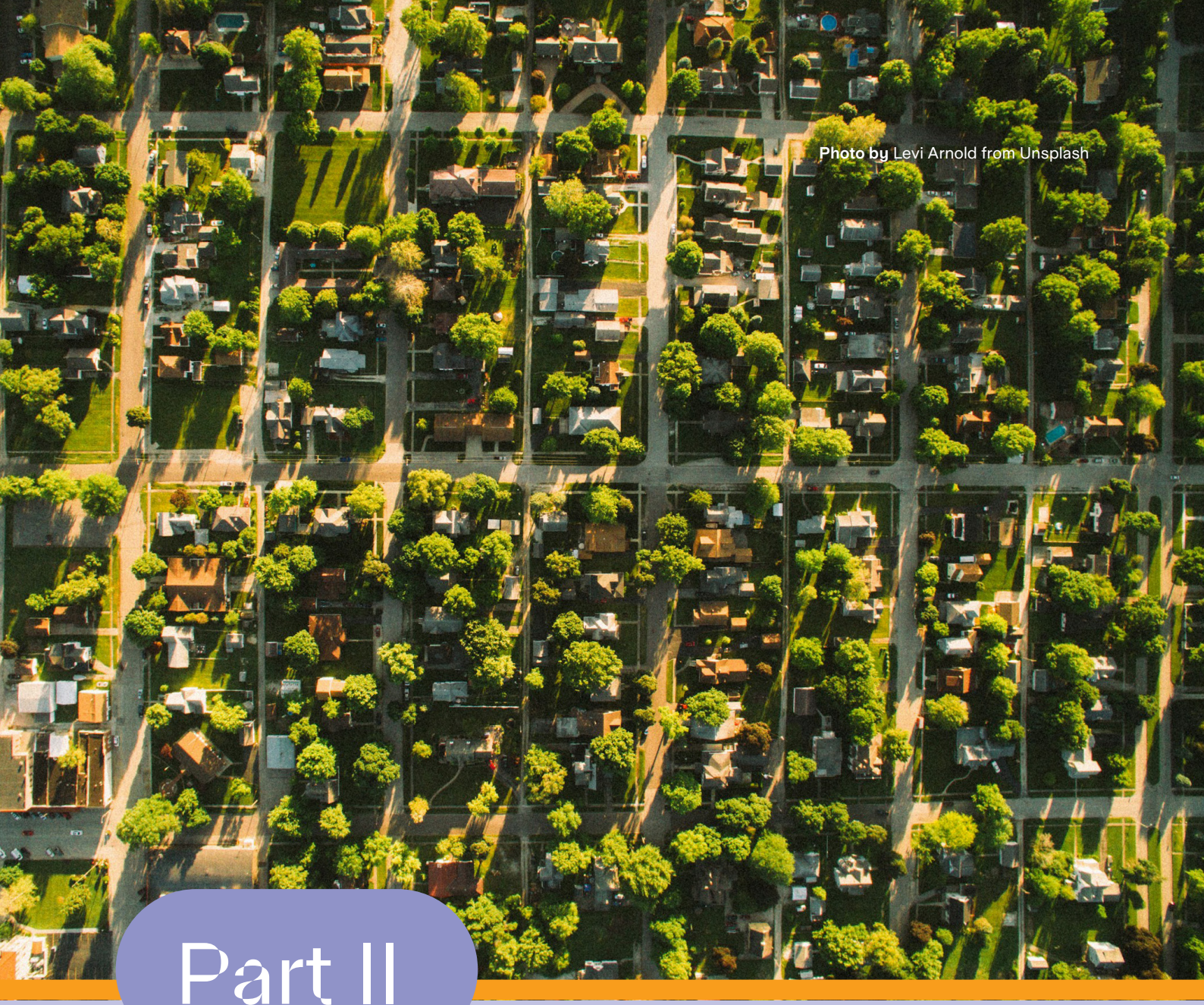


Photo by Levi Arnold from Unsplash

Part II

Planning and conducting the GHG impact assessment

Users starting a GHG impact assessment with any of the five ICAT GHG impact assessment guides – Agriculture, Renewable Energy, Buildings Efficiency, Transport Pricing or Forestry – should begin with this part of the **Introductory Guide**.

While the Introductory Guide is relevant to the entire series of ICAT policy assessment guides, this part focuses specifically on providing a step-by-step breakdown of the GHG impact assessment process. It introduces the **shared concepts, terminology and principles** that underpin all GHG impact assessment guides, and explains how to use them consistently.

The sectoral GHG impact assessment guides do not repeat this material. Instead, they build on the cross-cutting concepts presented here, and provide the sector-specific methods, equations, parameters and data considerations needed to quantify GHG impacts in each sector.

Users should therefore begin with these chapters in part II to structure and plan their GHG impact assessment, and then consult the relevant sectoral guide(s) for the technical steps required to estimate GHG impacts. The two components are complementary:

Part II ensures consistency, transparency, completeness and alignment with ICAT principles. Sectoral guides provide the detailed methodological tools required for quantification.

This structure allows users to clearly understand how the general ICAT policy assessment process links with the specific methods provided in each sectoral guide.

Users whose primary interest lies in assessing sustainable development or transformational change impacts may proceed directly to the corresponding ICAT guides, as the concepts introduced here are most directly relevant to GHG impact assessment.

The following chapters outline the **essential steps** needed to ensure that the assessment applies the TACCC principles consistently and is aligned with its intended purpose and users.

- **Chapter 4** introduces the assessment planning process, starting with the definition of key assessment elements and quality principles such as **transparency, accuracy and consistency.** It highlights the role of **stakeholder engagement** in achieving these principles, the importance of setting clear objectives, and methodological considerations including **data requirements, baseline concepts and selection criteria.** The chapter also provides strategies for **tracking implementation and progress,** such as selecting key performance indicators (KPIs), establishing measurement and reporting systems, and monitoring policy performance to enable corrective action when needed. Finally, it gives guidance on planning for **technical review** to maintain rigour and transparency.
- **Chapter 5** builds on chapter 4, addressing the selection of policies for analysis, describing policy activities and their GHG impacts, and related concepts. It briefly introduces **assessment types** and advises users to consult the ICAT guides on **GHG impacts, sustainable development and transformational change** if these impacts are also being assessed. The chapter further underscores the importance of considering **policy synergies and interactions**, where relevant.
- **Chapter 6** presents approaches for estimating the **cost of policy implementation.**
- **Chapter 7** focuses on designing effective **monitoring and reporting frameworks.**
- **Chapter 8** concludes with guidance on **documenting results** and capturing **lessons learned.**

Chapter 4: Key elements for planning an assessment

4.1 Main steps for the GHG impact assessment | 4.2 Assessment quality principles | 4.3 Stakeholder engagement and participation | 4.4 Setting objectives for the assessment | 4.5 Methodological considerations | 4.6 Planning the technical review

4.1. Main steps for the GHG impact assessment

This chapter presents the **cross-cutting steps** for planning and implementing a GHG impact assessment. These steps apply to all ICAT GHG impact assessment guides. The **sectoral guides** then show **how these steps are applied within each sector** and provide the detailed technical methods, parameters and equations needed to quantify GHG impacts.

The ICAT GHG impact assessment guides follow a **structured, step-by-step approach** to support an assessment in line with TACCC principles (UNFCCC, 2019) (more details are provided below in section 4.2). While each sectoral guide provides methods tailored to a specific sector, all guides share this **common methodological foundation,** which can be applied with flexibility depending on the user's objectives, data availability and context.

An overview of the cross-cutting steps is provided below.

1. **Determine the objective of the assessment**
   Users define the purpose and scope of the assessment – whether it is ex-ante (to inform policy design or compare policy options), during implementation (to understand progress or adjust course) or ex-post (to evaluate achieved impacts or support reporting such as under the ETF). Objectives may also include tracking progress over time or supporting stakeholder engagement. Clearly defining the assessment objective ensures that subsequent methodological choices, including the required level of rigour and data needs, remain aligned with policy needs and national priorities. Users should consider trade-offs between accuracy, resource requirements, feasibility, and the purpose of the assessment when selecting an appropriate methodological approach. While simpler approaches (e.g. Tier 1 – see below, section 4.5) may be necessary in ex-ante assessments due to data limitations, more advanced methods (e.g. Tier 2 or Tier 3) are generally expected for ex-post assessments, particularly when results are used for reporting purposes.
2. **Define the policy or action to be assessed**
   Users clearly describe the policy or action, its status, intended effects, implementing entity, instruments, target groups and interaction with other measures. This step provides the foundation for identifying impacts and establishing the baseline.
3. **Identify GHG impacts and map the causal chain**
   Users identify how the policy or action is expected to influence GHG emissions ex-ante, during implementation or ex-post. A causal chain is developed to describe activity-level and emission-level effects, including indirect impacts and interactions with other policies.
4. **Establish the baseline scenario**
   Users define the scenario that represents what would occur in the absence of the policy or action. This is one of the most critical steps, as all estimated impacts are measured relative to the baseline. Users determine which existing, adopted or planned policies are included, and ensure methodological consistency with national data sources. Baseline assumptions should be transparently documented.
5. **Define the assessment boundary and period**
   Users select the appropriate geographical, sectoral and temporal boundaries. They

also determine whether the assessment is ex-ante, ex-post, during implementation or a combination of these. This step ensures consideration of relevant GHG sources, sinks, pools, leakage and indirect effects.

6. **Estimate the implementation or outcome of the policy**
   Users estimate the expected or observed results of the policy (e.g. renewable capacity additions, energy savings, land-use changes, modal shifts, building efficiency improvements). These results link implementation to activity data used in the quantification step.
7. **Quantify GHG impact**
   Users quantify the GHG emission impacts of the policy relative to the baseline. Sectoral guides provide detailed methodologies, equations and data requirements to support this step.
8. **Monitor performance over time**
   Users identify indicators and parameters to track implementation and performance. This supports iterative policymaking and alignment with transparency frameworks (e.g. MPGs requirements).
9. **Report results and methods used**
   Users transparently document assumptions, data sources, methods, uncertainties, baselines and results so that the assessment can be understood, reproduced and compared.
10. **Review the assessment**
    Users may apply internal or external technical review processes to strengthen rigour and transparency. The ICAT Technical Review Guide provides further guidance.

Figure 4.1 illustrates these steps for the GHG impact assessment of policies.

These steps are designed to be applied flexibly, depending on the user's assessment objectives, capacity and available data. Users may also apply them in combination across multiple GHG impact assessment guides.

For example:

- The Sustainable Development Guide and Transformational Change Guide follow a similar stepwise structure, enabling integrated assessments.
- The Stakeholder Participation Guide supports inclusive engagement throughout every step of the process.
- The Technical Review Guide can be applied after completing the assessment, particularly for users following the key recommendations approach.

By working within this shared framework and adapting the depth of analysis to their specific objectives, users can produce assessments that are transparent, accurate, complete, consistent and comparable – and therefore useful for decision-making, learning and reporting.

4.2. Assessment quality principles

It is important to be familiar with TACCC assessment quality principles (transparency, accuracy, completeness, consistency and comparability), as they underpin and guide the GHG impact assessment process, especially where guidance provides flexibility or expert judgement is utilized. These principles are described below (Rich, 2014).

Transparency: Provide clear and complete information for stakeholders to assess the credibility and reliability of the results. Disclose and document all relevant methods, data sources, calculations, assumptions and uncertainties. Disclose the processes, procedures and limitations of the assessment in a clear, factual, neutral and understandable manner with clear documentation. The information should be sufficient to enable a party external to the assessment process to derive the same results if provided with the same source data. Chapter 7 provides a list of recommended information to report to ensure transparency. Refer to the templates section of each GHG impact assessment guide for the necessary forms to complete the assessment report.

Figure 4.1. Main steps of the GHG impact assessment



Notes

- These ten steps cover the GHG impact assessment. Where users also estimate the costs of implementing the policy, cost information forms part of the policy description (Table 5.1 and Section 5.2), methods for calculating costs are provided in Chapter 6, and Section 7.5.1 provides guidance on reporting cost information.
- Users are also recommended to refer to the relevant sectoral GHG Impact Assessment Guide for sector-specific methods, equations, and parameters when undertaking Step 7.

Accuracy: Ensure that the estimated impacts are systematically neither over, nor under, true values, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users and stakeholders to make appropriate and informed decisions with reasonable confidence. If accurate data for a given impact category is not currently available, users should strive to improve accuracy over time as better data becomes available.

Completeness: Include all significant GHG impacts in the scope, boundary and period of the assessment, including both positive and negative impacts. Disclose and justify any specific exclusions.

Consistency: Use assessment approaches, data sources, data-collection methods and calculation methods to allow for meaningful performance tracking over time, and ensure that methodologies are not changed without justification.

Comparability: In addition to the principles above, users should follow the principle of comparability if it is relevant to the assessment objectives, for example if the objective is to compare multiple policies based on their GHG impacts, or to aggregate the results of multiple GHG impact assessments and compare the collective impacts to national goals. Comparability ensures that methods, data sources, assumptions and reporting formats are such that the estimated impacts of multiple policies can be compared.

In addition to the TACCC principles defined under the UNFCCC, the ICAT GHG impact assessment guides are also governed by the additional principles of relevance and conservativeness.

Relevance: Ensure the assessment appropriately reflects the GHG impacts of the policy and serves the decision-making needs of users and stakeholders, both internal and external to the reporting entity. Applying the principle of relevance depends on the objectives of the assessment, broader policy objectives, national circumstances and stakeholder priorities.

Conservativeness: Apply assumptions and methodological choices that avoid overestimating mitigation impacts. Conservativeness supports credibility, particularly in situations of uncertainty or limited data availability. In combination with transparency and accuracy, this principle requires clear documentation and justification of all assumptions and conditions used in quantifying GHG impacts.

In some reporting or decision-making cases, users shall provide an estimate or description of assessment uncertainty to help interpret results. This could include documentation of the method or approach used to assess uncertainty and/or sensitivity of the results as a function of parameter values or models used. Investigating uncertainty can be helpful in improving assessment methods and data-collection processes.

The ICAT GHG impact assessment guides do not provide quantitative guidance on estimating uncertainty. Methodological guidance for qualifying or quantifying uncertainty can be found in the 2006 IPCC Guidelines volume 1, chapter 3 (Paciornik and Rypdal, 2006), with additional information relevant to policy GHG impact estimation in the Policy and Action Standard, chapter 12 (Rich, 2014), and the ICAT Technical Review Guide.

4.3. Stakeholder engagement and participation

A key recommendation across the ICAT series of policy assessment guides is to identify and engage relevant stakeholders. Opportunities for participation are highlighted throughout each guide and are aligned with specific steps of the methodology. The guides recommend integrating stakeholder engagement throughout the GHG impact assessment process – from planning and implementation, to monitoring, reporting and review.

Stakeholder engagement and participation are essential components of the GHG

impact assessment process. They enhance the quality, transparency, and credibility of an assessment, and support inclusive and equitable policy design and implementation.

Users do not need to consult three ICAT policy assessment guides for the same purpose.

Each guide plays a different role:

- **This Introductory Guide** explains why stakeholder engagement matters, and provides the **overall principles** for integrating engagement into the assessment process.
- **Sector-specific guides** provide **examples of stakeholders relevant to that sector,** helping users identify who to engage.
- The **Stakeholder Participation Guide** provides the **detailed methods and tools** (e.g. levels of participation, facilitation approaches, planning templates) when deeper guidance is needed.

Together, these guides ensure that users understand the purpose of engagement (Introductory Guide), know who to engage (sectoral guides) and can access practical 'how-to' support (Stakeholder Participation Guide). Users may consult all three guides where helpful, but only the **Introductory Guide and one sectoral guide** are needed in most GHG impact assessments; the Stakeholder Participation Guide is optional for users requiring more detailed engagement methods while the Technical Review Guide is useful when planning to mobilize finance.

Before beginning the assessment, users should consider how stakeholder engagement can support the process and allocate appropriate time and resources. A first step is to identify relevant stakeholder groups who may be affected by, or influential in, the policy, and determine suitable engagement approaches.

Effective stakeholder engagement and participation help stakeholders raise concerns before, during and after implementation; build trust, collaboration, shared ownership and support for policies; address perceptions of risks and impacts; and reduce negative impacts while enhancing benefits for all groups, including the most vulnerable. It also improves the credibility, accuracy and comprehensiveness of assessments through diverse expert, local and traditional knowledge; increases transparency, accountability, legitimacy and respect for rights; and can enable enhanced ambition and financing. Engagement further supports assessments of sustainable development and transformational impacts and the technical review process.

4.4. Setting objectives for the assessment

GHG impact assessments support evidence-based decision-making by enabling policymakers and stakeholders to understand the relationship between policies and their expected or achieved GHG impacts. The objective(s) of the assessment play a critical role in determining the appropriate level of methodological rigour, data requirements and assumptions. The objectives may differ for ex-ante, ex-post or during implementation assessments. These differences influence the choice of methods, the inclusion of GHGs, and the treatment of assumptions such as significance or conservativeness.

For example, an ex-ante assessment conducted to compare policy options may not require the same level of data detail or rigour as an ex-post assessment used for reporting under the ETF. Examples of assessment objectives are presented in table 4.1.

A key recommendation is to define the objectives clearly at the start of the process so that the assessment remains aligned with its intended use. Users should also identify the intended audience, which may include policymakers, domestic stakeholders, the public, NGOs, private sector actors, funders or financial institutions, analysts, and research institutions. Engaging stakeholders during the objective-setting phase can help ensure that the purpose of the assessment reflects diverse

information needs and priorities. (General guidance on stakeholder engagement is provided in section 4.3, and detailed methods can be found in the Stakeholder Participation Guide.)

The objective of the assessment should be clearly articulated and documented in the assessment report (an assessment report template is available in each GHG impact assessment guide).

4.5. Methodological considerations

This section introduces key assessment

Table 4.1. Policy assessment objectives examples

Objectives of assessing impacts before policy implementation (ex-ante)	Objectives of assessing impacts during or after policy implementation (ex-post)
Inform policy selection by comparing policy options based on their expected future impacts.	**Assess policy effectiveness** by determining whether policies are delivering the intended results.
Improve policy design and implementation by understanding the impacts of different design and implementation choices.	**Inform future policy design** and decide whether to continue current actions, enhance current actions or implement additional actions.
Inform goal setting by assessing the potential contribution of policy options to national goals, such as NDCs.	**Track progress** towards national goals such as NDCs and SDGs, and understand the contribution of policies towards achieving them.
Project and compare multiple expected impacts of policies, domestically and/or internationally.	**Improve policy implementation** by determining whether policies are being implemented as planned.
Access financing for policies under consideration by demonstrating expected future results.	**Report domestically or internationally,** including under the Paris Agreement's ETF, on the impacts of policies to date.
Assess administrative capacity required to implement policy activities, and collect associated data for evaluation and reporting.	**Meet funder requirements** to report on impacts of policies, if relevant.
Assess technical capacity at the national level to identify technical expertise needs.	**Assess the effectiveness of the policy instrument** in operationalizing mitigation measures and establishing necessary drivers for mitigation measure adoption.
Build support for additional mitigation measures to be adopted by the decision-makers.	

concepts that are applicable across all GHG impact assessment guides. It outlines important considerations for planning and conducting a policy GHG impact assessment, including:

- Understanding and preparing for data needs
- Identifying and selecting appropriate methodological tiers
- Using expert judgement
- Constructing a baseline scenario
- Approach to GHG impact assessment

4.5.1. Understanding and preparing for data needs

Identifying data parameters needed for assessment

It is a key recommendation to identify relevant data parameters, i.e. activity data and emission factors, and their associated references, when preparing for the assessment.

Once the assessment objective is defined and stakeholder engagement has commenced, the next step is to identify suitable calculation methods and determine the necessary activity data. Users must gather activity data relevant to the mitigation policy being developed or implemented. For example, for national-level policies, activity data may include aggregated data such as total electricity generation by fuel type, national fuel consumption by sector, or vehicle kilometres travelled across the transport system. For subnational or project-level actions, more disaggregated, location-specific data may be required, such as electricity consumption of specific facilities, local transport activity, or energy use in buildings within a defined area.

Activity data refers to a quantitative measure of an activity level that leads to GHG emissions and removals. For example, RE generation is a type of activity data. This data can be multiplied by an emission factor to estimate the GHG emissions and removals associated with a particular process.

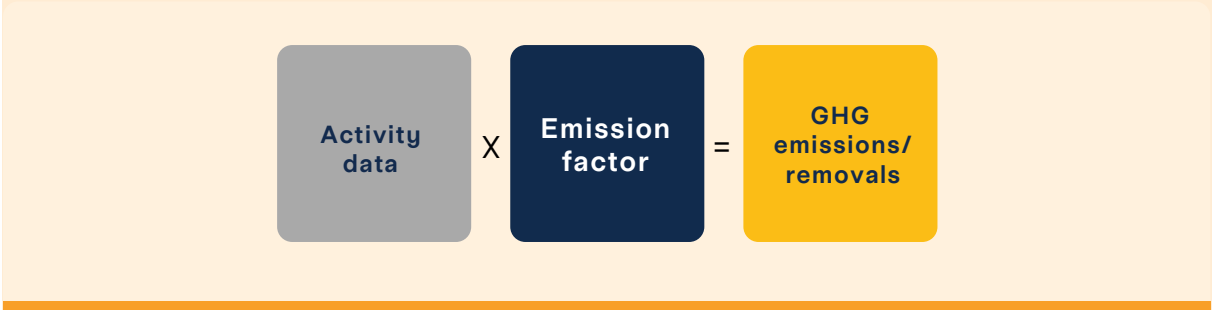
GHG emission factors represent the emission rate for a specific source per unit of activity. Where available, country-specific emission factors are preferred, as they better reflect national circumstances; however, in data-constrained contexts, default emission factors (e.g. from international sources) may be used. The simplest form of emission calculations involves multiplying activity data by the corresponding emission factor, as illustrated in figure 4.2.

These calculations are performed for each emission category and GHG and are then converted into carbon dioxide equivalent (CO_2e) using the global warming potential (GWP) of each GHG. Emissions and removals are estimated for each relevant scenario and time period.

Choosing a methodological tier

The complexity of calculations in a GHG

Figure 4.2. Emission calculation schematic showing the basic approach to calculating GHG emissions or removals for non-CO_2 gases.



impact assessment depends on the scope and assessment boundary of the policy under consideration, as well as the level of detail required to capture its effects. The 2006 IPCC Guidelines provide a tiered approach to emissions estimation methods, with increasing levels of complexity, data requirements and accuracy. Table 4.2 summarizes the IPCC's tier structure and outlines the associated trade-offs.

In the context of policy impact assessment, it is important to distinguish between estimating emissions for national inventories and assessing the impact of policies relative to a baseline scenario. While IPCC tiers are commonly used for inventory development, they can also inform the selection of methods for GHG impact assessment, provided that the approach is suitable for capturing changes attributable to the policy.

Tier 1 methods use default emission factors and simplified assumptions and may be appropriate for preliminary or ex-ante assessments, particularly where data are limited. However, they may not adequately capture the effects of mitigation actions. Tier 2 and Tier 3 methods, which rely on more detailed and country-specific data or modelling approaches, are generally better suited for ex-post assessments and tracking policy impacts with greater accuracy.

Users should consider trade-offs between accuracy, resource requirements, feasibility and the purpose of the assessment when selecting an appropriate tier. While Tier 1 methods may be necessary in ex-ante

Table 4.2. IPCC Guidelines tiers and related trade-offs and considerations when determining the assessment method.

Tier	Methodological description	Trade-offs and considerations
1	Employs default emission factors and default estimation methods, available in IPCC guidelines	Simplest to use, not country-specific; may not be sufficient to capture mitigation efforts of some activities or production efficiency improvements; is generally less accurate than the results under the other tiers
2	May use the same methodologies as Tier 1, or country-specific methodologies where proven to be more accurate than IPCC methods for the country; applies emission factors and parameters based on country-specific data; should have country-specific land-use and livestock population categories	Requires national data and research results to justify methodological decisions; estimates reflect country-specific agricultural production system characteristics, and climatic/production regions; should be used for key source categories (in terms of contribution to sector emissions)
3	Employs empirical or process-based estimation models to estimate or predict GHG emissions	More sophisticated and complex, requiring detailed and long-term data, high levels of human and financial resources to develop models and body of science to underpin modelling; provides greater accuracy for estimates and levels of uncertainty

assessments due to data constraints, Tier 2 or Tier 3 methods are generally expected for ex-post assessments, particularly when results are used for reporting purposes.

For planning purposes, it is helpful to identify the likely methodological tier prior to beginning a GHG impact assessment. For further guidance on tiered approaches, users are encouraged to consult the 2006 IPCC Guidelines (Eggleston et al., 2006).

Expert judgement

Assumptions based on expert judgement will likely be needed to complete an assessment, particularly where data are limited, uncertain or require interpretation. Expert judgement is defined by the IPCC as carefully considered, well-documented qualitative or quantitative choices, in the absence of unequivocal observational evidence, made by a person or persons who have demonstrable expertise in the given field.

The goal is to ensure that assumptions are as representative as possible of policy circumstances and relevant systems. The user leading policy development and assessment should therefore consult with experts in relevant fields.



The IPCC outlines procedures for expert elicitation, including specific guidance on the elicitation process, avoiding biases, and producing independent and reliable judgements and documentation. Sections of the ICAT policy assessment guides where expert judgement might be critical are identified with the expert judgement symbol.



To reduce uncertainty associated with expert judgements, users may consult a range of experts to identify possible values for the parameter in question, assess associated uncertainties, and support the selection of appropriate values. Expert judgement can also be informed through broader consultations with stakeholders. Users should document why expert judgement was necessary and the rationale for the values chosen.

Where expert judgement plays a significant role, or where key parameters are uncertain, uncertainty analysis can be used to support the interpretation of results and provide transparency on the level of confidence in the estimates. Other sector-specific data requirements and resources have been discussed in the GHG impact assessment guides.

4.5.2. Baseline types and estimation of baseline emissions

Estimating the GHG impacts of a policy requires a reference case, or baseline scenario, against which policy impacts are assessed. The baseline scenario represents what would have happened in the absence of the mitigation policy – also often referred to as the 'business-as-usual' or 'without-policy' scenario. The most likely scenario in the absence of the policy intervention should be defined as the baseline scenario.

Baseline emissions and removals are estimated based on this scenario, using credible assumptions about key sectoral drivers. These may include, for example, energy demand and fuel mix, transport activity and modal share, building stock development and energy use, industrial production and process technologies, land use and land-use change, or trends in technology uptake. The baseline provides a foundation for calculating the change (reduction or increase) in emissions, which is the difference between the baseline and policy scenario.

When developing the baseline scenario and estimating baseline emissions, users should follow a structured approach, including:

- Defining the most likely baseline scenario
- Selecting the desired level of accuracy, taking into account the purpose of the assessment and available resources
- Defining the emission estimation methods and parameters required (e.g. activity data, emission factors)
- Estimating baseline values for each parameter based on assumptions about key drivers

- Estimating baseline emissions for each relevant source and sink category
- Aggregating baseline emissions across all categories

The approach differs depending on whether the policy is assessed ex-ante or ex-post. Ex-ante assessments involve forecasting expected outcomes, while ex-post assessments use historical data to assess actual outcomes.

When developing the baseline scenario, users should consider how the sector will develop or would have developed without the policy. Key questions include:

- What mitigation practices or technologies would likely have been implemented in the absence of the policy (e.g. taking into consideration existing regulations, cost-effectiveness or market trends)?
- Are there existing other implemented or adopted policies or actions that could significantly affect GHG emissions and removals in the sector?
- Are there relevant non-policy drivers (e.g. market trends, technological developments, demographic changes) or other sectoral trends that should be reflected?

Policies included in the baseline scenario should generally be limited to those that are implemented or adopted at the time of the assessment (for ex-ante assessments) or implemented during the assessment period (for ex-post assessments). Planned policies may be included optionally in ex-ante assessments where relevant, for example when comparing the effects of multiple planned policies.

The approach used in the GHG impact assessment guides is based on identifying key parameters that represent influential drivers and applying reasonable assumptions about their values in the absence of the policy. For example, changes in national population and income per capita may be selected as drivers for emissions associated with energy demand, transport activity, industrial production or agricultural output. Users should evaluate the most relevant drivers for their national context and consider constraints such as labour shortages, limited resource access, technology gaps or market conditions.



Typically, a GHG impact assessment identifies a single baseline scenario that is considered most likely. However, in some cases, multiple plausible scenarios may be appropriate to explore the sensitivity of the impact estimates to assumptions about the future or counterfactuals. Users can consider constructing more than one baseline based on varying assumptions and drivers. This results in a range of possible emission reduction estimates. Assumptions should be supported by expert judgement and/or stakeholder consultation.

Depending on the availability and quality of historical and projected data, different approaches can be used to construct baseline scenarios. The most common types of baseline approaches are described below and illustrated in figures 4.3–4.5.

Constant baseline (base year/base period)

The constant baseline approach (figure 4.3) assumes there will be no change in key sectoral practices, technology use or activity levels during the assessment period with respect to the situation prior to policy implementation. It represents the simplest approach as only historical data is required.

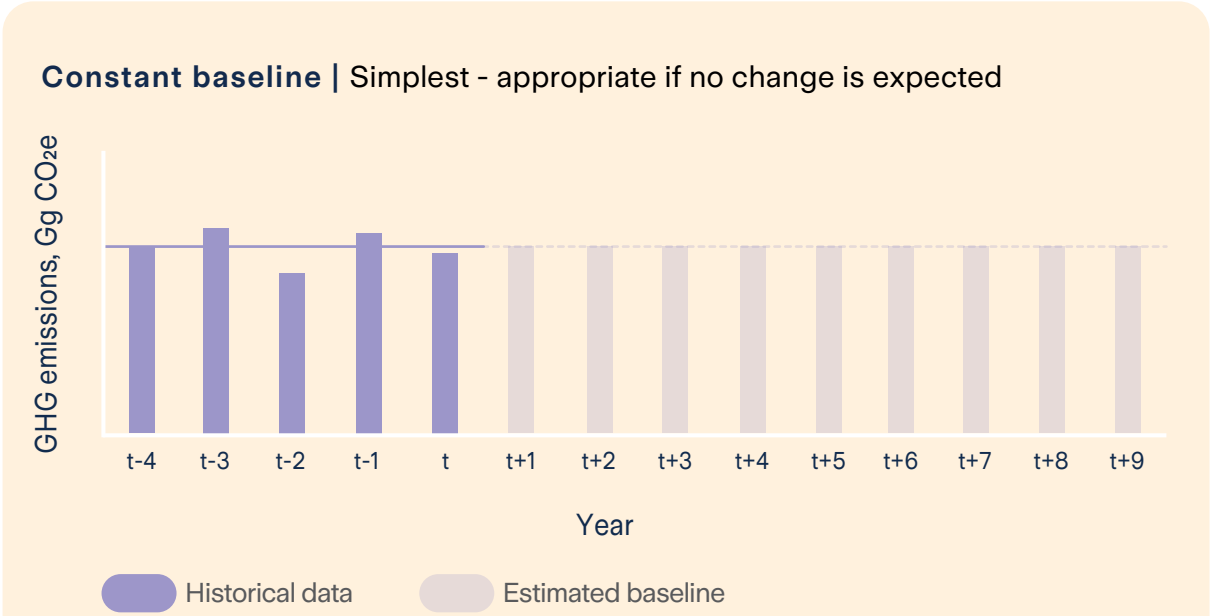
Values from either a base year or an average over a given base period are used as assumptions for the baseline scenario. The base year could be the most recent year for which data are available, although users should consider whether it represents a typical year (e.g. no droughts or major economic fluctuations). Alternatively, a base period can be selected as an average value from at least three years prior to the start of the policy implementation. This approach assumes these parameters do not change over the assessment period.

Users can consider constructing more than one baseline based on varying assumptions

and drivers. Under some conditions, multiple baselines may be established within a larger assessment boundary (for example, where there are varying subnational market trends or circumstances).

While this baseline approach is simplest to apply, it may lead to less reliable estimates if historical trends are not a good predictor of future developments within the assessment context.

Figure 4.3. An example of constant baseline



Simple trend baseline (extrapolation)

This trend baseline approach (figure 4.4) assumes that key parameters – such as practices, technology use or sectoral activity – will change relative to the past. This approach typically uses a linear or exponential extrapolation of historical trends for each assumed driver. Users can employ statistical regression analysis to estimate trends. To evaluate the quality of the regression, users can utilize statistical parameters such as R-squared (the proportion of variability explained by the fit) and mean squared error (the difference between observed values and model predictions).

This approach can be easy to implement; however, it may produce errors if it does not account for other policies or factors that are expected to cause a deviation from past trends in the sector.

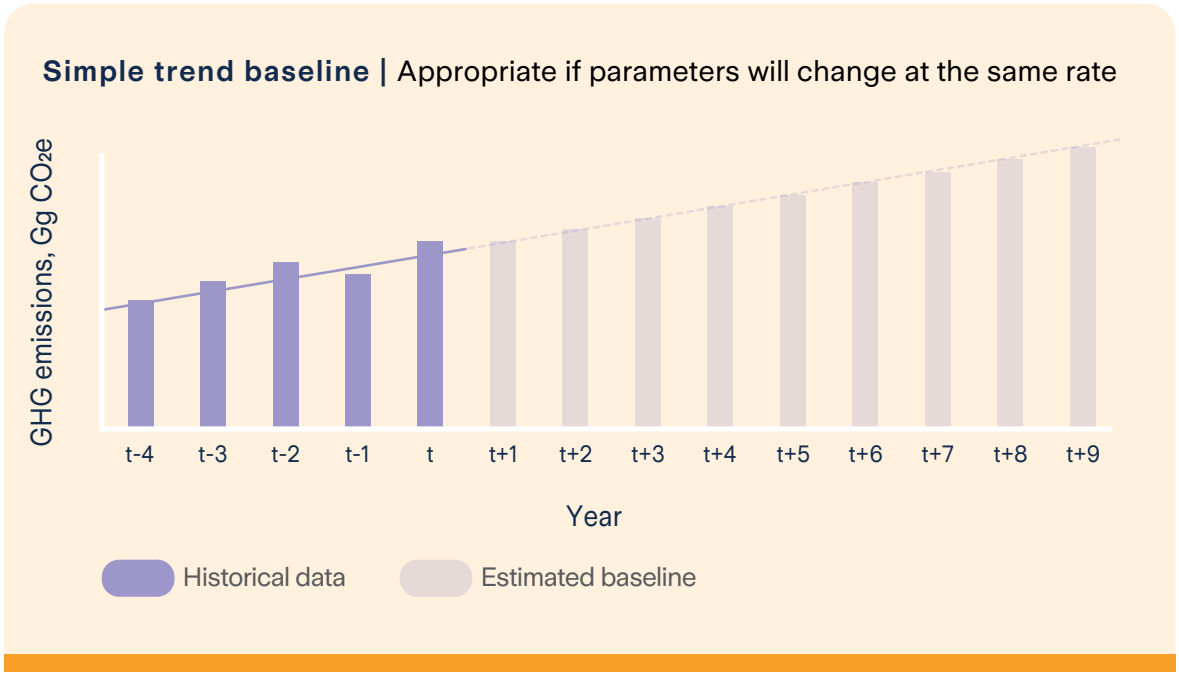
Users should collect historical data from 5–10 years prior to the implementation of the policy to quantify parameter trends. If no discernible trend exists, or if key drivers of emissions and removals are expected to remain relatively stable, a constant trend line based on historical averages may be used (Broekhoff and Lazarus, 2013), as described in the constant baseline section above.

Advanced trend baseline (modelling)

The advanced trend approach (figure 4.5) models the impact of multiple interacting factors, including trends in macroeconomic conditions, demographics, technological developments and other non-policy drivers. A modelled baseline can be constructed using either a top-down or bottom-up approach.

Top-down model: This approach uses macroeconomic and demographic projections (e.g. gross domestic product [GDP], population growth) to estimate sectoral changes and their influence on GHG emissions and removals.

Figure 4.4. An example of simple trend baseline



For example, it may model how GDP affects energy demand, production levels, transport activity or land-use change, depending on the sector being assessed.

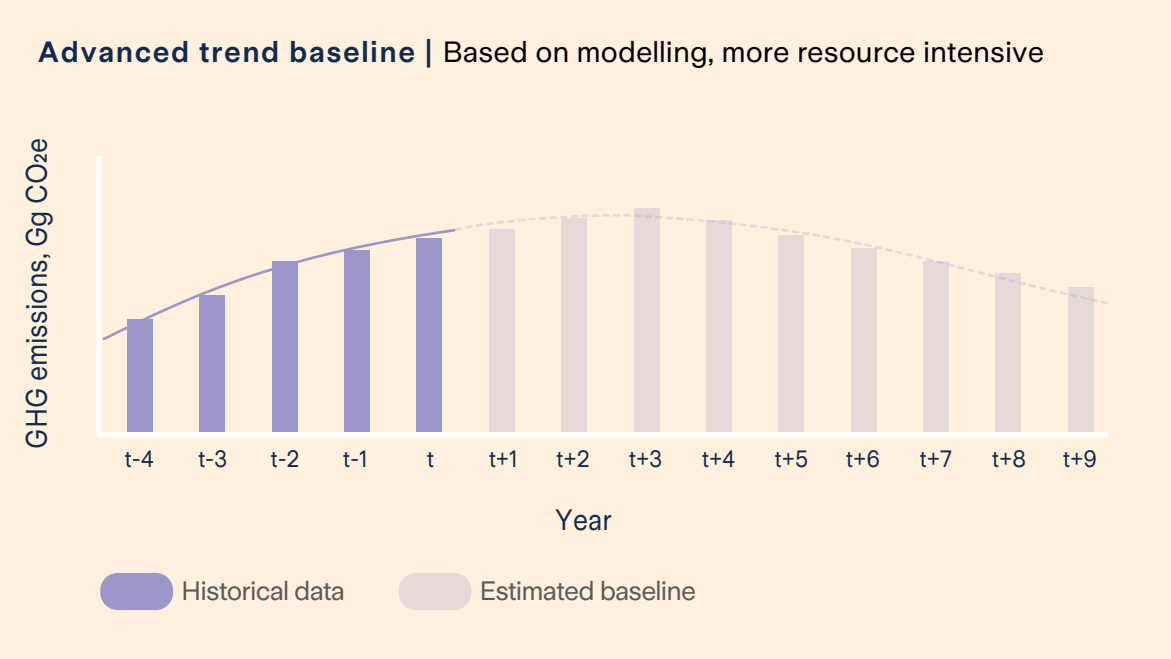
Bottom-up model: This approach focuses on the interaction of detailed sector-specific parameters – such as technology deployment, infrastructure expansion or production practices – and can provide more disaggregated projections of specific GHG sources and sinks. It generally requires detailed input data, such as activity data, technology characteristics, costs or operational practices. This approach is suitable when policies target specific subsectors, technologies or practices.

Selection of an appropriate modelling approach depends on national circumstances, such as economic structure, data availability, institutional capacity and the characteristics of the sector being assessed. Multiple types of data can be used to develop an advanced trend model, including national statistics (e.g. production volumes, energy consumption, transport activity), population and GDP data, technology uptake rates, and spatial data (e.g. land-use maps).

Choosing an approach

The choice of approach to determine the baseline scenario depends on the users' resources, capacity, access to data, and expectations for how national circumstances will or will not change. Models may be based on existing tools or developed for the specific sector or country context, including relatively simple models where appropriate. A constant baseline is the simplest option, and may be appropriate when parameters are likely to remain stable over time or the data lacks a clear trend. Advanced trend baseline approaches can take into account various drivers that affect conditions over time. However, more complex baseline prediction models require more data and a deeper understanding of multiple drivers. Users should select a baseline approach that yields the best prediction of the without-policy scenario within the national context, given the constraints on resources and data availability. Users should strive to develop an accurate baseline. Where data constraints exist, users may also consider applying a degree of conservativeness in making assumptions and selecting a baseline scenario, particularly where it is important to reduce the risk of overestimating the policy's mitigation impact.

Figure 4.5. An example of advanced trend baseline



Using robust national data, both historical and projected where available, is essential for developing the baseline. Expert judgement is often required to interpret data, fill gaps and support assumptions, but should be applied transparently and not as a substitute for available data.

Approaches to GHG impact assessment

Mitigation policies can be assessed by estimating either **GHG emission levels** or **GHG avoided emission**, using ex-ante or ex-post approaches. The choice of approach depends on the objectives of the assessment and the available data.

Estimating a GHG emissions level

A key objective of estimating emissions is to assess how well policies support NDCs. If an NDC has been set relative to a specific emissions base year, or RE deployment or sectoral emissions level, users do not need to develop a baseline scenario to track performance against that target.

Estimating emissions – either before (ex-ante) or after (ex-post) – helps compare actual or expected emissions level with a target, as shown in figure 4.6. The figure illustrates a country with NDC targets for both 2030 and 2035. The ex-ante estimate, conducted in 2025, shows that there is a gap, and expected emissions reductions in the sector are not on track to be met in 2035. The figure also shows an ex-post estimate of emissions levels, estimated in 2030. Here, the emissions level is higher than the target – in other words, the anticipated emissions reductions have not been achieved.

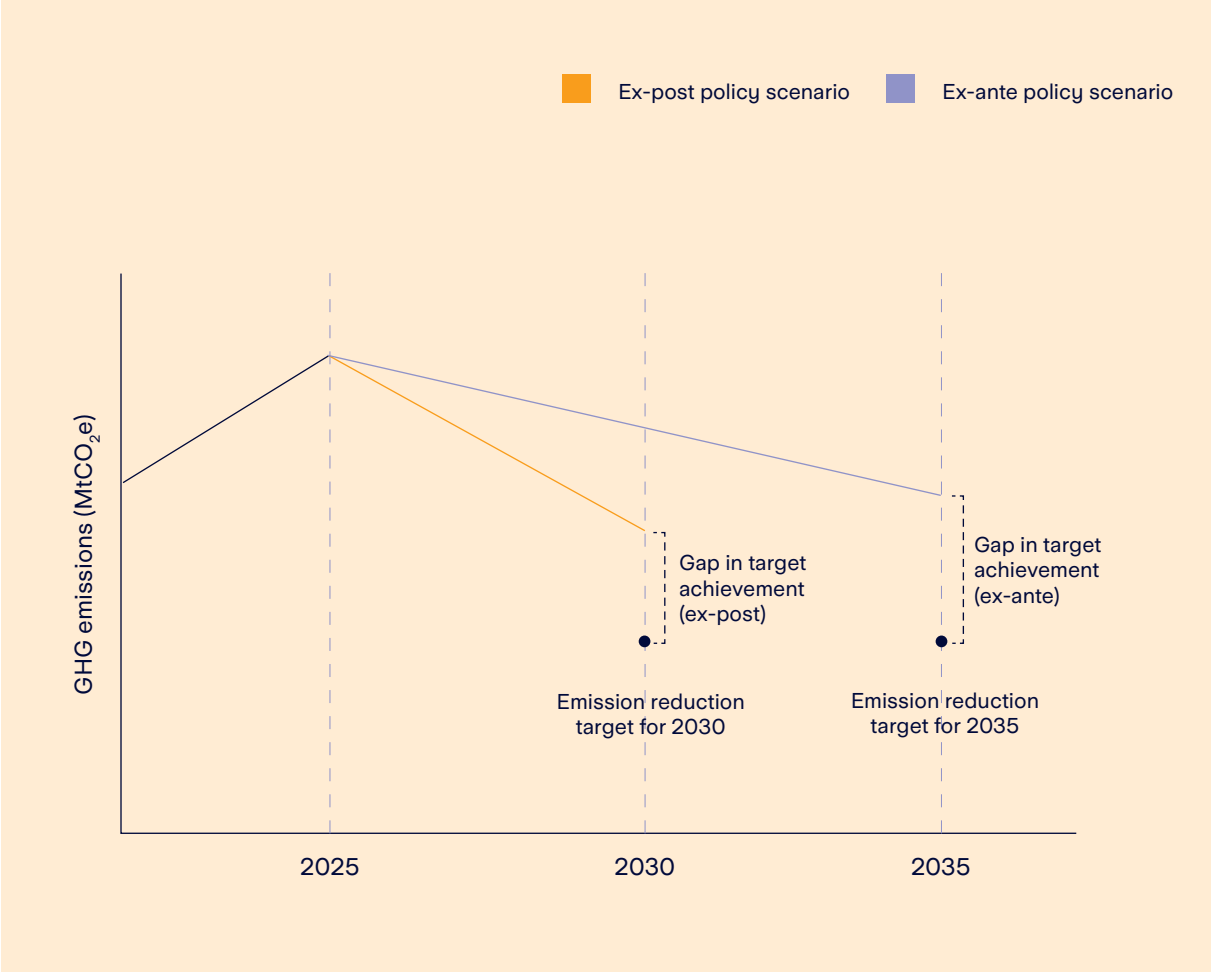
Estimating GHG avoided emissions

To assess a policy's GHG impact, avoided emissions are estimated by comparing emissions in the policy scenario with emissions in the baseline scenario – the trajectory that would have occurred without the policy. Avoided emissions represent the difference between these two trajectories, and are therefore a measure of the causal impact of a policy, not a measure of whether emissions have gone up or down over time (Gillenwater, 2025).

Estimating avoided emissions — either ex-ante or ex-post — helps assess whether a policy is delivering sufficient impact relative to an NDC target, as shown in figure 4.7. The figure illustrates a country with avoided emissions targets for both 2030 and 2035. The ex-ante estimate, conducted before 2030, uses forecasts for both scenarios, and identifies an

avoided emissions shortfall (ex-ante) where the projected impact falls short of the target. The ex-post estimate, conducted at 2030, replaces the policy scenario forecast with observed data, confirming the actual avoided emissions shortfall (ex-post) and revealing whether the target was achieved. Comparing the two estimates helps explain why outcomes differed from expectations, and informs the design of future policies and NDC commitments.

Figure 4.6. Use of GHG emissions level in ex-ante and ex-post impact assessment



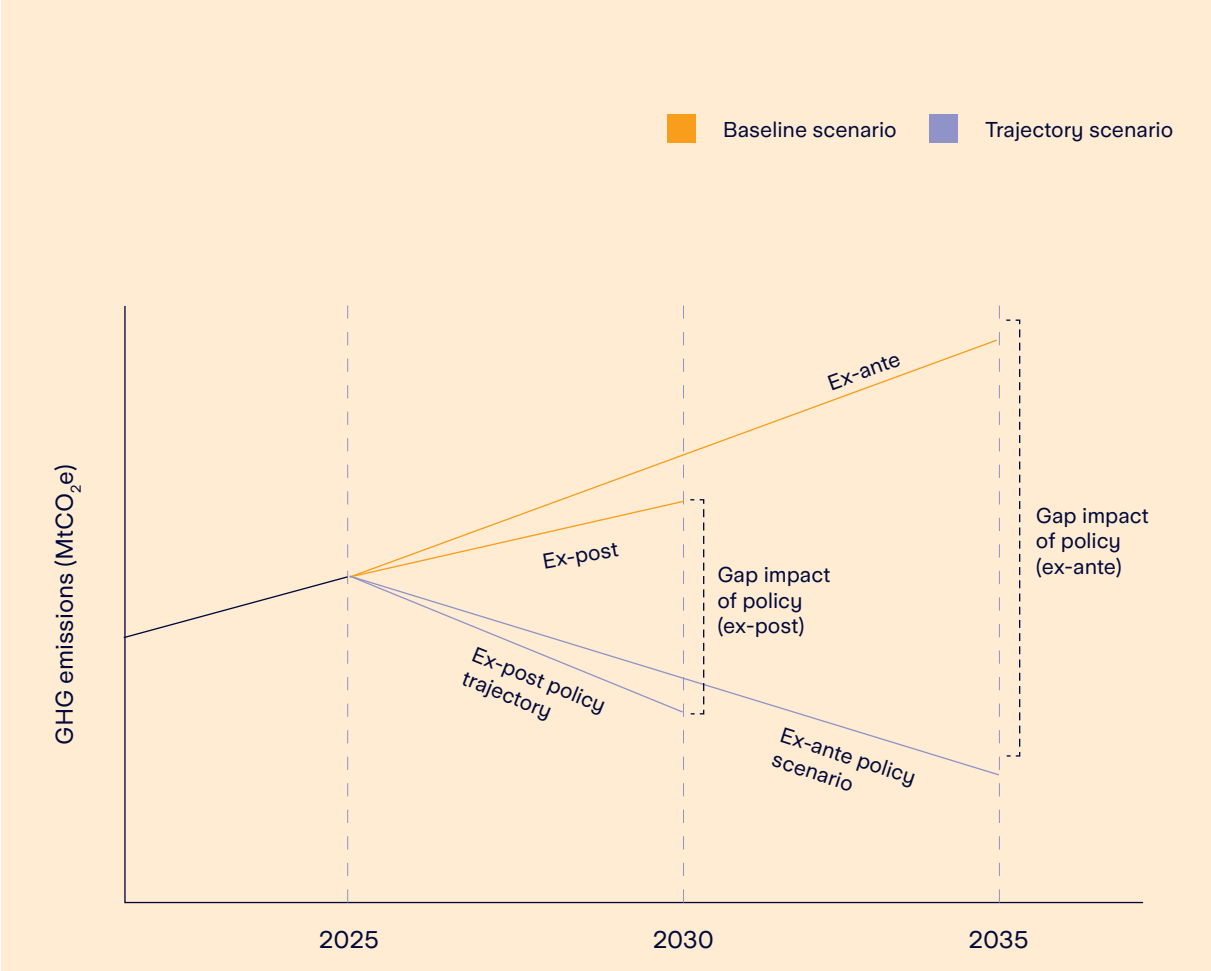
For example, a RE policy can generate avoided emissions even when absolute emissions are growing, as long as emissions in the policy scenario are lower than in the baseline. In a fast-growing economy where energy demand is rising, a RE policy may not stop emissions from increasing, but it can slow that increase significantly compared to what would have happened without the policy.

4.6. Planning the technical review

Before beginning the policy assessment, users should consider whether a technical review will be pursued and plan the necessary activities and resources accordingly. A technical review can strengthen the quality, transparency and credibility of the assessment by providing an independent evaluation of methods and results. It can also support learning and continual improvement, improve the selection, design and implementation of policies through a more rigorous understanding of their impacts, and increase transparency and confidence in reported results, including under the ETF. A review can further help demonstrate results to donor agencies or financial institutions, ensure consistent assessment

of a single policy over time, and enable comparability of impacts across different policies. A technical review is conducted after the assessment is complete. More detailed guidance is provided in the ICAT Technical Review Guide.

Figure 4.7. Estimating GHG avoided emissions reductions with a baseline scenario

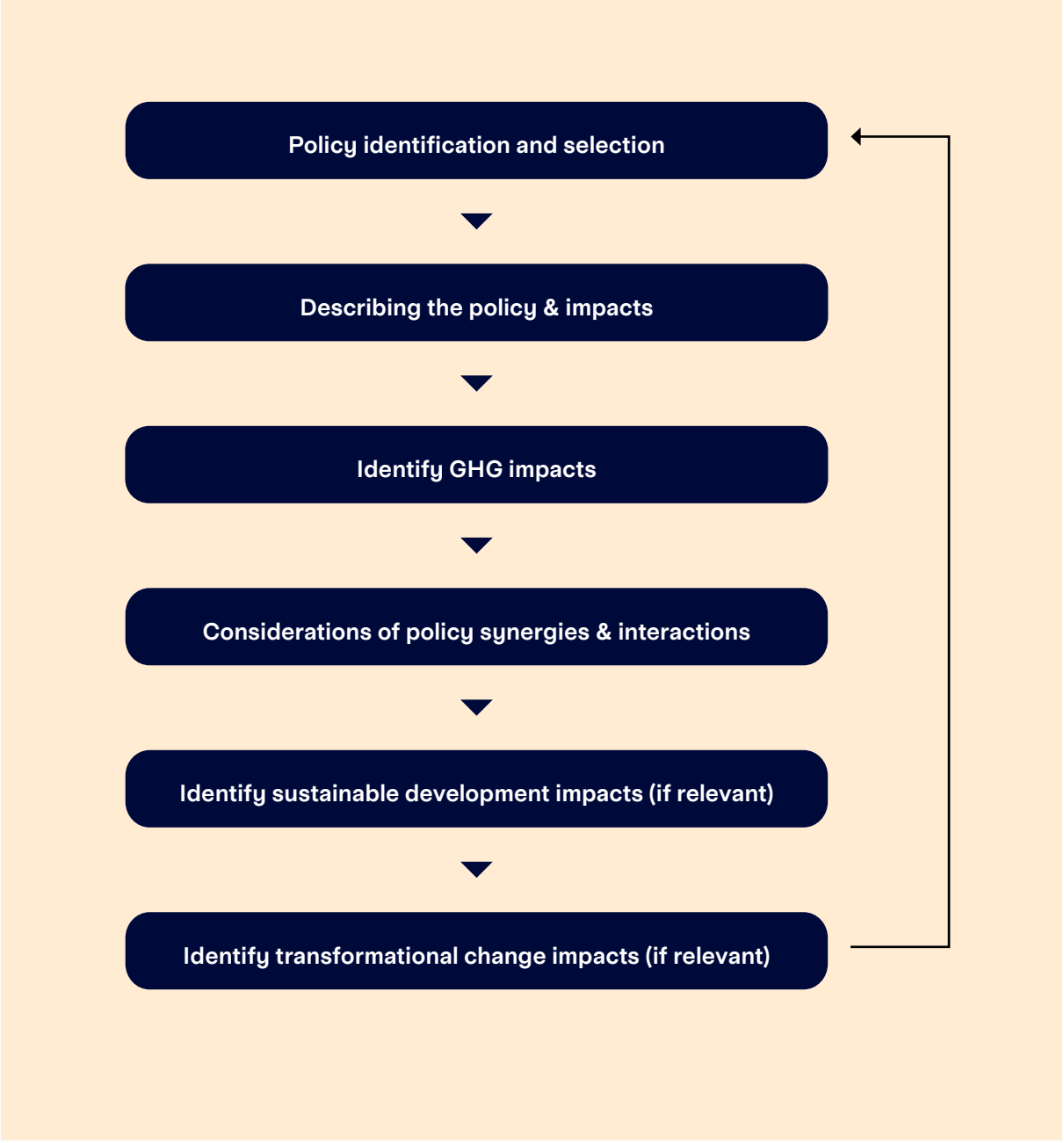


Chapter 5: Policy selection and policy impacts

5.1 Policy identification and selection | 5.2 Describing the policy and impacts | 5.3 Identifying GHG impacts | 5.4 Identify sustainable development impacts (if relevant) | 5.5 Identify transformational change impacts (if relevant)

Chapter 5 builds on the steps introduced in chapter 4, with practical guidance for selecting and describing policies and analysing their specific impacts (see figure 5.1). It also highlights the importance of considering policy synergies, and provides references for assessing sustainable development and transformational impacts.

Figure 5.1. Step-by-step approach to identification and selection of policies



5.1. Policy identification and selection

It is a key recommendation to prioritize a policy for assessment following the steps outlined in this section.

Users should consider to what extent the sector to be assessed contributes to the country's GHG emissions or removals to help determine which mitigation policies or actions should be prioritized. This can be informed by existing national analyses, such as key category analyses conducted as part of national GHG inventories, which identify the most significant sources and sinks of emissions. Countries may also draw on other national studies and planning processes, such as mitigation analyses, technology needs assessments (TNAs) or sectoral strategies, which can help identify priority mitigation options and inform policy selection.

Users are encouraged to identify existing, planned and envisaged future policies within the sector under assessment, and select three to five policies for initial consideration. The assessment team should then collect information on each policy or measure to determine whether it is likely to influence GHG emissions and removals.

Begin with basic information for each policy under consideration: policy or action name, adoption date or date of supporting legislation (if applicable), planned or actual implementation date, current implementation status, and a brief description. The description should include an overview of the policy or action, the context that led to its development, and the rationale for its relevance to GHG mitigation or removal.

Table 5.1 provides a set of considerations and types of information that can be used to evaluate candidate policies and help prioritize one for in-depth assessment. Users may adapt this list based on national circumstances and priorities. Information gathered during this step can also be used for future reporting under NDCs, BTRs and other international reporting frameworks.

Once information about each candidate policy is compiled, users should apply a qualitative ranking to identify which policy – or set of policies – is best suited for assessment. The most relevant considerations typically include:

- Availability of reliable data
- Institutional and strategic alignment – the policies that support national development and/or climate action priorities
- Anticipated GHG impact – in terms of high, medium and low impact

These elements help determine whether the policy is feasible to assess, is expected to result in meaningful emission reductions or removals, and is consistent with national climate and development strategies.

Once a policy has been selected, users can proceed to describe the policy in detail and define the key parameters for the GHG impact assessment.

5.2. Describing the policy and impacts

Once the user has familiarized themselves with mitigation measures and policy instruments and selected a policy for assessment, they can develop a detailed understanding of the policy objective. This section presents the process for describing the policy and its likely impacts, enabling the user to calculate the GHG impacts of the selected policy, as described in more detail in the GHG impact assessment guides.

5.2.1. Consideration of policy synergies and interactions

Policies may relate to other policies within the same sector, policies in different sectors, or policies that span multiple sectors. While the aim of the GHG impact assessment guides is to help users assess the impacts of a specific mitigation policy, it is recommended that users also consider potential synergies and trade-offs, and identify related or overlapping policies. Users should evaluate whether it is appropriate to assess a group of policies together, based on the feasibility of analysing

Table 5.1. Prioritization considerations for selecting a policy for assessment

Element	Description
Policy name	Official name of the policy or action.
Status of implementation	Whether the policy is planned, adopted or implemented.
Adoption date	If applicable.
Implementation start date	If applicable.
Policy effect start date	If applicable.
Brief description	Brief overview, circumstances that led to the development and need for the policy,and a broader context to understand the importance, relevance and purpose of the policy.
Objective	Describe what the policy is trying to achieve.
GHG source/sink categories affected	Identifying emissions sources and sinks impacted by the policy, whether the source/sink is a key category in the party's national inventory, and the anticipated level of the impact.
Intervention activities	Identify and describe key mitigation measures included in the policy.
Expected level of penetration	Provide a quantitative estimate of the extent to which the policy is expected to be adopted or implemented, including the scale or activity it aims to reach.
Funding allocations	Describe the designated annual and total budget or funding source that has been committed for the policy to make it feasible for implementation, if any.
Implementation cost	Provide an estimate of annual and total implementation cost.
Sustainable development impacts	Describe the potential sustainable development impacts of the policy.
Responsible entities and stakeholders	Identify who is responsible for the implementation of the policies, as well as those who will be affected by the policy.

Element	Description
Measurement, reporting and verification (MRV)	Describe whether the policy has a defined MRV plan/process outlined. If yes, identify the responsible stakeholders and institutional arrangement to monitor, review and verify the policy implications.
Current level of data availability	Describe data available for estimating GHG emissions from the impacted source categories, state the level of data that is available, and comment on the type of data that is/isn't available to estimate GHG emissions utilizing IPCC methodology. Levels of data availability could be characterized as: detailed data available, general data available, no data available, or unknown. Note if there are plans to collect data, either through policy implementation or establishment of a sectoral MRV system.
Risks and barriers	Identify the potential risks and/or barriers to successfully implementing the policy.
Alignment with national sector policies	Links to sectoral development goals or strategies.
Alignment with Low Emission Development Strategy (LEDS) and NDC targets	Synergies or trade-offs with national climate goals.
Relevance to international climate targets	Relevance for global goals or upcoming NDC updates.

cross-sectoral effects and the degree of interaction among the policies.

Policies are considered to interact when their combined effect differs from the sum of their individual impacts. This often occurs when policies influence the same sources of GHG emissions or removals. For example, policies at national and subnational levels within the same sector may interact if they target the same emissions sources or mitigation outcomes. Similarly, policies at the same level of governance may interact. In contrast, policies are not considered to interact if they do not affect the same GHG sources or sinks, either directly or indirectly.



Users can begin by identifying the type and extent of interaction among relevant policies, while following the steps in the previous section to describe a given policy. Interacting policies can be identified by determining which activities are targeted by a policy, and then identifying other policies that target the same activities. Once identified, users can assess the nature and level of interaction. This analysis may be based on expert judgement, NDC implementation plans where available, literature on similar policy combinations, or consultations with

relevant experts and stakeholders. At this stage, the assessment should remain preliminary and qualitative. Where interactions between policies exist, there may be benefits or challenges in assessing them separately or together as part of a policy package. The decision on how to proceed should be based on the purpose of the assessment and the level of interaction observed.

5.2.2. Outlining policy activities

Policy description

To effectively conduct a GHG impact assessment, it is necessary to have a detailed understanding and description of the policy being assessed.

The recommended information that should be included in a description to enable an effective assessment includes policy objectives, mitigation measures (i.e. actions taken under the policy), associated mitigation targets, geographic scale, timeline and budget. The description should also describe the roles of each entity involved in policy implementation and enforcement, data management systems, verification and/or reporting procedures, and administrative needs. The policy description also includes the identification of key stakeholders affected.

It is recommended that the user identify national emission levels and trends relevant to the sector in question to inform policy analysis.



A template for completing the policy description is available in the templates section in each guide.



Refer to the ICAT Stakeholder Participation Guide for detailed guidance on stakeholder engagement. Each sectoral guide also provides additional context-specific recommendations. Users may further draw on existing stakeholder mapping exercises to identify affected stakeholders.

Policy inputs and activities

Users should identify the policy's inputs and activities. Inputs are resources that go into implementing a policy, such as funds allocated for training and education programmes, as well as specific administrative capacities needed for implementation. Policy activities are administrative activities needed to implement the policy (undertaken by the responsible authority or entity). Activities may include an agency disbursing subsidies for energy efficiency upgrades, establishing a RE incentive programme, investing in low-emission transport infrastructure, hiring staff, or offering grants to support the adoption of clean technologies or practices.

When describing inputs, users should specify the level of financial and other resources needed, such as the amount of money required to adequately implement the policy, including funding needed for administrative activities. Information about policy inputs and activities should be included in the policy description. This information is used as a basis for understanding intermediate effects that occur as the result of those activities and impacts on GHG emissions and removals. Where available, users may draw on existing national sources, such as NDC implementation plans or climate finance and investment plans, which can provide relevant information on planned inputs, costs and resource allocation.

5.3. Identifying GHG Impacts

GHG impacts are the changes in GHG emissions and removals that result from the policy. This section provides a method for identifying the most common GHG impacts of mitigation policies, along with guidance to help users identify any additional impacts their specific policy may generate. From the full list of identified impacts, a subset considered significant is selected and included in the GHG assessment boundary, being careful to consider, and if necessary include, impacts outside the direct scope or control of the policy (e.g. potential leakage effects). The section also provides a method for defining the assessment period. The steps in this section are closely interrelated. Users may complete the steps sequentially or in parallel, and the process may be iterative.

5.3.1. Identify intermediate policy effects

To identify the GHG impacts of a policy, it is useful to first consider how the policy is implemented by identifying the relevant inputs and activities associated with its implementation. Inputs and activities lead to intermediate effects, which are changes in behaviour, technology, processes or practices that result from the policy. These intermediate effects then lead to the policy's GHG impacts (i.e. the reduction in emissions).

Identification of intermediate effects enables a complete and accurate assessment, and is necessary to determine the potential GHG impacts of the policy and develop a causal chain. To identify the intermediate effects, users should identify the stakeholders, along with the inputs and activities needed to implement the policy.

5.3.2. Identify potential GHG impacts

It is a key recommendation that users identify all potential GHG impacts of the policy, along with the associated GHG source categories.

Guidance is provided below, with further guidance available in the Policy and Action Standard (Rich, 2014). Several types of GHG impacts to consider are illustrated in table 5.2.

Users should consider impacts across the entire life cycle of the activities or systems affected by the policy. Some interventions may lead to indirect impacts, such as changes in land use, production practices or consumption patterns. Where relevant, existing methodologies can support the quantification of such impacts.

By separately identifying and categorizing in-jurisdiction and out-of-jurisdiction impacts, users can more accurately link the GHG impacts to the relevant jurisdiction's GHG inventory, targets and goals. This also improves transparency and helps identify potential double counting of out-of-jurisdiction impacts between jurisdictions. In some cases, a single impact may affect both in- and out-of-jurisdiction emissions, and separate tracking may not be feasible.

Stakeholder consultation can help ensure the completeness of the list of GHG impacts.

Refer to the ICAT Stakeholder Participation Guide (chapter 8) for guidance on designing and conducting consultations. Relevant stakeholders may include government agencies, regulatory bodies, private sector actors, civil society organizations and communities affected by the policy.

Finally, users should identify all relevant GHG source categories associated with the policy impacts of the policy. Examples are provided in table 5.3. Practitioners with project-level assessment experience may already be familiar with many of these source categories, which often align closely with those used in policy-level assessments.

5.3.3. Develop a causal chain

This section provides guidance for how to develop a causal chain, a conceptual diagram representing the sequence of changes that are expected to occur as a result of the policy. The inputs, activities and intermediate effects are mapped in a causal chain to illustrate the logical model for how the policy leads to the intended GHG impacts.

Users should include market-based effects to note linkages with economic implications and potential KPIs. Furthermore, users should call out which intermediate effects are due to the mitigation measure(s) central to the policy.

The length and complexity of the causal chain can influence the robustness of the assessment. Shorter causal chains, with more direct links between actions and outcomes, are generally associated with lower uncertainty and impacts that materialize over shorter time frames. In contrast, longer causal chains, such as those associated with research and development policies, may involve greater uncertainty and longer time horizons, making it more challenging to estimate impacts reliably. In some cases, where uncertainty is particularly high, conducting a quantitative GHG impact assessment may be challenging.

Table 5.2. Types of GHG impacts

Type of GHG impact	Description	Example
Positive impact vs. negative impact	Impacts that cause a decrease or increase in GHG emissions.	**Positive:** Reduced emissions from energy efficiency improvements in buildings or industry. **Negative:** Increased emissions from the production of new infrastructure materials.
Intended impact vs. unintended impact	Impacts that are either aligned or misaligned with the original objectives of the policy.	**Intended:** Reduced emissions from switching to low-carbon transport modes. **Unintended:** Increased emissions from induced demand or rebound effects.
In-jurisdiction vs. out-of-jurisdiction impact	Impacts that occur inside or outside the geographical boundary of the implementing entity.	**In-jurisdiction:** Reduced emissions from a national energy retrofit programme. **Out-of-jurisdiction:** Increased emissions from imported goods or fuel used in other countries.
Short-term vs. long-term impact	Impacts that occur in the near or distant future, depending on the timing of effects.	**Short-term:** Emissions reductions from installing low-emission technologies in industrial processes. **Long-term:** In the case of long terms effects (e.g. related to carbon dioxide removals), possible reversals may also need to be considered.

Table 5.3. Examples of GHG sources across sectors

Source category	Description	Emitting entity or equipment	Relevant GHGs
Grid-connected electricity generation	CO_2 emissions from fossil fuel-based power generation displaced or influenced by the policy	Power plants using coal, gas or oil	CO_2, CH4, N_2O
Industrial fuel combustion	CO_2 emissions from combustion of fossil fuels in industry	Boilers, furnaces, process heaters in industrial facilities	CO_2, CH4, N_2O
Transport fuel use	CO_2 and N_2O emissions from combustion of fuels in vehicles	Road vehicles, aviation, shipping	CO_2, CH4, N_2O
Fugitive emissions from energy production	CH_4 and CO_2 from leaks in natural gas, oil, or geothermal systems	Pipelines, compressors, geothermal steam vents	CH_4, CO_2
Industrial process emissions	CO_2 and other gases emitted during chemical or physical processes	Cement kilns, steel production, refrigeration systems	CO_2, HFCs, SF_6
Agricultural soil management	N_2O emissions from fertilizer application or tillage practices	Agricultural fields	N_2O
Livestock emissions	CH_4 from enteric fermentation and manure management	Cattle, sheep, swine	CH_4, N_2O
Land-use change and forestry	CO_2 emissions or removals from deforestation, afforestation or land management	Forests, cropland, grassland	CO_2
Building energy use	CO_2 emissions from electricity and fuel use for heating, cooling and appliances	Residential and commercial buildings	CO_2

Source category	Description	Emitting entity or equipment	Relevant GHGs
Water reservoirs and wastewater treatment	CH_4 and N_2O emissions from decomposition of organic matter	Dams, sewage treatment facilities	CH_4, N_2O
Treatment of solid waste	CH_4 emissions from landfills and waste treatment	Landfill sites, composting facilities	CH_4

The causal chain serves as the basis for defining the GHG assessment boundary and assessment period discussed in the following section.

A causal chain approach is used to understand how the policy and its corresponding inputs and activities cause intermediate effects and ultimately result in GHG impacts, tracing the process by which the policy leads to GHG impacts through a series of interlinked logical and sequential stages of cause-and-effect relationships. It allows users to visually understand how policies lead to changes in emissions.

Specific examples of causal chains tailored to individual sectors or policy types can be found in each of the GHG impact assessment guides. A generic example of a causal chain by stage is provided in figure 5.2 below.

Start by drawing links from the policy to the inputs and activities. Draw links from inputs and activities to stakeholders and intermediate effects. There may be a series of intermediate effects in the causal chain until it leads to a GHG impact. All the detailed information about stakeholders, inputs, activities and intermediate effects described in the previous sections should be included in the causal chain.

Consultations with stakeholders can help with the development and/or validation of the causal chain by integrating stakeholder insights on cause-effect relationships between the policy, behaviour change and expected impacts.

Together, a causal chain, policy description, table of policy impacts and the provided templates are the tools you need to describe the policy. The tabular format provided in the sectoral guides might be most useful in reporting or setting up subsequent assessment steps, while the diagram provides a visual sequential representation of what occurs (or is expected to occur) under the policy.

The diagram is an effective way to engage stakeholders to enhance understanding of the relevant elements of the policy and their logical flow. The preparation of this diagram offers an interactive exercise, which stimulates discussion and validates assumptions.

The table listing policy impacts and the causal chain are completed iteratively to improve accuracy and completeness. Table 5.4 provides an overview of causal chain elements and their description.

5.3.4. Select policy assessment boundary and period

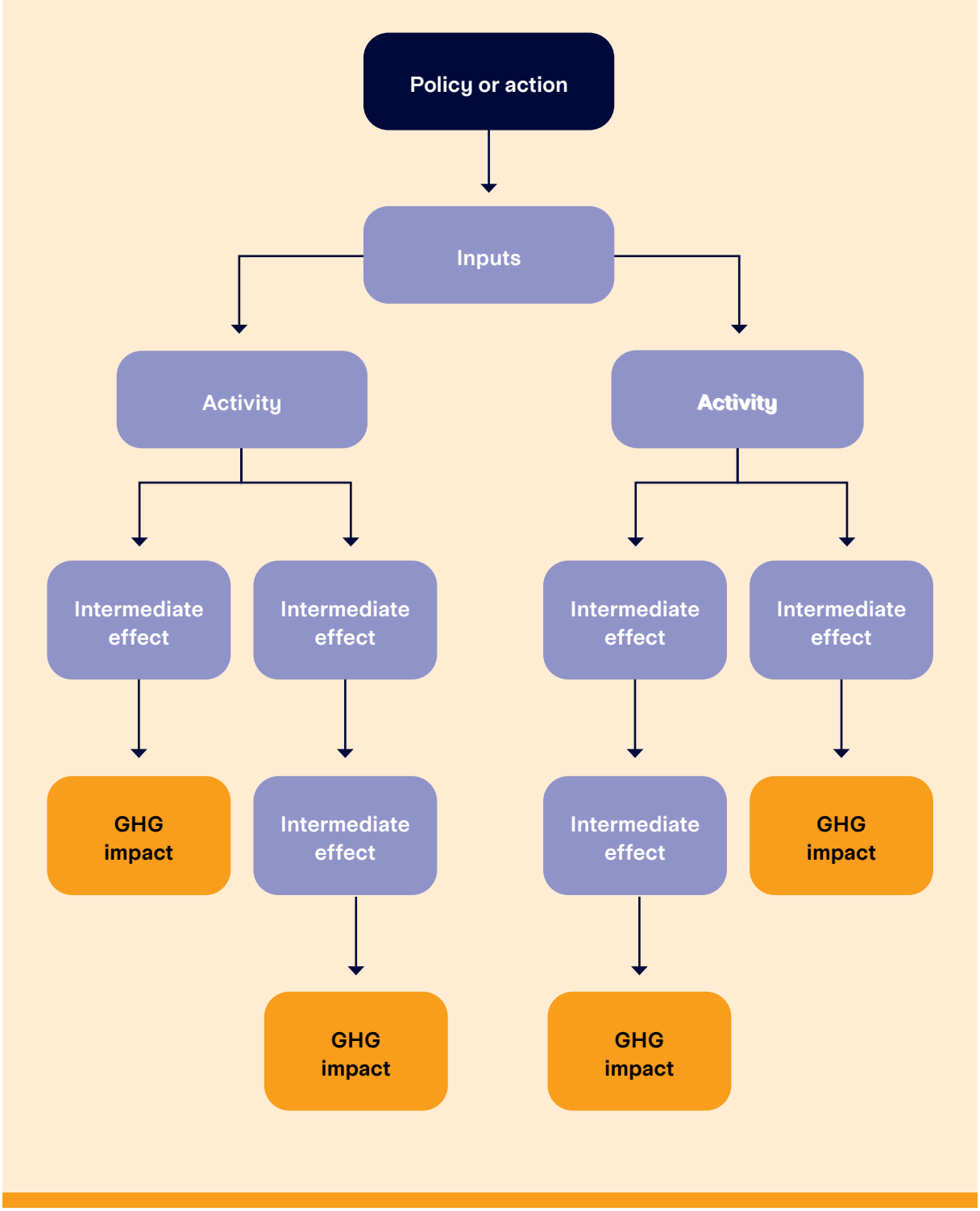
Policy assessment boundary

The GHG assessment boundary defines the scope of the assessment in terms of the range of GHG impacts.

It is a key recommendation to include all significant GHG impacts in the GHG assessment boundary.

The identified GHG impacts and the associated GHG source categories should be categorized for magnitude and likelihood. They should be included in the GHG assessment boundary if they are categorized as moderate or major in magnitude, and very likely, likely or possible (i.e. deemed significant). Users should also consider whether indirect impacts,

Figure 5.2. Causal chain



Source: GHG Protocol

Table 5.4. Causal Chain for a Mitigation Policy

Causal chain element	Description
Mitigation policy	Mitigation policy is introduced
Inputs and activities	▪ Institutional arrangements and staff mobilized ▪ Financial and technical support is provided ▪ Outreach and training activities conducted
Stakeholder consultation	▪ Target groups adopt new technologies, practices or behaviours
Intermediate effects	▪ Improved efficiency/performance of systems or equipment ▪ Enhanced resource management ▪ Technology deployment and uptake ▪ Increased productivity or service delivery per unit of input ▪ Reduced emissions intensity ▪ Co-benefits: improved health, air quality or economic resilience
GHG impacts	▪ Reduced GHG emissions per unit of activity ▪ Absolute GHG emissions reductions ▪ Avoided emissions ▪ Potential rebound or leakage effects ▪ Emission removals or enhanced sinks (if applicable)

including those occurring outside the direct scope or control of the policy (e.g. potential leakage effects), are significant and should be included in the assessment boundary. The Policy and Action Standard (Rich, 2014) provides further information about categorizing GHG impacts.

Estimate the likelihood that each GHG impact will occur

For each GHG impact identified, estimate the likelihood that it will occur by classifying each impact according to the options in table 5.5. For ex-ante assessments, this involves predicting the likelihood of each impact occurring in the future as a result of the policy. For ex-post assessments, this involves assessing the likelihood that the impact occurred in the past as a result of the policy, since impacts may have occurred during the assessment period for reasons unrelated to the policy being assessed. If a given impact is unlikely to occur, the subsequent impacts that follow from that impact can also be considered unlikely to occur. Where the likelihood is unknown or cannot be estimated, it should be classified as 'possible'.

The likelihood classification should be based on evidence to the extent possible, such as published literature, prior experience, modelling results, risk management methods, consultation with stakeholders, or expert judgement. Where the likelihood is unknown or cannot be determined, take into consideration the principle of conservativeness, meaning classifying downward positive impacts and upward negative impacts.

Estimate the magnitude of each GHG impact

Next, classify the magnitude of each GHG impact as major, moderate or minor according to table 5.6. This involves approximating the change in GHG emissions and removals

resulting from each GHG impact relative to the overall change in GHG emissions from the policy. GHG emissions and removals do not need to be precisely calculated at this stage; however, the relative magnitude should be categorized using available information, expert judgement or indicative estimates (e.g. order-of-magnitude comparisons or proxy data). Where countries have established measurement, reporting and verification (MRV) systems or relevant data sets, these should be used as a basis for informing the estimation. The relative magnitude of each GHG impact depends on the size of the GHG source or carbon pool affected and the magnitude of the change expected due to policy. The size of the GHG source or carbon pool can be estimated based on GHG inventories or other sources such as sectoral studies, academic research, industry data, national statistics, remote sensing data or project-level measurements. The magnitude of each GHG impact should be estimated relative to the total GHG emission change expected from the policy, and should be based on the absolute value of change in GHG considering both increases and decreases in emissions and removals.



This determination requires some level of expert judgement and should be done in consultation with stakeholders. If it is not possible to classify the magnitude of an impact as major, moderate or minor (e.g. due to lack of data or capacity), users can classify a given impact as 'uncertain' or 'cannot be determined', as appropriate, during ex-ante assessments. However, additional effort should be made to either collect relevant data or undertake expert judgement for policy assessments during implementation, and ex-post. Users can also estimate changes in activity data rather than changes in emissions to assess the magnitude of the GHG impact, where relevant. Percentages provided in table 5.6 provide approximate ranges for determining the relative magnitude of the impact. Users may adjust these ranges to better represent national circumstances.

Table 5.5. Estimating likelihood of GHG impacts

Likelihood	Description
Very likely	Reason to believe the impact will happen (or did happen) as a result of the policy.
Likely	Reason to believe the impact will probably happen (or probably happened) as a result of the policy.
Possible	Reason to believe the impact may or may not happen (or may or may not have happened) as a result of the policy. About as likely as not. Cases where the likelihood is unknown or cannot be determined should be considered possible.
Unlikely	Reason to believe the impact probably will not happen (or probably did not happen) as a result of the policy.
Very unlikely	Reason to believe the impact will not happen (or did not happen) as a result of the policy.

Determine which GHG impacts to include in the assessment boundary

Once the likelihood and magnitude of each impact have been determined, users also need to determine which impacts should be considered significant, as shown in figure 5.3. Generally, impacts are significant (Rich, 2014) unless they are either minor in size or unlikely or very unlikely to occur. Impacts that are considered significant should be included in the assessment. When the significance of all identified GHG impacts has been evaluated, the user should return to the causal chain diagram and the table where all the policy activities and associated effects are documented, and label those that will be included in the assessment.

5.3.5. Define the assessment period

The assessment period is the time over which impacts resulting from the policy are assessed. The starting date and the duration of the assessment period may vary depending on whether an ex-ante or ex-post assessment will be conducted. Choosing between ex-ante and ex-post assessment depends on the status of the policy. Where the policy is planned, or adopted but not yet implemented, the assessment will be ex-ante. Alternatively, where the policy has been implemented, the assessment can be ex-ante, ex-post, or a combination of ex-ante and ex-post. In addition, assessments can be conducted during policy implementation to monitor progress and inform potential adjustments if outcomes differ from expectations.

The assessment is an ex-post assessment if the objective is to estimate the impacts of the policy to date; an ex-ante assessment if the objective is to estimate the expected impacts in the future; or a combined ex-ante and ex-post assessment, to estimate both the future and past impacts respectively. An ex-ante assessment can include historical data if the policy is already implemented, but it is still an ex-ante assessment (rather than an ex-post) if the objective is to estimate future effects of the policy.

Ex-ante assessment

The ex-ante assessment period is usually determined by the longest-term impact included in the GHG assessment boundary. The assessment period can continue until the policy implementation period ends or it can be longer than the policy implementation period, as

Table 5.6. Estimating relative magnitude of GHG impacts

Relative magnitude	Description	Approximate relative magnitude
Major	The change in the GHG source or carbon pool is (or is expected to be) substantial in size (either positive or negative). The impact significantly influences the effectiveness of the policy.	**>10%**
Moderate	The change in the GHG source or carbon pool is (or is expected to be) moderate in size (either positive or negative). The impact somewhat influences the effectiveness of the policy.	**1–10%**
Minor	The change in the GHG source or carbon pool is (or is expected to be) insignificant in size (either positive or negative). The impact is inconsequential to the effectiveness of the policy.	**<1%**

some significant GHG impacts can occur after the policy implementation period ends. The assessment period should be defined to include all significant GHG impacts included in the GHG assessment boundary, based on when they are expected to occur. To determine the end of the assessment period, users can choose from the following approaches, among others:

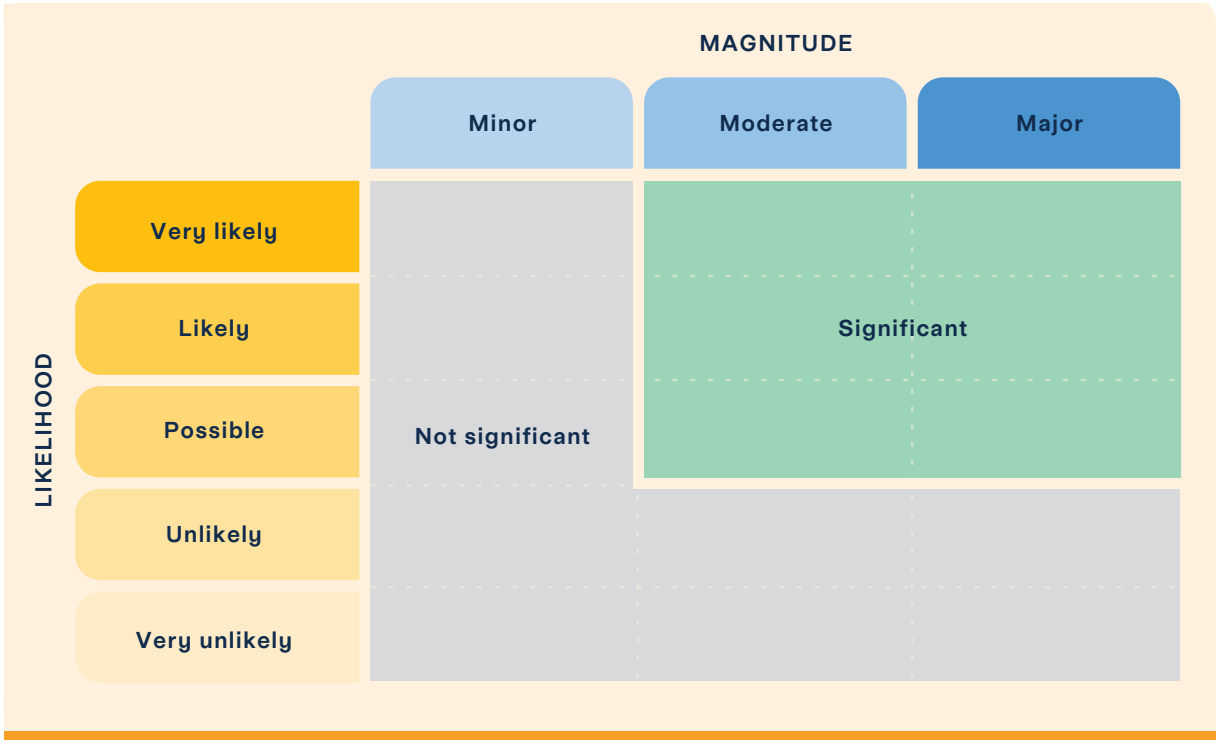
- A time frame or date that is directly specified in the policy goal or target (e.g. reduce emissions by 50 per cent by 2030).
- The length of time for which the policy is funded or expected to be funded.
- A period of time that has otherwise been identified as the policy implementation end date.
- A period of time aligned to GHG emission and removal dynamics.
- A period of time that corresponds to the implementation of another interacting policy.

Ex-post assessment

For an ex-post assessment, the assessment period can be the period between the date the policy is implemented and the date of the assessment, or it can be a shorter period between those two dates.

Furthermore, if the policy implementation has started while future impacts have not yet been assessed, the user can define the assessment period as a combination of ex-ante and ex-post periods. This approach evaluates the effect of the policy to date and projects its performance into the future, and can therefore inform any adjustments to the policy that may be appropriate. In addition, users can separately estimate and report impacts over any other time periods that are relevant. For example, if the assessment period is 2020–2040, a user may choose to separately estimate and report impacts over the periods 2020–2030, 2031–2040 and 2020–2040.

Figure 5.3. Recommended approach for determining significance based on likelihood and magnitude



Source: Adapted from Rich (2014)

5.4. Identify sustainable development impacts (if relevant)

Policies can generate multiple sustainable development impacts in addition to their GHG impacts. Sustainable development impacts refer to changes in environmental, social or economic conditions resulting from a policy or action – for example, changes in economic activity, employment, public health, air quality or resource security. Where significant (either positive or negative), these impacts should be considered alongside GHG impacts when prioritizing policies for selection and implementation.

Refer to the ICAT Sustainable Development Guide for guidance on how to assess sustainable development impacts.

5.5. Identify transformational change impacts (if relevant)

Policies may contribute to transformational change in addition to achieving GHG emissions reductions. For example, they may stimulate widespread adoption of low-emission technologies, mobilize private sector investment, or lead to significant structural shifts in how services or systems are delivered within a sector. Such changes can lay the groundwork for further systemic transformation across broader parts of the economy or society.

In the context of GHG mitigation, transformational change refers to a fundamental, sustained systemic shift that disrupts established high-emissions development pathways and supports progress towards zero-carbon development, in line with the goals of the Paris Agreement and the SDGs.

Please refer to the ICAT Transformational Change Guide for guidance on assessing the transformational impacts of policies and their ability to influence systemic processes, remove barriers to low-emission development and contribute to long-term structural change, through the analysis of both process and outcome characteristics.

The following chapter sets out methods for calculating the costs of implementing the policy. This cost information also forms part of the policy description (see Table 5.1). Users should note that the assessment of GHG impacts takes place after this step. For sector-specific methods, equations, and parameters, refer to the relevant ICAT GHG Impact Assessment Guide.

Chapter 6: Estimating the cost of policy implementation

6.1 Introduction to estimating the cost of policy implementation | 6.2 Approach to estimating the cost of policy implementation

This chapter focuses on the methodologies and approaches for estimating the cost of implementing policies. It provides guidance to understanding, selecting and applying appropriate methods to assess the financial implications of policy implementation. Accurate cost estimation is critical for effective policy planning, budgeting and informed decision-making.

6.1. Introduction to estimating the cost of policy implementation

The cost of policy implementation refers to the financial resources required to implement a policy effectively. This includes direct costs (such as programme funding, infrastructure and personnel) and indirect costs (such as administrative overhead, training, monitoring and evaluation).

Why estimating the cost of implementation is important

1. **Budgetary planning:** Accurate cost estimation ensures that sufficient funds are allocated to implement the policy without financial shortfalls.
2. **Feasibility assessment:** It helps policymakers and stakeholders determine the financial viability of a policy.
3. **Resource allocation:** Estimating costs supports the efficient allocation of resources across competing priorities.
4. **Accountability and transparency:** Cost estimates provide a basis for monitoring and evaluating the financial performance of policy implementation.
5. **Stakeholder communication:** Clear cost estimates help communicate the financial implications of a policy to stakeholders, including government agencies, donors and the public.

The cost of implementation can be estimated both ex-ante (before policy implementation) and ex-post (during and after policy implementation). This allows users to compare expected and actual resource requirements, identify key cost drivers and implementation risks, and assess both projected and realized cost-effectiveness (e.g. cost per megawatt hour [MWh] deployed or per tons of CO2 [tCO_2] abated).

Comparing ex-ante and ex-post estimates helps policymakers and stakeholders improve future forecasts, guide policy adjustments, and inform decisions on corrective actions or design improvements. In addition, estimating costs during implementation supports ongoing monitoring and reporting, including under international transparency frameworks.

6.2. Approach to estimating the cost of policy implementation

A structured approach to estimating the cost of policy implementation ensures accurate financial planning and efficient resource allocation. This section outlines a methodology to systematically assess the financial requirements of policy execution, as seen in figure 6.1. Please also see Appendix A for an illustrative example of what is discussed in this chapter.

1. **Define the scope of the policy**
   Clearly outline the policy's objectives, key activities and implementing entities, following guidelines provided in chapter 5. Identify whether the policy involves direct financial instruments (e.g. subsidies, grants) or regulatory actions (e.g. mandates, reporting requirements).
   A clear understanding of the policy's scope helps determine which cost elements are relevant for estimation.

Figure 6.1. Step-by-step approach to costing policy implementation



2. **Identify cost components**
Policy implementation costs can be categorized into several components. These include:

- Financial allocations: Direct government expenditure, such as subsidies or incentives (e.g. budget allocation for solar photovoltaic [PV] incentives).
- Administrative costs: Expenses related to policy design, coordination, stakeholders' engagement and governance (e.g. setting up a regulatory body), information technology infrastructure, etc.
- Legislative and regulatory costs: Costs of drafting and enforcing legal frameworks, such as conducting legislative reviews or passing new laws.

- Awareness and capacity-building costs: These include expenses for training programmes, public awareness campaigns and stakeholder engagement.
- Monitoring, reporting and enforcement costs: Financial resources needed for compliance checks, audits and impact assessments are included in this category.

3. **Select the estimation method**

- Top-down approach: Historical or aggregated cost data from similar policies or past implementations is used to estimate costs.
    - This approach is suitable when limited project-specific data is available, but historical expenditure data for similar policies exists. For example, estimating the future costs of a FiT policy to promote RE based on the average costs of similar past programmes.
- Bottom-up approach: Identifies individual cost components (e.g. administrative expenses, awareness campaigns, enforcement) and estimates the cost of each component. The costs are then aggregated to arrive at the total implementation cost.
    - This approach is suitable for policies with multiple distinct implementation cost components, for which detailed information on each component is available for cost estimation.
- Hybrid approach: Top-down and bottom-up methods are combined in this approach. It uses top-down benchmarks for known costs (from existing policies) and bottom-up analysis for new components. For example, administrative costs can be based on benchmark outreach, and IT system costs can be estimated based on planned activities.

Expert judgement: Stakeholders, including technical experts, are engaged to estimate costs based on experience and expected resource needs. It is used when empirical data is lacking, especially in early planning stages. Multiple cost estimates can be developed based on policy design variants and different implementation pathways. The approach is suitable for planning under uncertainty. It can also be adopted for testing sensitivity to assumptions. For example, the approach can be used to estimate cost under varying FiT rates with different RE deployment scenarios.

A scenario-based approach can be adopted in all cases (top-down and bottom-up approaches, hybrid approach, and expert judgement), as it helps to address uncertainty in the estimates in these approaches.

Selecting an appropriate method for estimating policy implementation costs is essential to ensure accuracy and reliability. The method should be tailored to the policy type, data availability and required level of detail.

Key considerations for selecting a method

Before choosing a method, consider the following factors:

- **Policy type and complexity –** Simple policies, such as tax incentives, are typically explicit, measurable, and based on well-defined parameters, such as the eligible population, duration and unit cost. As a result, identifying individual cost components is relatively straightforward, making the bottom-up costing method more appropriate. In contrast, complex regulatory policies (national RE portfolio standard) pose challenges for direct cost estimation due to system-wide impacts, indirect costs (e.g. compliance burdens, economic shifts) and long-term enforcement requirements. These policies often require scenario modelling or impact simulations, making the top-down costing method more suitable.
- **Data availability –** If historical cost data or budget reports exist, a top-down approach may be suitable; otherwise, a bottom-up estimation may be needed.

- **Accuracy and granularity –** Some policies require high precision in cost estimates, while others can use approximations based on similar past policies.
  - When high accuracy and detailed cost breakdowns are required, for example, in targeted subsidy programmes or small-scale RE grant schemes, a bottom-up costing method is more suitable. This approach allows policymakers and stakeholders to estimate individual cost components (e.g. number of units installed, labour cost, material cost) with precision.
  - When such granularity is not feasible or necessary, particularly for broad or complex national policies where only a general estimate is needed, such as a national feed-in tariff (FiT) scheme or carbon pricing for the power sector, a top-down costing or benchmarking method is more appropriate. These methods rely on historical data, macroeconomic indicators, or comparative case studies, and are better suited for estimating aggregate impacts and system-wide costs.

4. **Gather data**

- Review government financial reports, past policy expenditures and case studies.
- Engage experts and policymakers and stakeholders to validate cost assumptions.
- Use comparative analysis from similar policies in other jurisdictions when direct data is unavailable.

5. **Estimate implementation costs**

- Apply the selected method (top-down, bottom-up or hybrid) to quantify costs.
- Consider different implementation scenarios to reflect potential cost variations.

6. **Validate assumptions**
   Validation is essential to ensure the reliability, credibility and accuracy of the cost estimates before they are used for budgeting, funding proposals or policy design. The validation process involves the following activities:

- All major assumptions such as unit costs, inflation rates, expected lifetimes of technologies, administrative overheads, etc. should be reviewed to check if they are based on current and credible sources (e.g. national benchmarks, published data, procurement records).
- Cost estimates should also be checked against benchmarks or actual expenditures from similar policies or programmes in the country or region. Adjustments should be made for context differences (e.g. project size, technology, geography, etc.).
- Costs estimates should also be validated with those who will implement or be affected by the policy (e.g. utility companies, local governments, regulators, NGOs). They can provide insight into hidden costs or overlooked operational challenges. The cost estimates could be revised, if needed, based on input from experts and stakeholders.
- Technical and financial experts should be involved in reviewing cost categories, estimation methods and data quality. This may include government finance staff, auditors, economists or sector experts.
- Conducting basic sensitivity analysis to assess how cost estimates change under different scenarios (e.g. currency fluctuation, interest rate change, fuel price increase) helps flag high-uncertainty areas.

7. **Present cost estimates**
   The implementation cost estimates can be included in the policy assessment report, along with results from sensitivity analysis. In addition, cost estimates should be communicated to decision makers and other stakeholders. The purpose is to ensure the cost findings are understood, trusted and used effectively in decision-making processes related to budgeting, approval and policy refinement.

Chapter 7: Monitoring and reporting

7.1 Monitoring performance over time | 7.2 Identifying key performance indicators | 7.3 Creating a monitoring plan | 7.4 Monitoring indicators and parameters over time | 7.5 Reporting

Monitoring and reporting are essential components of a robust policy GHG impact assessment process. Monitoring helps determine whether policies are being implemented as planned and whether they are achieving their intended objectives. Reporting ensures transparency and facilitates accountability by communicating the methodology, data, assumptions and findings to decision makers and stakeholders.

This chapter presents a harmonized approach to monitoring and reporting that applies across all GHG impact assessment guides. The assessment methodology primarily focuses on GHG impacts. Tracking of non-GHG impacts, such as sustainable development outcomes, is not a mandatory component of the ICAT GHG assessment methodology. However, other ICAT guides – particularly the Sustainable Development Guide – provide useful approaches for assessing and tracking such impacts where relevant.

7.1. Monitoring performance over time

Monitoring is an essential component of the policy impact assessment process. It helps determine whether a policy is being implemented as planned and whether it is achieving its intended objectives over time. Monitoring also supports the estimation of GHG impacts, particularly for ex-post assessments.

In practice, monitoring serves two main purposes:

1. **Evaluating policy implementation and performance,** including whether the policy is on track to achieve its objectives.
2. **Supporting the estimation of GHG impacts,** particularly for ex-post analysis.

While this monitoring framework primarily supports the assessment of GHG impacts, monitoring may also include non-GHG impacts, such as environmental, social or economic outcomes, where these are relevant to policy objectives. Guidance on assessing such impacts is provided in other ICAT guides, particularly the Sustainable Development Guide.

Monitoring may also include tracking policy implementation costs, as described in chapter 6.

This chapter provides guidance on identifying **KPIs** and parameters, setting up data management systems, and developing a **monitoring plan** for data collection and management. Users conducting only **ex-ante assessments**, without plans to monitor policy performance or conduct ex-post assessments, may skip this chapter.

While a range of indicators may be relevant, users are encouraged to focus on a limited number of key indicators that are most relevant for tracking policy implementation and estimating impacts. Selecting a manageable set of indicators helps ensure that monitoring is feasible given data availability and institutional capacity.

Checklist of key recommendations

- Identify a limited number of key indicators for tracking policy implementation and performance over time.
- Define the parameters required to estimate GHG emissions ex-post.

- Develop a monitoring plan for collecting and managing relevant data.
- Monitor indicators and parameters consistently throughout policy implementation.

7.2. Identifying key performance indicators

While planning the assessment, the next step is to consider the key KPIs to track progress. A KPI is a metric indicating the state or level of a policy's performance (i.e. whether the policy is on track and being implemented as planned). This section provides examples of KPIs.



It is a key recommendation to identify KPIs for tracking policy performance over time. If a mitigation policy is to be included in a country's NDC, the KPIs will be used for tracking progress in implementation and achievement of NDC, and should meet the requirements set in MPGs for the transparency framework (UNFCCC, 2019).

To meet the requirements, indicators shall be relevant to the NDC, measurable, and based on consistent methods for evaluation. While KPIs used to monitor individual policies or actions may differ from those used at the NDC level, they should, where appropriate, support the tracking of progress towards NDC targets.

Furthermore, information shall be provided on indicator reference levels in the baseline scenario, projected levels, and for each reporting year reflecting policy implementation to determine if the policy is performing as expected. Indicators can also reflect mitigation co-benefits of adaptation actions and sustainable development impacts.

While KPIs are initially identified during the planning phase, they can be further refined and modified during the assessment process to better capture key parameters that should be monitored to track policy implementation.

Table 7.1 defines and provides examples of KPIs. Refer to the GHG impact assessment guides' assessment toolkit for resources on developing policy KPIs, such as WRI's working paper on monitoring implementation and effects of GHG mitigation policies (Singh and Vieweg, 2015).

Performance indicators should be clearly defined and, in combination, cover the range of activities under the policy, utilize available data with appropriate quality and timeliness, and allow for comparability between policies. Once identified, they should be included in reporting and monitoring plans.

GHG impact assessment guides provide sector-specific examples of KPIs. Users are encouraged to adapt these examples as necessary and to consult the toolkit in the GHG impact assessment guides for templates and references.

7.3. Creating a monitoring plan

A monitoring plan is the system for obtaining, recording, compiling and analysing data and information necessary for tracking policy KPIs and assessing GHG impacts.

The monitoring plan should ideally be developed during the policy design phase, to ensure that relevant data are collected consistently throughout the implementation period.

7.3.1. Monitoring period

The monitoring period should generally cover the entire policy implementation period, and may include:

- Pre-policy monitoring, where relevant, to establish baseline conditions
- Monitoring during implementation, to track policy activities and performance
- Post-policy monitoring, where relevant, to assess sustained impacts

Different indicators may require different monitoring time frames. Users should consider aligning monitoring periods across multiple assessments (e.g. GHG impacts, sustainable development impacts and transformational change).

Table 7.1. KPI examples for policy assessment and monitoring

Policy implementation components	Definition	KPI examples
Inputs	Resources that go into implementing a policy	▪ Budget allocated to policy implementation ▪ Staff and institutional capacity ▪ Funding disbursed to implementing agencies ▪ Equipment or infrastructure procured
Activities	Administrative and operational activities involved in implementing the policy	▪ Number of training sessions delivered ▪ Number of stakeholders engaged ▪ Coverage or scale of implementation (e.g. geographic area, sectors affected) ▪ Number of permits/licences issued ▪ Communication or outreach materials disseminated
Intermediate effects	Changes in behaviour, technology, practices or processes resulting from the policy	▪ Uptake of relevant technologies or practices ▪ Change in service or product usage patterns ▪ Adoption rate of compliance measures ▪ Efficiency improvements in targeted operations ▪ Change in stakeholder behaviour or awareness ▪ Timeliness of reporting (e.g. % of reports submitted on time for BTR/ETF requirements) ▪ Existence and operationalization of a monitoring framework (e.g. monitoring system established and functioning) ▪ Volume of financial support mobilized or received (e.g. additional or conditional funding linked to implementation progress)
GHG impacts	Changes in GHG emissions by sources or removals by sinks resulting from intermediate effects	▪ Change in sectoral GHG emissions ▪ Emissions reduced per unit of output ▪ Change in carbon sequestration rates ▪ GHG intensity per unit of activity (e.g. per km travelled, per MWh generated)

Policy implementation components	Definition	KPI examples
Non-GHG effects	Changes in environmental, social or economic conditions resulting from the policy	▪ Job creation or employment effects ▪ Impact on air or water quality ▪ Economic cost savings or productivity gains ▪ Improvements in health outcomes ▪ Social equity or access to services

7.3.2. Institutional arrangements

Monitoring often requires data from multiple institutions. Clear institutional arrangements are therefore essential. These arrangements should:

- Define clear roles and responsibilities for data collection and analysis
- Establish a coordinating body or team responsible for the overall MRV system
- Align with or expand existing national MRV systems, where possible
- Ensure that responsible institutions have adequate capacity and authority

Countries may draw on guidance under the ETF when strengthening institutional arrangements for effective MRV systems.

7.3.3. Key elements of a monitoring plan

A robust monitoring plan should include:

Roles and responsibilities – Identify institutions or individuals responsible for collecting and managing each indicator or parameter.

Competencies – Specify required technical skills and identify any training needs.

Methods – Document methods used for collecting, compiling, storing and reporting data.

Frequency of data collection – Define how often data will be collected (e.g. quarterly, annually), balancing data quality with cost and feasibility.

Data management systems – Identify tools or systems used to monitor data.

Quality assurance/quality control (QA/QC) – Define procedures to ensure the transparency, accuracy, completeness, consistency and comparability of data and results, including data checks, calculation reviews and internal verification processes.

Record keeping and documentation – Establish procedures for documenting methods, assumptions and results to support transparency and future assessments.

Continuous improvement – Include provisions to periodically review and improve monitoring procedures.

Financial resources – Estimate the cost of monitoring activities and identify potential funding sources.

7.4. Monitoring indicators and parameters over time

Once the monitoring plan has been established, it is a key recommendation to track all selected indicators and parameters throughout the monitoring period.

Monitoring frequency should reflect:

- Policy objectives
- Stakeholder priorities

Table 7.2. Monitoring plan informational elements

Monitoring plan element	Description
Roles and responsibilities	Identify the entity or person responsible for monitoring KPI and parameters, and clarify the roles and responsibilities of the personnel conducting the monitoring.
Competencies	Include information on the competencies required to carry out monitoring and impact assessment, including skills related to data collection, management and analysis. This should explicitly include competencies for applying QA/QC procedures from the initial stages of data collection, as these can influence overall assessment outcomes. Training needs should be identified to ensure that personnel have the necessary capabilities. Where relevant, these competencies and procedures can be formalized in a standard operating procedure (SOP) to ensure consistency over time and to support onboarding of new personnel.
Monitoring methods	Explain the methods for collecting, processing, storing and reporting data on monitored parameters.
Monitoring period	The policy implementation period is the time during which the policy is in effect. The assessment period is the time over which the GHG impacts resulting from the policy are assessed. The monitoring period is the time over which the policy is monitored. At minimum, the monitoring period should include the policy implementation period. Users can have multiple monitoring periods for separate assessment periods. A monitoring period can also include monitoring of relevant activities prior to the implementation of the policy and after the policy implementation period.
Frequency	KPIs and parameters can be monitored at various frequencies, such as monthly, quarterly or annually. Determine the appropriate frequency of monitoring based on the needs of decision-makers and stakeholders, cost and data availability. The frequency of monitoring can be consistent with measurements conducted under the national MRV system.
Collecting and managing data	Identify the databases, tools or software systems used for collecting and managing data and other information.
Quality Assurance and Quality Control (QA/QC)	Define the methods for QA/QC to enhance confidence in the assessment results. QA is a planned review process conducted by personnel who are not directly involved in the data collection and processing. QC is a procedure or routine set of steps that are performed by the personnel compiling the data to ensure the quality of the data.

Monitoring plan element	Description
Record keeping and internal documentation	Define procedures for clearly documenting data collection processes as well as what data and information are collected.
Continual improvement	Include a process for improving processes for taking measurements, running surveys, modelling and analysing data. Continual improvement of monitoring can reduce uncertainty in GHG impact estimates over time.
Financial resources	Identify the cost of monitoring and sources of funds.

- Data availability and quality
- Institutional capacity
- Feasibility and resource constraints
- Reporting requirements, including BTRs under the ETF

Monitoring results may also reveal that assumptions used in the ex-ante assessment are no longer valid. In such cases, users may update the assessment by revising assumptions or conducting an ex-post assessment using observed data.

Input from stakeholders can be valuable in developing a monitoring plan and selecting KPIs. Table 7.2 provides an overview of the elements that should be included in the monitoring plan.

A monitoring plan should be developed during the policy design phase or soon after the start of policy implementation. If the policy is included in a country's NDC, then the monitoring plan should recognize that under the Paris Agreement, countries must provide information necessary to track progress towards achieving their NDC targets (UNFCCC, 2019).

7.5. Reporting

Reporting ensures transparency, supports comparability, and enables integration of policy assessments into broader national and international reporting frameworks, including BTRs.

Checklist of key recommendations

- Report all relevant information about the assessment process, including methods, assumptions, results and costs of policy implementation.
- Ensure transparent and consistent documentation of methodology, data sources and assumptions.
- Where multiple ICAT guides are used, avoid duplicating information.

7.5.1. Recommended information to include in reports

Assessment reports should include the following information.

General information

- Name of the policy assessed
- Assessment date
- Names of individuals or organizations conducting the assessment
- Reference to previous assessments, if applicable

Methodology

- Objective and scope of the assessment

- Description of the policy and implementation context
- Assessment boundary and time period
- Baseline scenario description and assumptions
- Policy scenario description and assumptions
- Methods used for estimating GHG impacts
- Data sources and data quality assessment
- Sensitivity or uncertainty analysis (if conducted)

Results

- Estimated or observed GHG impacts
- Relevant non-GHG impacts, where assessed
- Key indicators tracked and progress observed
- Deviations from initial assumptions
- Co-benefits and trade-offs identified

Cost information

- Estimated or observed costs of policy implementation
- Methods and assumptions used for estimating costs
- Changes in cost estimates during implementation, where relevant

Monitoring and QA/QC

- Description of the monitoring plan
- Institutions involved in monitoring and reporting
- QA/QC procedures applied

Lessons learned

- Challenges encountered during implementation or assessment
- Recommendations for improving policy design or implementation
- Opportunities to strengthen climate ambition or integrate findings into national strategies

For additional guidance on communicating assessment results to stakeholders, users may consult the **ICAT Stakeholder Participation Guide.**

7.5.2. Developing a measurement, reporting and verification (MRV) system for tracking progress

Information on KPIs and parameters needed for GHG inventories and mitigation policy assessments may be dispersed among institutions and governmental agencies. Strong institutional arrangements with clear roles, responsibilities and data flows play a central role in coordinating MRV. A technical coordinator or coordinating team should oversee the procedures for data collection, analysis and reporting.

Countries may already have institutional arrangements in place as part of their national climate MRV system, for instance established under the UNFCCC. Where this is the case, users can consider incorporating or integrating policy GHG impact assessment within the MRV system. Where strong institutional arrangements do not yet exist, users should assign governmental ministries or departments – with the appropriate capacity and authority – as responsible for monitoring the policy and setting the necessary legal arrangements. Institutional mandates help to strengthen policy procedures, and may also help secure funding from the Government to ensure the continuity of policy data collection and assessment.

Chapter 8: Final steps

8.1 Document Results | 8.2 Lessons learned | 8.3 Next Steps

This chapter provides guidance on what to do once the GHG impact assessment is complete. It outlines steps for documenting and communicating results, applying them to support decision-making, interpreting findings appropriately, learning from the assessment and planning for future impact assessments.

8.1. Document results

Going through the steps outlined in the previous chapters of this guide likely resulted in numerous documents, including policy descriptions, tables and diagrams outlining policy effects, compilations of activity data, and spreadsheets with calculations. Reporting the results, methodology and assumptions used is important to ensure the GHG impact assessment is transparent and provides decision makers and stakeholders with the information they need to properly interpret the results. For guidance on engaging stakeholders, refer to the ICAT Stakeholder Participation Guide.

Once the assessment is complete, users should prepare an assessment report that documents the process and results. Each GHG impact assessment guide includes a report template in the template section to support this step. Establishing a consistent and structured documentation process is strongly recommended, while allowing for flexibility to adapt to national circumstances, data availability and institutional arrangements. This supports transparency, facilitates replication of the assessment over time and ensures continuity across assessment cycles. Compiling and presenting this information in a structured report is recommended to enhance communication with key decision makers and to support its inclusion in national reporting under the ETF, particularly in BTRs.

8.2. Lessons learned

After completing the assessment, it is recommended to consider what was learned from the assessment and how it can help inform future policy design and improve quantification of GHG emissions. Including such reflections in the assessment report is good practice to document the main takeaways from the process. These can include things such as the results of the assessment, the process related conducting the assessment, methodological issues/ data gaps identified, or even broader lessons related to achieving meaningful climate action by the country. The user is encouraged to document the key lessons learned and share them with relevant policymakers and stakeholders.

Assessment objectives

When the assessment is complete, it is recommended that the user revisit the objectives of the assessment and the intended outcomes of the policy to see if they were achieved. As one of the overarching objectives of the assessment is to quantify GHG emissions associated with the policy, the user should determine if the policy activities will help achieve the emission reduction targets identified. If ex-post assessment is being conducted and emission reduction targets are not met, this can trigger corrective actions as next steps. For ex-ante assessment, identifying when projected reductions are falling short of targets can enable policymakers and stakeholders to refine the design of the policy, such as the policy instrument, or parameters such as incentive levels.

Data gaps and further assessment refinement

The assessment process can help reveal data gaps that prevent the team from applying more advanced calculation methods or quantifying

GHG impacts. The assessment can help identify key data parameters that countries need to prioritize to improve future calculations or evaluate policy performance. Tracking activities occurring under the policy can support both the generation of activity data and evaluation of policy implementation.

Users should compile a list of the data needed for the policy assessment, document data sources and identify strategies for obtaining any missing information.

Alignment with the country's climate and sector policies and international commitments

Countries are expected to increase their climate action ambition under the Paris Agreement. However, some mitigation measures may have unintended negative effects on other national development objectives. For example, a policy that reduces emissions in one sector may limit economic output, restrict access to essential services or negatively impact livelihoods. Addressing such impacts is closely linked to the concept of a just transition, which aims to ensure that climate actions are implemented in an inclusive and equitable manner, supporting affected workers and communities, in line with ICAT's work in this area. In some cases, the opposite can also occur, where efforts to advance development priorities – such as increasing infrastructure, production or access – may lead to higher GHG emissions.

It is therefore important to identify and understand how the impacts of the policy being assessed may align with or counteract other national policies or programmes, such as low-emission development strategies, long-term strategies, sustainable development plans or NDC targets. Quantifying these impacts can help inform policy amendments to ensure that sustainable development is balanced across environmental, economic and social dimensions.

Assessment results can also highlight opportunities to enhance the ambition of NDCs and improve policy coherence. Users should consider and document how the results of the assessment relate to the broader national context, including sectoral development priorities and climate action commitments.

8.3. Next steps

Following the assessment, the user can consider the results and lessons learned, and utilize that information to determine what next steps could be appropriate to undertake. These can range from additional technical work, addressing the gaps in the country's data collection and management system, or conducting further assessments of the policy. The user is encouraged to identify and discuss next steps that match country's priorities with policymakers and stakeholders.

Technical review and uncertainty analysis

During the planning phase of the assessment, users may consider whether an independent technical review will be conducted. A review process can inform future improvements to the assessment and enhance the transparency and credibility of its results.

Understanding uncertainty is essential for interpreting GHG estimates. Identifying and documenting sources of uncertainty can help users improve the quality of assessments and build confidence in the findings. While this guide does not provide detailed quantitative methods for estimating uncertainty, users are encouraged to apply qualitative assessments or sensitivity analysis to determine how GHG estimates respond to different assumptions and parameters. For more detailed guidance on uncertainty estimation methods, users are encouraged to consult relevant sources such as the 2006 IPCC Guidelines (Eggleston et al., 2006), which provide approaches for both qualitative and quantitative uncertainty analysis.

For more detailed guidance, users can also refer to the ICAT Technical Review Guide.

Enhancement of data collection and MRV systems

A common challenge in conducting GHG impact assessments is the lack of relevant data. Preparing for and completing the

assessment helps users to identify key data needs and opportunities to improve sectoral MRV systems.

The process may highlight the need for survey instruments, templates or system upgrades to support better data collection. These improvements may be institutionalized through the policy's implementation framework. Collecting data as part of implementation can lead to the development of country-specific emission factors, and allow for higher-tier calculations in future assessments.

Corrective action and policy refinement

Assessment results may indicate that intended GHG reductions have not been – or may not be – achieved. For ex-post assessments, corrective action should be triggered if KPIs show the policy is off track. This can involve redesigning the policy or enhancing implementation mechanisms. The ability to identify when corrective action is needed is essential to the country's ability to achieve its NDC target and contribute to global climate goals.

In ex-ante assessments, if projected impacts differ from original expectations, policymakers and stakeholders can refine the policy design or address barriers to implementation – such as institutional, financial or behavioural constraints – to maximize mitigation outcomes. Assessments conducted during policy implementation, including those combining ex-ante projections and ex-post monitoring, can also support ongoing policy refinement and course correction.

Appendix A

Hypothetical example of the implementation cost of the tax incentive policy for solar technologies

Below is an example of cost estimation for implementing a tax incentive policy aimed at promoting the installation of capacity for solar PV systems as part of the RE strategy in a country. It can be applied to different use cases, and therefore not too much specificity was added on purpose.

Example: Bottom-up costing

Step 1: Define the scope of the policy

Name of act/document	Tax Incentive Policy for Solar Technologies
Responsible institution	Ministry of Finance, Ministry of Energy and Mining
Type of act	Government regulation (public policy document)
Implementation period	2025–2027
Date of assessment	June 2025

Step 2: Identify cost components

Based on the available information, the following cost components have been identified for the implementation of the Tax Incentive Policy for Solar Technologies:

- Tax incentives (financial allocation)
- Policy design (administrative costs)
- Legitimization process (legislative and regulatory costs)
- Awareness campaign (awareness and capacity-building costs)
- Training for tax staff (awareness and capacity-building costs)
- IT system upgrade and maintenance (administrative costs)
- Monitoring and evaluation (monitoring, reporting and enforcement costs)

Step 3: Select the estimation method

Considering the identified cost components, the **bottom-up costing approach** is deemed most suitable for the assessment, as it allows for detailed estimation based on the availability of actual costs for each individual component. This method ensures greater accuracy by aggregating the specific costs associated with policy design, implementation and operational activities.

Steps 4 and 5: Gather data and estimate implementation costs

Key cost component	Cost component	Resource type	Quantity	Unit cost (incentive) (USD)	Total cost (USD)	Year
Financial allocation	Tax incentives	Incentives	125,000 kW	(28)	(3,500,000)	2025
Financial allocation	Tax incentives	Incentives	89,286 kW	(28)	(2,500,000)	2026
Financial allocation	Tax incentives	Incentives	53,571 kW	(28)	(1,500,000)	2027
Administrative costs	Policy design and drafting	Consulting (design)	100 Days	500	50,000	2025
Administrative costs	Regulatory costs	Experts (authorities)	40 Days	500	20,000	2025
Administrative costs	Application processing and licensing	Experts (authorities)	20 Days	500	10,000	2025
Transactional and operational costs	Contract and compliance management	Experts (authorities)	30 Days	500	15,000	2025
Transactional and operational costs	Customer service and support	Experts (authorities)	50 Days	500	25,000	2025
Legislative and regulatory costs	Legitimization Process	Experts (authorities)	30 Days	500	15,000	2025
Awareness and capacity-building costs	Awareness campaign	Materials	2,000 Pages	0.1	200	2025
Awareness and capacity-building costs	Awareness campaign	Distribution	1,000 Packages	0.5	500	2025
Awareness and capacity-building costs	Training for tax staff	Trainer fee	5 Days	600	3,000	2025
Awareness and capacity-building costs	Training for tax staff	Materials	100 Sets	10	1,000	2025
Awareness and capacity-building costs	Public awareness campaigns	Experts (authorities)	80 Days	500	40,000	2025

Key cost component	Cost component	Resource type	Quantity	Unit cost (incentive) (USD)	Total cost (USD)	Year
Outreach and stakeholder engagement	Industry or investor engagement	Experts (authorities)	60 Days	500	30,000	2025
Administrative costs	IT system upgrade	Software development	400 Hours	100	40,000	2025
Administrative costs	IT system upgrade	Testing	100 Hours	80	8,000	2025
Administrative costs	IT maintenance	Support services	12 Months	2,000	24,000	2026
Monitoring, reporting and enforcement costs	Evaluation	External expert	20 Days	800	16,000	2027
Monitoring, reporting and enforcement costs	Contingency reserve	Experts (authorities)	100 Days	500	50,000	2025
Monitoring, reporting and enforcement costs	Periodic reviews and revisions	Experts (authorities)	90 Days	500	45,000	2025

Step 6: Validate assumptions and revise estimates based on inputs from experts and stakeholders (if needed)

Stakeholders were consulted through a validation workshop to refine assumptions and enhance the reliability of the assessment.

Below are the responses from the stakeholder consultation:

1. The incentive per unit (kW) should be revised from 28 to 25.
2. The duration for the legislative and regulatory process should be revised from 30 days to 35 days.
3. The training materials for tax staff should be increased from 100 to 150.

Revised cost estimates

The following presents the revised and updated detailed cost breakdown based on the validation process.

Key cost component	Cost component	Resource type	Quantity	Unit cost (incentive) (USD)	Total cost (USD)	Year
Financial allocation	Tax incentives	Incentives	125,000 kW	(25)	(3,125,000)	2025

Key cost component	Cost component	Resource type	Quantity	Unit cost (incentive) (USD)	Total cost (USD)	Year
Financial allocation	Tax incentives	Incentives	89,286 kW	(25)	(2,232,150)	2026
Financial allocation	Tax incentives	Incentives	53,571 kW	(25)	(1,339,286)	2027
Administrative costs	Policy design and drafting	Consulting (design)	100 Days	500	50,000	2025
Administrative costs	Regulatory costs	Experts (authorities)	40 Days	500	20,000	2025
Transactional and operational costs	Application processing and licensing	Experts (authorities)	20 Days	500	10,000	2025
Administrative costs	Contract and compliance management	Experts (authorities)	30 Days	500	15,000	2025
Transactional and operational costs	Customer service and support	Experts (authorities)	50 Days	500	25,000	2025
Legislative and regulatory costs	Legitimization Process	Experts (authorities)	35 Days	500	17,500	2025
Awareness and capacity-building costs	Awareness campaign	Materials	2,000 Pages	0.1	200	2025
Awareness and capacity-building costs	Awareness campaign	Distribution	1,000 Packages	0.5	500	2025
Awareness and capacity-building costs	Training for tax staff	Trainer fee	5 Days	600	3,000	2025
Awareness and capacity-building costs	Training for tax staff	Materials	150 Sets	10	1,500	2025
Awareness and capacity-building costs	Public awareness campaigns	Experts (authorities)	80 Days	500	40,000	2025
Outreach and stakeholder engagement	Industry or investor engagement	Experts (authorities)	60 Days	500	30,000	2025
Administrative costs	IT system upgrade	Software development	400 Hours	100	40,000	2025

Key cost component	Cost component	Resource type	Quantity	Unit cost (incentive) (USD)	Total cost (USD)	Year
Administrative costs	IT system upgrade	Testing	100 Hours	80	8,000	2025
Administrative costs	IT maintenance	Support services	12 Months	2,000	24,000	2026
Monitoring, reporting and enforcement costs	Evaluation	External expert	20 Days	800	16,000	2027
Monitoring, reporting and enforcement costs	Contingency reserve	Experts (authorities)	100 Days	500	50,000	2025
Monitoring, reporting and enforcement costs	Periodic reviews and revisions	Experts (authorities)	90 Days	500	45,000	2025

Templates

Cost estimation for policy design and implementation

A. Administrative and institutional costs

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Policy design and drafting	Legal, technical and stakeholder input into policy formulation		Consultants, expert meetings, studies costs
Regulatory setup	Creating or strengthening regulatory entities or frameworks		New institutions or adapting existing on costs
Monitoring, reporting and evaluation (M&E)	Systems for data collection, tracking outcomes and policy impact assessment		Includes software/tools and staffing costs
Capacity-building and training	For implementers, utilities and regulators		Workshops, manuals, online training costs

B. Transaction and operational costs

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Application processing and licensing	Managing applications, permitting processes		Staff, databases, legal review costs
Contract and compliance management	Drafting and enforcing contracts, compliance monitoring		Legal support, compliance with staff costs

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Customer service and support	Help desks, consumer interface platforms		Especially important in end user programmes (e.g. demand-side management [DSM])

C. Financial support/implementation costs

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Incentives/ subsidies (if applicable)	Payments to beneficiaries (e.g. FiT premium, tax credit)		Depends on policy design
Risk-sharing mechanisms	Guarantee funds, insurance mechanisms		Optional
Grid or infrastructure upgrades	Investments required to implement or support the policy		Especially relevant in energy sector

D. Outreach and stakeholder engagement

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Public awareness campaigns	Communications strategy to inform public and target groups		Print, television/ radio, events, social media costs
Industry or investor engagement	Promotion to attract private sector participation		Roundtables, investment forums costs

E. Contingency and evaluation costs

Cost item	Description	Estimated cost (USD)	Notes/ assumptions
Contingency reserve	Buffer for unforeseen costs or cost overruns		Typically, 5–10% of total cost
Periodic reviews and revisions	Midterm or post-implementation policy evaluation		External consultants, data collection

F. Summary table

Administrative and institutional	
Transaction and operational	
Financial support/implementation	
Outreach and stakeholder engagement	
Contingency and evaluation	
Total	

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Tools, templates and resources

To support users in applying the ICAT methodologies, a set of tools, templates and resources are available to facilitate data collection, GHG reduction estimation, reporting and policy assessment across sectors.

Standardized sectoral templates

Each ICAT impact assessment guide includes standardized templates designed to assist with the planning, implementation and reporting of assessments. These templates are tailored to the specific needs and characteristics of each sector, ensuring alignment with methodological requirements and enhancing consistency in documentation and reporting.

Although standardized in structure, these templates are sector-specific and therefore included directly in the respective policy guides. Users are encouraged to consult the templates section of each guide to access the following relevant templates:

- Policy description template
- Policy inputs, activities and intermediate effects template
- Policy GHG impacts template
- Policy causal chain template
- Assessment boundary template
- Assessment reporting template

The templates are available through the individual guide pages on the ICAT website. Access the series of Policy Impact Assessment Guides here.

Tools

ICAT supports the use of a range of publicly available tools and databases to implement the methodologies described in its assessment guides. These tools assist users in tasks such as emission factor calculations, GHG emissions estimation and scenario modelling.

Tools referenced in the guides include, but are not limited to:

- GHG emission factor databases (e.g. IPCC Emissions Factor Database)
- GHG calculation tools (e.g. spreadsheet models, online calculators, IPCC Inventory Software)
- Scenario modelling software applicable across sectors (e.g. LEAP, GACMO)

Each ICAT policy assessment guide includes references to the most relevant tools, models and data sources for that sector. Users are encouraged to explore these resources as part of the assessment planning and implementation process.

Overview and access to tools: ICAT Toolbox

Case studies

To support users in applying the ICAT policy assessment guides, examples are available demonstrating how countries have successfully used the guides to assess the impacts of climate mitigation policies and actions. These case studies illustrate how the methodologies have been applied in practice across various sectors, and how they can inform policy design, evaluation and reporting.

The case studies may cover a range of policy types and include both ex-ante and ex-post assessments. They also highlight how the ICAT guides have supported enhanced transparency, improved data use, and integration of assessment results into national policy processes and reporting frameworks. The case studies are available through the individual guide pages on the ICAT website. Access the series of Policy Impact Assessment Guides here.

Abbreviations and acronyms

BTR	Biennial transparency report
CO^2e	Carbon dioxide equivalent
ETF	Enhanced transparency framework
FiT	Feed-in tariff
GDP	Gross domestic product
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation)
ICAT	Initiative for Climate Action Transparency
IPCC	Intergovernmental Panel on Climate Change
KPI	Key performance indicator
LEDS	Low Emission Development Strategies
MPGs	Modalities, procedures and guidelines
MRV	Measurement, reporting and verification
NDC	Nationally determined contribution
NGO	Non-governmental organization
PV	Photovoltaic
QA	Quality assurance
QC	Quality control
RE	Renewable energy
SDG	Sustainable Development Goal
TACCC	Transparency, accuracy, completeness, consistency and comparability
UNFCCC	United Nations Framework Convention on Climate Change
WRI	World Resources Institute

Glossary

Activities (related to inputs when describing policy)	Administrative activities involved in implementing the policy or action (undertaken by the authority or entity that implements the policy or action), such as permitting, licensing, procurement, or compliance and enforcement. Examples include provision of technical assistance or incentive payments.
Activity	Data on the magnitude of a human activity resulting in emissions or removals taking place during a given period of time. Examples include data on land areas, management systems and fertilizer use.
Assessment boundary	The scope of the assessment in terms of the range of GHG impacts that are included in the assessment.
Assessment period	The time period over which GHG impacts resulting from a policy are assessed.
Assessment report	A report, completed by the user, that documents the assessment process and the GHG, sustainable development and/or transformational impacts of the policy.
Baseline scenario	A reference case that represents the events or conditions most likely to occur in the absence of a policy (or package of policies) being assessed.
Carbon pool	A system which has the capacity to accumulate or release carbon. The carbon pools involved in carbon stock changes include soil organic matter, biomass and dead organic matter.
Causal chain	A conceptual diagram tracing the process by which the policy leads to impacts through cause-and-effect relationships.
Emission factor	A factor that converts activity data into GHG emissions data.
Ex-ante assessment	The process of estimating expected future GHG impacts of a policy (forward-looking)
Expert judgement	A considered, documented judgement made in the absence of definitive evidence by domain experts.
Ex-post assessment	The process of estimating historical GHG impacts of a policy (backward-looking).
GHG impacts	Changes in GHG emissions by sources and carbon pools resulting from a policy.

Global warming potential	A metric comparing the radiative forcing of a GHG to CO_2 over a specific time-horizon.
Impact assessment	The estimation of changes in GHG emissions or removals resulting from a policy.
Inputs	Resources that go into implementing the policy, such as financing.
Intended effects	Effects which reflect the original objectives of the policy.
Interacting policies	Policies that produce combined effects differing from the sum of individual effects if implemented alone.
Intermediate effects	Changes in behaviour, technology or practices resulting from the policy.
Jurisdiction	The geographic area within which an authority (e.g. a Government) exercises control.
Key performance indicator	A metric that indicates the performance of a policy.
Measure	Implementation of technologies, processes or practices outlined in a policy instrument.
Monitoring period	The time over which the policy is monitored, potentially including pre- and post-policy periods.
Negative impacts	Impacts perceived as unfavourable by decision makers and stakeholders.
Parameter	A variable (e.g. activity data, emission factor) needed to estimate GHG impacts.
Policies and/or actions	Interventions ranging from broad strategies to specific instruments for achieving policy goals.
Policy instrument	A tool such as a law, regulation, incentive or investment used to implement a policy.
Policy implementation period	The time period during which the policy is in effect
Policy scenario	A scenario reflecting conditions expected to occur with the implementation of the policy.

Positive impacts	Impacts perceived as favourable by decision makers and stakeholders.
Stakeholders	Individuals or groups affected by or able to influence a policy.
Sustainable development impacts	Changes in environmental, social or economic conditions due to the policy.
Uncertainty	A measure (quantitative or qualitative) of the lack of certainty in data, methods or outcomes.
Unintended effects	Effects not directly controlled by the policy that may enhance or diminish its impact.



Introduction to the ICAT Series of Policy Assessment Guides: Assessing the Impacts of Climate Policies and Actions

ICAT Initiative for Climate Action Transparency