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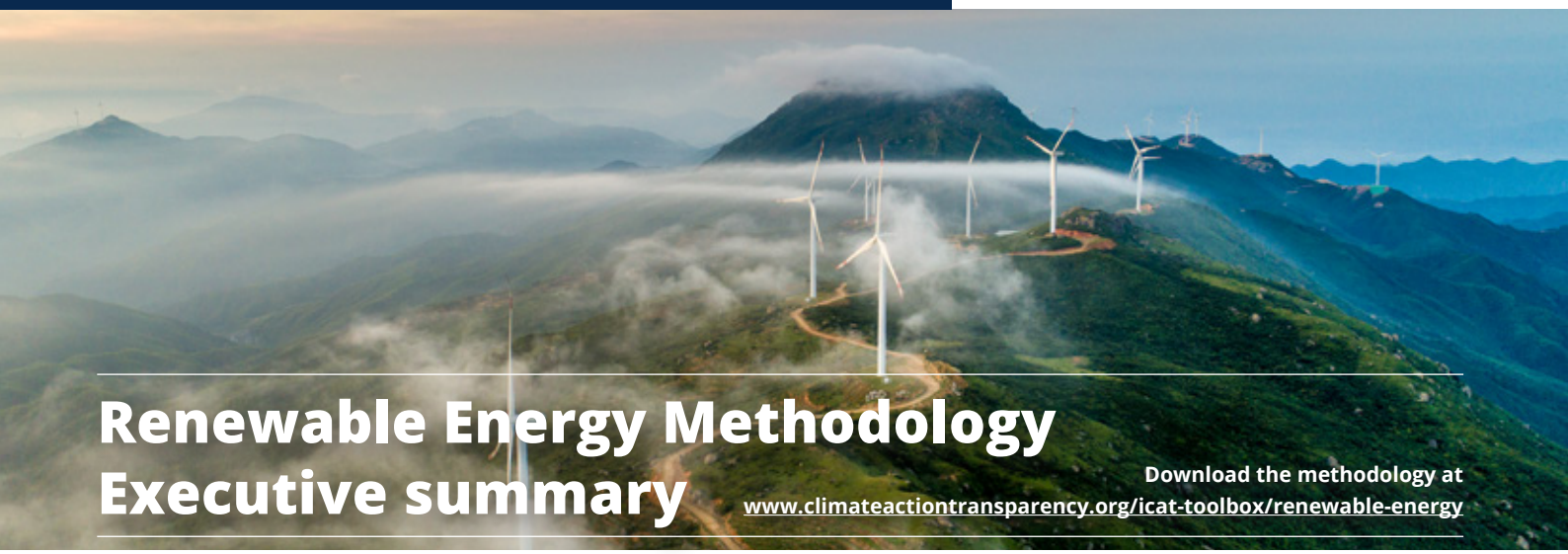
ICAT | INITIATIVE FOR Climate Action Transparency



Renewable Energy Methodology Executive summary

Download the methodology at
www.climateactiontransparency.org/icat-toolbox/renewable-energy

Energy use is responsible for almost 75% of global greenhouse gas (GHG) emissions. More than 40% of these emissions come from electricity and heat production. A fundamental transformation of the energy system is required to achieve net zero global emissions in the second half of the 21st century.

Renewable energy policies will play a significant role in this transition. Governments around the world are implementing increasingly ambitious policies to accelerate the move away from fossil fuel sources of energy to renewable sources. The declining cost of renewable energy technologies and their potential to support sustainable development objectives are helping to accelerate the change.

The Paris Agreement aims to hold the increase in global average temperature to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. The 2030 Agenda for Sustainable Development established the Sustainable Development Goals (SDGs), which call for access to affordable, reliable, sustainable and modern energy for all. The urgency of a transition towards net zero global GHG emissions, and the integral role of the energy sector in achieving this, were underlined in the 2018 Special Report on Global Warming of 1.5°C by the Intergovernmental Panel on Climate Change.

In this context, there is an increasing need to assess and communicate the impacts of renewable energy policies to ensure that they are effective in mitigating GHG emissions, advancing development objectives, and helping countries meet their sectoral targets and national commitments. The Initiative for Climate Action Transparency (ICAT) Renewable Energy Methodology *helps policymakers assess the impacts of renewable energy policies and improve the effectiveness of policies. It can play a critical role in providing the information needed for preparing reports under the Paris Agreement's enhanced transparency framework and for the SDGs.*

Assessing the impacts of renewable energy policies

Renewable energy deployment reduces GHG emissions by displacing the use of fossil fuels in existing installations and/or the building of new fossil fuel installations. For renewable energy to play its role, a strong policy framework is needed, including setting the right incentives and (in the case of grid-connected renewables) ensuring that power generated by renewable sources has access to the transmission grid. Policies to support renewable energy have become increasingly effective, and, as the cost of renewable energy technologies has decreased, they have allowed emissions reductions at very low (and even negative) cost.

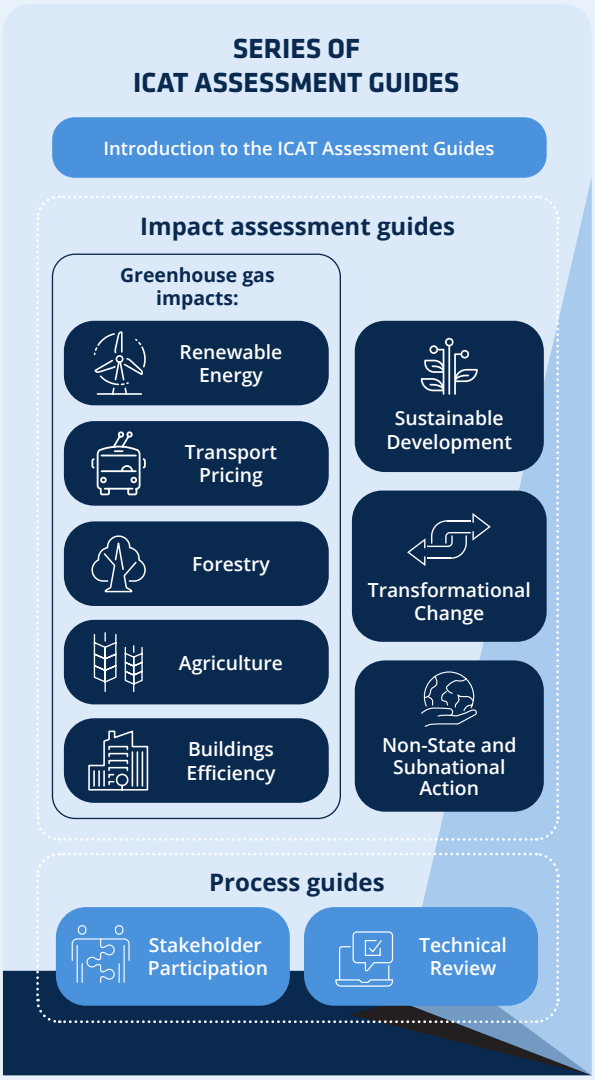
Assessing the impacts of renewable energy policies supports evidence-based decision making by enabling policymakers and stakeholders to understand the relationship between policies and their expected GHG and other impacts. Policymakers and other users can apply the ICAT *Renewable Energy Methodology* to assess these impacts, pursuing one or several of the objectives of transparency, including to:

- improve policy design and implementation by understanding the impacts of different design and implementation choices
- inform goal setting by assessing the potential contribution of policies to national goals such as national energy sector strategies or action plans, nationally determined contributions (NDCs) and the SDGs
- track progress towards these goals and understand the contribution of policies to achieving them
- provide information for reporting domestically or internationally, including under the Paris Agreement's enhanced transparency framework
- attract finance by demonstrating the results of effective policies
- ensure that policies are cost-effective and that limited resources are invested efficiently.

Series of ICAT assessment guides

ICAT aims to help countries assess the impacts of their climate actions, and to support greater transparency, effectiveness, ambition and trust in climate policies worldwide. The *Renewable Energy Methodology* is part of the ICAT series of guides for assessing the GHG, sustainable development and transformational impacts of policies and actions in an integrated way. The guides are a result of collaboration with technical experts from around the world.

The ICAT *Renewable Energy Methodology* can be used on its own or together with other ICAT guides.



The assessment guides have been used to support capacity-building for transparency in more than 20 countries. Case studies are available on the ICAT website. To learn more about how ICAT supports countries, visit www.climateactiontransparency.org.

Intended audience

The primary intended users of the *Renewable Energy Methodology* are developing country governments and their partners (domestic and international) who are planning, implementing and assessing renewable energy policies, particularly in the context of development and implementation of NDCs, national low-emission development strategies, nationally appropriate mitigation actions (NAMAs) and other mechanisms. Other stakeholders who are affected by, or can influence, the policy – such as research institutions, funders, financial institutions, non-governmental organizations and companies – can also use the methodology. The methodology can be used at the national, subnational or municipal level.

Main impacts of renewable energy policies

The most significant GHG impact of renewable energy policies is a reduction in emissions from existing and new fossil fuel power plants, caused by the substitution of electricity generated by fossil fuel sources with that generated by renewable sources.

The methodology also allows quantification of emissions from biomass power plants (emissions associated with agriculture and land use), hydro power plants (emissions associated with reservoirs) and geothermal power plants (fugitive methane and carbon dioxide emissions) if these are relevant to the policy being assessed.

Renewable energy policies contribute to sustainable development in many ways, including through changes in economic activity, employment, air quality, public health, water consumption and energy security. The methodology helps identify these broad environmental, social and economic impacts, and links them to the SDGs. The ICAT *Sustainable Development Methodology* can then be used to assess these impacts. Identifying and assessing sustainable development impacts can play an important role in making the case for new renewable energy policies, and ensuring that they are understood and supported by society.

Implemented in the right way, renewable energy polices can lead to significant penetration of renewable energy technologies and mobilize private sector investment in renewable energy deployment. If this is fundamental and sustained change that disrupts established high-GHG emissions pathways and contributes to zero-carbon development, it can be considered to be transformational change. For example, the promotion of solar energy worldwide led to an increase in manufacturing capacity for solar panels and a consequent fall in their price. This has been a major factor in making solar energy cost-competitive with conventional sources of energy, thus helping to entrench solar technologies in the energy mix. The ICAT *Transformational Change Methodology* provides a way to assess these transformational impacts. As with the *Sustainable Development Methodology*, it is designed to be used in conjunction with the *Renewable Energy Methodology*.

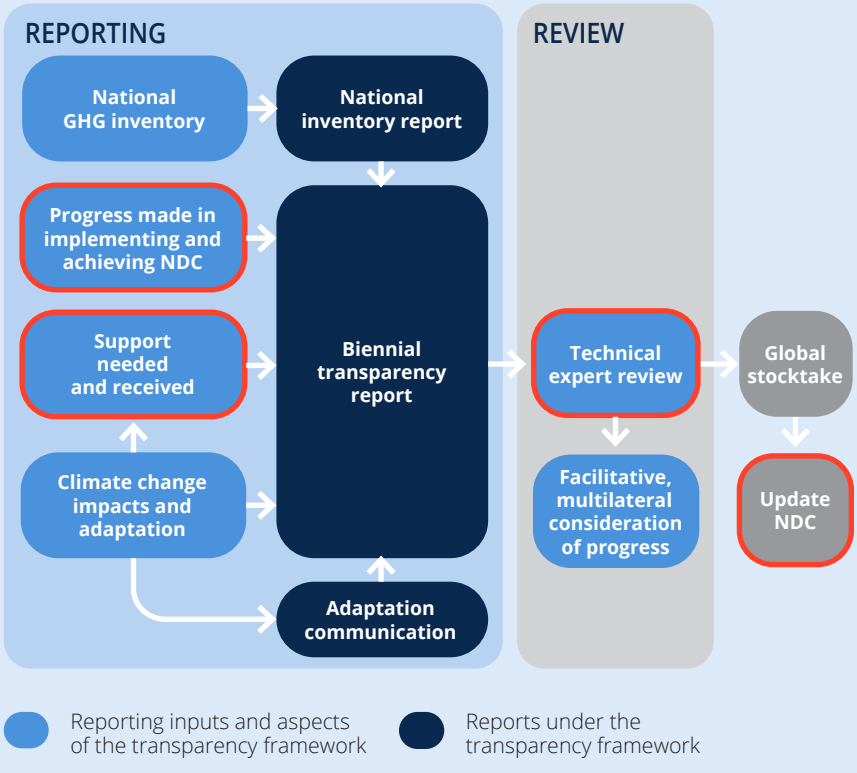
Types of policies covered by the methodology

Incentive mechanisms are a core driver of the expansion in renewable energy capacity. The methodology focuses on renewable energy policies that are widely implemented and have been shown to be successful in advancing renewable energy deployment:

- **feed-in tariff policies, including feed-in premiums** – policies that aim to promote renewable energy deployment by offering long-term power purchase agreements and premiums (on top of market electricity prices) to power producers
- **auction policies, including tender policies** – competitive bidding procurement processes for renewable electricity in the form of either capacity or electricity generated
- **tax incentive policies** – policies under which authorities at the national, subnational or municipal level offer tax incentives for the installation and operation of renewable energy installations.

The methodology can be used to assess a single policy or a package of related policies.

Advancing climate action through the enhanced transparency framework



By helping policymakers assess the impacts of policies, the ICAT assessment guides can help countries track progress in implementation and further develop their NDCs towards enhanced ambition. The ICAT assessment guides can also help provide the necessary information for countries to report under the Paris Agreement's enhanced transparency framework including estimating baseline emissions, estimating policy impacts, estimating resource needs, conducting projections, and monitoring progress in implementation over time. This enables countries to plan their actions, account for their contributions, and track progress towards implementation and achievement of their NDCs.

Using the methodology during policy design and implementation

The methodology can be used at different stages of a policy design and implementation cycle: before, during or after policy implementation. It can be used to conduct forward-looking assessments of future impacts, as well as backward-looking assessments of past impacts.

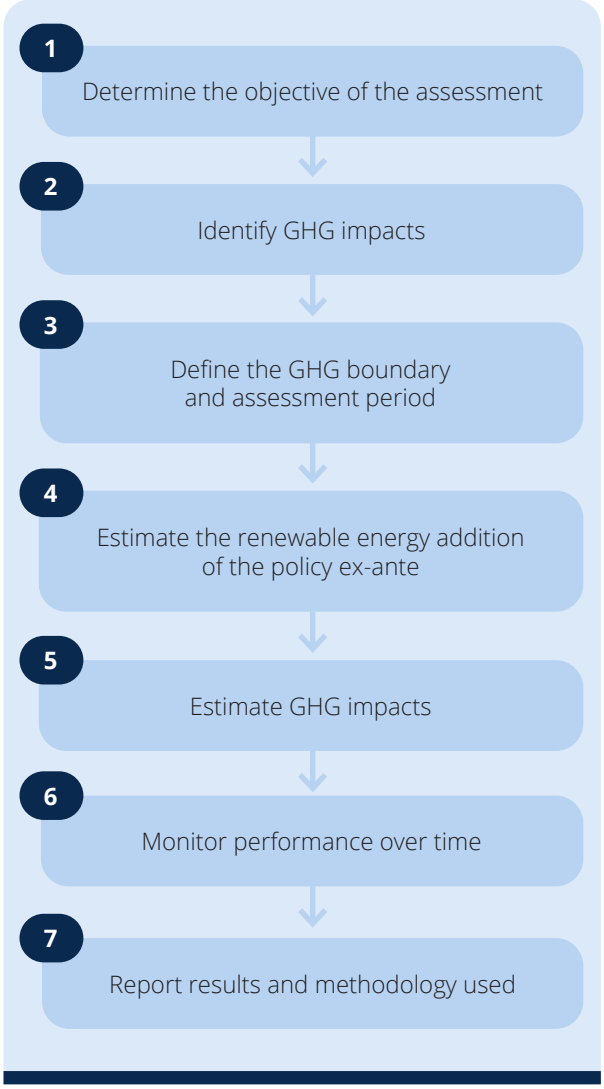
A country's needs and objectives will determine when to use the methodology. For example, if a country wants to improve the design of a policy or set renewable energy goals, the methodology would be used before policy implementation.

If a country wants to track the progress of implementing its NDCs and report the results under the enhanced transparency framework, the methodology would be used during or after policy implementation. For demonstrating the results of a policy to a funder, the methodology would likewise be used during or after policy implementation.

If the methodology is used at multiple stages in a policy design and implementation cycle, it becomes an iterative process, such that previous experience informs improvements to policy design and implementation, and the development of new policies.

Main steps of the methodology

The methodology provides a stepwise approach to estimating the GHG impacts of renewable energy policies.



A key step is estimating the renewable energy addition, which is the newly installed renewable energy capacity or generated electricity attributable to a renewable energy policy, as follows:

1. Estimate the technical potential for the assessment period of the policy. This is the amount of renewable energy that could be deployed with full implementation of the relevant technologies.

2. Account for design characteristics of the policy, such as the eligibility conditions of the policy and the longevity of financial support provided by the policy.

3. Account for the effect of financial incentives provided by the policy on the financial feasibility of renewable energy deployment.

4. Account for the effect of other barriers, including technical, regulatory, institutional, market, awareness and public acceptance barriers.

This renewable energy addition is then converted into GHG emissions reductions, which are the estimated GHG impact of the policy.

The methodology contains numerous worked examples to illustrate how it can be used.