

Buildings Efficiency Guidance

Guidance for assessing the greenhouse gas impacts of buildings policies

May 2018

How to monitor indicators over time and report results

10. MONITORING PERFORMANCE OVER TIME

Monitoring serves two objectives – evaluation of the policy's performance (monitor trends in performance parameters to understand whether the policy is on track and being implemented as planned) and estimation of the policy's GHG impacts. This chapter provides guidance on monitoring the performance of policies during the implementation period and collecting data for estimating GHG impacts ex-post.

Figure 10.1: Overview of steps in the chapter



Checklist of key recommendations

- Identify the key performance indicators that will be used to track performance of the policy over time and define the parameters necessary to estimate GHG emissions ex-post
- Create a plan for monitoring key performance indicators and parameters
- Monitor each of the indicators and parameters over time, in accordance with the monitoring plan

10.1 Identify key performance indicators

To estimate ex-post GHG impacts, users collect data on a broader range of indicators and parameters to be monitored during the implementation period. A key performance indicator is a metric that helps track the performance of the policy. A parameter is a variable such as activity data or an emission factor that that is needed to estimate emissions.

It is a *key recommendation* to identify the key performance indicators that will be used to track performance of the policy over time and define the parameters necessary to estimate GHG emissions ex-post. The selection of indicators and parameters should be tailored to the policy, the needs of stakeholders, the availability of existing data and the cost of collecting data. Table 10.1 provides

examples of key performance indicators for policies covered by this guidance, while Table 10.2: *Example parameters for estimating the GHG impacts of buildings policies* provides example parameters. Users should adapt the indicators and parameters as needed for the specific policies being assessed.

Table 10.1: Key performance indicators for buildings policies

Key performance indicators	Definition	Example key performance indicators
Inputs	Resources that go into implementing a policy	<ul style="list-style-type: none"> Financial resources for implementing and administering the policy (<i>all policies</i>)
Activities and intermediate effects	<p>Activity: Administrative activities involved in implementing the policy</p> <p>Intermediate effects: Changes in behaviour, technology, processes or practices</p>	<ul style="list-style-type: none"> Number of inspections carried out under the policy Number of building permits issued/refused under the policy Number of subnational governments or municipalities adopting the policy Energy-efficient equipment or building components sold Financial resources paid out under a financial support policy Number of successful applications for a financial support policy
Sustainable development impacts	Changes in relevant environmental, social or economic conditions that result from the policy	<ul style="list-style-type: none"> Cost savings achieved Employment generated Number of households with reduced energy costs Number of new business and/or investment opportunities Air quality

Table 10.2: Example parameters for estimating the GHG impacts of buildings policies

Parameter/Unit	Potential sources of data	Parameter type	Suggested monitoring frequency
<i>Number of buildings per type_(b) in climate zone_(z)</i>	Government information system	Measured	Annual
<i>Average annual specific energy use per m² per building by type_(b) in climate zone_(z)</i>	Sampled metering and survey	Measured for select buildings and estimated for the rest	Annual
<i>Share of energy carrier_(f) in fuel mix per building by type_(b) in climate zone_(z)</i>	Sampled metering and survey	Measured for select buildings and estimated for the rest	Annual

<i>Average floor area per building by building type_(b)</i>	Government information system and/or survey	Measured	Annual
<i>Energy carrier_(f) emission factors</i>	IPCC, National government assessments	Estimated	Annual

10.2 Create a monitoring plan

A monitoring plan is important to ensure that the necessary data are collected and analysed. It is a *key recommendation* to create a plan for monitoring key performance indicators and parameters. A monitoring plan is the system for obtaining, recording, compiling and analysing data and information important for tracking performance and estimating GHG impacts. Where feasible, users should develop the monitoring plan during the policy design phase (before implementation) rather than after the policy has been designed and implemented.

Monitoring period

The policy implementation period is the time period during which the policy is in effect. The assessment period is the time period over which the GHG impacts resulting from the policy are assessed. The monitoring period is the time period over which the policy is monitored. There can be multiple monitoring periods within the assessment period.

At minimum, the monitoring period should include the policy implementation period, but it is also useful if the period covers pre-policy monitoring of relevant activities prior to the implementation of the policy and post-policy monitoring of relevant activities after the implementation period. Depending on the indicators being monitored, it may be necessary to monitor some indicators over different time periods than others.

Users should strive to align the monitoring period with those of other assessments being conducted with other ICAT guidance documents. For example, if assessing sustainable development impacts using the ICAT *Sustainable Development Guidance* in addition to assessing GHG impacts, the monitoring periods should be the same.

Institutional arrangements for coordinated monitoring

Information on key performance indicators and parameters can be dispersed among a number of different institutions. Given the wide variety of data needed for impact assessment and a range of different stakeholders involved, strong institutional arrangements serve an important function. They play a central role in coordinating monitoring. A technical coordinator, coordinating team, or body is often assigned to lead monitoring, reporting and verification (MRV) processes in which responsibilities have been delegated to different institutions. Since data can be widely dispersed between institutions, the coordinating body oversees the procedures for data collection, management and reporting.

Countries may already have institutions in place as part of the national MRV system. Where this is the case, users can consider expanding the national MRV system to also monitor the impact of the policy. Where strong institutional arrangements do not yet exist, countries can determine the governmental body with the adequate capacity and authority to be responsible for the MRV system and to establish the necessary legal arrangements. Institutional mandates help to strengthen the procedures and the system,

and may also help secure funding from the government to ensure the continuity of the process. Users can refer to the UNFCCC *Toolkit on Establishing Institutional Arrangements for National Communications and Biennial Update Reports*, as well as other sources, for support on establishing or improving the institutional arrangements for a robust MRV system.¹

Considerations for a robust monitoring plan

To ensure that the monitoring plan is robust, consider including the following elements in the plan:

- **Roles and responsibilities:** Identify the entity or person that is responsible for monitoring key performance indicators and parameters, and clarify the roles and responsibilities of the personnel conducting the monitoring
- **Competencies:** Include information about any required competencies and any training needed to ensure that personnel have necessary skills
- **Methods:** Explain the methods for generating, storing, collating and reporting data on monitored parameters
- **Frequency:** Key performance indicators 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. In general, the more frequent that data is collected, the more robust the assessment will be. Frequency of monitoring can be consistent with measurement conducted under the national MRV system.
- **Collecting and managing data:** Identify the databases, tools or software systems that are used for collecting and managing data and information
- **Quality assurance and quality control (QA/QC):** Define the methods for QA/QC to ensure the quality of data enhance the confidence of the assessment results. Quality assurance is a planned review process conducted by personnel who are not directly involved in the data collection and processing. Quality control is a procedure or routine set of steps that are performed by the personnel compiling the data to ensure the quality of the data.
- **Record keeping and internal documentation:** Define procedures for clearly documenting the procedures and approaches for data collection as well as the data and information collected. This information is beneficial for improving the availability of information for subsequent monitoring events, documenting improvements over time and creating a robust historical record for archiving.
- **Continual improvement:** Include a process for improving the methods for collecting data, taking measurements, running surveys, monitoring impacts, and modelling or analysing data. Continual improvement of monitoring can help reduce uncertainty in GHG estimates over time.
- **Financial resources:** Identify the cost of monitoring and sources of funds.

¹ Available at: http://unfccc.int/files/national_reports/non-annex_i_natcom/training_material/methodological_documents/application/pdf/unfccc_mda-toolkit_131108_ly.pdf

10.3 Monitor indicators and parameters over time

It is a *key recommendation* to monitor each of the indicators and parameters over time, in accordance with the monitoring plan. The frequency of monitoring is dependent on stakeholder resources, data availability, feasibility and the uncertainty requirement of reporting or estimation needs. The monitoring plan should include an iterative process for balancing these dependencies. Users should adapt the indicators and parameters as needed for the specific policy being assessed. Where monitoring indicates that the assumptions used in the ex-ante assessment are no longer valid, users should document the difference and account for the monitoring results when updating ex-ante estimates or when estimating ex-post GHG impacts.

11. REPORTING

Reporting the results, methodology and assumptions used is important to ensure the GHG impact assessment is transparent and gives decision-makers and stakeholders the information they need to properly interpret the results. This chapter provides a list of information that is recommended for inclusion in an assessment report.

Checklist of key recommendations

- Report information about the assessment process and the GHG impacts resulting from the policy (including the information listed in Section 11.1)

11.1 Recommended information to report

It is a *key recommendation* to report information about the assessment process and the GHG impacts resulting from the policy (including the information listed below²). For guidance on providing information to stakeholders, refer to the *ICAT Stakeholder Participation Guidance* (Chapter 7).

General information

- The name of the policy assessed
- The person(s)/organisation(s) that did the assessment
- The date of the assessment
- Whether the assessment is an update of a previous assessment, and if so, links to any previous assessments

Chapter 2: Objectives of Assessing the GHG impacts of Policies

- The objective(s) and intended audience(s) of the assessment

Chapter 3: Steps and Assessment Principles

- Opportunities for stakeholders to participate in the assessment

Chapter 5: Describing the policy

- A description of the policy including the recommended information in Table 5.1
- Whether the assessment applies to an individual policy or a package of related policies, and if a package is assessed, which policies are included in the package
- Whether the assessment is ex-ante, ex-post, or a combination of ex-ante and ex-post

² The list does not cover all chapters in this document because some chapters provide information or guidance not relevant to reporting.

Chapter 6: Identifying Impacts: How Buildings Policies Reduce GHG Emissions

- A list of all GHG impacts identified, using a causal chain, showing which impacts are included in the GHG assessment boundary
- A list of source categories and GHGs affected by the policy
- A list of potential GHG impacts that are excluded from the GHG assessment boundary with justification for their exclusion
- The assessment period

Chapter 7: Estimating Baseline Emissions

- A description of the drivers that affect the baseline scenario and the baseline scenario itself, as well as a justification of why it is considered the most likely scenario
- The base year distinguishing the baseline scenario and policy scenario
- The estimated baseline values for each estimation parameter
- The method or approach used to assess uncertainty
- An estimate or description of the uncertainty and/or sensitivity of the results in order to help users of the information properly interpret the results

Chapter 8: Estimating GHG Impacts Ex-Ante

- The values for relevant estimation parameters for each year of the assessment period, including assumptions and methods used
- The total effect of the policy on the value each of the estimation parameters
- The estimated effect of barriers not addressed by the policy on the relevant estimation parameters
- The estimated GHG impacts calculated for each year of the assessment period using the ex-ante estimated values for each parameter
- Any methodologies and assumptions used to estimate policy scenario emissions, including any models used
- All sources of data used to estimate parameters, including activity data, emission factors and assumptions
- The method or approach used to assess uncertainty
- An estimate or description of the uncertainty and/or sensitivity of the results in order to help users of the information properly interpret the results

Chapter 9: Estimating GHG Impacts Ex-Post

- Total annual and cumulative policy scenario emissions and removals over the GHG assessment period
- The methodology and assumptions used to estimate policy scenario emissions, including the emissions estimation methods (including any models) used
- All sources of data to estimate key parameters, including activity data, emission factors, GWP values, and assumptions
- An estimate of the total cumulative GHG impacts of the policy over the assessment period, and disaggregated by each GHG source included in the GHG assessment boundary
- The method or approach used to assess uncertainty
- An estimate or description of the uncertainty and/or sensitivity of the results in order to help users of the information properly interpret the results

Chapter 11: Monitoring Performance Over Time

- A list of the key performance indicators used to track performance over time and the rationale for their selection
- Sources of key performance indicator data and monitoring frequency

Additional information to report (if relevant)

- The type of technical review undertaken (first-, second-, or third-party), the qualifications of the reviewers and the review conclusions. More guidance on reporting information related to technical review is provided in Chapter 9 of the *Technical Review Guidance*.