Zukunft Umwelt Gesellschaft

IKI INTERNATIONAL CLIMATE INITIATIVE

Guidance document on estimating GHG emission reductions for financial intermediaries

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Table of Contents

Figures

Tables

List of Abbreviations

AFOLU	Agriculture, Forestry, and Other Land Use
BAU	Business-as-Usual
BE	Baseline Emissions
CDM	Clean Development Mechanism
CO_2e	Carbon Dioxide Equivalent
EC	Energy Consumption
EF	Emission Factor
ER	Emission Reductions
EX-ACT	Ex-Ante Carbon Balance Tool
FAO	Food and Agriculture Organisation
GHG	Greenhouse Gas
GHGP	Greenhouse Gas Protocol
GEF	Grid Emission Factor
GS	Gold Standard
HVAC	Heating, Ventilation, and Air Conditioning
IKI	International Climate Initiative
IPCC	Intergovernmental Panel on Climate Change
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
LE	Leakage Emissions
LPG	Liquefied Petroleum Gas
PE	Project Emissions
RETScreen	Clean Energy Management Software
SI1	Standard Indicator 1
SME	Small and Medium-sized Enterprises
SWM	Solid Waste Management
tCO_2e	Metric Tons of Carbon Dioxide Equivalent
VCS	Verified Carbon Standard
ZUG	Zukunft – Umwelt – Gesellschaft gGmbH (IKI Programme Managing Institution)

1 Introduction and purpose

Since 2022, the Standard Indicator 1 - Mitigation (SI1 - Mitigation) measures the extent to which International Climate Initiative (IKI) projects contribute to reducing greenhouse gas (GHG) emissions. This guidance document is specifically intended for **financial intermediaries, such as funds,** supported by the IKI. It aims to ensure that they, **acting as implementing organisations,** provide robust and transparent GHG impact reporting in line with IKI SI 1 reporting requirements. Specifically, it seeks to:

- **Clarify IKI SI1 reporting requirements**: Providing a two-tiered approach to ensure compliance and consistency in reporting.
- **Support the alignment of reporting processes**: Facilitating comparability and efficiency of GHG impact reporting.
- **Improve transparency in GHG impact assessment methodologies**: Assisting financial intermediaries that already have sound methodologies with clearly transferring their assessment steps and results into Annex 7.
- **Enhance precision of GHG mitigation estimation**: Supporting financial intermediaries that currently rely on rudimentary estimates in refining their methodologies.
- **Ensure consistent and comprehensive reporting across various financial intermediaries**: Ensuring that all necessary information is provided to ZUG to allow for thorough GHG impact review and aggregation.

This guidance document follows the core principles of IKI's Guidelines on Project Planning and Monitoring, so financial intermediaries can seamlessly integrate the recommended approaches into their reporting processes. In addition, this document is developed in alignment with the IKI SI1 Guidelines for Energy, Agriculture, Forestry and Other Land Use (AFOLU), Mobility / Transport, and Buildings projects (02/2024), which provide sector-specific approaches to estimating emission reductions. Those guidelines integrate key concepts such as direct and indirect mitigation, methodological consistency, and default values to enhance accuracy. Please consult the sectoral guidelines for recommendations on sector and technology specific methodological approaches.

This document follows a logical sequence beginning with the description of SI1-specific requirements for financial intermediaries (Chapter 2), followed by a discussion of characteristics and challenges in this context (Chapter 3). It then provides guidance on estimation approaches (Chapter 4) and concludes with details on how to structure and report results in the IKI Standard Indicator Report/ Annex 7 (Chapter 5). This document reflects a new two-tiered reporting approach consisting of a total portfolio estimate combined with one detailed estimation example. It also includes an Annex 7 example for reference.

2 IKI SI1 reporting requirements for financial intermediaries

2.1 Summary of reporting requirements

In the context of the IKI, reporting of GHG emission reductions under Standard Indicator 1 (SI1 - Mitigation) is required, if applicable. Based on interviews with several financial intermediaries, it became evident that most have developed internal GHG assessment frameworks. However, due to confidentiality concerns and the diversity of financial structures, these frameworks are not always fully accessible to ZUG. Yet, transparency about the methodological approach is required by the IKI to assess plausibility of reported values. Such assessment is needed to enable annual aggregated SI-reporting by the IKI.

To address this, a practical compromise was developed: Financial intermediaries are required to provide overall estimations of total GHG emission reductions achieved annually and additionally submit a detailed estimation example for a selected financed mitigation activity or technology. This two-tiered approach ensures transparency and traceability while respecting confidentiality constraints.

Each detailed example must include an explanation of:

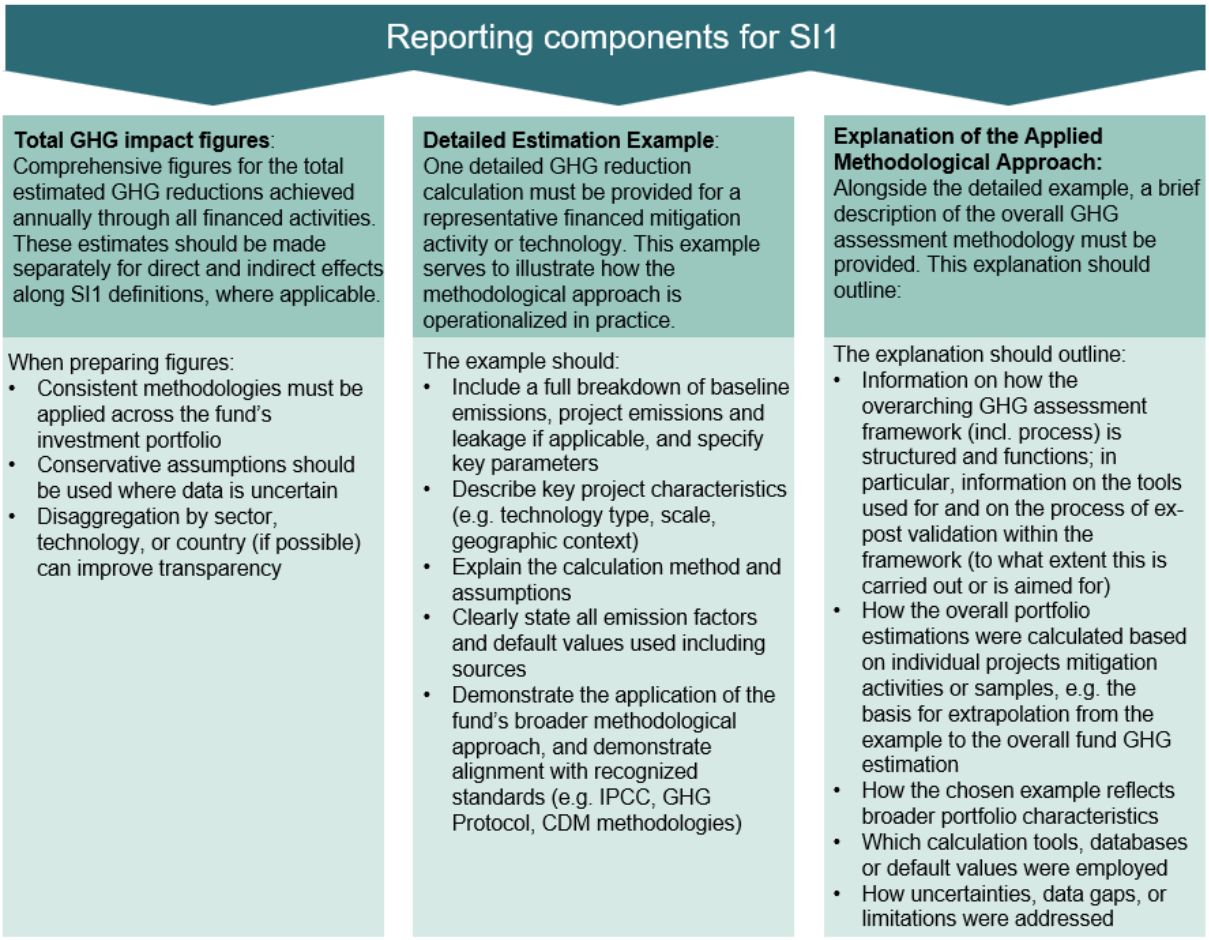
- The methodological approach used to estimate the total GHG emission reductions.
- How this methodology is applied and illustrated through the selected mitigation activity or technology example.

This combined reporting ensures that the plausibility and robustness of reported figures can be evaluated by ZUG without necessitating full disclosure of confidential frameworks.

2.2 Core elements of SI1 reporting for financial intermediaries

Reporting under SI1 needs to include the components as shown below in Figure 1, ensuring that GHG emission reductions are reported in a robust, transparent and verifiable manner (see Chapter 5 for more detailed guidance and examples):

Figure 1: Reporting components for SI1 for financial intermediaries



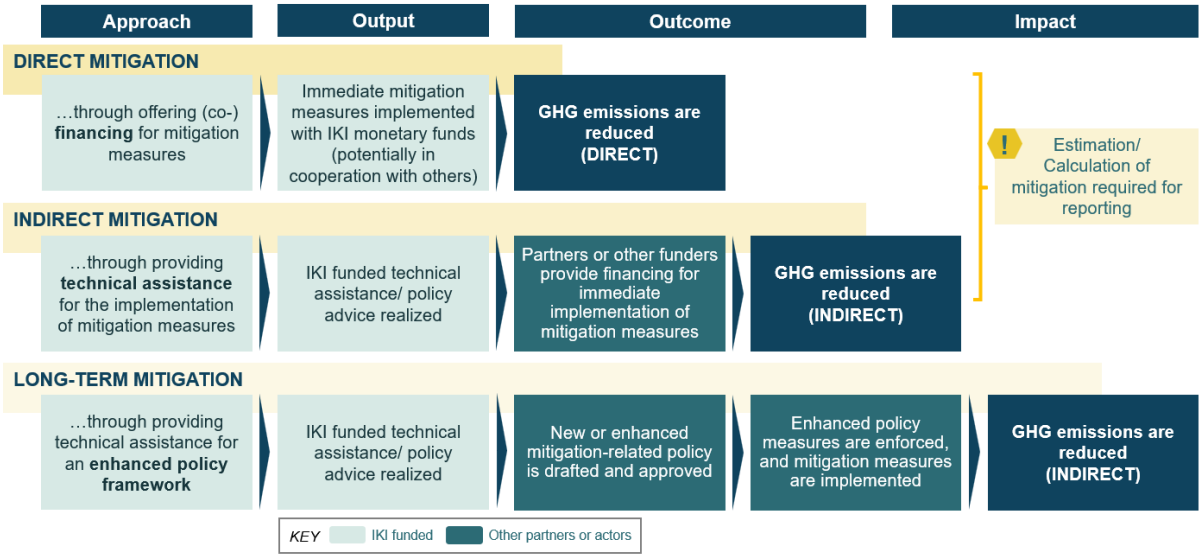
All of these components **must be reported in IKI's Annex 7 template**. Where appropriate, e.g. in case the detailed information exceeds the available space or would compromise clarity, a separate explanatory document can be referenced. A short summary may then be included in Annex 7 and reference to one supplementary document annexed to the submission containing the full calculation and framework explanation may be given. Any explanations both in Annex 7 and in the supplementary document should be written in a concise way for a non-expert audience.

All key data sources, assumptions and calculation steps must be documented systematically to ensure transparency and allow for external validation.

2.3 SI1 categorisation of emission reductions

In the context of SI1 reporting, reported GHG emission reductions must be classified into three distinct categories (see Figure 2 below) based on the nature and pathway of the mitigation impact. This categorisation aligns with the latest IKI Monitoring and Planning Guidelines (see Chapter 3.3.1) and ensures coherence with overarching IKI reporting structures.

Figure 2: Pathways to GHG emission reduction / carbon stock enhancement for SI1 for financial intermediaries



Examples for **Direct Mitigation** may include:

- Solar Photovoltaic (PV) Installations: Financing rooftop solar PV systems that replace fossil-fuel-based electricity generation, leading to immediate reductions in CO_2 emissions.
- Energy-Efficient Infrastructure: Providing concessional loans for the retrofitting of commercial buildings to achieve significant energy savings and emission reductions.
- Reforestation Projects: Direct financial support for tree planting initiatives aimed at enhancing carbon stocks through sequestration.

Examples for **Indirect Mitigation** may include:

- Municipal energy planning: Supporting municipalities in designing sustainable energy plans, resulting in externally financed renewable energy projects.
- Initial feasibility or scoping studies.
- Capacity development for building codes: Training architects and engineers on low-carbon construction techniques, leading to widespread adoption of energy-efficient buildings through non-IKI investments.
- Technical design of credit lines: Establishing technical criteria for a green financing facility operated by a national development bank, which subsequently finances climate-friendly projects.

Examples for **Contribution to Enhanced Policy Frameworks** may include:

- National renewable energy strategy: Assisting in drafting a national renewable energy roadmap, resulting in an official government commitment to significantly increase renewable energy capacity.
- Energy efficiency regulation development: Supporting the establishment of energy efficiency standards for appliances, leading to large-scale market transformation.
- Urban mobility policy: Providing policy advice that facilitates the rollout of low-carbon public transportation systems.

2.4 Ex-post reporting and lifetime estimates

Consistent with IKI's overall expectations for SI1 reporting, the most robust and reliable presentation of GHG emission reductions over time must be used. The following principles apply and the relevant option must be made transparent throughout reporting

Annual ex-post reporting (Preferred option):

Whenever feasible, data for actual measured GHG emission reductions should be collected and reported on an annual basis following the implementation of mitigation measures.

This ex-post reporting approach ensures that real impacts are captured based on operational data rather than projections. Ex-post reporting is especially encouraged for:

- Direct mitigation activities (e.g. financed renewable energy or energy efficiency projects). For direct mitigation, annual ex-post reporting is generally expected, particularly where physical project performance data (e.g. electricity production, energy savings) is available.
- Indirect mitigation activities where direct outcome monitoring is possible (e.g. emissions savings from municipally implemented projects). For indirect mitigation, ex-post reporting may be feasible if linked to clearly traceable projects initiated through technical support.

Ex-ante lifetime estimations (Fallback option):

In cases where annual ex-post data collection is not feasible (e.g. due to fund structures, data availability due to collaboration with further financial intermediaries etc.), ex-ante estimates for annual emission reductions must be submitted over the expected operational lifetime of the technology or measure. These estimates must be transparent, documenting all assumptions and sources used, as well as conservative, tending on the side of lower-bound impact projections when uncertainties are significant.

Consistency across reporting periods: The approach selected for each intervention must be applied consistently across reporting periods. Any methodological changes (e.g. improved data availability allowing for ex-post reporting) must be documented clearly. Initial ex-ante estimates should be adjusted if better ex-post data becomes available during implementation or post-closure periods. This iterative update strengthens the credibility and accuracy of IKI reporting.

Continuous improvement target: As part of good practice, it is encouraged to progressively move towards greater use of ex-post data collection systems over time, particularly for recurring investment portfolios, infrastructure funds, or technology financing programs.

3 Characteristics and challenges of financial intermediaries regarding GHG emission reduction and reporting

3.1 Sectoral focus of financing activities

Financial intermediaries receiving financing from IKI often support diverse sectors, each with distinct emission reduction potentials. The typical sectors and activities include:

- **Renewable energy**: Investments in solar, wind, hydropower, and biomass energy projects. These initiatives focus on replacing fossil fuel-based energy sources and reducing grid emission factors. In some cases, renewable energy projects may also address energy storage solutions to enhance grid stability and efficiency.
- **Energy efficiency in buildings**: Financing for energy-efficient retrofits of residential and commercial buildings. This includes measures such as improved insulation, energy-efficient HVAC systems, and the adoption of renewable energy sources for heating and cooling.
- **Industrial process improvements**: Funding for mitigation activities aimed at reducing energy consumption in industrial settings, such as upgrading equipment, implementing energy management systems, and optimizing production processes.

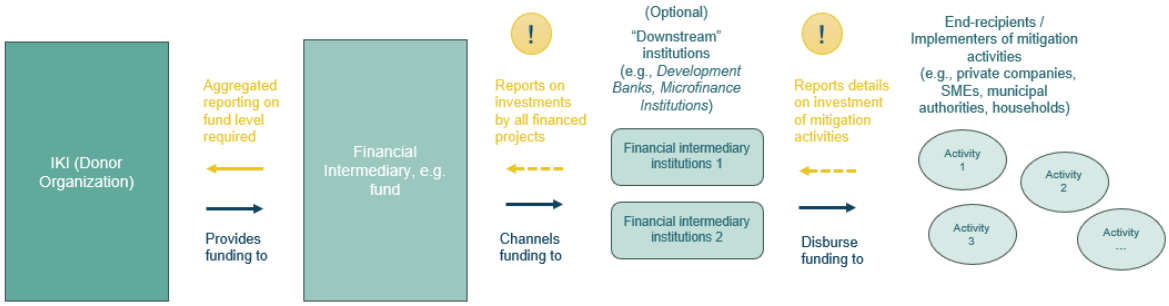
3.2 Flow of funds and reporting challenges in climate finance

The disbursement of funds in climate finance often involves multiple intermediary layers, ensuring that resources reach the intended beneficiaries effectively. Understanding the flow of funds is essential for tracking financial contributions, monitoring implementation of mitigation activities and ensuring they align with intended climate goals. This structure often makes it challenging to track impact from investments. A streamlined process amongst the involved institutions can facilitate transparent reporting and accountability.

The financial flows typically follow a multi-layered structure (see Figure 3 below):

1. **IKI** provides funding to financial intermediary that aggregates the collected data across all “downstream” financial flows to prepare an overall GHG report for submission back to IKI.
2. The financial intermediary channels IKI funding to one or more “downstream” **institutions**, such as banks, microfinance institutions or sectoral development organisations. “Downstream” institutions aggregate information received from their financed mitigation activities and provide a compiled report back to the financial intermediary.
3. The “downstream“ institutions disburse the financial flows to **end customers, which are the implementers of mitigation activities**, including private companies, municipal authorities, or individual households. End-recipients are expected to report on individual activities (e.g. technical details for estimating emission reductions achieved) to the “downstream” institutions.

Figure 3: Flow of funds and reporting for SI1 for financial intermediaries



Through this multi-layered flow of funds, several challenges can arise in estimating and reporting the actual emission reduction potential:

General challenges

1. **Data gaps and delays**: End customers or implementers receiving finance for implementation of mitigation activities may lack the technical expertise or resources to collect and report the necessary data on mitigation outcomes. This often leads to incomplete or delayed reporting.
2. **Discrepancies in assumptions**: Variability in baseline assumptions or methodological approaches across different "downstream" institutions and financed mitigation activities can lead to inconsistencies in reported outcomes.
3. **Leakage and rebound effects**: Mitigation measures in one area may inadvertently lead to increased emissions elsewhere, complicating the assessment of net emission reductions.

Specific challenges for financial intermediaries

1. **Attribution challenges**: Emission reductions may result from co-financed mitigation activities involving multiple funding sources. Disentangling the share attributable to IKI funding can be complex without standardized attribution methodologies.
2. **Complexity in aggregating data**: Consolidating data from numerous small-scale mitigation activities to generate a portfolio-level impact assessment is resource-intensive and prone to errors without robust tools and frameworks.
3. **Data availability**: Many "downstream" institutions do not track detailed information about the underlying mitigation activities they finance. For instance, financing provided to SMEs for enhancing energy efficiency may lack specific details on the type of measures implemented, technology specifications, or expected performance metrics, making it challenging to estimate the actual emission reduction potential accurately. This challenge is often compounded by the absence of structured incentives for "downstream" institutions and financed mitigation activities to collect and report data on mitigation effects. Without clear benefits or contractual obligations tied to climate reporting, data provision is frequently deprioritized in favour of operational efficiency or

financial performance tracking. Establishing performance-based incentive systems or contractual data requirements could encourage more consistent and higher-quality data reporting by “downstream” institutions and their clients.

4. **Ex-ante estimations without ex-post validation**: Emission reduction potentials are often estimated ex-ante at the beginning of an investment, but they are rarely validated ex-post through actual measurement. This is because ”downstream” institutions primarily focus on initial investments for portfolio analysis, which may not prioritize follow-up assessments to confirm actual impacts.

Addressing these challenges requires clear reporting frameworks, capacity-building initiatives for ”downstream” institutions and implementers of mitigation activities, and the adoption of standardized tools for emission estimation and data aggregation.

4 Guidance for financial intermediaries on how to estimate mitigation reductions

This chapter provides guidance for financial intermediaries to report on GHG impacts addressing general challenges and the specific challenges as outlined in Chapter 3.

4.1 General

In order to assess the impact of mitigation efforts, it is essential to compare the GHG emissions resulting from mitigation activities against a baseline. This involves analysing, for instance, the energy use and fuel consumption both before and after implementation. Please also refer to the guidance in Chapter 3.3.1 on SI 1: Mitigation in the Guidelines on Project Planning and Monitoring.

Identify financed activities with major mitigation potential

Financial intermediaries should first identify which activities in their portfolio have the highest emission reduction potential. This ensures that reporting efforts focus on the most impactful investments, improving the credibility and efficiency of GHG assessments. By concentrating on key sectors—such as renewable energy, energy efficiency, waste management, and industrial decarbonization—funds can prioritize accurate and detailed reporting for high-impact projects.

- Prioritize activities with the **highest emission reduction potential**, such as **renewable energy projects, energy efficiency measures, industrial process optimizations, and waste management improvements**.
- Focus reporting efforts on activities with a measurable and substantial impact.

Estimate mitigation potential by comparing situation after implementation with the baseline scenario, and determine the planned target

The calculation of emission reductions directly or indirectly achieved may vary according to the underlying mitigation measures to be implemented. In general, the assessment of the mitigation impact, measured in terms of reduction of tCO_2e, is based on comparing the level of GHG emissions before **(baseline scenario)** and after implementing the mitigation activity **(mitigation or project scenario),** considering any **leakage emissions**. The calculation procedure for determining GHG emission reductions generally follows a standardised approach: The achieved **emission reductions** from a mitigation activity are typically calculated as the **difference between baseline emissions (BE) and project emissions after implementation (PE)**, considering any potential leakage (LE).[1]

[1] Mitigation Action Facility (2023): Mitigation Action Facility Mitigation Guideline for Project Concept Phase, pp. 14-15. Retrieved from here.

$$ER_y = BE_y - PE_y - LE_y \qquad \text{Equation (1)}$$

Where:

ER_y	**=**	**Emission reductions in year y (tCO_2e)**
BE_y	=	Baseline emissions in year y (tCO_2e)
PE_y	=	Project emissions in year y (tCO_2e)
LE_y	=	Leakage emissions in year y (tCO_2e)

To accurately determine the required parameters and data for the calculation in Equation 1, it is necessary to identify the emission sources and GHGs associated with each technology. Established carbon market methodologies, such as methodologies under the Clean Development Mechanism (CDM) or Article 6 of the Paris Agreement, and standards, e.g. the GHG Protocol, can be used as a reference to identify technology-specific emission sources and GHGs associated with the baseline and project scenario. Further guidance for sector-specific approaches to estimating emission reductions, including suitable methodological approaches and information on baseline scenario, project scenario and leakage emissions are provided on the IKI webpage ("IKI Standard Indicator 1 – Mitigation"). Please refer to the IKI SI1 Guidelines for Energy, Agriculture, Forestry and Other Land Use (AFOLU), Mobility / Transport, and Buildings projects for established sector specific methodologies, standards and calculation examples.

Integrate the indicator into the monitoring system as part of the continuous monitoring and reporting

To ensure consistency with IKI's SI1 requirements, financial intermediaries should systematically integrate the indicator into their ongoing monitoring and reporting processes. This includes embedding SI1 reporting into internal M&E frameworks, data collection routines, and financial oversight processes across all investment layers. From the outset, it should be assessed whether financed activities fall under the defined SI1 categories (direct and indirect) and define realistic, transparent target estimates. These should be recorded in the Standard Indicator Report (Annex 7 Excel Tool) and aligned with internal data management systems to ensure that both ex-ante projections and ex-post results can be updated consistently. Continuous monitoring should include mechanisms to validate assumptions, update baselines when project realities change, and ensure that reported mitigation effects remain traceable to fund-supported interventions. Financial intermediaries are encouraged to adapt their monitoring systems so that they can also capture updates and corrections across investment cycles, especially in the case of revolving instruments or multi-phase activities.

4.2 Specific aspects for financial intermediaries in estimating emission reduction potential

4.2.1 Timeframe considerations

When estimating emission reductions related to investments, the following timeframe aspects need to be considered:

1. **Ex-ante and ex-post annual reporting**: Emission reduction estimates are often calculated ex-ante based on assumptions about project outcomes. However, incorporating ex-post validations through measured data enhances the accuracy and credibility of reports. Annual reporting mechanisms can help track progress and refine estimates over time.
2. **Defining the timeframe**: Are emissions assessed on an annual basis, over the entire investment period, or as part of a specific reporting cycle?
    - **Project period**: Emission reductions are calculated for the duration of the project implementation, typically aligned with funding agreements.
    - **Loan period**: For projects financed through loans, the timeframe could be tied to the loan repayment period, which may not always align with the operational life of the mitigation measures.
    - **Technology lifetime**: Estimations can extend to the full operational lifetime of the technology or infrastructure financed, reflecting its long-term impact on emissions.
3. **Revolving investments**: Many financial instruments operate on a revolving investment model, where capital is recycled to finance new projects. This poses challenges in determining the cumulative emission reductions attributable to the IKI funding over time. Each cycle of investment needs tracking to accurately capture the long-term mitigation potential.

To address these complexities, funds should adopt transparent methodologies to define the timeframe, incorporate ex-post validations where feasible, and use conservative assumptions to ensure the reliability of reported impacts.

4.2.2 Attribution considerations for direct mitigation under SI1

For direct mitigation, attributing emission reductions to specific financing sources is essential for ensuring transparency and accountability. Since many projects are co-financed by multiple stakeholders, clearly defining how emission reductions are allocated helps avoid double counting and ensures that each contributor's role is appropriately reflected. The following aspects provide guidance on how financial intermediaries can determine and document attribution (i.e. the IKI Funding Factor under SI1) within their GHG impact assessments.

Step 1: Attribution of GHG reductions to IKI funding

- **IKI's Share in funding the IKI project**: If a fund receives part of its financing from IKI and other parts from further donors or investors, the GHG reductions from direct mitigation

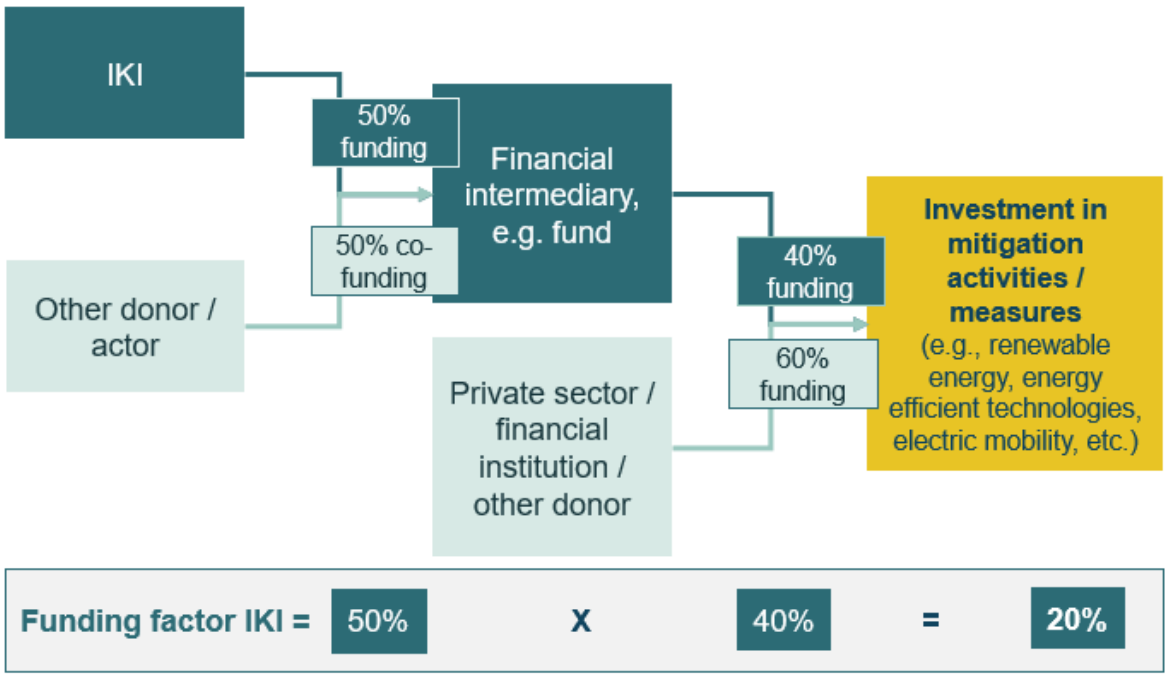
effects attributable to IKI should be calculated based on IKI's share of the total volume of finance of the fund.

Step 2: Attribution of GHG reductions to fund financing

- **Proportional attribution**: Emission reductions from direct mitigation effects can be allocated based on the proportion of the IKI project's financial contribution to the total costs of the mitigation activities (pro-rata).

For instance, if IKI contributes 50% of a fund's capital and the fund finances 40% of the total cost of an mitigation activity, then the combined IKI Funding Factor would be 20%, meaning 20% of the related GHG reductions would be attributed to IKI (see Figure 4 below).

Figure 4: IKI Funding Factor under SI1



- **Transparency in Reporting**: Clear documentation of the attribution methodology, including assumptions and financial flows, is essential to ensure transparency and facilitate validation by stakeholders.

Challenges in attribution and how to address them

Attribution can be complex due to the involvement of multiple funding sources, blended finance models, and varying investment structures. Ensuring clarity in attribution methodologies helps financial intermediaries to report GHG reductions more accurately and consistently.

- **Overlapping contributions**: In cases where multiple financial sources contribute to the same mitigation activities, ensuring that emission reductions are not double-counted across different sources of financing can be challenging.
- **Complex financing structures**: Activities with intricate financial arrangements, such as blended finance or public-private partnerships, may require advanced methods to disentangle and fairly allocate GHG reductions among contributors.

To address these issues, financial intermediaries should develop standardized attribution frameworks, ensure consistency across mitigation activities, and provide detailed documentation of financial contributions and their corresponding impact shares.

4.2.3 Use of databases and tools

Financial intermediaries often rely on databases and tools to estimate the emission reduction potential of individual mitigation technologies. The use of such tools involves several key considerations:

Types of tools used

- **External tools**: financial intermediaries may utilize established external tools developed by recognized institutions or research organisations, e.g.:
    - EX-ACT (Environmental externalities accounting tool) or NEXT (Nationally determined contribution expert tool): Developed by the Food and Agriculture Organisation (FAO), these tools can be used to assess the carbon balance of agriculture and forestry projects.
    - RETScreen: A clean energy management software developed by Natural Resources Canada, used to evaluate the energy efficiency and renewable energy potential of projects.
- **In-house tools**: Some financial intermediaries develop proprietary in-house tools tailored to their specific portfolios and investment types. These tools often integrate sector-specific methodologies and default values aligned with international standards, allowing to track and aggregate emission reductions consistently.

Transparency

Tools should clearly document the underlying standards, methodologies, and assumptions used for emission calculations. Ensuring that methodologies align with recognized frameworks, such as the IPCC Guidelines, the GHG Protocol, or the CDM methodologies, helps improve credibility and comparability.

Data accessibility and reporting

The accessibility of data and results generated by these tools is a crucial aspect of emissions reporting. It should be ensured that:

- The results can be easily extracted, verified, and integrated into the reporting framework of the financial intermediaries (ultimately used e.g. for the reporting to IKI).

- Stakeholders, including funders and regulatory bodies, can access documentation and assumptions to ensure transparency.
- When external consultants are used, the financial intermediaries maintain access to data and methodologies to enable consistent reporting across multiple funding cycles.

Challenges in using databases and tools

While databases and tools play a crucial role in enhancing the accuracy and consistency of GHG impact assessments, there are several challenges occurring in their application. These challenges can affect the reliability of emission reduction estimates and the overall efficiency of the reporting process. Addressing these issues requires careful selection of tools, capacity building, and proper integration into the operational framework of the financial intermediaries. The key challenges include:

- **Data availability**: Tools often require detailed input data that may not always be available, particularly for SME financing or indirect investments.
- **Complexity**: Some external tools have a steep learning curve, requiring specialized expertise to operate and interpret results effectively.
- **Customization needs**: In-house tools need periodic updates to integrate evolving methodologies, new technologies, or sector-specific mitigation approaches.

To address these issues, financial intermediaries should ensure regular training for internal staff and external consultants, maintain documentation on methodological updates, and adopt user-friendly tools that facilitate accurate and transparent emissions estimation.

4.3 How to set up a GHG assessment management process and derive more precise emission reduction estimates

Recognizing that not all financial intermediaries currently have a formal GHG assessment framework in place, they are nevertheless encouraged to establish one. Developing an internal GHG framework significantly enhances the quality, reliability and credibility of climate impact reporting, benefiting both the financial intermediary itself and the broader climate finance community.

Establish a structured framework: Development of a systematic GHG assessment framework that aligns with recognized standards is encouraged (e.g. with IPCC Guidelines, GHG Protocol, CDM methodologies). A basic framework should cover:

- Clear objectives and scope for GHG assessments.
- Methodological approach and tools used.
- Attribution methods for co-financed mitigation activities.
- Procedures for ex-post validation and data quality management.

Internal capacity development is crucial. Thus, investment in training of internal teams and key partners (e.g. “downstream” financial intermediaries, IFIs) is recommended to ensure robust

data collection and reporting. GHG assessment methodologies should be reviewed and updated periodically to reflect evolving best practices, sectoral innovations, and lessons learned from ongoing implementation.

All key methodological elements, assumptions, emission factors, and calculation steps applied in the framework must be documented clearly and made available for ZUG's review to ensure transparency and reproducibility.

Establishing a structured GHG assessment management process is essential to accurately estimate and report emission reductions. A well-defined process ensures that financial intermediaries can track emission reductions systematically, refine calculations over time, and align with IKI's reporting requirements. Below listed are some key elements of a robust GHG assessment framework.

Defining the objective and instruments for GHG reduction

Financial intermediaries should start by clearly defining their **climate mitigation objectives** and the **financial instruments** used to achieve them. This helps generating measurable GHG reduction impacts and ensures that emission reduction assessments focus on relevant investment areas.

- Clearly define the primary objective regarding GHG reduction and mitigation impact.
- Identify the financial instruments used to reduce emissions with IKI contributions, such as direct lending, blended finance, grants, or guarantees.
- Specify the targeted sector(s), such as renewable energy, energy efficiency, waste management, or industrial decarbonization.

Managing the GHG impact assessment

A **systematic approach** to managing GHG impact assessment ensures that financial intermediaries can consistently track, analyse, and report emission reductions along the entire "downstream" flow of funds. The assessment framework should be integrated into the operational and decision-making processes.

- **GHG assessment management process:** Define how the financial intermediary structures and conducts its emissions impact assessment, including the methodologies and tools used.
- **Establishment and adaptation for IKI requirements:** Describe when and how the GHG assessment management process was initially established and whether it has been adjusted to align with IKI's reporting standards.
- **Integration into all operations:** Ensure that the assessment process is embedded into investment decision-making, monitoring, and reporting cycles.

To facilitate consistent and reliable data collection, **financial intermediaries should establish agreements with "downstream" institutions involved** outlining data requirements and reporting obligations. These agreements should ensure that data on financed activities, emissions baselines, and GHG impact assessments are systematically collected and shared. Including a data-sharing provision in financial agreements with

“downstream” financial intermediary institutions can help streamline data flows and improve reporting accuracy.

Scope of the GHG impact assessment

It should be **clearly defined** what is included in the impact assessment. This involves identifying the extent of emissions measured, distinguishing between carbon footprint analysis and specific emission reduction assessments, and determining which lending activities are covered.

- **Portfolio carbon footprint vs. emission reductions:** Define whether the financial intermediary primarily measures the overall carbon footprint of its portfolio or tracks specific emission reductions associated with its financing activities.
- **Lending activities included:** Clarify whether the assessment covers the entire portfolio or is limited to specific credit lines, programs, or investment categories.
- **Timeframe considerations:** Establish clear timeframes for GHG impact assessment, including ex-ante estimates, annual reporting cycles, and ex-post validation processes.

Begin with assessment of representative mitigation activities and extrapolate for portfolio

If assessing each mitigation activity in a large portfolio is not be feasible, a **representative sampling approach** should be adopted. By **conducting in-depth assessments on a selection of mitigation activities**, reliable **emission reduction factors** can be derived and applied to similar activities across the portfolio. This method provides a **practical balance between accuracy and efficiency**.

- Start by **assessing a set of representative mitigation activities** to establish a baseline.
- Use these representative cases to **extrapolate results for the broader portfolio**, ensuring that assumptions and scaling factors are transparently documented.
- Ensure that extrapolation follows **sectoral benchmarks and conservative assumptions** to maintain credibility.

Data sources, tools, and attribution methodologies

Reliable data and appropriate **GHG calculation tools** are crucial for accurate reporting. It should be ensured that they use internationally recognized tools and databases for emissions estimation and clear attribution methodologies are established to avoid overestimations.

- **Databases and tools:** Identify external and in-house tools used for emissions estimation.
- **Attribution methodology:** Ensure a transparent approach to determining the share of emission reductions attributable to IKI’s financing versus other funding sources (see Section 4.2.2).
- **Transparency and accessibility:** Maintain clear documentation of methodologies, assumptions, and calculations to enhance transparency and facilitate external review.

Continuous improvement and capacity building

To enhance the accuracy of GHG assessments, financial intermediaries should continuously refine their methodologies and build capacity among stakeholders involved in the reporting process.

- **Improving data collection:** Strengthen collaboration with intermediaries, borrowers, and external consultants to enhance data availability and accuracy.
- **Training and capacity building:** Provide training for staff and partner institutions on best practices in GHG assessment and reporting.
- **Leveraging revolving investments:** Establish methodologies for tracking and reporting emission reductions from revolving investments to avoid double counting and ensure long-term impact assessment.

By implementing a structured GHG assessment management process, the precision and reliability of their emission reduction estimates can be improved while ensuring compliance with IKI's Standard Indicator 1 requirements. Ensuring methodological consistency, transparency, and regular reporting will support effective climate impact monitoring and enhance credibility. It is important that such a structured approach is implemented along the entire "downstream" flow of funds.

5 How to transfer estimates into IKI SI Report/Annex 7

Following the GHG estimation conducted by the financial intermediary, the emission reduction results need be transferred into the official Standard Indicator Report (Annex 7 Excel Tool).

In accordance with the **two-tiered reporting structure** introduced earlier, two key elements must be reflected in Annex 7:

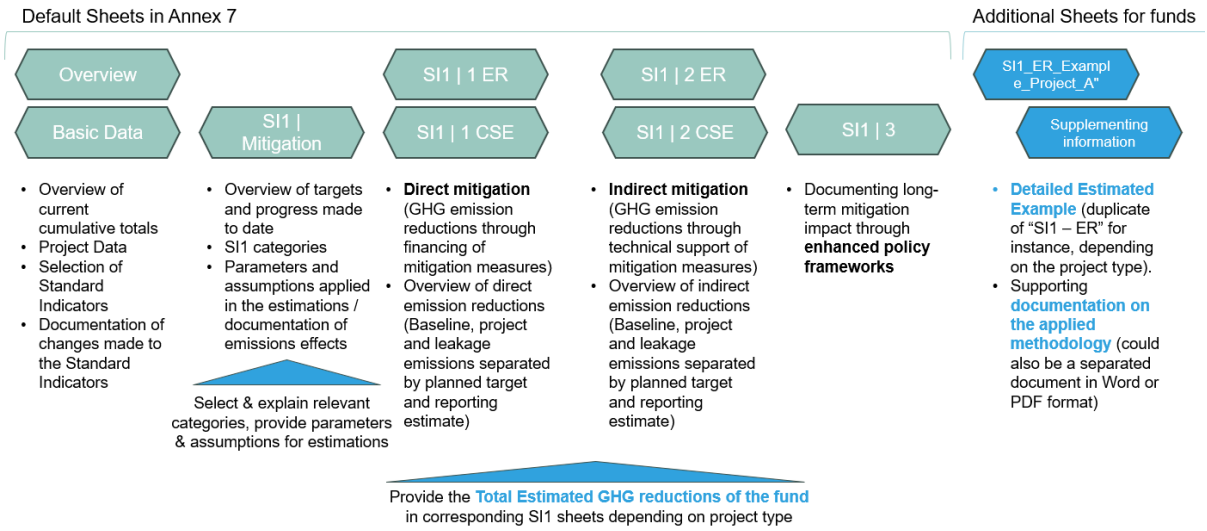
1. Provide the **total GHG impact** across all financed activities (as per section 5.1), and
2. Submit a **detailed estimation example** for a selected financed mitigation activity or technology, illustrating the applied methodology transparently and comprehensibly (as per section 5.2).

Both elements serve distinct but complementary purposes and need be reported separately and clearly labelled in Annex 7. To ensure the transparency, traceability and usability of reported data, it is essential that financial intermediaries structure Annex 7 clearly and consistently.

1. The existing sheets in the Standard Indicator Report - (i.e. SI1 | 1 ER, SI1 | 1 CSE, SI1 | 2 ER, SI1 | 2 CSE as applicable) - must be used to report the **total estimated GHG reductions at the portfolio level** (see Figure 5). In addition, supplementing information on the methodology applied may be added in an extra sheet or document (see Figure 5, “Supplementing Information”) providing a short overview of underlying methodology, tools and attribution logic (if not yet described elsewhere in existing sheets).
2. For the detailed **estimation example**, one of these standard sheets should be duplicated and renamed accordingly (e.g. “SI1_ER_Example_PV_Kenya”) to illustrate the methodology applied to a single representative mitigation activity (see Section 5.2). The duplicated sheet should mirror the structure of the original and include clear annotations explaining assumptions, emission factors, data sources, and calculations. Where possible, additional explanatory comments or brief headers can be included within each sheet to guide reviewers.

This structured and labelled approach enables ZUG to quickly distinguish between total portfolio values and the example case, ensures methodological transparency, and supports a smooth and effective review process. These two components support transparency and accountability in different ways: while the total estimate quantifies the overall contribution to climate mitigation, the detailed example enables ZUG to review the robustness and plausibility of the applied methods.

Figure 5: Structuring Annex 7 for clarity



This section explains how to enter both the portfolio-wide total estimate and a detailed estimation example into the Annex 7 in a manner consistent with IKI's reporting requirements.

Note: An Annex 7 example is provided alongside this guidance on the IKI Website to illustrate how the total estimated GHG reductions and a detailed estimation example can be constructed in practice. This example offers a reference format for structuring data and documenting assumptions transparently and consistently.

5.1 Provide the total estimated GHG impact figures

The overall GHG reductions for the entire portfolio supported by IKI should be entered into the standard sheets of Annex 7 (for both direct and indirect impacts, as applicable, see also Figure 5):

- SI1 – Emission Reduction (ER): for emission reductions from funded activities,
- SI1 – Carbon Stock Enhancement (CSE): for mitigation efforts resulting in enhanced carbon storage (e.g. reforestation, agroforestry).

These are the official templates provided in the IKI Annex 7 Standard Indicator Report. They already contain the structure required for disaggregating results by:

- Type of mitigation: direct, indirect, contribution to enhanced policy frameworks,
- Basis of reporting: ex-post (achieved) and ex-ante (estimated over the project/technology lifetime),
- Level of attribution: share attributable to IKI financing for direct impacts.

The entered values should reflect the results from the internal GHG assessment of the financial intermediaries. This can be done as total amount of GHG reduced or avoided, i.e. in tCO_2e. The methodology to derive this value, should be described in the corresponding sheets for ER or CSE total estimates. Any parameters and assumption should be consistent with the

assumptions and methods explained in the methodology applied. Please add clear and traceable references to the sources and information used, e.g. the methodology documentation etc., and provide the corresponding documents allowing an insight into the monitoring framework. Where applicable, supplementary breakdowns by sector, country, or investment window may be added using the open cells or notes sections of the tool.

Example: 500 rooftop solar PV systems have been financed across multiple countries, primarily targeting commercial and residential buildings through co-financing with national financial institutions.

The aggregated GHG emission reductions for the entire portfolio, entered in the "SI1 – ER" sheet of Annex 7, are as follows:

Table 1: Aggregated GHG emission reduction for entire portfolio

SI1 Category	Ex-Post (tCO_2e)	Ex-Ante (tCO_2e over lifetime)
Direct Mitigation	31,400[2]	313,900
Indirect Mitigation	—	—
Policy Enhancement	—	Not applicable (qualitative only)

- Number of financed systems: 500 rooftop PV projects
- Total installed capacity: 50 MW_p (each system: 100 kW_p)
- Expected annual generation (aggregate): 50,000 MWh/year
- Operational lifetime: 20 years
- Attribution to IKI: Based on 50% financial contribution from IKI

The total ex-ante estimate of 313,900 tCO_2e is calculated based on 500 systems × 1 system-level reduction of 628 tCO_2e (see Section 5.2). The ex-post component reflects the actual measured performance of the systems for Year 1 post-installation.

5.2 Provide a detailed step-by-step estimation example

In addition to the aggregated portfolio-level estimates, submitting at least a project-specific estimation example is required. This example must demonstrate how the GHG assessment methodology is operationalized in practice and provide sufficient detail to enable plausibility checks by ZUG. Since in many cases only aggregated emission reduction values are reported from financial intermediary institutions or reporting tools, it is crucial to demonstrate transparency through such a case study. Financial intermediaries should therefore provide detailed information for one or more investments and/or disclose the underlying calculation from their tool.

[2] For simplification in this example, it is assumed that all systems are in operation at the beginning of year 1.

This example should be entered into a duplicate of one of the two official Annex 7 sheets (i.e., either the “SI1 – ER” or “SI1 – CSE” sheet, depending on the project type, see also Figure 5). The duplicated sheet should be renamed to indicate that it is an example - e.g.:

- "SI1_ER_Example_Project_A" or
- "SI1_CSE_Example_AgroProject".

This estimation example should include, as per template:

- **Project description**: sector, location, technology, scale, financing structure, and reporting year etc.
- **Full calculation logic,** i.e. step-by-step breakdown of the GHG calculation:
    - Baseline emissions (BE)
    - Project emissions (PE)
    - Leakage emissions (LE)
    - Emission reductions (ER = BE – PE – LE or CSE = PCS – BCS – LE)
- **All assumptions and parameters**, including emission factors and their sources (e.g. IPCC, CDM, national databases).
- **Identification of data sources**, (e.g. energy audits, performance certificates).
- **Distinction between ex-ante and ex-post values**, i.e. planned target and reported achieved values.
- **Reference to the broader estimation methodology** used and the representative function for the full portfolio.

If necessary, an additional note can be included in the sheet (or referenced in the “Methodology Summary”) to explain how this example is representative of the wider portfolio.

Example: The following example presents a **representative calculation** for one of the 500 rooftop PV systems financed as introduced under Section 5.2. The system is located in Nairobi, Kenya, and reflects typical design and performance assumptions used for the broader solar PV portfolio of the financial intermediary in the region.

This example is submitted in a **duplicated sheet** of the “SI1 – ER” tab in Annex 7, labelled: **SI1_ER_Example_PV_Kenya.**

In the **project description** outline the project’s location, technical specifications, financing context and reporting basis. The project - a rooftop solar PV system installed on a cold storage facility in Nairobi, Kenya - is representative of the broader portfolio of distributed renewable energy investments in the region. Add the relevant parameters and assumptions to the Example sheet and the list of *Parameters and assumptions applied in the estimations / documentation of emissions effects* in sheet *SI1 | Mitigation.*

Table 2: Attributes for project description

Attribute	Description
Project Title	Rooftop Solar PV – SME Cold Storage Facility
Location	Nairobi, Kenya
Installed Capacity	100 kWp
Expected Annual Generation	146,000 kWh/year (based on 1,460 kWh/kWp/year)
Project Lifetime	20 years
IKI Funding Factor	50% of investment cost covered by IKI
Reporting Basis	Ex-Ante
Mitigation Category	Direct Mitigation

The **step-by-step emission reduction calculation** demonstrates the core logic behind the GHG reduction estimate for the selected project. It details the inputs and assumptions used to calculate the emission savings compared to a business-as-usual scenario (grid electricity use).

Table 3: Parameter for emission reduction calculation

Parameter	Value
Baseline Scenario	Electricity from Kenyan national grid
Grid Emission Factor	0.43 tCO_2e/MWh (Kenya average, conservative)
Project Emissions	0 tCO_2e (solar PV, grid-tied)
Leakage	0 tCO_2e (no offsite effects expected)
Annual Emission Reductions	146 MWh × 0.43 = **62.8 tCO_2e/year**
Lifetime Emission Reductions	62.8 × 20 = **1,256 tCO_2e**
Attributed to IKI	50% × 1,256 = **628 tCO_2e**

Assumptions and data sources should outline the key technical and methodological assumptions used in the GHG estimate and specify the sources from which data were drawn.

Table 4: Assumptions and data sources used for GHG estimate

Aspect	Detail
Tool Used	RETScreen Expert for generation estimate + manual calculation in Excel
Performance Ratio	0.80 (adjusted for high solar irradiance in Nairobi)
Emission Factor Source	IEA 2023 / Kenya Power / CDM default for East Africa
System Degradation	0.5%/a (conservative approach)
Attribution Logic	Pro-rata based on IKI's co-financing share

This example should be accompanied by a brief narrative explanation of the applied methodology. If necessary, an optional supporting document may be submitted - but it must be clearly structured and suitable for review by non-specialists (see Section 5.3).

5.3 Practical tips and requirements

Optional use of supporting documents

If the example or methodology is too detailed to be documented entirely within the Annex 7 spreadsheet, a separate document (maximum 1 document) may be submitted. However, this should be used only when strictly necessary. Any such document must:

- Be clearly structured with logical sectioning (e.g. context, assumptions, data, steps),
- Follow a step-by-step calculation format consistent with the duplicated sheet for the example calculation.
- Be understandable to non-specialist reviewers, including ZUG program managers and external evaluators.
- Explicitly cite all data sources, methodologies, and tools used,
- Avoid overly technical or unstructured formats (e.g. long, unannotated spreadsheets without guidance).

For full transparency and reviewability, we strongly recommend that the entire estimation logic be made traceable directly within Annex 7, unless the complexity or confidentiality of the framework explicitly requires external documentation. If submitting a separate document, reference it in the "Basic Data" sheet of Annex 7 and clearly explain its role and structure.

Share access to tools and databases

Providing access to the tools and databases used for emission reduction estimation is essential to ensure transparency, enable independent plausibility checks, and support methodological validation by the ZUG teams. Whether external tools (e.g. RETScreen, EX-ACT) or proprietary in-house models are used, it must be ensured that both the inputs and calculation logic are comprehensible to reviewers. If external consultants are involved in the assessment, financial

intermediaries should ensure that the underlying assumptions and calculations remain accessible for verification.

- **Provide ZUG with clear access** to the tools or models used, either through downloadable links, referenced online platforms, or structured documentation.
- **Ensure that external reviewers** can validate all relevant assumptions, emission factors, default values and formulas.
- **If proprietary in-house tools are used**, a well-structured explanation of the tool's logic, calculation approach and embedded assumptions shall be provided considering the requirement for supporting documents above.

Ensure Full Transparency and Traceability

Maintaining a structured and well-documented reporting approach is essential to ensuring **consistency, reproducibility, and credibility** in emission reduction assessments. Financial intermediaries should document and archive all key data, assumptions and methodologies used for the total GHG impact across all financed activities (as per Section 5.1), and the detailed estimation example for a selected financed mitigation activities or technology, illustrating the applied methodology transparently and comprehensibly (as per Section 5.2), making them accessible to the ZUG team for review.

- Maintain a **structured record** of:
    - **Data sources** (e.g. project documents, energy performance certificates, emission factors used).
    - **Methodological choices** (e.g. baseline scenario definition, inclusion/exclusion criteria).
    - **Assumptions and Limitations** (e.g. energy efficiency rebound effects, uncertainty factors).
- These records should be **accessible for verification** and review by ZUG and external evaluators.

By following these recommendations, financial intermediaries can enhance transparency in their GHG impact reporting, ensuring that ZUG can trace the origins of reported emission reductions. This will contribute to greater accountability and consistency in climate finance impact reporting of financial intermediaries supported under the IKI.

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