INTERNATIONAL FINANCIAL INSTITUTIONS TECHNICAL WORKING GROUP ON GREENHOUSE GAS ACCOUNTING

IFI TWG - AHSA-002

IFI Approach to GHG Accounting for Energy Efficiency Projects

Version 03.0

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1. Overview

1. This note sets out a common approach of accounting for relative greenhouse gas GHG emissions of energy efficiency (EE) projects in accordance with the International Financial Institution (IFI) Framework for a Harmonised Approach to Greenhouse Gas Accounting.[1]

2. Scope

2. This document, developed by a Technical Working Group (TWG) of IFIs, provides guidance for relative (against a baseline) emissions accounting for EE projects and/or EE project components, including those in the *Common Principles for Climate Mitigation Finance Tracking*.[2]

3. The proposed approach is primarily focused on accounting for the reduction of energy intensity induced by investments in the rehabilitation, retrofitting and/or replacement with more efficient technologies at the recipient facility.[3] Where the project design and operation considers efficiency gains from demand-side measures, including process and behaviour change, these impacts can also be taken into account in the calculations. The proposed approach is also applicable to the rehabilitation or retrofitting of renewable energy plants[4] and water supply systems.

4. For the purposes of this note, to be considered as an energy efficiency investment, a project must be expected to reduce the energy or carbon intensity[5] at the recipient facility.

5. A characteristic of EE rehabilitation/retrofit projects is that they frequently involve an increase of production and/or an extension of the facility's lifetime. This note defines a methodology that takes into account these characteristics as well.

6. To calculate relative emissions, project emissions and baseline emissions are estimated in accordance with the principles outlined in the *International Financial Institutions Guideline for a Harmonised Approach to Greenhouse Gas Accounting*[6] (the IFI Guideline hereinafter), and in particular the definition of the baseline in paragraph 18 of the IFI Guideline. The emission reduction achieved by the project is calculated by subtracting baseline emissions from project emissions.

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[1] Available here.

[2] https://www.eib.org/attachments/documents/mdb_idfc_mitigation_common_principles_en.pdf.

[3] "Facility" is used to denote the operations, site, equipment, etc., that is the subject of the IFI-financed project.

[4] Applicable renewable energy technologies are defined in the "IFI Approach to GHG Accounting for Renewable Energy Projects" available here.

[5] Some projects may result in fuel switching. In such cases, the emissions factors for the fuels replaced are used.

[6] See AHG-003 at https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies.

7. Assumptions on the project's energy use and energy intensity (MWh or GJ) are based on information collected during the appraisal conducted by each IFI for its environmental, technical and/or investment due diligence.

8. Project GHG emissions from construction, other upstream and downstream activities, leakage, and the rebound effect can be excluded as per the *International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting*,[7] unless these are deemed as significant and assessed in the project appraisal.

3. Representative Year

9. Greenhouse gas emissions are calculated on an annual basis for a representative year at the expected average output of the post-investment facility. In some cases, it is not possible to point out a single representative year, for example, when the project lifetime exceeds the lifetime of the pre-investment facility. In that case two or more representative years may be chosen, each with its own baseline, and a weighted average will be calculated for the emissions.

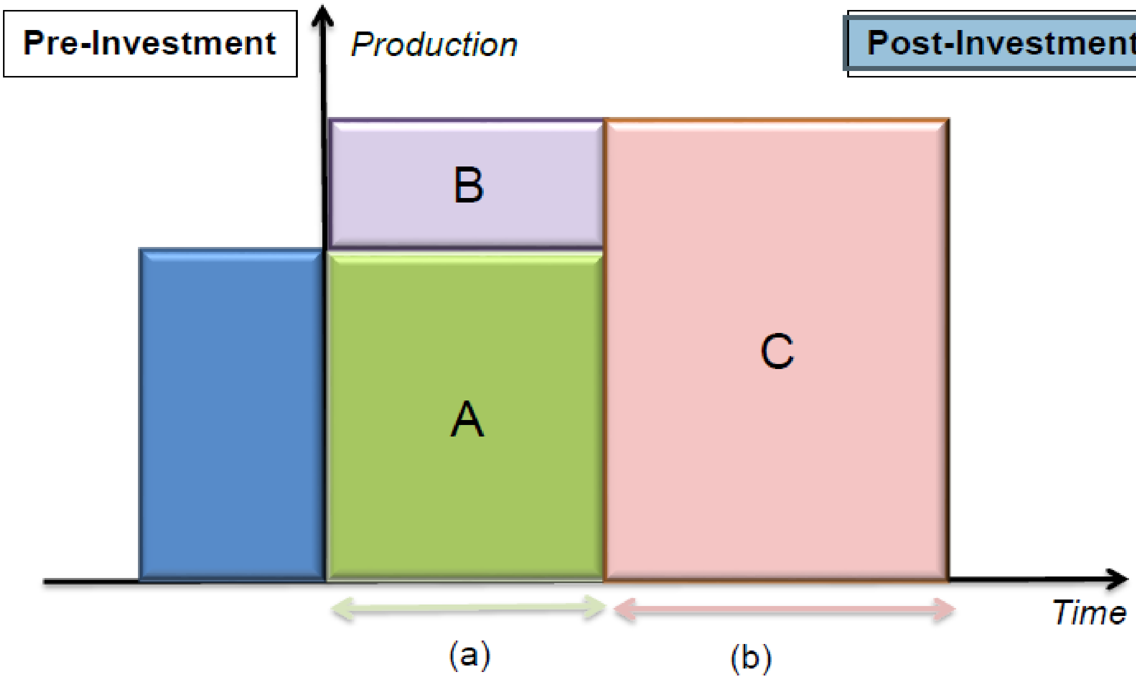
4. Baselines

10. The baseline should be viable for the expected project lifetime. Equipment that is evidently operationally unviable (e.g., at the end of equipment life or expected to cease operating due to high costs or other market barriers, or not conforming to legal requirements), do not constitute an acceptable baseline.

11. In the below figure, area "A" represents the pre-investment production, area "B" represents the increased production compared to the pre-investment production during the expected remaining lifetime of the pre-investment facility and area "C" represents the production beyond the pre-investment facility lifetime.

[7] https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting.

Figure 1. Baseline determination framework for Energy Efficiency Projects



12. For projects where the pre-investment and post-investment production levels are broadly equivalent, the actual emissions at the pre-investment facility prior to the investment can be used as a baseline, but only until the end of the expected lifetime of the pre-investment facility. In the above diagram, area "A" represents this production, corresponding to 18 (c) in the IFI Guideline.

13. For projects where the investment is expected to result in an increase of production, the output of the retrofitted/rehabilitated facility should be sub-divided into the following components (also see the figure above):

    (a) Output of the pre-investment facility during its remaining technical/economic life (A); and

    (b) Additional output related to increased capacity and extended operating life (B+C).

14. The additional output would typically displace production from new capacity that would have been built in the country or elsewhere or displace existing production. The baseline to be used for the displaced production may be based on a similar level of service or output provided by the project. This could be based on a benchmark for energy efficient sources of existing production or for efficient new technologies or a combination of the two.[8]

15. For the purposes of simplification, the baseline for "B" may be represented by a benchmark comprising existing sources of energy efficient production, corresponding to

[8] For projects involving the production or avoidance of grid electricity the baseline for the grid electricity could be defined by the renewable energy OM/BM methodologies (see IFI Approach to GHG Accounting for Renewable Energy Projects).

18 (b) of the IFI Guideline. The baseline for "C" should in principle comprise energy efficient new technologies, corresponding to 18 (a) of the IFI Guideline, or a relevant benchmark of the most energy efficient existing technologies may be used.[9]

16. The IFI will document the choice of baseline and any supporting assumptions. IFIs that are reporting project or portfolio emissions data are encouraged to also disclose the associated assumptions and methodology.

17. For the refurbishment of renewable energy generation plants, the baseline is defined as follows:

    (a) If the pre-investment facility has reached the end of its technical life, the baseline methodology defined by the "IFI Approach to GHG Accounting for Renewable Energy Projects"[10] for new electricity production should be applied.

    (b) If the pre-investment facility has a significant remaining economic life, the emissions factor of the pre-investment facility is applied to A, and the emissions factors defined by the "IFI Approach to GHG Accounting for Renewable Energy Projects" for new electricity production is applied to the sum of B and C.

18. In those cases where a project is replacing specific production, the IFI should transparently document and share the baseline used for this production with the TWG.

19. Baseline determination in the specific case of water supply systems:

    (a) For brownfield water supply projects, the baseline scenario is the continued use of existing equipment that is within its current economic lifetime for refurbishment, rehabilitation, and non-revenue water (NRW) reduction projects. NRW reduction projects can also assume that changes in emissions between the project and baseline scenarios can be due to a reduction in the volume of water produced, inclusive of technical losses. Since NRW reduction projects are often coupled with network expansion and/or changes in pressure that affect the energy intensity of service delivery, these factors should also be taken into account when present in a water project that includes NRW reduction.

    (b) For greenfield water supply projects, baseline scenarios can include zero-emissions baselines (rainwater collection, surface water collection on foot, hand pumps, etc.) if these methods of water collection can be reasonably assumed to continue without the project due to the relevant economic conditions in the sector and project area. GHG-emissive baseline scenarios can also be used when they are relevant to the project area, including the continued use of tanker trucks and household coping mechanisms (household water boiling, local pumping systems).

    (c) In the specific case of tanker use, conservative assumptions about the length of each trip should be assumed in the absence of local site-specific data. A

[9] As a result, where the increase in production has a carbon intensity that is lower than the facility's pre-investment level, but higher than a recognised benchmark, the increase in production should be treated as net increase in emissions.

[10] See AHSA-001 at https://unfccc.int/climate-action/sectoral-engagement/ifis-harmonization-of-standards-for-ghg-accounting/ifi-twg-list-of-methodologies.

conservative consumption rate of 20–25 litres per capita per day for each potential beneficiary who currently uses tankers or are expected to use tankers in the absence of the project should also be assumed. The most recent year available for fuel economy for relevant tankers should also be assumed.

(d) A common set of practices and default values for energy intensity, pumping efficiency, and tanker fuel standards developed and maintained by the IFI TWG can also be used.[11] This covers source pumping, conveyance to a water treatment plant, potable water treatment, and potable water distribution, as well as tanker use, household pumping, and household water boiling.

5. Sector-specific Considerations

20. Power plants: For project that involve retrofits/rehabilitation or efficiency improvements to power plants the baseline determined in line with the above principles can comprise the combination, of a) continuation of current situation related to energy production in the existing facility for the equipment being replaced, modified or retrofitted for the expected remaining lifetime of the existing equipment; b) a combined margin for emissions[12] in the receiving electricity grid applied to the incremental increase in level of service expected from the project; and c) a combined margin for emissions[13] in the receiving electricity grid applied to the generation produced during the additional lifetime.

21. Industrial projects: UNFCCC standardised baselines should be used when available.

22. Buildings – For retrofits/rehabilitation of existing buildings, baselines could be based on pre-investment building conditions or prevailing building standards or a combination of the two.

6. Boundaries

23. Boundaries for GHG calculations are defined in paragraph 4 (c) of the IFI Guideline. The following principles should be noted:

(a) The assessment boundary for the project may not be the same for calculating absolute and relative emissions. More specifically, the assessment boundary for the project scenario to calculate relative emissions may be larger than that for absolute emissions.

(b) For facilities comprising multiple, independent processes, the boundary can be defined at this sub-process level if the sub-process does not affect other sub-processes and has measurable inputs, outputs, and energy use, with the boundary for the baseline scenario defined similarly.

(c) In the specific case of water supply projects, boundaries should be defined according to where the actual project investments are going to be located, who the intended beneficiaries are and where they live, as well as where existing

[11] This work is currently being undertaken by the IFI TWG and will be made available in near future.

[12] The combined margin is defined by the "IFI Approach to GHG Accounting for Renewable Energy Projects" (available here) for new electricity production can be used as the baseline for B and C.

[13] Ibid.

equipment is currently located, as long as the baseline conforms to agreed-upon rules for defining baselines.

(d) Where efforts to improve efficiency in an activity result in a form of other consequential emissions referred to as leakages—unintended GHG emissions in another location or sector beyond the control of the entity responsible for the project being implemented—emissions outside the project boundary (e.g., the broader market or on the electricity grid or distribution system) may be calculated as leakage.

7. Emission Factors

24. In the calculation, the energy consumption (or production) of the project is multiplied by relevant emission factors in tCO_2e/MWh or tCO_2e/GJ as applicable, or the fuel emission factor for a captive power plant or a third-party combined heat and power plant.

25. For simplification, the emission factor for reduced electricity consumption from the grid is defined as for grid-based renewable energy, with a weighting of 33% Operating Margin (OM) and 67% Build Margin (BM).[14]

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Document information

Version	*Date*	*Description*
03.0	January 2023	The revision includes a reference to the “International Financial Institutions Guideline for a Harmonised Approach to Greenhouse Gas Accounting”, for determining assessment boundary for the project and calculation of relative emissions, project emissions, baseline emissions and leakage.
02.0	July 2019	The revision broadens the applicability to cover projects involving energy efficiency in water supply system.
01.0	November 2015	Initial adoption.

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Business Function: Methodology
Keywords: Energy efficiency, Baseline, Emission factor

[14] Over time, the TWG in coordination with the UNFCCC, will consider future modifications of the weights applied between OM and BM to account for additional factors, such as countries with high or low demand growth. Until more definitive guidance is available on weighting in countries with high demand growth, the IFI should transparently document and share with the TWG any alternative weighting proposal for a specific country.