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GUIDELINES FOR GREENHOUSE GAS EMISSIONS ACCOUNTING AND REPORTING FOR GEF PROJECTS

- FINDINGS AND RECOMMENDATIONS OF GEF WORKING GROUPS

ABBREVIATIONS

AFOLU	Agriculture Forestry and Other Land Use
APMs	AFOLU Project Methodologies
BC	Black Carbon
BRT	Bus rapid transit
BSI	British Standards Institution
CCM	Climate change mitigation
CCS	Carbon capture and storage
CDM	Clean Development Mechanism
CFC	Chlorofluorocarbons
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COPERT	Computer programme to calculate emissions from road transport
CURB	Climate Action for Urban Sustainability
EE	Energy efficiency
Ex-ACT	Ex-Ante Carbon-balance Tool
FAO	Food and Agriculture Organization of the United Nations
FREAT	Freight Routing and Emissions Analysis Tool
GEF	Global Environment Facility
GEF CSO	GEF Civil Society Organizations
GEF IEO	GEF Independent Evaluation Office
GHG	Greenhouse gas
GPC	Community-Scale Greenhouse Gas Emission Inventories
GPS	Global positioning system
GWP	Global warming potential
HFCs	Hydrofluorocarbons
IAP	Integrated Approach Pilots
ICLEI	Local Governments for Sustainability
IDB	Inter-American Development Bank
IEA	International Energy Agency
IFC	International Finance Corporation
IFI	International Financial Institution
IGES	Institute for Global Environmental Strategies
IPCC	Intergovernmental Panel on Climate Change
IRENA	The International Renewable Energy Agency
ISO	International Standards Organisation
MFA	Multi-focal area
N_2O	Nitrous oxide
NF_3	Nitrogen trifluoride
PAS	Publicly Available Specification

PFCs	Perfluorocarbons
PIF	Project Identification Form
QA/QC	Quality assurance/quality checking
RBM	Results-based management
RE	Renewable energy
REL	Renewable electricity
SF_6	Sulfur hexafluoride
SFM	Sustainable Forestry Management
STAP	Scientific and Technical Advisory Panel
SULTAN	Sustainable Transport (tool)
TEEMPs	Transportation Emissions Evaluation Models for Projects
UNFCCC	United Nations Framework Convention on Climate Change
UPMs	Urban Project Methodologies
US EPA	United States Environmental Protection Agency
WB	World Bank
WRI	World Resources Institute

EXECUTIVE SUMMARY

1. This document provides an update on the progress of the improvement to the GEF's greenhouse gas (GHG) emission reduction calculation methodologies, responding to Council decision on GEF/ME/C.45/1 and GEF/ME/C.45/2 of the GEF 45th Council meeting[1]. In collaboration with the Scientific and Technical Advisory Panel (STAP) and other relevant entities, the GEF Secretariat contracted an independent consultant firm to help establish, manage and facilitate three technical working groups to discuss options for the GEF regarding methodology improvements. This was done through a series of in-depth meetings and by preparing detailed recommendations and proposals for review by the working groups. Key messages from this document to the GEF Council can be summarized in three areas: (1) findings and recommendations on the main issues that were raised by the GEF Council for the GEF Secretariat and STAP to improve the assessment of direct and consequential emissions; (2) recommendations to improve the three existing GEF methodology manuals for energy efficiency, renewable energy and transport projects; and (3) proposed new methodological frameworks of GHG accounting for urban, biomass, agriculture, forestry and other land use (AFOLU) projects.

2. A major step in improving the GEF assessment of direct and consequential emissions can be taken by adopting widely applied standards for estimating GHG emissions. For example, the World Resources Institute's GHG Protocol Policy and Action Standard[2] (the WRI Standard) provides such a standard. The working groups have advised the GEF to consider incorporating the WRI Standard into its future guidelines for GHG accounting.

3. The three existing GEF manuals (on energy efficiency, renewable energy, and transport) can be improved by addressing a number of issues. These may include providing clarity on defining project boundaries, consistency and transparency in mapping the causal chain, incorporating more illustrative case studies and improving guidance on estimating ex-post GHG emissions.

4. New methodological frameworks for urban, AFOLU, and stationary combustion of biomass projects are being proposed by the working groups in this document. They will serve as the core methodological frameworks and guidance for GEF Agencies to estimate GHG emission reductions for GEF projects during project development and implementation in the future. Recommendations are also made to identify "meta datasets" and to operationalize the proposed methodological frameworks and guidelines.

5. In addition, the document introduces an improved terminology for the term "indirect emissions reduction" to better describe the GHG impacts achieved by GEF projects after closure and outside the project logical framework (logframe). These impacts are recommended to be redefined as "consequential emission reductions" in the new methodological frameworks and the revised existing methodologies.

[1] Page 2 of the document at www.thegef.org/gef/sites/thegef.org/files/documents/November%207_Joint_Summary_of%20the%20Chairs_v3_FINAL.pdf

[2] www.wri.org/publication/policy-and-action-standard

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INTRODUCTION

1. This information document presents findings and recommendations addressing the improvement of greenhouse gas[3] (GHG) accounting methodologies in response to the decision of the GEF 45th Council meeting[4]. The GEF Council requested the GEF Secretariat, in collaboration with the Scientific and Technical Advisory Panel (STAP) and other relevant entities, to continue its work on the improvement of the methodology of GHG emission reduction calculations and to engage in a dialogue to improve (i) the assessment of direct GHG emission reduction during project implementation and at completion, and (ii) the estimation of indirect GHG emission reduction.

2. On March 24, 2014, the GEF Secretariat convened an inception meeting with STAP and GEF Agencies, which resulted in the development of the implementation approach presented to the 46th GEF Council in May 2014 (GEF/C.46/Inf.11). The GEF Secretariat proposed to:

(a) Engage major stakeholders (such as the representatives of the GEF Council, the GEF Independent Evaluation Office (GEF IEO), the GEF Agencies and the GEF Civil Society Organizations (CSOs)) in the further development of the GEF GHG accounting methodologies;

(b) Engage a consulting firm to undertake a study; and

(c) Establish three working groups addressing different issues related to GHG accounting to:

(i) Improve the existing GEF methodologies;

(ii) Develop new methodological frameworks for urban, and agriculture, forestry and other land-use (AFOLU) projects; and

(iii) Propose a mechanism to operationalize the GEF GHG mitigation accounting methodologies.

3. From November 2014 to April 2015, in collaboration with STAP and with support from an independent consulting firm, the GEF Secretariat worked with the three working groups, and organized two meetings and regular teleconferences that resulted in the development of the proposed Guidelines for GHG Accounting and Reporting for GEF projects (GEF Guidelines)[5]. The three working groups consisted of representatives from the GEF Secretariat, the GEF Council, STAP, the GEF IEO, GEF Agencies and representatives outside of the GEF such the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC)[6]. The GEF Guidelines presented in the annexes to this information document do not propose new methodologies, but aim to provide recommendations and guidance for the use of existing methodologies available elsewhere

[3] The GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and sulfur hexafluoride (SF_6).
[4] Joint Summary of the Chairs of the 45th GEF Council, available at: www.thegef.org/gef/sites/thegef.org/files/documents/November%207_Joint_Summary_of%20the%20Chairs_v3_FINAL.pdf , November 7, 2013
[5] All recommendations presented in this paper were reviewed, commented and agreed by the Working Groups
[6] The GEF Civil Society Organizations (CSOs) network concurred to participate in the working groups, received the draft report, but they did not actively attend the meetings.

that cover all categories of climate mitigation activities eligible for GEF financing. To date, the GEF and STAP have developed the GHG accounting methodologies for GEF-funded transportation[7], energy efficiency (EE)[8] and renewable energy (RE) projects[9]. Over the last several years, more GHG accounting methodologies that address different mitigation sectors have been developed by GEF Agencies and other institutions. The multiplicity of available methodologies and approaches to GHG accounting has created a need for the harmonization and guidance for their use. The GEF aims to align with and supports the International Financial Institutions' (IFI) Framework for a Harmonized Approach to Greenhouse Gas Accounting, which is a process to harmonize the approach of the 14 IFIs for their projects in accounting GHG emissions[10].

4. While there is a need for harmonization in the approach to GHG accounting across institutions, it must be recognized that GEF-funded projects provide support to tangible and intangible assets such as national policies, standards and codes; institutional development; technology transfer; capacity building and other technical assistance. Compared to most IFIs, the GEF tends to invest more in intangible assets than it does in tangible assets[11]. Developing sound methodological frameworks and guidelines for quantifying the GHG emissions associated with intangible investments – in addition to investments in tangible assets – is critically important for the GEF to fully estimate the global environmental benefits of its projects.

5. The progress made by the GEF Secretariat in GHG accounting needs to be linked, eventually, to the development of the GEF results based management (RBM) system, including GEF tracking tools. In this context, additional future work will be necessary to refine GHG accounting methodologies particularly with respect to multi-focal area projects and programs in natural resources management, chemicals and climate change adaptation that have carbon mitigation benefits.

6. In May 2015, the GEF Secretariat also setup a dedicated area on the GEF website where all GEF GHG accounting manuals, methodologies, frameworks, and tracking tools can be accessed. The web link is: http://www.thegef.org/gef/ghg-accounting

[7] Calculating Greenhouse Gas Benefits of GEF Transportation Projects (2011). Available at: www.thegef.org/gef/pubs/STAP/CO2-Calculator

[8] Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects (Version 1.0) Available at: www.thegef.org/gef/pubs/STAP/Methodology-for-Calculating-GHG-Benefits-of-GEF-Energy-Efficiency-Projects-v.1

[9] Manual for calculating GHG benefits of GEF projects: Energy efficiency and renewable energy projects. Available at: www.thegef.org/gef/node/313

[10] www.worldbank.org/content/dam/Worldbank/document/IFI_Framework_for_Harmonized_Approach%20to_Greenhouse_Gas_Accounting.pdf

[11] According to an analysis of 47 closed GEF energy efficiency projects, the GEF spent approximately 84% of its USD313 million grants on policy, standards, codes, institutional development, technology transfer and capacity building. The remainder (16%) was spent on new equipment acquisition and new construction works. Source: www.springer.com/us/book/9781447145158

COMMON ISSUES RELATED TO ALL METHODOLOGICAL FRAMEWORKS PRESENTED IN THE GEF GUIDELINES

7. The findings and recommendations of the three working groups presented in this section respond to the two main issues highlighted by the GEF Council.

Revising the Definition of Indirect GHG Emission Reductions

8. The GEF's existing definition and use of the terms "direct emission" and "indirect emission" do not correspond with the widely accepted use of the terms in GHG accounting methodologies. In particular, the GEF's use of "indirect emissions" made it difficult to compare GEF GHG impact with that of other institutions using alternative definitions of "indirect emissions" (Table 1). Therefore, as a first step in improving GHG accounting, it is recommended that the GEF definition is updated so that it is harmonized with the international standards and best practice.

Table 1: Existing Definitions of "Indirect Emissions"

Institution	Purpose	Definition
UNFCCC Clean Development Mechanism (CDM)	Project Accounting	Indirect emissions are categorized as either "off-site" or "on-site". Indirect on-site emissions are emissions from activities at the physical project site, but are only indirectly related to project activity, such as the transport of materials on site. Indirect off-site emissions are from activities that do not take place at the physical site and are not directly related to the project activity[12].
International Organization for Standardization (ISO)	Corporate Accounting	Indirect GHG emissions classified as either "energy indirect" (i.e. GHG emissions from the generation of imported electricity, heat or steam consumed by the organization) or "other indirect" (i.e. GHG emissions that are a consequence of an organization's activities, but arise from GHG sources that are owned or controlled by other organizations)[13].
World Resources Institute (WRI) GHG Protocol Corporate Standard	Corporate Accounting	Mirrors the ISO's definition. "Indirect GHG emissions are emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity. Categorized as either Scope 2 (energy purchases) or Scope 3 (value chain)"[14].
Local Governments for Sustainability Network (ICLEI)	Sub-National Accounting	Mirrors the WRI GHG Protocol Corporate Standard definition[15].

[12] https://wbcarbonfinance.org/docs/b_en_cdm_guide_ld.pdf, pg. 48
[13] www.iso.org/iso/ghg_climate-change.pdf
[14] www.wri.org/sites/default/files/pdf/ghg_protocol_2004.pdf
[15] www.iclei.org/fileadmin/user_upload/ICLEI_WS/Documents/Climate/GPC_12-8-14_1_.pdf

Institution	Purpose	Definition
Inter-governmental Panel on Climate Change (IPCC)	National Accounting	In the AFOLU Sector, "indirect emissions" refers to the formation of GHGs displaced in time and space from the activities that are their ultimate cause[16].
GEF Climate Change Mitigation Tracking Tool	Project Accounting	Lifetime indirect GHG emissions avoided (top-down and bottom-up): indirect emission reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation and catalytic action for replication.

9. Instead of the previously used term "indirect emissions", the GEF Guidelines recommend the use of "consequential emissions" defined as:

Consequential GHG emission reductions are those projected emissions that could result from a broader adoption of the outcomes of a GEF project plus longer-term emission reductions from behavioral change. Broader adoption of a GEF project proceeds through several processes including sustaining, mainstreaming, replication, scaling-up and market change. Consequential emission reductions are typically achieved after GEF project closure and occur outside of the project logical framework (logframe). Top-down and bottom-up approaches are recommended to estimate consequential emission reductions. These rely heavily on assumptions and expert judgment regarding the GEF project investment, and its assumed contribution to future market potential and penetration. As such, consequential GHG emission reductions should be reported separately from direct and/or direct post-project GHG emission reductions.

10. The GEF's definition of direct GHG emission reductions remains unchanged as follows[17]:

Direct GHG emission reductions are those emission reductions attributable to the investments made during the project's supervised implementation period, totaled over the respective lifetime of the investments.

Incorporating WRI GHG Accounting Guidance

11. A major step in improving the assessment of direct and consequential emissions was taken by adopting the guidance provided by *The World Resources Institute's GHG Protocol Policy and Action Standard*[18] (the WRI Standard). This was implemented by using referenced text directly in the manuals or by providing a link to the relevant section of the WRI Standard.

[16] This IPCC definition of indirect emissions can be found in 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 7, Precursors and Indirect Emissions, Indirect N_2O Emissions from the Atmospheric Deposition of Nitrogen in NOx and NH_3.
[17] GEF Climate Mitigation Tracking Tools, available at: www.thegef.org/gef/tracking_tool_CCM
[18] www.wri.org/publication/policy-and-action-standard

12. As GEF projects are more complex than simple capital investment projects and may have multiple components including assessments and technical assistance, GEF Agencies need more guidance on how to define a project in a standardized way. The WRI Standard provides the most suitable guidelines for the project proponents on how they define their projects. The WRI Standard serves the purpose of providing consistency and transparency for the estimation of GHG emission reductions that come about as a result of policies and actions[19]. The WRI Standard is equally useful in helping to identify the full range of causal effects, catalytic impacts and non-GHG effects (co-benefits) that GEF projects could measure and report more systematically.

13. Practical guidance on mapping a causal chain is available in the WRI Standard and can help project proponents better identify direct and consequential emission reductions at the ex-ante stage. The GEF IEO describes the GEF's well-established theory of change[20] [21], but guidance on how this can be implemented practically is not provided in the existing GEF GHG accounting methodology manuals. The GEF Guidelines address this deficiency.

14. It is recommended that project proponents use the WRI Standard to define a project boundary when applicable. Defining the project boundary in this way would allow for a more standardized description of GEF projects, and provide a more reliable estimation of causal and catalytic impacts, a key consideration when estimating potential consequential emissions as a result of the GEF intervention.

15. Accurate assumptions and estimations of baseline scenarios are cornerstones of any robust GHG accounting methodology. The WRI Standard offers guidance on collecting data and estimating emissions at a greater level of detail than the existing GEF manuals. It also provides guidance on assumptions and considerations on GHG accounting elements such as dynamic baselines, potential inclusion of sensitivity analyses and statistical methods for estimating GHG effects. However, the WRI guidance is a standard, not a methodology. Therefore, it does not provide step-by-step approaches, detailed formulas and datasets for estimating GHG emissions. It needs to be complemented by tools and datasets such as those provided in the existing GEF manuals or those recommended for use in the newly proposed frameworks. This is an advantage of the guidance – it means that it is flexible enough to be applicable to the wide range of GEF projects, while providing direction to project proponents. The WRI Standard was developed in November 2104. As of April 2015, no report has been found on the application of the Standard.

16. There is no process in place for periodically updating default factors used in the calculation of emission reductions or for directing users towards emerging or more relevant datasets. To ensure that GHG accounting tools remain relevant over time, the GEF Guidelines recommend that project proponents refer to and incorporate the relevant guidance and good practice set out in the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (Chapter 5, Time Series Consistency) and in the WRI Standard.

[19] As per the standard: "'policies' and 'actions' refer to interventions taken or mandated by a government, institution, or other entity, and may include laws, directives, and decrees; regulations and standards; taxes, charges, subsidies, and incentives; information instruments; voluntary agreements; implementation of new technologies, processes, or practices; and public or private sector financing and investment".

[20] www.thegef.org/gef/sites/thegef.org/files/documents/Impact%20-%20Climate%20Change%20Mitigation%20IE.pdf

[21] www.thegef.org/gef/sites/thegef.org/files/documents/OPS5-Final-Report-EN.pdf

17. Recommended meta-datasets for use in GHG accounting have been identified throughout the GEF Guidelines. For example, the frameworks developed for urban, stationary combustion of biomass and AFOLU projects all include emission factor datasets (or reference to suitable ones) and other recommended GHG accounting inputs. In addition, meta-datasets have been identified for the existing manuals, such as the Institute for Global Environmental Strategies (IGES) collation of national grid emission factors and benchmark performance standards for EE measures used by the European Union.

18. The GEF should communicate the significant co-benefits of its climate mitigation projects more effectively. There are many co-benefits of GEF projects including positive economic development impacts, employment benefits, local pollution and public health benefits, awareness of the importance of climate change mitigation and energy savings through its projects. The GEF IEO has already identified five pathways for the broader impact of GEF projects – sustaining, mainstreaming, replication, scaling-up and market change. These pathways should be better integrated within a standardized approach to mapping a causal chain. By requiring methodology users to sketch out simple illustrations of causal chains – even for non-GHG co-benefits – allows for consideration of various effects at each stage and, for example, assists in identifying other consequential emission reductions attributable to the original policy impact that may not have been considered previously.

19. The current GEF's monitoring and evaluation mechanisms are not developed sufficiently for systematically estimating ex-post GHG emission reductions. They are not covered by the existing GEF's Tracking Tool for Climate Change Mitigation (CCM) Projects[22] and they are not described in the GEF existing methodologies for EE, renewable electricity and transportation projects. However, they were considered in the new accounting frameworks for urban, stationary biomass combustion and AFOLU projects. Accurate ex-post calculations enable the evaluation of project success, communication with donors, and the use of the data to design policies and projects. If reliable data are to be made available for the ex-post calculation of direct and consequential emission reductions, a good monitoring plan needs to be in place. While the GEF guidelines did not address this issue directly, it is recommended that the GEF Partnership – including the GEF Secretariat, the GEF Council, GEF Agencies, the GEF IEO, STAP and the GEF CSO network – consider how direct and consequential GHG emission reductions may be monitored after project completion. Many of the GEF investment benefits are likely to be most compelling after project completion. Therefore, ex-post monitoring of a sub-set of GEF projects may be beneficial to inform future project design and implementation.

20. The GEF Guidelines recommend that GHG direct and consequential emission reductions are documented in final evaluation reports. During the project implementation period, GEF Agencies have difficulties in reporting reliable amounts of GHG direct and consequential emission reductions, since project equipment and construction works to generate GHG reductions are often installed at the end of the project implementation. Therefore, the frequency and scope of ex-post monitoring and reporting is an item listed in the Conclusions and Recommendations section of this paper as an area for further discussion with the GEF IEO.

[22] www.thegef.org/gef/tracking_tool_CCM

21. More guidance should be provided with respect to monitoring. The WRI Standard can assist GEF Agencies by offering clear guidance on monitoring, yet still remains flexible enough to be applied to the broad spectrum of GEF project types. GEF Agencies can be directed towards monitoring parameters such as those used in CDM projects where it is feasible to draw upon lists of standardized monitoring parameters and ways of describing a monitoring plan (e.g. roles and responsibilities, and quality assurance/quality checking (QA/QC) procedures). It would mean taking advantage of the CDM methodologies, without needing to comply with the overall CDM methodology or project registration process. By doing so, feedback from the GEF IEO will be addressed[23].

FINDINGS AND RECOMMENDATIONS WITH RESPECT TO THE EXISTING GEF METHODOLOGIES

22. The title of the existing 2008 GEF "Manual for Estimating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects" should be renamed to use the term "renewable electricity" (REL). This will reflect its focus on renewable electricity generation and not renewable energy (e.g. it does not cover renewable heat or biofuels projects). The sections in the EE Manual should also be removed as this guidance has now been superseded by a dedicated Manual for EE projects.

23. The three existing GEF GHG manuals, when updated, should incorporate actual case studies rather than providing theoretical examples. An actual case study or adding further detail to the examples provided would offer more context to the decision on how to apportion emission reductions as either direct, direct post-project or consequential emission impacts.

24. To refine assumptions on the lifetime of equipment, it is recommended that project proponents use the UNFCCC "Tool to Determine the Remaining Lifetime of Equipment"[24] in all applications for project funding. The current guidance in GEF manuals ensures comparability and consistency of approach to an extent, but lacks specific guidance such as on the lifetime of equipment. This technical recommendation will add a greater degree of accuracy to baseline modeling and emission reductions calculations for RE and EE projects.

25. It is recommended that GEF Agencies use the UNFCCC's "Guidelines for the Reporting and Validation of Plant Load Factors"[25] in all applications for project funding. Plant load factor is a key input into the calculation of activity data which, in turn, determine emissions and emission reductions. The UNFCCC guidelines provide minimum criteria to estimate, ex-ante, the plant load factor associated with a proposed project activity. Reliable plant load factors will make these emission reductions estimations more accurate. This recommendation is applicable to the RE and EE Manuals.

26. It is recommended that project proponents use the UNFCCC's "Tool to calculate the emission factor for an electricity system"[26]. It provides definitions and methodologies to calculate Operating and Build Margins (to make a Combined Margin) for electricity systems.

[23] Which stated that guidance is needed for "how, at project implementation and project completion, agencies should clarify the assumptions used and update the values of parameters such as emission factors, capacity factors, and timescales"
[24] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf
[25] https://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid35.pdf
[26] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

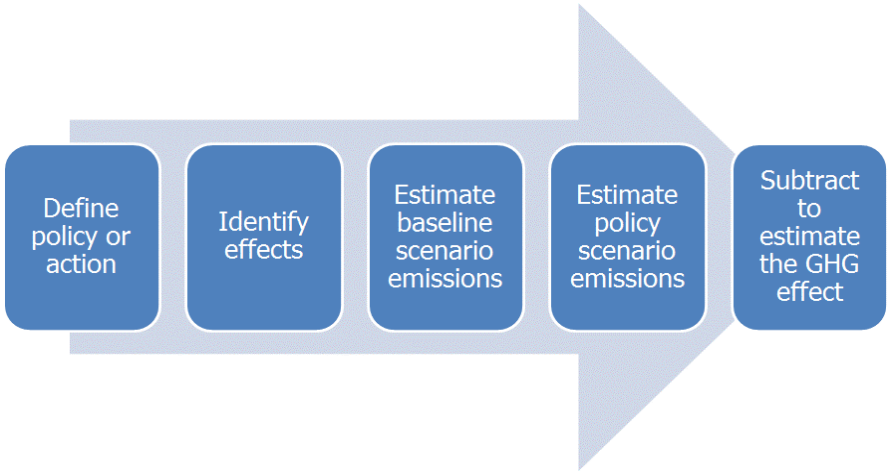
When calculating Operating Margin, the "Simple Operating Margin" option in the tool requires the use of a number of years' data. Therefore, the tool also takes into account fluctuations in primary fuel prices and generation due to seasonal factors affecting existing RE plants.

27. Although the GEF-6 CCM strategy supports actions to reduce black carbon (BC) emissions, the GEF does not account for reductions in BC resulting from climate change mitigation or other projects. STAP is in the process of developing an information document that would assist GEF partners in designing projects addressing BC emissions[27]. When applicable, BC emission reductions expected to be generated by GEF projects should be optionally considered as a co-benefit of GEF investments.

PROPOSED NEW FRAMEWORKS IN THE GEF GUIDELINES

28. In the following sections, the WRI Standard is used in the frameworks to estimate the GHG emission reductions impact realized as a result of GEF urban, stationary combustion of biomass and AFOLU projects. An illustration of the basic procedure employed by a typical GHG mitigation project accounting in the GEF Guidelines is shown in Figure 1.

Figure 1: WRI Procedure for Estimating Emission Reductions from Projects to be used in the GEF Guidelines



Source: WRI

29. The proposed new frameworks follow the approach, terminology, and principles outlined in the existing Manual for Calculating Greenhouse Gas Benefits of Global Environment Facility Transportation Projects[28]. Furthermore, they use the lessons learned from experience to tailor these methodologies expressly for the thematic focus of the target projects. A framework approach provides uniformity in the calculations and assumptions used to estimate the GHG mitigation impact over a diverse array of potential projects, which may be expanded in future. It does so by providing elements that the GEF might recommend

[27] Sims, R., V. B. Gorsevski, and S. Anenberg (2015). Black Carbon Mitigation and the Role of the Global Environment Facility: A STAP Advisory Document. Global Environment Facility, Washington, D.C – in preparation.

[28] www.thegef.org/gef/pubs/STAP/CO2-Calculator

as being preferred for use, along with associated guidance where required, which GEF Agencies can use when estimating emission reductions from projects focused on urban sector, stationary biomass combustion or AFOLU projects.

30. The frameworks guide the development of ex-ante, mid-term and ex-post estimations of the GHG impacts of a diverse array of potential GEF projects. However, the purpose of the different methodologies in the respective frameworks goes beyond mere impact estimation; they are designed to encourage high-quality project design, increase consistency and maintain objectivity in impact estimation.

31. In addition to global environmental benefits, GEF projects also produce significant "local co-benefits" that, in many cases, could be the primary justification for the host country to pursue the project. While local co-benefits do not directly create global benefits, they can increase the engagement and investment of local stakeholders and they can increase the replication potential of projects. Co-benefits have been discussed as part of this project, but the GEF and its stakeholders agree that accounting for these co-benefits is beyond the scope of the project which led to this recommendations paper.

RECOMMENDED FRAMEWORK FOR URBAN SECTOR PROJECTS (ANNEX 3)

32. The new Urban Sector Framework has been proposed as a result of consultation with the working groups that led to the recommendations in this document. The methodologies recommended in this Framework are referred to as Urban Project Methodologies (UPMs). The UPMs are used to estimate GHG emissions for the baseline and the alternative scenario.

33. The following UPMs for city/community/urban GHG emissions estimations are recommended for use by GEF Agencies:

(a) The WRI Standard;

(b) Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)[29];

(c) Publicly Available Specification (PAS) 2070:2013, Specification for the assessment of GHG emissions of a city – direct plus supply chain and consumption-based methodologies[30];

(d) Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories[31]; and

(e) 2006 IPCC Guidelines for National Greenhouse Gas Inventories [32] (IPCC Guidelines).

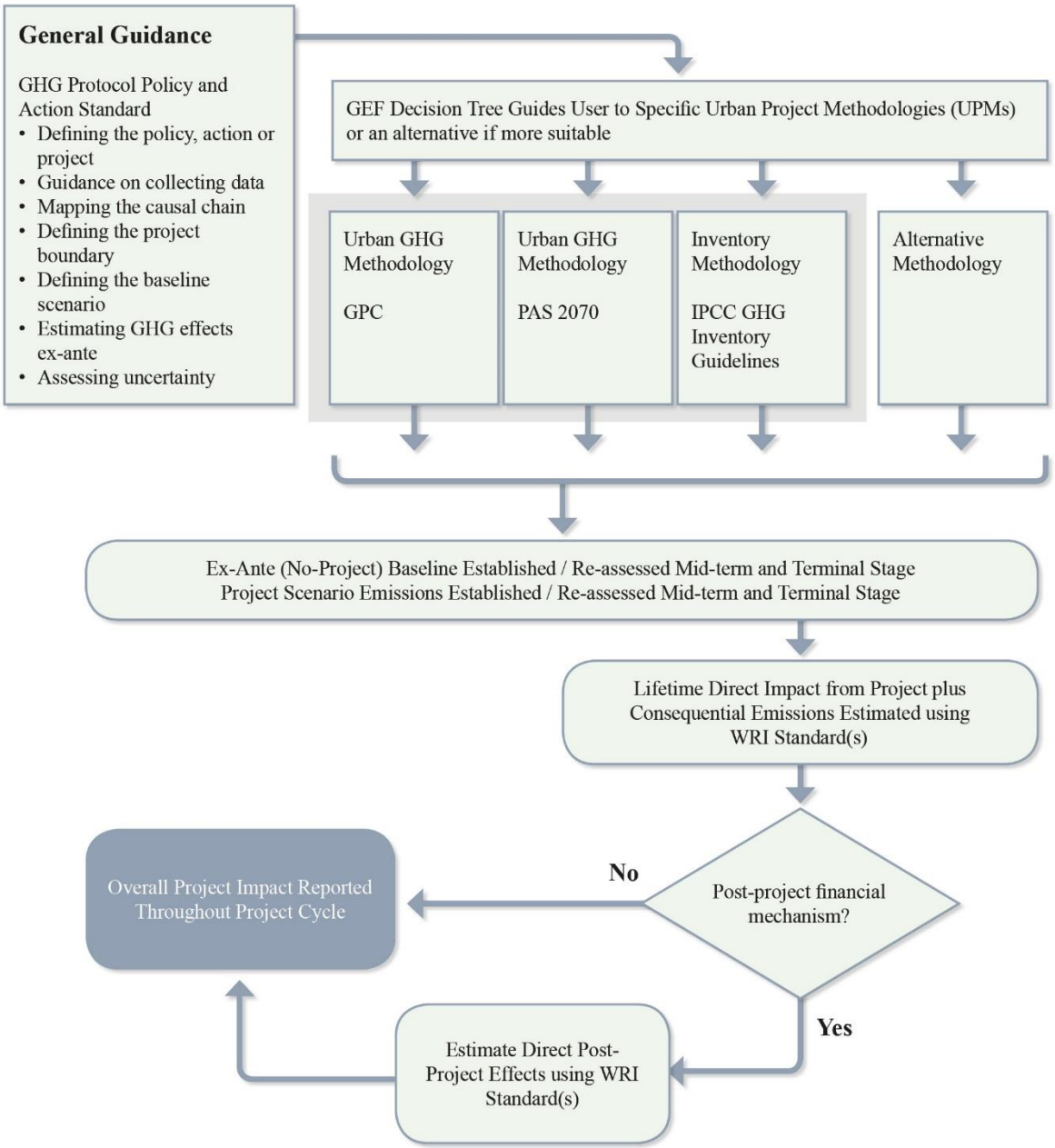
34. The WRI Standard is described above. The GPC is also produced by the WRI GHG Protocol team and is an inventory-type methodology, with guidance to help GEF Agencies estimate emissions. The British Standards Institution (BSI) methodology (PAS 2070) was developed by an international steering group of experts and has a wider scope than the GPC.

[29] www.ghgprotocol.org/city-accounting
[30] http://shop.bsigroup.com/forms/PASs/PAS-2070-2013/
[31] www.ipcc-nggip.iges.or.jp/public/gl/invs1.html
[32] www.ipcc-nggip.iges.or.jp/public/2006gl/

The IPCC Guidelines form the basis for many other methodologies, including the GPC and PAS 2070, both of which use the same reporting categories.

35. A graphical illustration of the Urban Sector Framework is shown in Figure 2. Steps for employing it for GHG accounting are presented beneath. The GEF Guidelines also include decision tree diagrams.

Figure 2: Proposed Urban Sector Framework



36. The steps for employing the new Urban Sector Framework to estimate emission reductions are:

(a) Use the WRI Standard to define the project (e.g. a project within a defined urban district that will mitigate GHG emissions across several integrated sectors), map the causal chain, define project boundaries and scenarios, etc.;

(b) For GHG accounting methodologies (see WRI Standard, section 8.4.3), use the decision tree in this Framework to select one of the three recommended methods – the GPC, PAS 2070 or the IPCC Guidelines. Alternatively, use the WRI Standard in conjunction with another methodology deemed more suitable, if it can be justified why this would lead to a more reliable estimation of GHG impact;

(c) Use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions – ex-ante, mid-term and terminal stage (including direct and consequential emissions); and

(d) Estimate and report the emissions mitigation impact of the project.

RECOMMENDED FRAMEWORK FOR STATIONARY COMBUSTION OF BIOMASS PROJECTS (ANNEX 4)

37. The new Stationary Combustion of Biomass Framework[33] is proposed as a result of consultation with the working groups set up, which led to the recommendations made in this paper. It guides project proponents in the development of ex-ante, mid-term and ex-post estimations of the GHG impacts of stationary biomass combustion projects (e.g. the Framework does not apply to mobile combustion of biomass-based fuels).

38. This Framework is important for many reasons, including providing project proponents with methods for accounting for the complex upstream emissions from the growth, harvest, transport, processing and use of biogenic feedstocks at a stationary source[34]. Due to the production and consumption cycles of biomass feedstocks as well as the related issue of "leakage" [35] [36], GEF Agencies will need to further consider the net atmospheric contributions of biogenic carbon dioxide (CO_2) emissions[37] in developing projects.

[33] At the request of STAP, the proposed accounting framework applies to both, the "biomass-to-power" and "biomass-to-heat" projects.

[34] These refer to the upstream supply chain or "fuel chain".

[35] "Leakage" refers to the indirect impact that a targeted activity in a certain place at a certain time has on carbon storage at another place or time.

[36] The CDM provides useful tools for estimating emissions associated with leakage from biomass projects which can be used in conjunction with the tools provided in this framework.

[37] Net atmospheric emissions take into account factors related to the biological carbon cycle. These factors include changes in biogenic carbon-based stocks and emissions—known as "carbon fluxes"—that occur (or are avoided) as a result of (1) feedstock growth and harvest; (2) processing, transport, storage, and use of a biogenic feedstock at the stationary source; and/or (3) the possible alternative fate of biogenic feedstock materials if not used for bioenergy. The GEF Agencies need to consider these issues in project development and implementation.

39. The following methodological tools are recommended for use by project proponents:

(a) The UK Solid and Gaseous Biomass Carbon Calculator, Version 2.0, January 2015[38];

(b) Biograce II, Harmonised Greenhouse Gas Calculations for Electricity, Heating and Cooling from Biomass, Version 2, January 2015[39];

(c) CDM Methodology Booklet, Sixth edition, UNFCCC, November 2014[40];

(d) International Finance Corporation (IFC) Greenhouse Gas Reduction Accounting Guidance for Climate-Related Projects; IFC Climate Business Department, December 2013[41];

(e) The WRI GHG Protocol for Project Accounting[42]; and

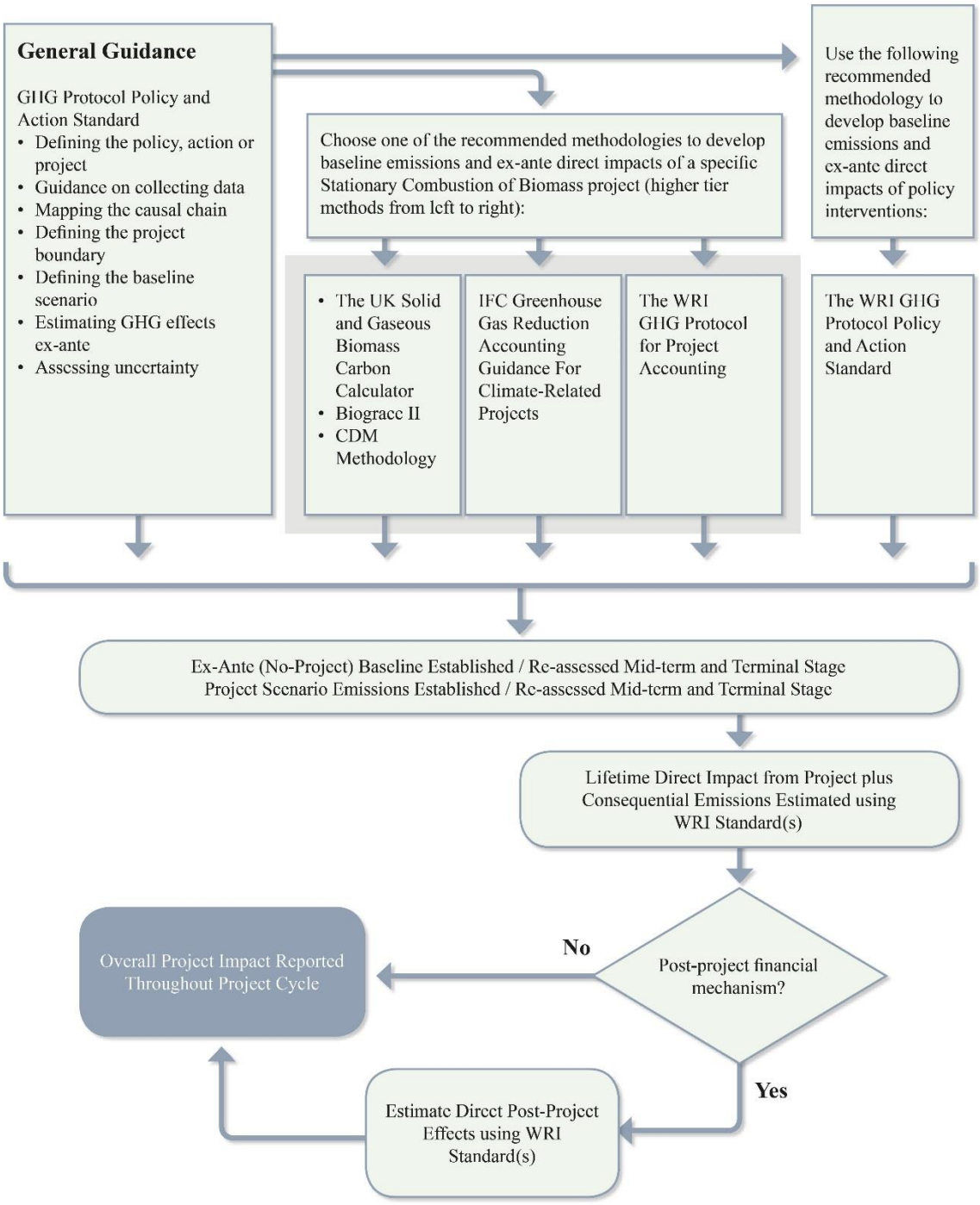
(f) The WRI GHG Protocol Policy and Action Standard.

40. The UK Biomass & Biogas Carbon Calculator and the Biograce II tool are based on assumptions for Europe, but are fully customizable for other regions. These tools – along with the CDM tools – require GEF Agency expertise. However, they are robust enough for GEF interventions focused on physical projects, but less so for policy interventions. While the IFC methodology and the WRI Project Accounting protocol are not considered as robust as the above referenced methods, they are, nonetheless, still considered very useful. The WRI GHG Protocol Policy and Action Standard has been discussed above.

41. A graphical illustration of the Stationary Combustion of Biomass Framework is shown in Figure 3 and steps for employing it for GHG accounting are presented beneath. It should be noted that, previously, GHG accounting guidance has treated all CO_2 emitted as a result of biomass combustion as carbon neutral (CH_4 and N_2O are also emitted during the process and accounted for as direct emissions). However, debate has emerged as a result of increased scientific understanding of the net atmospheric contributions of biogenic CO_2 emissions. For this reason, a decision tree for this Framework has not been created at this point in time.

[38] https://www.ofgem.gov.uk/publications-and-updates/uk-solid-and-gaseous-biomass-carbon-calculator
[39] www.biograce.net/home
[40] https://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf
[41] www.ifc.org/wps/wcm/connect/21d21b80423bdbf19f39bf0dc33b630b/IFC+GHG+Reduction+Accounting+Guidance.pdf?MOD=AJPERES
[42] www.ghgprotocol.org/standards/project-protocol

Figure 3: Proposed Stationary Combustion of Biomass Framework



42. The steps for using the new Stationary Combustion of Biomass Framework for GHG accounting are:

(a) Use the WRI Standard to define the project, map the causal chain, and define project boundaries and scenarios, etc.;

(b) Select the most appropriate recommended methodology for the proposed project (the more detailed methods are listed from left to right in the diagram).

Alternatively, use the WRI Standard in conjunction with another methodology deemed more suitable if it can be justified why this would lead to a more reliable estimation of GHG impact;

(c) Use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions – ex-ante, mid-term and ex-post stages (including direct and consequential emissions); and

(d) Estimate and report the emissions mitigation impact of the project.

RECOMMENDED FRAMEWORK FOR AFOLU PROJECTS (ANNEX 5)

43. The new AFOLU Framework designed by the working groups can be applied to different AFOLU project types that are typically funded by the GEF including those addressing land degradation, sustainable forest management, improvement of smallholder agriculture, biodiversity conservation and enhancement of carbon stocks. Depending on the AFOLU project type, the Framework provides guidance for voluntary or mandatory reporting and help in the selection of a specific GHG accounting methodology.

44. A graphical illustration of the AFOLU Framework is shown in Figure 4. Steps for employing it for GHG accounting are presented beneath.

45. The steps for employing the new AFOLU Framework for GHG accounting are:

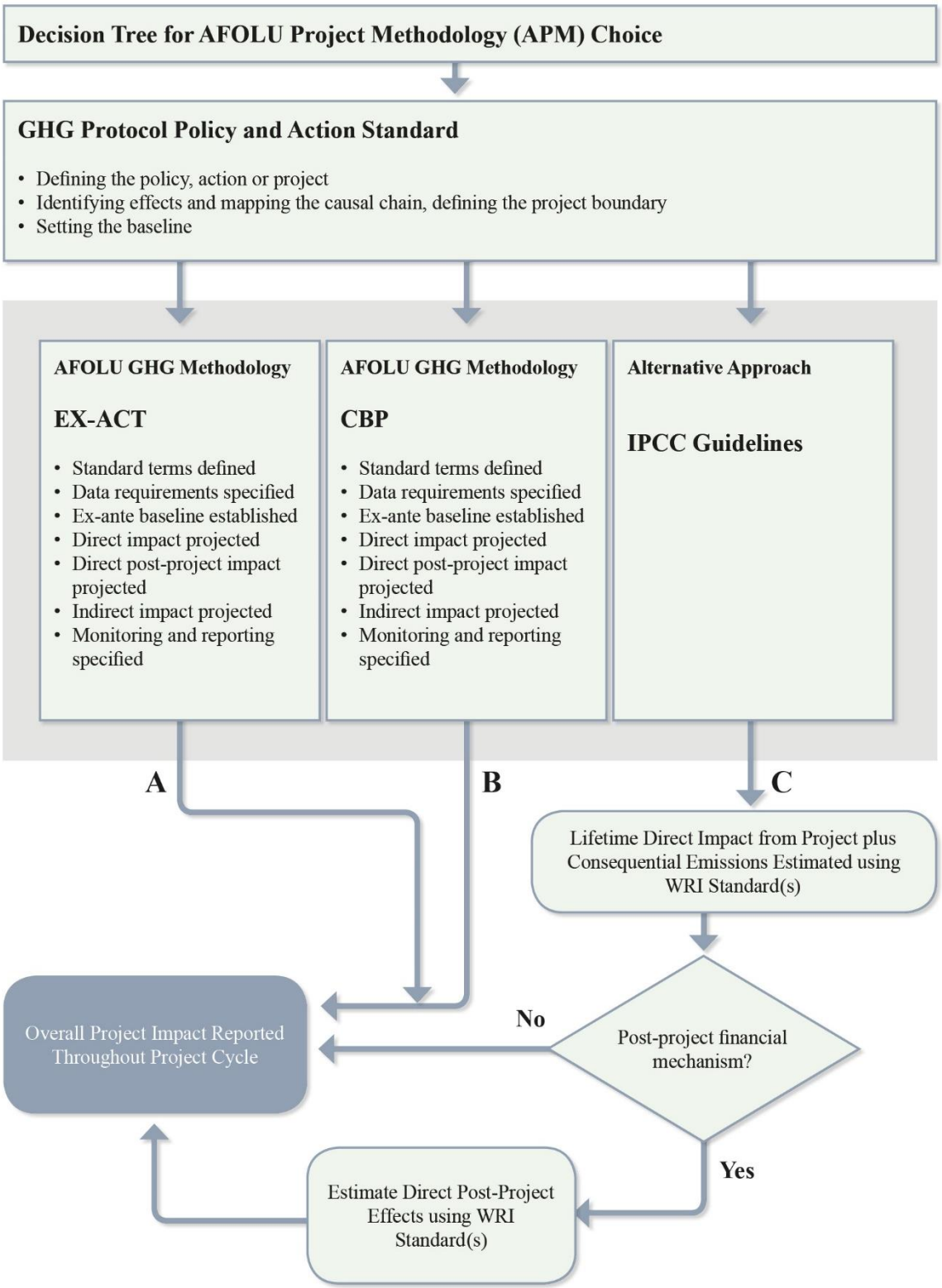
(a) Use the decision tree in the AFOLU Framework to select a GHG accounting methodology (see WRI Standard, section 8.4.3);

(b) Use the selected GHG accounting methodology alongside the WRI Standard to define the project (e.g. a project that influences GHG emissions from changes to land management in an agricultural or forestry context), map the causal chain, define boundaries and scenarios etc.;

(c) Use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions – ex-ante, mid-term and terminal stage (including direct and consequential emissions); and

(d) Estimate and report the GHG emission reductions of the project.

Figure 4: Proposed AFOLU Framework



CONCLUSIONS AND RECOMMENDATIONS

46. The three working groups conclude this document by making the following key recommendations:

(a) The GEF Secretariat should actively participate in the IFIs Harmonization Initiative with respect to the promotion of these Guidelines, their revision and future developments in GHG accounting.

(b) For the estimation of the GHG impact of urban, stationary combustion of biomass and AFOLU projects, the GEF Agencies and project proponents should use the guidelines and methodological frameworks as proposed in the Annexes of this document. Recommendations of this document for the three existing GEF methodologies are also applicable to all relevant GEF projects.

(c) In addition to GHG reduction benefits, GEF projects generate other benefits that, in many cases, could be the primary justification for the host country to pursue the project. Such multiple benefits increase the engagement and investment of local stakeholders in project success and increase the replication potential of projects – both of which result in increased global environmental benefits. As they are an essential driver for GEF interventions, additional work to better define, measure and report multiple benefits should be undertaken within the context of GEF's efforts to improve the overall monitoring and evaluation of GEF impact.

(d) The value of and need for GEF Agencies to produce mid-term and terminal evaluation reports to estimate the GHG impact of GEF projects should be reconsidered. Reporting and evaluation at these stages can be useful for conventional capital investment projects where impact is realized almost instantaneously. However, for GEF projects, where construction might take place at the end of the project that provides an enabling environment for investment, it may appear that there has been no significant GHG impact due to the GEF project at the mid-term or even terminal evaluation points. If GEF Agencies continue reporting GHG emission reductions at project mid-term stage, it is recommended that they incorporate or modify the WRI Standard's Reporting Template to help capture impacts and outcomes. This recommendation is not meant to create an additional reporting burden for GEF Agencies, but GEF Agencies can improve their project monitoring and evaluation practice to meet general transparency and completeness criteria expected for GHG reporting.

(e) The GEF should strengthen institutional support for ex-post monitoring, evaluation and reporting of GHG emission reductions of GEF projects. It is recommended that the GEF IEO establishes a protocol and working procedures to undertake ex-post evaluations for relevant GEF projects on a regular basis.

(f) When applicable, BC emission reductions expected to be generated by GEF projects should be optionally considered as one of the multiple benefits of GEF investments in the future reports by GEF Agencies.

ANNEX 1: INTRODUCTION AND SCOPE

1. Today, the GEF has documents called manuals for the estimation of GHG benefits from RE, EE and transportation projects. They all provide step-by-step methodologies to conduct ex-ante and ex-post GHG estimations. However, in the EE and Transportation Manuals, a framework approach is taken to guide the manual user through the step-by-step process. Depending on the type of project, the user is directed to different "modules" (EE) or "emissions evaluation models" (transportation) within the Framework. Dedicated spreadsheet-based calculation tools are provided for the four EE modules and transportation models. Transportation Emissions Evaluation Models for Projects (TEEMPs) are available for projects involving:

(a) Building codes;

(b) Demonstration and diffusion of technologies;

(c) Financial instruments; and

(d) Standards and labeling.

2. A simplified tool is also provided in the RE Manual. Standardized datasets are referred to or provided with the manuals, some are more comprehensive than others.

3. It is recommended that a similar approach to that used in the Transportation Manual be used for the proposed new frameworks presented in the following annexes.

4. Within the frameworks, relevant methodologies are identified to guide GEF Agencies through the necessary steps to estimate GHG benefits at appropriate stages in GEF projects. The basic steps for estimating the impacts of GHG mitigation policies is summarized in

Figure A1.1: Overview of Steps

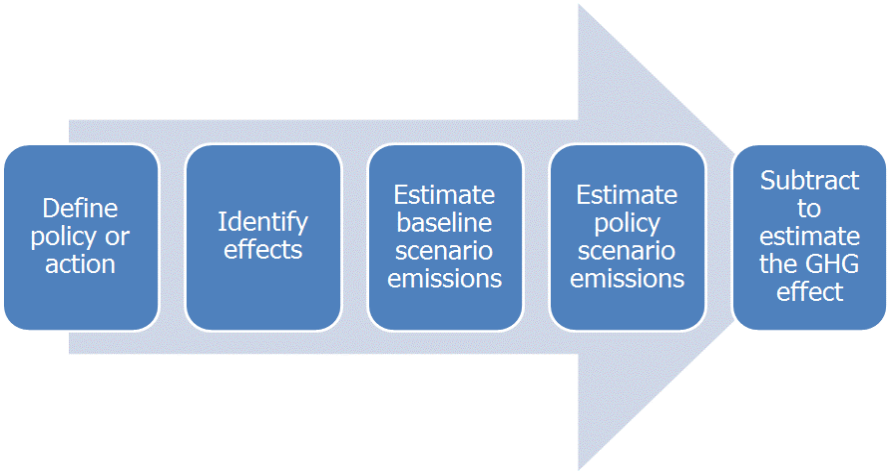


Figure A1.1.

Source: WRI Standard

5. For the proposed new frameworks:

   (a) Where the identified methodologies do not have associated estimation/ modeling tools, complementary options are suggested; and

   (b) Where a methodology is considered to not cover all or enough of the project components, the user can refer to the WRI Standard for guidance on boundary setting, baseline estimations, monitoring plans, etc. This Standard is considered to represent best practice in the challenging task of estimating the GHG emissions of policies.

ANNEX 2: DEFINITIONS OF KEY GHG ACCOUNTING TERMS

Activity data	A quantitative measure of a level of activity that results in GHG emissions. Activity data is multiplied by an emission factor to derive the GHG emissions associated with a process or an operation. (Adapted from WRI)
Alternative [GEF] scenario	Represents the events or conditions most likely to occur in the presence of the GEF policy being assessed. (Adapted from WRI)
Assessment [GHG] boundary	The scope of the assessment in terms of the range of GHG effects (and non-GHG effects, if relevant), sources, and greenhouse gases that are included in the assessment. (Adapted from WRI)
Baseline scenario	Represents the events or conditions most likely to occur in the absence of the GEF policy (or package of policies) being assessed. (Adapted from WRI)
Biomass	Non-fossilized and biodegradable organic material originating from plants, animals and micro-organisms including: (a) Biomass residue; (b) The non-fossilized and biodegradable organic fractions of industrial and municipal wastes; and (c) The gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material. (UNFCCC, CDM Glossary Terms)
Biomass Residues	Non-fossilized and biodegradable organic material originating from plants, animals and micro-organisms which is a by-product, residue or waste stream from agriculture, forestry and related industries. (UNFCCC, CDM Glossary Terms)
Carbon stocks	The absolute quantity of carbon held within a reservoir (e.g. oceans, soils and forests) at a specified time. (Adapted from EPA)

City boundary	Border of a city or urban area. NOTE: The city boundary is usually geopolitical and defined by one or more municipal governments. (PAS 2070)
Co-benefit	The positive effects that a policy or measure aimed at one objective [for the GEF – GHG mitigation] might have on other objectives, irrespective of the net effect on overall social welfare. Co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices. Co-benefits are also called ancillary benefits. (Adopted from IPCC AR5)
Consequential GHG emissions	Consequential GHG emission reductions are those projected emissions that could result from a broader adoption of the outcomes of a GEF project, plus longer-term emission reductions from behavioral change. Broader adoption of a GEF project proceeds through several processes including sustaining, mainstreaming, replication, scaling-up and market-change. Consequential emission reductions are typically achieved after GEF project closure and occur outside of the project logframe. Top-down and bottom-up approaches are usually recommended to estimate consequential emission reductions. They rely heavily upon assumptions and expert judgment regarding the GEF project investment and its assumed contribution to future market potential and penetration. As such, consequential GHG emission reductions should be reported separately from direct and/or direct post-project GHG emission reductions.
Consumption-based GHG emissions	Direct and lifecycle emissions from all goods and services used and consumed by households (e.g. emissions are allocated to the final consumers of the goods and users of the services, rather than the producers and providers respectively). (Adapted from PAS 2070, p.1)
Direct GHG emission reductions	Direct CO_2 emission reductions achieved by investments that are directly part of the results of the projects. (GEF Transportation Manual)

Direct post-project GHG emissions	Direct post-project emission reductions achieved through those investments that are supported by GEF-sponsored revolving financial mechanisms still active after the project's conclusion (GEF Transportation Manual)
Discounting [for GHG emissions]	An approach used to assess the likelihood of achieving GHG impact potentials by comparing prior GEF ex post and ex ante analyses (where similar methodologies were used for both). (Adapted from GEF Guidelines)
Economic consumption	The use of goods and services by households.
Emissions factor	A factor that converts activity data into GHG emissions data (e.g. kg of carbon dioxide equivalent (CO_2e) emitted per liter of fuel consumed, kg of CO_2e emitted per kilometer travelled, etc). (Adapted from GPC, p.163)
GEF causality factor	The percentage of a realized market potential that can be reasonably attributed to the long-term effect of a project as the result of overcoming market barriers. (Adapted from GEF Guidelines)
Leakage	Leakage refers to the indirect impact that a targeted activity in a certain place at a certain time has on carbon storage at another place or time (US EPA)
Lifetime of investment	A temporal parameter for projects that is impacted by the various technologies, investment conditions, and assumptions associated with each project. (Adapted from GEF Guidelines)
Offsetting	Offsets are discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory GHG target or cap. They are calculated relative to a baseline that represents a hypothetical scenario for what emissions would have been in the absence of the mitigation project that generates the offsets. To avoid double counting, the reduction giving rise to the offset must occur at sources or sinks not included in the target or cap for which it is used. (Adapted from WRI)

Replication factor	The number of times an investment will be repeated during the "influence period" (e.g., 10 years) after the closure of a project. (Adapted from GEF Guidelines)
Slow steaming	Operating at a speed above the cut-out point of the ship's auxiliary blowers and that it will not result in the engine being operated outside the manufacturer's recommendation. (DTU Transport, Technical University of Denmark)

ANNEX 3: GUIDELINES FOR ESTIMATING THE GHG BENEFITS OF URBAN SECTOR PROJECTS

1. A framework approach provides uniformity in the estimations and assumptions used to estimate the GHG mitigation impact over a diverse array of potential projects, which may be expanded in future. This new Urban Sector Framework provides the first methodology designed specifically for projects in the urban sector. The need is furthered by the increased focus on integrated sustainable cities projects as part of the GEF-6 replenishment, where a move from project types on a city level to an integrated approach to GHG accounting is desired.

2. It follows the general framework, terminology and principles of the earlier GEF modules. More importantly, it uses the lessons learned from experience to tailor these methodologies expressly for urban projects.

3. The GEF Urban Sector Framework guides the development of ex-ante estimations of the GHG impacts of urban interventions (projects) as accurately as possible, without requiring data so exacting that it discourages investment in the sector.

4. However, the purpose of the different methodologies within the Framework goes beyond mere impact estimation. They are designed to encourage high-quality project design, increase consistency and maintain objectivity in impact estimation.

Overview for Applying the GEF Urban Sector Framework

5. This Framework refers to existing methodologies for the assessment of GHG mitigation impacts of urban projects. The methodologies can be used to assess GHG emissions for:

(a) Ex-ante assessment of baseline emissions (i.e. emissions assuming the project is not implemented) and GHG mitigation impacts of a project;

(b) Mid-term project monitoring and reporting; and

(c) End-of-project update of the baseline emissions and estimated GHG mitigation impacts, terminal evaluations and other ex-post assessments.

6. The methodologies recommended in this Framework are referred to as Urban Project Methodologies (UPMs). Please refer to paragraph 80 for details of who developed the UPMs.

7. The UPMs are used to estimate GHG emissions for the baseline and for the alternative scenario. Estimation of mitigation values shall be assessed with guidance from the WRI Standard. Emission reductions attributable to the GEF project will be obtained by subtracting alternative scenario emissions from baseline scenario emissions.

Concepts Used in Developing the Framework

8. This guidance was developed from the following concepts:

(a) Changes in greenhouse gases related to a given policy change may be insignificant thereby justifying an exclusion from the GHG assessment.

Estimation of GHG emission changes should be done only for projects where implementation is expected to cause significant changes to GHG emissions.

(b) Assessment of changes in GHG emissions shall be done at a sector level (e.g. using a transport-specific framework for a project that is designed to change transport infrastructure) unless it can be shown that the project implementation effects will cause significant changes in GHG emissions outside of the target sector. If significant GHG changes are expected outside of the target sector, this can be determined by causal chain mapping (please refer to Section 6.3 of the WRI Standard) and this Framework shall be used.

(c) In using this Framework, the GEF Agency shall decide whether the estimation of GHG benefits of urban sector projects requires the benefits to be reported in the context of the emissions from the urban community as a whole. The GHG benefits may be reported for the scope of the causal chain or at a whole community level by assessing the community GHG inventory and/or the emissions associated with community economic consumption.

(d) For benefits to be reported in the context of the emissions from the urban community as a whole, the GEF Agencies shall decide whether the project implementation is expected to significantly influence economic consumption of goods and services produced outside the urban community boundary. If this is the case, the effects of the project implementation on GHG emissions associated with economic consumption shall be assessed.

Assumptions in Applying the GEF Framework for Urban Sector Projects

9. The data and assumptions necessary for the GHG emissions reduction assessment will vary according to the type of urban projects being assessed. However, some general rules are important in all steps of a GHG mitigation impact assessment for the GEF:

(a) The assessment methodology shall be based on the IPCC Guidelines. Using the same emissions categories allows the use of IPCC default values where appropriate. The flexibility to use the 1996 or 2006 Guidelines allows the GEF Agencies to be consistent with the guidelines used for the national GHG inventory for the country of the urban community, thus facilitating use of data from the national inventory if required;

(b) All GHG emissions are converted to tonnes of CO_2e for the project;

(c) The CO_2e reductions reported are cumulative reductions, estimated for the lifetimes of the investments. No GEF projects may claim impacts for more than 20 years after the project ends[43];

(d) There is no discounting for future GHG emission reductions;

(e) Whether or not the UPMs or other methodologies are used, all GEF impact estimations should incorporate as much locally measured data as possible.

[43] The 20 year temporal parameter for GEF projects is given in the document *Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, Version 1.0, March 2013*. This was subsequently confirmed during working group meetings as the temporal project boundary limit for evaluating the GHG impacts of GEF projects.

Please refer to the section below for guidance on data selection and for data quality rules; and

(f) Estimating GHG emission reduction impact shall be done at three points in the implementation of all GEF projects – at project document submission, mid-term during project implementation and at project completion.

Data Requirements and Selection

10. Data collection for city inventories is complex due to the wide range of activities covered, the complexity and availability of data, and the ultimate purpose of the inventory. Therefore, a wide degree of flexibility is usually required, using broad principles.

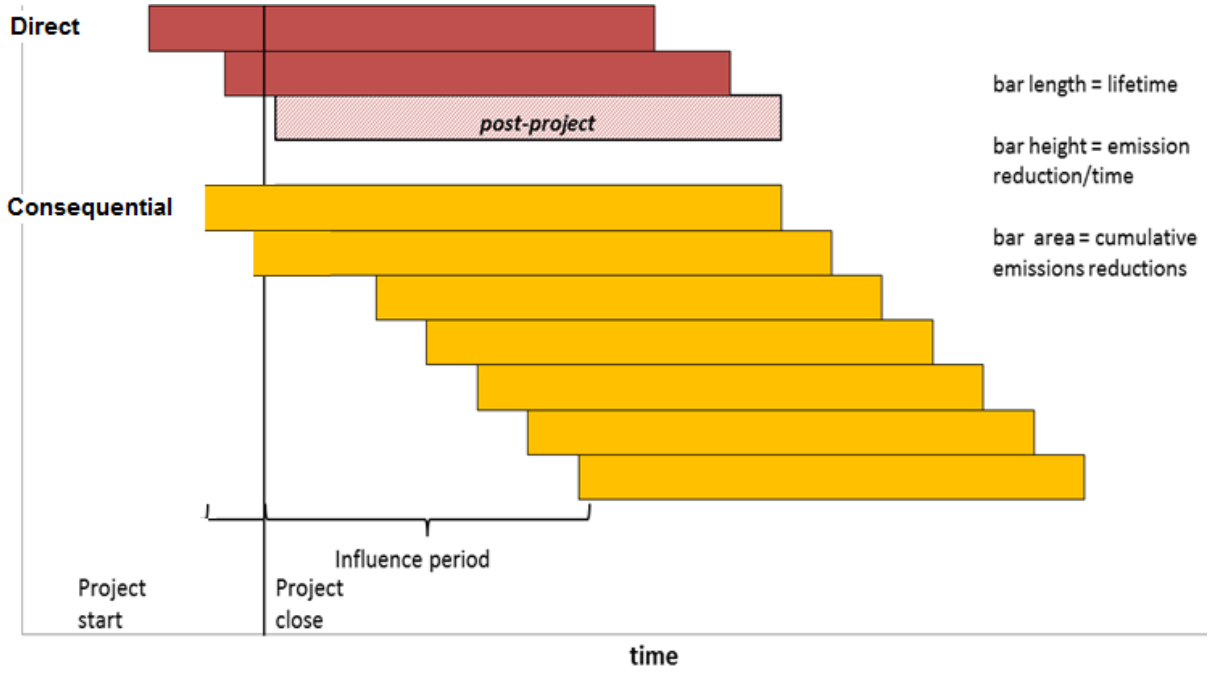
11. For most emission sources, cities will need to estimate GHG emissions by multiplying activity data by an emission factor associated with the activity being measured. Activity data are quantitative measures of a level of activity that results in GHG emissions taking place during a given period of time (e.g. volume of gas used, kilometers driven, tonnes of waste sent to landfill). An emission factor is a measure of the mass of GHG emissions relative to a unit of activity. For example, estimating CO_2e emissions from the use of electricity involves multiplying data on kilowatt-hours (kWh) of electricity used by the emission factor (kg of CO_2e/kWh) for electricity, which will depend on the technology and type of fuel used to generate the electricity.

12. There is a wide range of sources that can provide data – from local government departments and statistics agencies to utility companies and research studies by universities and other institutions. Local and national data are generally preferable to international data. This note applies for the Stationary Combustion of Biomass and AFOLU Frameworks that follow.

Defining the GHG Assessment Boundary

13. The **temporal assessment boundary** for direct GHG emissions shall include the project duration (i.e. the period of funding from the GEF), plus direct post-project GHG emissions for 20 years after the project ends. Please see Figure A3.1**Error! Reference source not found.** for an illustration of when different types of emission reduction may be generated by a project.

Figure A3.1: Emission Reductions Generated by Projects



Source: GEF Secretariat

14. The **territorial boundary** for the assessment may be a whole city or any part of an urban area that is defined geographically.

15. The boundary for activities and materials to be included in the assessment shall be as defined in the chosen methodology. The following GHGs shall be included in the assessment:

(a) Carbon dioxide (CO_2), excluding CO_2 emitted from biogenic carbon sources;

(b) Methane (CH_4);

(c) Nitrous oxide (N_2O);

(d) Hydrofluorocarbons (HFCs);

(e) Perfluorocarbons (PFCs);

(f) Sulfur hexafluoride (SF_6); and

(g) Nitrogen trifluoride (NF_3).

16. In addition to the global warming potential (GWP) of GHGs (for which emissions mitigation impacts of GEF projects shall be assessed), there is increasing interest in the emissions of BC. BC is mainly a regional pollutant that exhibits strong spatial heterogeneity and temporal variability due to its short atmospheric lifetime. Sources include vehicles, brick kilns, cooking stoves and open-field burning.

17. Although the GEF – 6 CCM strategy supports actions to reduce BC emissions, the GEF does not presently account for reductions in BC resulting from climate change mitigation or other projects. Therefore, this framework does not require, but does encourage,

the reporting of BC emissions or mitigation from implementation of GEF-funded projects. There is no mandatory requirement, but this will be considered again in future revisions.

18. STAP is in the process of developing an information document that would assist GEF partners in designing and measuring the impact of projects addressing BC emissions[44]. Where applicable, BC emission reductions expected to be generated by GEF projects should be considered (optional) as a co-benefit of GEF investments.

19. Offset mechanisms shall not be used to adjust the GHG emissions totals for baseline or project implementation assessments. Where offset mechanisms for GHG emissions are implemented in a business-as-usual (baseline) context or within a project, the quantity of GHG emissions that is offset may be reported separately from the totals for baseline or project implementation assessments.

Categories and Sources of Data

20. The GPC, one of the most widely recognized approaches to city inventories, has several key categories to be covered. These are broadly consistent with PAS 2070 and with the IPCC Guidelines:

(a) Stationary energy – combustion of fuel in buildings (commercial, residential, institutional), power plants and 'fugitive emissions';

(b) Transportation – road, rail, water and air, including inter-city travel. Combustion of fuel and grid-supplied electricity;

(c) Waste – waste disposal and treatment, including decomposition and incineration;

(d) Industrial processes and product use (IPPU) – industrial processes and other activities; and

(e) AFOLU – livestock, land use and land-use change.

21. Data can be gathered from a variety of sources and should include:

(a) Definition and description of the dataset – time series, sector breakdown, units, assumptions, uncertainties and known gaps;

(b) Frequency and timescales for data collection and publication; and

(c) Contact names and organizations.

22. If these data are not available, surveys can be conducted alongside physical measurements and sampling activities.

[44] Sims, R., V. B. Gorsevski, and S. Anenberg (2015). Black Carbon Mitigation and the Role of the Global Environment Facility: A STAP Advisory Document. Global Environment Facility, Washington, D.C.

Default Values for Carbon Stocks

23. Values shall be used from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Hayama, Japan: Institute for Global Environmental Strategies, 2006.

Emissions Factors

24. Emissions factors are used along with GWP values to convert activity data into CO_2e values. Sources of emission factors shall be recorded. GEF Agencies can rely on the conservative default values provided in UPMs. Default values in other methodologies may be used, but their application will require documentation of sources.

25. The assessment may use emission factors from more than one source. For many countries, emission factors are available from government, industry or academic sources.

Data Quality

26. Data quality guidelines are given in the WRI Standard (e.g. Table 8.8 and Appendix A in the WRI Standard). Assessing the GHG impact of policies and projects is, at times, a data-intensive process, and the quality of data used directly reflects the final outcome of the GHG assessment. GEF Agencies should ensure that data collected and applied to evaluate GEF GHG projects are robust and accurately reflect the GHG emissions changes associated with their projects.

Overview of Methodologies Available

27. The GPC provides a review (Annex A of the GPC) of other methodologies for comparison with the GPC, including the following:

(a) IPCC Guidelines;

(b) International Local Government GHG Emissions Analysis Protocol (IEAP);

(c) International Standard for Determining Greenhouse Gas Emissions for Cities (ISDGC);

(d) Baseline Emissions Inventory/Monitoring Emissions Inventory methodology (BEI/MEI);

(e) US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (US Community Protocol);

(f) PAS 2070:2013, Specification for the assessment of greenhouse gas emissions of a city; and

(g) GHG Protocol Corporate Standard.

28. The WRI Standard is not included in the GPC review (because it was published after the GPC), but it is included as part of this Framework.

29. Recently, a beta-tested version of the Climate Action for Urban Sustainability (CURB) Tool has become available. CURB was developed through a collaboration between the World Bank Group, the C40 Cities network and AECOM Consulting. CURB may be a suitable methodology for GEF urban project GHG estimation. It has some advantages over

other inventory methods in that it is designed to explore and compare the impacts of different interventions. However, as it has not been fully field tested, it is not ready to be considered for GEF project assessments. It is recommended that the GEF Secretariat, STAP and the consultant firm liaise with the IFI Harmonization process to incorporate CURB as soon as it is suitably tested and ready for use.

30. The following UPMs for city/community/urban GHG emissions estimations are recommended for use by GEF Agencies:

(a) The WRI Standard;

(b) The GPC[45];

(c) PAS 2070:2013[46], Specification for the assessment of greenhouse gas emissions of a city – Direct plus supply chain and consumption-based methodologies; and

(d) IPCC Guidelines.

31. The WRI Standard is a new and widely accepted standard that sets out how to estimate and report the change in GHG emissions and removals resulting from policies and actions. It can be applied to projects and is particularly suitable for use with the types of project that are funded by the GEF.

32. The GPC is also produced by the WRI GHG Protocol team. It is a well-written, inventory-type methodology containing guidance to help a GEF Agency estimate emissions. It is highly respected and its development has taken account of the PAS 2070.

33. BSI methodology PAS 2070 was developed by an international steering group of experts. It has a wider scope than the GPC as it includes a consumption-based methodology alongside a "direct plus supply chain" (mainly territorial) methodology to estimate emissions. This additional feature was confirmed as potentially useful for some GEF projects by the GEF Secretariat.

34. The IPCC Guidelines form the basis of many other methodologies, including the GPC and PAS 2070, both of which use the same reporting categories. The IPCC Guidelines may be used in place of the GPC or PAS 2070, but the GEF Agencies will require a higher level of knowledge and expertise than that required for the GPC or PAS 2070. The flexibility to use either 1996 or 2006 guidelines allows the GEF Agencies to be consistent with the version of the guidelines used for the national GHG inventory for the country of the urban community, thus facilitating use of data from the national inventory if required.

Steps for Implementation

35. Steps for implementation are illustrated in Figure A3.2. The diagram supports the GEF Agencies in using this Framework. The steps for implementation illustrated in the diagram are described as follows:

[45] www.ghgprotocol.org/city-accounting
[46] http://shop.bsigroup.com/forms/PASs/PAS-2070-2013/

(a) Use the WRI Standard to define the project (e.g. a project within a defined urban district that will mitigate GHG emissions across several integrated sectors), map the causal chain, define boundaries and scenarios etc.;

(b) For GHG accounting methodologies (see Section 8.4.3 of the WRI Standard), use the decision tree in this Framework (see Figure A3.2 and associated guidance below) to select one of three alternative methods: the GPC, PAS 2070 or the IPCC Guidelines;

(c) Continue to use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions ex-ante, mid-term and terminal stage (including direct and consequential emissions); and

(d) Report the emissions mitigation impact of the project.

36. The WRI Standard and the GHG accounting methodologies have guidance that the user should follow to apply them correctly. This guidance covers data selection, choice of emissions factors, etc.

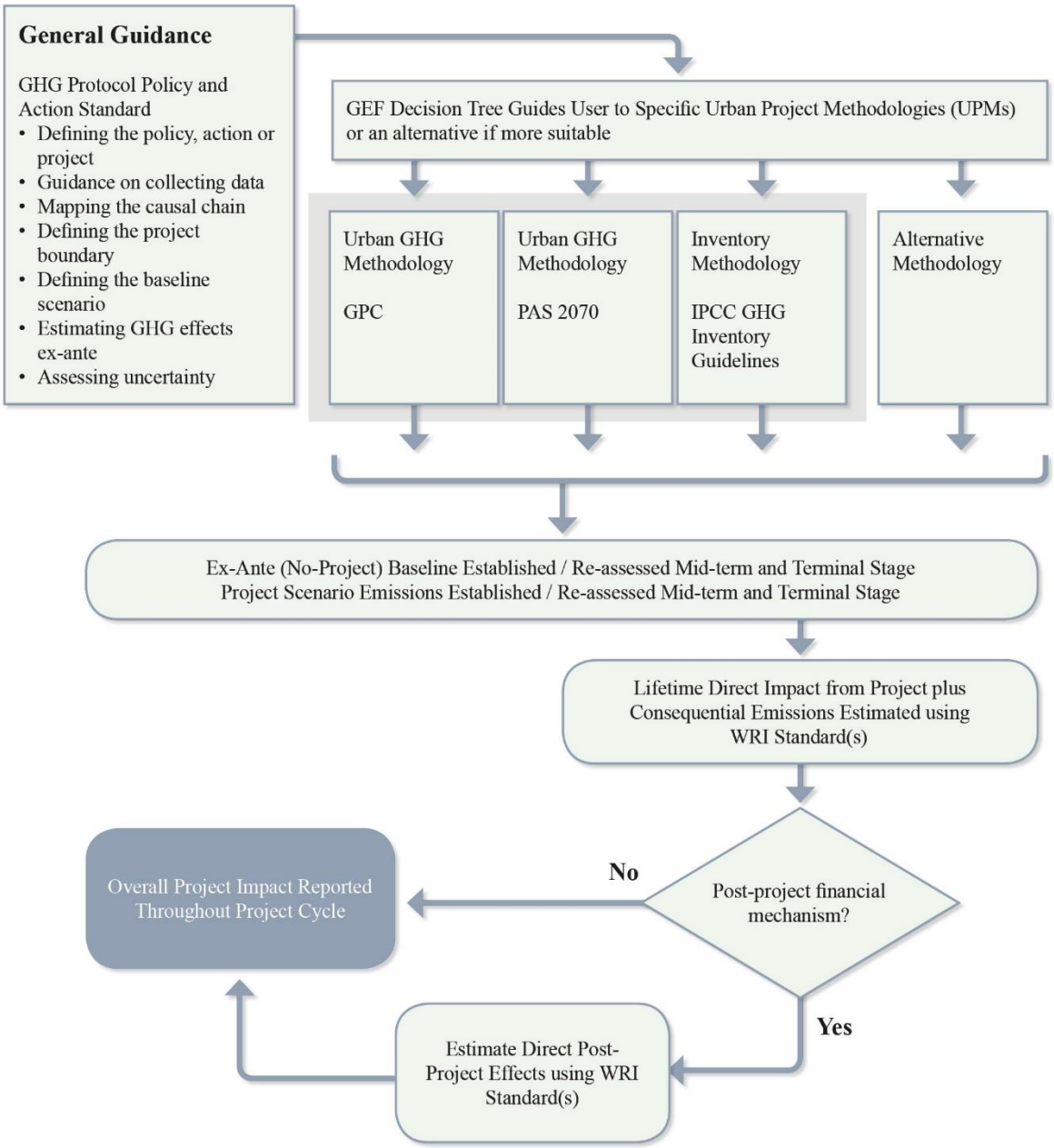


Figure A3.2: Urban Methodological Framework

Selection of UPMs Using a Decision Tree

37. This section provides guidance on the selection of a methodology. The following decision tree in Figure A3.3 guides the GEF Agencies to an appropriate methodology. Further explanatory text follows the diagram.

38. This guidance is applicable to all urban projects that will have GHG benefits.

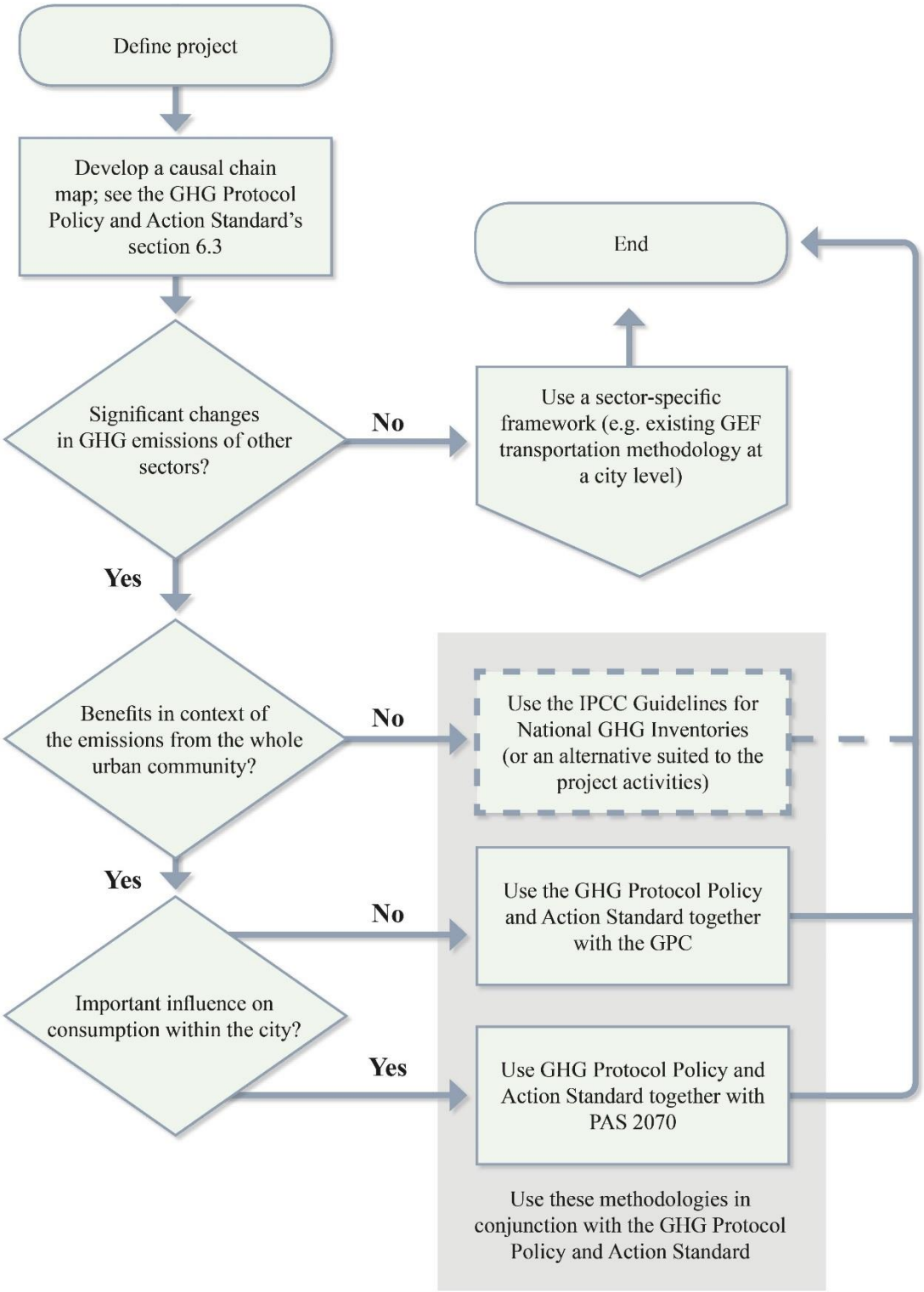


Figure A3.3: Decision Tree for Choosing a GHG Assessment Methodology

Decision Tree Notes

39. The GPC estimates territorial GHG emissions produced in the city and emissions associated with large supply chains. PAS 2070 provides two methodologies to recognize cities as consumers and producers. The direct plus supply chain (DPSC) methodology estimates territorial GHG emissions and those associated with the largest supply chains serving cities and is consistent with the GPC. The consumption-based (CB) methodology uses input-output modeling to estimate direct and lifecycle GHG emissions for all goods and services consumed by residents of a city.

40. The optional route to use the IPCC Guidelines provides GEF Agencies with an alternative methodology to the GPC and PAS 2070. Other methodologies may be chosen. However, the choice shall be justified by demonstrating that the chosen methodology assesses all significant sources of emissions that are mitigated by the project and meets the assumptions outlined above.

41. The WRI Standard and the GHG assessment methodologies (the GPC, PAS 2070 or IPCC Guidelines) should be used for:

(a) Defining the baseline;

(b) Guiding the timing of the GHG emissions assessments;

(c) Mapping the causal chain;

(d) Assessing uncertainty; and

(e) Reporting.

Estimating Project GHG Emissions Mitigation Impact

42. The UPMs are used to estimate GHG emissions, for the baseline and for the alternative scenario. The methodology for estimating the GHG emissions is explained in the UPMs and GEF Agencies should follow those methodologies.

43. However, the UPMs alone do not provide a measure of project impact on GHG mitigation. The GEF project impact on GHG mitigation is derived by subtracting the GHG emissions of the baseline scenario from those of the alternative scenario. This is the effect of the project on GHG emissions and, therefore, the impact on GHG emissions mitigation. The mitigation values shall be assessed with guidance from the WRI Standard.

44. Ex-post consequential emissions shall also be estimated with guidance from the WRI Standard. The bottom-up approach generally provides the lower extent in the range of possible consequential impacts from a project. The underlying assumption of the top-down approach is that each investment has the potential to economically impact 100% of the market being targeted by the initiative.

45. As per the GEF's existing Transportation Manual "Clearly, both of these approaches are unlikely to hold in reality. Therefore, the GEF uses a correction factor variable, the 'GEF causality factor' that expresses the degree to which the GEF intervention can take credit for these improvements. This causality factor is used to calibrate the 'top-down' estimate for consequential emissions, which generally provide the upper limit of the range of consequential GHG benefits". The content in the last two paragraphs applies to the Stationary

Combustion of Biomass and AFOLU Frameworks which are presented in subsequent annexes.

Reporting

46. Please refer to the current GEF guidance on monitoring and reporting. Currently, the GEF requires the use of a tracking tool for climate change mitigation projects to report the assessment results.

47. Consequential GHG emission reductions should be reported separately from direct and/or direct post-project GHG emission reductions.

48. Further reporting guidance may be found in the UPMs and is also covered in depth in Chapter 14 of the WRI Standard.

Reporting the Co-Benefits of Urban Projects

49. Co-benefits of GEF climate change mitigating activities can include local pollution reduction; reliable energy supply; job creation; and other environmental, social and economic benefits. Although this Framework focuses on the assessment of GHG reduction benefits, it is recommended that co-benefits are reported.

ANNEX 4: GUIDELINES FOR ESTIMATING THE GHG BENEFITS OF STATIONARY COMBUSTION OF BIOMASS PROJECTS

1. The new GEF Framework for Stationary Combustion of Biomass Projects provides the first methodology designed specifically for these types of project. It follows the general framework, terminology and principles of other GEF modules.

Overview for Applying This Framework

2. This Framework refers to existing methodologies for assessing the GHG mitigation impacts of projects. The methodologies can be used to assess GHG emissions for:

(a) Ex-ante assessment of baseline emissions (i.e. emissions assuming the project is not implemented) and GHG mitigation impacts of a project;

(b) Mid-project monitoring (e.g. annual updates of the baseline emissions and estimated GHG mitigation impacts); and

(c) End-of-project update of the baseline emissions and estimated GHG mitigation impacts, terminal evaluations and other ex-post assessments.

3. The methodologies in this Framework directly estimate GHG emissions for the baseline and the alternative scenario. They are designed to provide a measure of project impact on GHG mitigation and should be used together with the WRI Standard. This will ensure that the project impact on GHG mitigation is estimated by subtracting the alternative scenario emissions from those of the baseline scenario.

Concepts Used in Developing This Framework

4. This guidance was developed from the following concepts:

(a) Changes in greenhouse gases related to a given policy change may be insignificant thereby justifying an exclusion from the GHG assessment. Estimating GHG emissions changes should be done only for projects where the implementation is expected to cause significant changes to GHG emissions; and

(b) The detailed stationary combustion of biomass estimation tools pointed to in this Framework are not suitable for the evaluation of a policy or a set of policies. Instead, where the project being evaluated involves a policy or a package of policies, the WRI Standard should be used.

Assumptions in Applying the GEF Framework for Stationary Combustion of Biomass Projects

5. The data and assumptions necessary for the GHG emissions reduction assessment will vary by the type of biomass project being proposed or assessed. However, some general rules are important in all steps of a GHG mitigation impact assessment for the GEF:

(a) All GHG emissions are converted to tonnes of CO_2e for the project;

(b) The CO_2e reductions reported are cumulative reductions, calculated for the lifetimes of the investments. No GEF projects may claim impacts for more than 20 years;

(c) There is no discounting for future GHG emission reductions;

(d) Whether or not the framework methodologies or other methodologies are used, all GEF impact estimations should incorporate as much locally measured data as possible. Please refer to the next sections for guidance on data selection and for data quality rules; and

(e) Estimation of GHG emission reduction impact shall be done at three points in all GEF projects Estimating GHG emission reduction impact shall be done at three points in the implementation of all GEF projects – at project document submission, mid-term during project implementation and at project completion.

Data Requirements and Selection

6. Data collection for biomass projects is complex due to the wide range of fuel types and land use and land-use change activities included, the complexity and availability of data, and the policy considerations involved (e.g. how the user defines renewable biomass).

7. As per the notes on "Data Requirement and Selection" in Annex 3. However, for most estimations users will need to estimate GHG emissions by multiplying activity data by an emission factor associated with the activity being measured.

Categories and Sources of Data

8. While certain IPCC sources of data for biomass may be appropriate for use among GEF Agencies to develop emissions estimates, using the IPCC's guidance for national accounting methodologies to evaluate biogenic CO_2 emissions from individual stationary sources is not recommended. This is confirmed by a statement from a related analysis by the US Environmental Protection Agency's (EPA) Scientific Advisory Board:

> "The IPCC inventories – a static snapshot of emissions at any given point in time – are a reporting convention that has no associated connections to policies or implementation. These inventories do not explicitly link biogenic CO_2 emission sources and sinks to stationary sources – nor do they provide a mechanism for measuring changes in emissions as a result of changes in the building and operation of stationary sources using biomass.[47]"

9. Data can be gathered from a variety of sources and should include the following information:

(a) Definition and description of the dataset – time series, sector breakdown, units, assumptions, uncertainties and known gaps;

(b) Frequency and timescales for data collection and publication; and

[47] www.epa.gov/climatechange/downloads/Framework-for-Assessing-Biogenic-CO2-Emissions.pdf

(c) Contact name and organizations.

10. If these data are not available, surveys can be conducted alongside physical measurements and sampling activities.

Default Values for Carbon Stocks

11. Values shall be used from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Hayama, Japan: Institute for Global Environmental Strategies, 2006.

Emissions Factors

12. Emissions factors are used along with GWP values to convert activity data into CO_2e. Sources of emission factors shall be recorded. GEF Agencies can rely on the conservative default values provided in recommended methodologies. Default values in other methodologies may be used, but their application will require documentation of sources.

13. The assessment may use emission factors from more than one source. For many countries, emission factors are available from government, industry or academic sources.

Data Quality

14. Data quality guidelines are given in the WRI Standard (see especially Table 8.8 and Appendix A within the Standard).

Defining the GHG Assessment Boundary

15. The temporal assessment boundary for direct GHG emissions shall include the project duration (i.e. the period of funding from the GEF), plus direct post-project GHG emissions for 20 years after the project end.

16. The boundary for activities and materials to be included in the assessment shall be as defined in the chosen methodology.

17. The following GHGs shall be included in the assessment:

(a) CO_2, excluding CO_2 emitted from biogenic carbon sources;

(b) CH_4;

(c) N_2O;

(d) HFCs;

(e) PFCs;

(f) SF_6; and

(g) NF_3.

18. In practice, most GHG emissions from biomass combustion are CO_2, CH_4 and N_2O. Emissions of the other gases listed above will be immaterial in most project assessments.

19. In addition to the GWP of GHGs (for which emissions mitigation impacts of GEF projects shall be assessed), there is increasing interest in the emissions of BC. BC is mainly a regional pollutant that exhibits strong spatial heterogeneity and temporal variability due to its short atmospheric lifetime. Sources include vehicles, brick kilns, cooking stoves and open-field burning.

20. Although the GEF – 6 CCM strategy supports actions to reduce BC emissions, the GEF does not account for reductions in BC resulting from climate change mitigation or other projects. Therefore, this Framework does not require, but encourages, reporting of BC emissions or mitigation from implementation of GEF-funded projects. There is no mandatory requirement, but this will be considered again in future revisions.

21. STAP is in the process of developing an information document that would assist GEF partners in designing and measuring the impact of projects addressing BC emissions[48]. When applicable, BC emission reductions expected to be generated by GEF projects should be considered (optional) as a co-benefit of GEF investments.

22. Offset mechanisms shall not be used to adjust the GHG emissions totals for baseline or project implementation assessments. Where offset mechanisms for GHG emissions are implemented in a business-as-usual (baseline) context or within a project, the quantity of GHG emissions that is offset may be reported separately from the totals for baseline or project implementation assessments.

Overview of Methodologies Available

23. Many GHG estimation methodologies for stationary combustion of biomass projects have been identified for use in the Framework and are listed below (shown in chronological order rather than preference). The first three methodologies/tools require more detailed data collection, familiarity with the tools and level of effort than the IFC GHG methodology or the WRI Project Accounting standard. In all cases, the methodologies can account for the upstream supply chain emissions of stationary combustion of biomass projects that are of particular relevance to biomass projects in general.

(a) The UK Solid and Gaseous Biomass Carbon Calculator, User Manual for the Solid and Gaseous Biomass Carbon Calculator, Version 2.0, DECC et al, January 2015. The Calculator is developed for estimating carbon intensity and GHG savings of solid biomass and biogas used for electricity and heat generation. The UK Biomass & Biogas Carbon Calculator incorporates the calculation methodology set out in the Renewable Energy Directive, taking account of the recommendations set out by the European Commission in its report on sustainability requirements for solid and gaseous biomass.

(b) Biograce II, Harmonised Greenhouse Gas Calculations for Electricity, Heating and Cooling from Biomass, Version 2. European Commission, January 2015. The BioGrace GHG calculation tool has been recognized as a voluntary scheme by the European Commission and is in line with the sustainability criteria of the Renewable Energy Directive (2009/28/EC, RED). The BioGrace

[48] Sims, R., V. B. Gorsevski, and S. Anenberg (2015). Black Carbon Mitigation and the Role of the Global Environment Facility: A STAP Advisory Document. Global Environment Facility, Washington, D.C.

tool is a comprehensive, user-friendly GHG calculator, which is based on a spreadsheet, featuring unanimously defined standard values, detailed calculation rules and a user manual. The tool covers the origin of raw materials and provides a mass balance system as well as requirements for verification of emissions/emission reductions.

(c) CDM Methodology Booklet, Sixth edition, UNFCCC, November 2014. This booklet provides concise summaries of CDM methodologies and descriptions of methodological tools that are approved by the CDM Executive Board. It is arranged to assist CDM project developers in identifying methodologies that are suitable for their CDM project activities, including stationary combustion of biomass. Relevant modules include: ACM0006-Electricity and heat generation from biomass; AM0007-Analysis of the least-cost fuel option for seasonally operating biomass cogeneration plants; AM0042 Grid-connected electricity generation using biomass; ACM0018 Electricity generation from biomass residues; and ACM0020 Co-firing of biomass residues for heat generation and/or electricity generation in grid connected power plants.

(d) IFC Greenhouse Gas Reduction Accounting Guidance for Climate-Related Projects, IFC Climate Business Department, December 2013. Technical guidance document that includes simplified methodologies for IFC investment staff to conduct GHG emission reduction calculations for climate-related projects. The biomass-to-electricity component is separate from the RE component to address issues associated with leakage. The document gives a simple methodology for grid-connected and off-grid projects.

(e) The WRI GHG Protocol for Project Accounting, November 2005. This is a comprehensive, policy-neutral accounting tool for quantifying the GHG benefits of climate change mitigation projects. It is the culmination of a four-year dialogue among business, environmental and government experts led by WRI and the World Business Council for Sustainable Development.

Steps for Implementation

24. The implementation steps for the Stationary Combustion of Biomass Framework are illustrated in Figure A4.1 and described as follows:

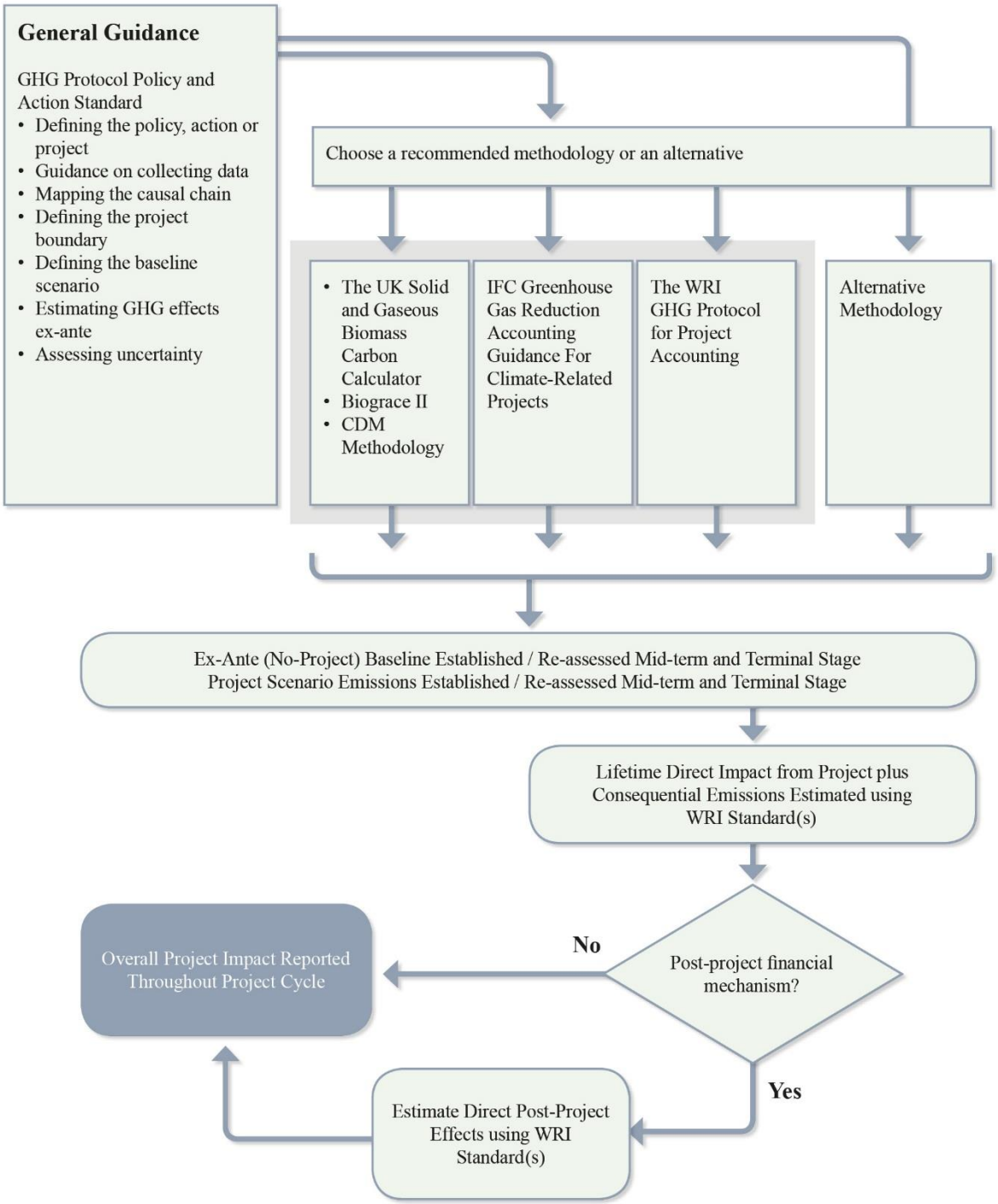
(a) Use the WRI Standard to define the project, map the causal chain, define project boundaries and scenarios etc.;

(b) Select one of the recommended methods (higher tier methods are listed from left to right in the diagram);

(c) Use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions – ex-ante, mid-term and terminal stage (including direct and consequential emissions); and

(d) Estimate and report the emissions mitigation impact of the project.

Figure A4.1: Stationary Combustion of Biomass Framework



25. The UK Biomass & Biogas Carbon Calculator and the Biograce II tool are based on assumptions for Europe, but are fully customizable for other regions and countries. These tools – along with the CDM tools – require GEF Agency expertise, but are very robust for GEF interventions focused on physical projects and less so for policy interventions. The IFC methodology and the WRI Project Accounting protocol are lower-tier methods, but useful nonetheless.

26. The WRI Standard should be used together with the GHG assessment methodologies provided in this Framework for purposes other than the quantification of GHG emissions. For example, the WRI Standard should be used for other important considerations such as:

(a) Defining the project;

(b) Mapping the causal chain;

(c) Setting the project boundary; and

(d) Assessing uncertainty.

Estimating Project GHG Emissions Mitigation Impact

27. The Framework methodologies presented are used to estimate GHG emissions for the baseline and the alternative scenario. The methodology for estimating the GHG emissions is explained in the calculator tools and accompanying methodological user guides. GEF Agencies should follow those methodologies.

28. The project impact on GHG mitigation is the difference between the GHG emissions of the baseline scenario and the alternative scenario. Mitigation values shall be assessed with guidance from the WRI Standard. Ex-post consequential emissions shall be estimated with guidance from the WRI Standard. The bottom-up approach generally provides the lower extent in the range of possible consequential impacts from a project. The underlying assumption of the top-down approach is that each investment has the potential to economically impact 100% of the market being targeted by the initiative. Please refer to the note on causality factors in paragraph 95.

Reporting

29. Please refer to current GEF guidance on monitoring and reporting. The GEF requires the use of a tracking tool for climate change mitigation projects to report the assessment results.

30. Direct emissions shall not be aggregated with consequential emissions and must be reported separately.

31. Further reporting guidance may be found in the recommended methodologies and in depth in Chapter 14 of the WRI Standard.

Outstanding Issues and Questions

32. Previously, GHG accounting guidance has treated all CO_2 emitted as a result of biomass combustion as being carbon neutral (CH_4 and N_2O are also emitted during the process and accounted for as direct emissions). However, debate has emerged as a result of increased scientific understanding of the production and consumption cycles of biomass feedstocks and urges consideration of the net atmospheric contributions of biogenic CO_2 emissions[49]. The purpose of the development of the Framework and guideline for biomass

[49] For more information please see: Framework for Assessing Biogenic CO_2 Emissions from Stationary Sources, US EPA, November 2014.

combustion projects is for GEF Agencies to take into account carbon leakages in project development, implementation and evaluation.

ANNEX 5: GUIDELINES FOR ESTIMATING THE GHG BENEFITS OF AFOLU PROJECTS

1. A framework approach provides uniformity in the calculations and assumptions used to estimate the GHG mitigation impact resulting from a diverse array of potential projects addressing emissions in the AFOLU sector. The proposed GEF Framework is the first framework designed specifically for projects in the AFOLU sector. It follows the general approach, terminology and principles of earlier GEF manuals (please refer to the Transportation Manual). More importantly, it uses the lessons learned from experience to tailor this Framework expressly for AFOLU projects.

2. However, the purpose of the different methodologies in the Framework goes beyond mere impact estimation. They are designed to encourage high-quality project design, increase consistency and maintain objectivity in impact estimation.

Overview for Applying This Framework

3. This Framework refers to existing methodologies for assessing GHG mitigation impacts of projects (AFOLU project methodologies (APMs). The methodologies, some of which have associated software tools, can be used to assess GHG emissions for:

(a) Ex-ante assessment of baseline emissions (i.e. emissions assuming the project is not implemented) and GHG mitigation impacts of a project;

(b) Mid-term project monitoring (e.g. mid-term project updates of the baseline emissions and estimated GHG mitigation impacts); and

(c) End-of-project update of the baseline emissions, estimated GHG mitigation impacts, terminal evaluations and other ex-post assessments.

4. The APMs are used to directly estimate GHG emissions, for the baseline and for the alternative scenario. They are designed to provide a measure of project impact on GHG mitigation and should be used together with the WRI Standard. This will ensure that the project impact on GHG mitigation is estimated by subtracting the alternative scenario emissions from those of the baseline scenario.

Concepts Used in Developing This Framework

5. This guidance was developed from the following concepts:

(a) Changes in greenhouse gases related to a given policy change may be insignificant thereby justifying an exclusion from the GHG assessment. Estimation of GHG emissions changes should be done only for projects where the implementation is expected to cause significant changes to GHG emissions; and

(b) Methodologies used shall follow the GHG emissions estimation principles and the emissions categorization of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Assumptions in Applying the GEF Framework for AFOLU Projects

6. The data and assumptions necessary for the GHG emissions reduction assessment will vary by the type of AFOLU project being proposed or assessed. Project types are given in the section Decision Tree for Matching GEF Project Types to Appropriate Methodologies. However, some general rules are important in all steps of a GHG mitigation impact assessment for the GEF:

(a) The assessment methodology shall be based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Using the same emissions categories allows the use of IPCC default values where appropriate;

(b) All GHG emissions are converted to tonnes of CO_2e for the project;

(c) The CO_2e reductions reported are cumulative reductions, estimated for the lifetimes of the investments. No GEF projects may claim GHG mitigation impacts for more than 20 years after the project end;

(d) There is no discounting for future GHG emission reductions;

(e) All GEF impact estimations should incorporate as much locally measured data as possible. Please refer to "Defining the Assessment Boundary" in the WRI Standard (Section 7) for guidance on data requirements and selection; and

(f) Estimating GHG emission reduction impact shall be done at three points in the implementation of all GEF projects – at project submission, during project implementation and at project completion.

Data Requirements and Selection

7. Data collection for AFOLU projects is complex due to the wide range of activities covered, the complexity and availability of data, and the ultimate purpose of the inventory. The role of natural processes (e.g. microbial processes in soil) in the emission of GHGs adds further complexity. Therefore, it is necessary to use estimated emissions factors, such as emissions of N_2O per quantity of nitrogen fertilizer applied, from internationally recognized sources such as the IPCC.

8. For most emission sources, emissions are estimated by multiplying activity data by an emission factor associated with the activity being measured. Activity data quantify a level of activity that results in GHG emissions taking place during a given period of time (e.g. quantity of fertilizer used, etc.). An emission factor is a measure of the mass of GHG emissions relative to a unit of activity. For example, estimating CO_2e emissions from the use of electricity involves multiplying data on kWh of electricity used by the emission factor (kg of CO_2e/kWh) for electricity, which will depend on the technology and type of fuel used to generate the electricity.

9. Categories to be covered shall be consistent with IPCC Guidelines. AFOLU is a term used in IPCC Guidelines.

10. Data can be gathered from a variety of sources and should include the following information:

(a) Definition and description of the dataset – time series, sector breakdown, units, assumptions, uncertainties and known gaps;

(b) Frequency and timescales for data collection and publication; and

(c) Contact names and organizations.

11. If this is not available, surveys can be conducted alongside physical measurements and sampling activities.

Defining the GHG Assessment Boundary

12. The temporal assessment boundary for direct GHG emissions shall include the project duration (i.e. the period of funding from the GEF), plus direct post-project GHG emissions for 20 years after the project end.

13. The territorial boundary (also known as the geographic boundary) for the assessment shall be the land affected by project activities including, if necessary, land that is managed together with the affected land.

14. The boundary for activities and materials to be included in the assessment shall be as defined in the chosen methodology.

15. The following GHGs shall be included in the assessment:

(a) CO_2, excluding CO_2 emitted from biogenic carbon sources;

(b) CH_4;

(c) N_2O;

(d) HFCs;

(e) PFCs;

(f) SF_6; and

(g) NF_3.

16. In practice, most GHG emissions from AFOLU are CO_2, CH_4 and N_2O. Emissions of the other gases listed above will be immaterial in most project assessments.

17. In addition to the GWP of GHGs (for which emissions mitigation impacts of GEF projects shall be assessed), there is increasing interest in the emissions of BC. BC is mainly a regional pollutant that exhibits strong spatial heterogeneity and temporal variability due to its short atmospheric lifetime. Sources include vehicles, brick kilns, cooking stoves and open-field burning.

18. Although the GEF – 6 CCM strategy supports actions to reduce BC emissions, the GEF does not account for reductions in BC resulting from climate change mitigation or other projects. Therefore, this Framework does not require, but encourages, reporting of BC emissions or mitigation from implementation of GEF-funded projects. There is no mandatory requirement, but this will be considered again in future revisions.

19. STAP is in the process of developing an information document that would assist GEF partners in designing and measuring the impact of projects addressing BC emissions[50]. When applicable, BC emission reductions expected to be generated by GEF projects should be considered (optional) as a co-benefit of GEF investments.

20. Offset mechanisms shall not be used to adjust the GHG emissions totals for baseline or project implementation assessments. Where offset mechanisms for GHG emissions are implemented in a business-as-usual (baseline) context or within a project, the quantity of GHG emissions that is offset may be reported separately from the totals for baseline or project implementation assessments.

21. The boundary for activities and materials to be included in the assessment shall exclude upstream activities associated with materials used in agriculture, forestry and land management (e.g. embedded emissions in fertilizers, from fertilizer manufacture), and shall exclude downstream emissions resulting from the transport and use of products from the land (e.g. transport of farm-produced goods away from the farm and use of those goods).

Default Values for Carbon Stocks

22. Values shall be used from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories[51].

Emissions Factors

23. Emissions factors are used along with GWPs to convert activity data into CO_2e. Sources of emission factors shall be recorded. GEF Agencies can rely on the conservative default values provided in APMs. Default values in other methodologies may be used, but their application will require documentation of sources.

24. The assessment may use emission factors from more than one source. For many countries, emission factors are available from government, industry or academic sources.

Data Quality

25. Data quality guidelines are given in the WRI Standard (see especially Table 8.8 and Appendix A within the WRI Standard).

Overview of Methodologies Available

26. Methodologies used by GEF agencies, and with the potential to be used for AFOLU projects, have been reviewed to arrive at final recommendations:

(a) Review of GHG Calculators in Agriculture and Forestry Sectors: A Guideline for Appropriate Choice and Use of Landscape Based Tools. Vincent COLOMB et al., 2012[52].

[50] Sims, R., V. B. Gorsevski, and S. Anenberg (2015). Black Carbon Mitigation and the Role of the Global Environment Facility: A STAP Advisory Document. Global Environment Facility, Washington, D.C.
[51] www.ipcc-nggip.iges.or.jp/public/2006gl/index.html
[52] www.fao.org/fileadmin/templates/ex_act/pdf/ADEME/Review_existingGHGtool_VF_UK4.pdf

(b) Selection of appropriate calculators for landscape-scale greenhouse gas assessment for agriculture and forestry. Vincent Colomb et al., 2013[53].

(c) Milne E, Neufeldt H, Smalligan M, Rosenstock T, Bernoux M, Bird N, Casarim F, Denef K, Easter M, Malin D, Ogle S, Ostwald M, Paustian K, Pearson T and Steglich E. 2012. Methods for the quantification of emissions at the landscape level for developing countries in smallholder contexts. CCAFS Report No. 9. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Available online at: www.ccafs.cgiar.org

(d) Denef K, Pautian K, Archibeque S, Biggar S, Pape D. 2012. Report of Greenhouse Gas Accounting Tools for Agriculture and Forestry Sectors. Interim report to USDA under Contract No. GS-23F-8182H. Available at: www.usda.gov/oce/climate_change/techguide/Denef_et_al_2012_GHG_Accounting_Tools_v1.pdf

27. Driver K, Haugen-Kozyra K, Janzen R. 2010. Agriculture sector greenhouse gas practices and quantification review: Phase 1 report. Market Mechanisms for Agricultural Greenhouse Gases (M-AGG). Available online at: http://sustainablefood.org/images/stories/pdf/Phase-1-Draft-v13.pdfA web-based selection tool is available at http://ird.t-t-web.com/, this gives details of suitability based on the assessment aim, region, activities, sources of emissions and ease of use.Of the many methodologies reviewed, the following APMs best meet the criteria for assessment of GHG mitigation impacts of GEF projects:

(a) Ex-Ante Carbon Balance Tool (Ex-ACT)[54];

(b) Carbon Benefits Project greenhouse gas inventory toolkit[55] (CBP);

(c) 2006 IPCC Guidelines for National Greenhouse Gas Inventories; and

(d) The WRI Standard.

28. Other methodologies may have specialist applications for projects that have components outside the scope of Ex-ACT or CBP. Where a suitable methodology cannot be found, the WRI Standard guidance can be used for setting boundaries, collecting data, etc. The 2006 IPCC Guidelines for National Greenhouse Gas Inventories can be used to generate estimates of GHG emissions using an inventory approach.

29. It is recommended that the Ex-ACT, CBP and IPCC methodologies be used at the lowest level of detail (i.e. Tier 1 for Ex-ACT / IPCC, and simple assessment for CBP). Although higher level assessments can provide more detail and precision, it is often difficult to identify the data required and have confidence in the accuracy of the data.

30. Ex-ACT and the CBP have been developed for project assessment and allow the GEF Agency to assess the GHG mitigation impact of project implementation. They have a wide

[53] www.fao.org/fileadmin/templates/ex_act/pdf/other_publications/Colomb_et_al_2013_Selection_of_appropriate_calculators_for_landscape-scale_greenhouse_gas_assessment.pdf
[54] www.fao.org/tc/exact/review-of-ghg-tools-in-agriculture/en/
[55] http://carbonbenefitsproject-compa.colostate.edu/

scope of application (covering the AFOLU emissions category) and they are based on IPCC Guidelines' methodology. The IPPC Guidelines may be used in place of Ex-ACT or the CBP, but this will require the GEF Agency using it to have a higher level of knowledge and expertise.

31. The WRI Standard is a new standard that sets out how to estimate and report the change in GHG emissions and removals resulting from policies and actions. It can be applied to projects and is suitable for application to the types of project funded by the GEF.

Steps for Implementation

32. Steps for implementation are illustrated in Figure A5.1 to support the GEF Agency in using this Framework.

33. The steps for implementation illustrated in the diagram are described as follows:

(a) Use the decision tree in this Framework (see Figure A5.2) to select a GHG accounting methodology (see Section 8.4.3 of the WRI Standard);

(b) Use the selected GHG accounting methodology alongside the WRI Standard to define the project (e.g. a project that influences GHG emissions from changes to land management in an agricultural or forestry context), map the causal chain, define boundaries and scenarios, etc.;

(c) Continue to use the WRI Standard alongside the chosen GHG accounting methodology to assess baseline emissions and alternative scenario emissions, ex-ante, mid-term and terminal stage (including direct and consequential emissions); and

(d) Estimate and report the emissions mitigation impact of the project.

34. The WRI Standard and the GHG accounting methodologies have guidance that the user should follow to apply them correctly. This guidance covers data selection, choice of emissions factors, etc.

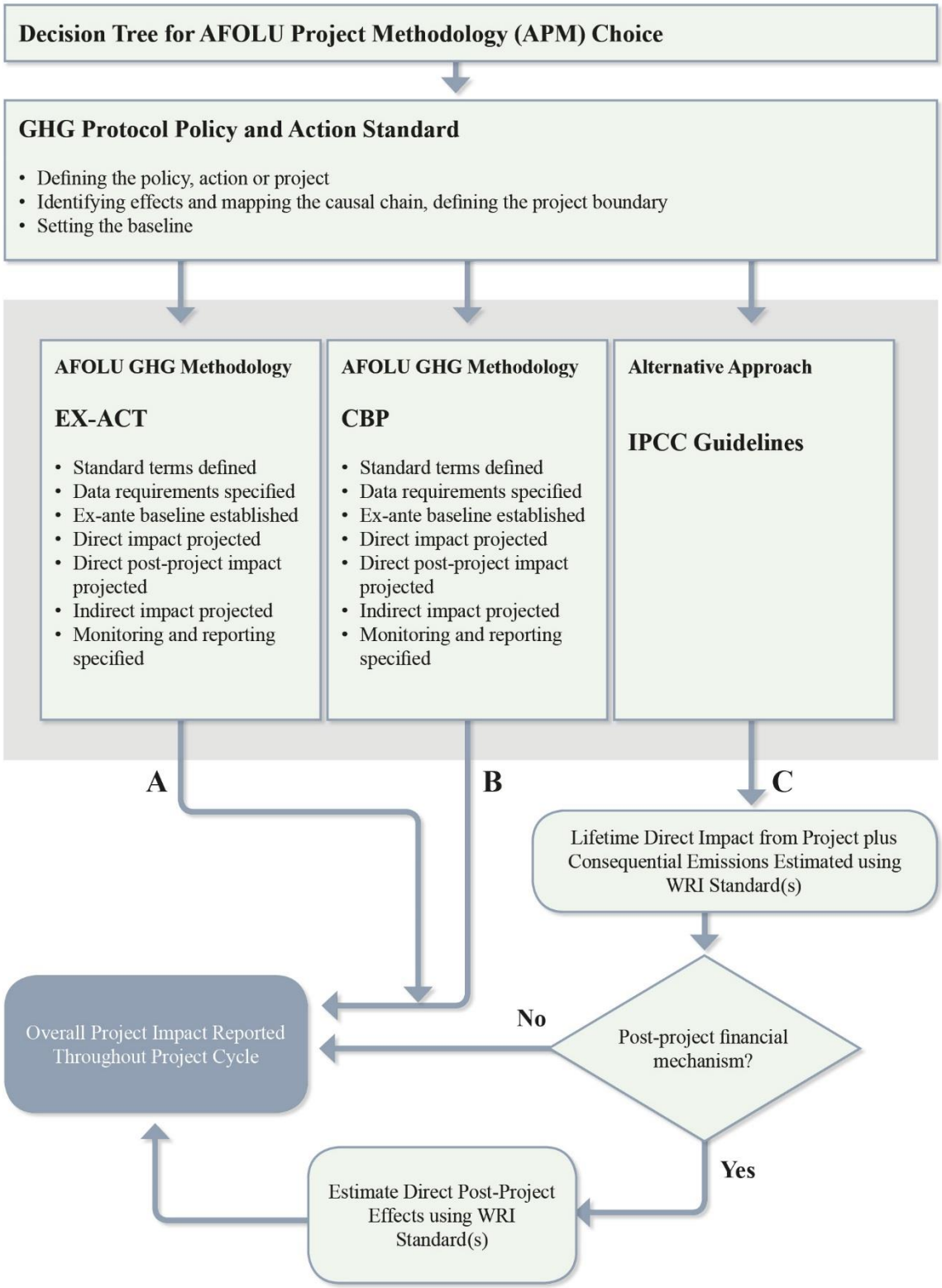


Figure A5.1: AFOLU Methodological Framework

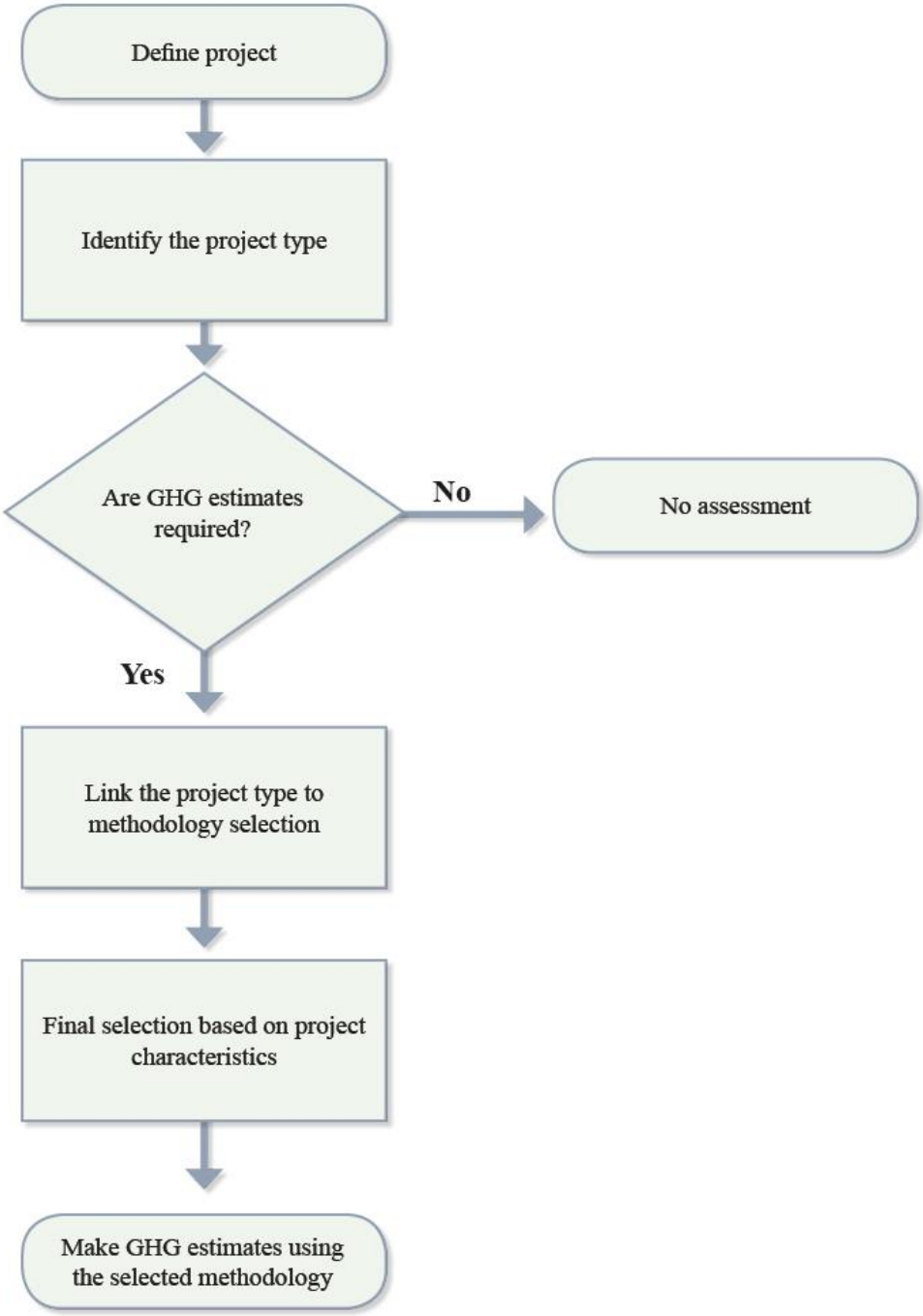
Decision Tree for Matching GEF Project Types to Appropriate Methodologies

35. This section provides guidance on the selection of a methodology. The selection is based on the need for GHG emissions estimates, then the inclusion in the project of activities that influence specified sources of emissions.

36. The process for selecting a methodology for assessment of GHG mitigation benefits is summarized in Figure A5.2 – this diagram refers to Table A5.1 to

37. Table A5.4, which guide a GEF Agency in selecting a methodology. The project typology (presented in Table A5.1) was supplied by the GEF and may be used to refine the

Figure A5.2: Summary of Process for Selecting a GHG Mitigation Impact Assessment Methodology



selection of GHG accounting methodology in future work.

Table A5.1: The Main GEF AFOLU Project Types

Number	Short name	Description
1	Land degradation	Projects that promote agricultural practices that respond to land degradation issues and enhance soil quality with a focus on reducing agro-based GHG emissions, including climate smart agriculture (GEF "CC-M", "CC-M/LD" projects) [*GHG estimates are required by the GEF*]
2	Sustainable Forest Management (SFM)	Sustainable Forest Management (SFM) projects and programs that include biodiversity (BD) priorities, sustainable land management (SLM) and climate change mitigation (CC-M) actions targeting deforestation and degradation drivers, to provide carbon benefits as well as other social and multiple environmental benefits that forests provide as an ecosystem [*GHG estimates are required by the GEF*]
3	Improving smallholder agriculture	Projects in sustainable agriculture and rangeland management that focus on maintaining or improving the productivity of smallholder agricultural systems such as crop diversification, crop rotation, conservation agriculture, agroforestry, water harvesting, small-scale irrigation schemes, resolution of wildlife-livestock-crop conflicts, conservation of indigenous genetic resources, and reducing water and wind erosion in rangelands (LD; LD/BD projects) [*GHG estimates are voluntary, but recommended if expected to be significant]*
4	Biodiversity and carbon stocks	Protected area establishment and management projects that focus on biodiversity conservation while maintaining and enhancing carbon stocks as a co-benefit and which may also include activities in buffer zones that focus on LD objectives. [*GHG estimates are voluntary, but* rec*ommended if expected to be significant]*
5	Policy, regulation, financial mechanisms, capacity building	Projects that develop policy and regulatory frameworks and/or pilot financial mechanisms such as certification, payment for environmental services, Reducing Emissions from Deforestation and Forest Degradation (REDD+), and/or mainstream development investments and value-chains, and/or apply cross-sector policy and land-use planning approaches in AFOLU sectors, including related capacity building. [*GHG estimates are required if these type of projects are funded under the CC-M or SFM-program and are voluntary for all other types, but recommended if expected to be significant]*
6	Integrated Approach Pilots (IAPs)	In addition, GEF is piloting IAPs that can be mapped across Focal Area Objectives and will have relevance with regard to GHG benefits in AFOLU sectors.

Table A5.2: Requirement for GHG Estimates

Project type	Criteria		GHG estimates required?
1	All projects		Yes
2	All projects		Yes
3	GHG emissions expected to be significant		Yes
	GHG emissions NOT expected to be significant		No
4	GHG emissions expected to be significant		Yes
	GHG emissions NOT expected to be significant		No
5	Project funded under the CC-M or SFM-program		Yes
	Project NOT funded under the CC-M or SFM-program	GHG emissions expected to be significant	Yes
	Project NOT funded under the CC-M or SFM-program	GHG emissions NOT expected to be significant	No

38. Table A5.3 provides an initial suggested link between project type (Table A5.1) and GHG accounting methodology, which can then be checked in more detail using

39. Table A5.4.

40. A GHG accounting methodology should be used alongside the WRI Standard (see Steps for Implementation above). The suggested choices between the CBP toolkit and the Ex-ACT tool are based on the following characteristics of those methodologies:

(a) The CBP toolkit is spatially explicit and can be used to assess many geo-referenced sites in one assessment, whereas the Ex-ACT tool requires many assessments to assess multiple sites;

(b) The Ex-ACT tool does not account for N_2O emissions that arise as a consequence of incorporating crop residues into soil. It does not cover field trees, hedges or agroforestry systems; and

(c) The CBP toolkit does not cover protected horticulture (e.g. production in greenhouses) or emissions from fossil fuel use and electricity.

41. It is recognized that the methodologies may be developed further (e.g. it is understood from the Food and Agriculture Organization of the United Nations (FAO) that the Ex-ACT tool may be improved to deal with agroforestry). Thus, the decision process presented here will need to be kept under review.

Table A5.3: Linking Project Type to Initial Methodology Selection, Subject to Further Guidance in

Table A5.4

Number	Short name	Initial methodology selection
1	Land degradation	CBP
2	Sustainable Forest Management	Ex-ACT
3	Improving smallholder agriculture	CBP
4	Biodiversity and carbon stocks	CBP
5	Policy, regulation, financial mechanisms, capacity building	IPCC Guidelines
6	Integrated Approach Pilots	Consult Table A5.4

Table A5.4: Final Selection Stage or Selection Check Based on Project Characteristics

Question	Y/N	Methodology
1. Does the project develop policy, regulatory frameworks, financial mechanisms, etc. and/or apply cross-sector policy and land-use planning approaches, including capacity building?	Yes	The WRI Standard together with the IPCC 2006 Guidelines
	No	Go to 2
2. Does the project influence field trees, hedges or agroforestry area/performance or significantly change emissions from crop residue incorporation into soil?	Yes	Go to 3
	No	Use Ex-ACT

3. Does the project include protected horticulture (glasshouse/tunnel production systems)?	Yes	Either: a) Use the CBP together with bespoke estimates based on IPCC 2006 guidelines; or b) Use IPCC 2006 guidelines.
	No	Go to 4
4. Does the project significantly influence emissions from fossil fuel use and/or electricity?	Yes	Either: a) Use the CBP together with bespoke estimates based on IPCC 2006 guidelines; or b) Use IPCC 2006 guidelines
	No	Use the CBP

42. The selection of methodologies recommended here is not mandatory. If a GEF Agency is more comfortable with a different selection, it may use its preferred method. In this case, the choice shall be justified by demonstrating that the chosen methodology assesses all significant sources of emissions that are mitigated by the project and meets the assumptions required in "Assumptions in Applying the GEF Framework for AFOLU Projects".

Estimating Project GHG Emissions Mitigation Impact

43. The APMs are used to estimate GHG emissions, for the baseline and for the alternative scenario. The methodology for estimating GHG emissions is explained in the APMs and GEF Agencies should follow those methodologies.

44. The APMs are designed to provide a measure of project impact on GHG mitigation, which shall be assessed alongside guidance from the WRI Standard. The project impact on GHG mitigation is the difference between the GHG emissions of the baseline scenario and the alternative scenario.

Reporting the GHG Benefits of AFOLU Projects

45. Please refer to current GEF guidance on reporting. The GEF requires the use of a tracking tool for climate change mitigation projects when reporting assessment results.

46. It is recommended that the following are reported:

(a) The name of the methodology used and the option selection (e.g. Tier 1 methods for Ex-ACT or IPCC Guidelines; simple assessment tool for CBP); and

(b) The main source(s) of emissions factors and carbon stock change factors.

47. Sampling strategies for data collection shall be reported where such strategies are used.

48. Further reporting guidance may be found in the recommended methodologies and in particular Chapter 14 of the WRI Standard.

Reporting the Co-Benefits of AFOLU Projects

49. Co-benefits of GEF climate change mitigating activities can include pollution reduction; reliable energy supply; job creation; and other environmental, social and economic benefits. Although this Framework is focused on the assessment of GHG benefits, the reporting of co-benefits is recommended.

ANNEX 6: IMPROVING GUIDELINES IN EXISTING GHG ACCOUNTING MANUALS

Task Introduction and Scope

1. Aside from the development of new frameworks, the project that led to the recommendations presented in this paper included two other goals:

(a) To make recommendations and proposals to improve the existing GEF GHG accounting methodologies for the ex-ante estimation of direct GHG emission reductions in transportation, RE[56] and EE projects; and

(b) To provide guidance on how to strengthen the usefulness of estimated and reported consequential impacts (currently known as "indirect emission reductions") of GEF projects in the above-mentioned sectors, and low-GHG urban development and stationary combustion of biomass projects.

2. Recommendations and proposals for improving existing manuals are provided. Implementing recommendations and adopting proposals when updating the manuals will be the next step in the GEF's process to improve GHG accounting of its projects.

3. The manuals should be designed in a consistent format, much like the UNFCCC methodologies. While only a matter of aesthetics, it adds to the overall sense of consistency.

4. In general, there could be more guidance on data collection activities and project monitoring. These two elements of an accounting guideline are fundamental to accurately calculating and reporting emission reductions.

5. The results of the GEF's effort to improve GHG accounting of its projects should be shared with other bodies and initiatives such as the IFI Harmonization Initiative. This recommendation should be actioned soon because the completion of that project's deliverables is in late 2015. This means that both processes can draw on the experience of the other, once the proposals and recommendations which the GEF Council agree on are implemented. Recommendations are based on an approach of improving and expanding the current methodologies, and filling in gaps by pointing to best practice guidance (such as the WRI Standard) where needed, but not carrying out a wholesale redrafting of the manuals (except maybe with respect to style and format). The following UNFCCC statement guides the recommendations that follow:

"This sector-based work has to take into account methodologies developed by GEF Agencies and within the context of the United Nations Framework Convention on Climate Change (UNFCCC)"[57]

The WRI GHG Protocol Policy and Action Standard

6. The WRI Standard was published in November 2014. It is a landmark document in accounting for the GHG effects of policies and actions, and is particularly relevant to the

[56] One of the first recommendations made on existing manuals is to rename the manual that currently provides guidance for "Renewable Energy" as it is actually focused on "Renewable Electricity".

[57] www.thegef.org/gef/node/10459

work of the GEF and GEF Agencies. Recognizing the need for a global GHG accounting standard that meets the needs of governments, donors, financial institutions and other public sector organizations that enact policies and measures to reduce GHG emissions, the WRI carried out a two-year, multi stakeholder process to produce the Standard. This involved 270 participants from 40 countries, with pilot testing of 27 policies in 20 countries and cities.

7. As per the WRI Standard "policies" and "actions" refer to "interventions taken or mandated by a government, institution or other entity, and may include laws, directives, and decrees; regulations and standards; taxes, charges, subsidies, and incentives; information instruments; voluntary agreements; implementation of new technologies, processes, or practices; and public or private sector financing and investment. The terms "policy" and "action" may refer to interventions at various stages along a policy-making continuum, from (1) broad strategies or plans that define high-level objectives or desired outcomes (such as increasing EE by 20% by 2020) to (2) specific policy instruments to carry out a strategy or achieve desired outcomes (such as an EE standard for appliances) to (3) the implementation of technologies, processes, or practices (sometimes called "measures") that result from policy instruments (such as the replacement of old appliances with more efficient ones)".

8. The GEF partners including GEF Agencies are a primary audience for the WRI Standard. Therefore, guidance to support many of the following recommendations refer to this document. It serves the exact purpose of providing consistency and transparency for the estimation of GHG emission reductions that come about as a result of policies and actions. The WRI Standard is equally useful for helping to identify the full range of catalytic impacts and non-GHG effects that GEF projects seek to measure and report. The recommendations made below include text and diagrams directly taken from the WRI Standard.

9. The WRI Standard sets a best practice framework with detail and direction, but it is flexible enough to be applied to any GHG mitigation policy project. It is recommended that adoption of the WRI Standard's requirements are added to existing GEF manuals either wholesale or where necessary, with a link/reference to the relevant section in the WRI Standard.

GEF Manuals Referred to in This Annex

10. Recommendations are made on the content and documents that support the three existing GEF manuals in Table A6.1.

Table A6.1: Recommendations on the Content and Documents That Support the Manuals

Ref	Title	Notes
GEF/C.33/Inf.18, April 16, 2008	Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects	The EE section has been superseded by later guidance (next row in this table). Therefore, it should be removed from this Manual. In addition, the Manual is actually focused on "renewable electricity" not "renewable energy".
Version 1.0, 2013	Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects	EE guidance expanded to provide "modules" to calculate emission reductions of four specific types of EE project.
Version 1.0, 2010	Calculating Greenhouse Gas Benefits of GEF Transportation Projects	Transportation Emissions Evaluation Models for Projects (TEEMPs) provided for five specific project types.

Recommendations

Issue 1: Standard Definitions: Change the GEF's Use of "Indirect Emissions" to "Consequential Emissions"

11. This recommendation is applicable to all GEF GHG accounting methodologies. The GEF's current treatment of the terms "direct" and "indirect" GHG emissions can be summarized in the following language taken from the GEF's most recent EE Manual:

12. "*Direct GHG emission reductions* are those achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project's supervised implementation period (from the project start to the project closure). In contrast, GHG emission reductions achieved, for example, as a result of market facilitation and development through project-supported policy and institutional frameworks, capacity building, information gathering, and replication effects of demonstration activities, are considered *indirect GHG emission reductions*. In addition, a third category, *direct post-project emission reductions*, has been used to quantify the GHG emission reductions of GEF-supported revolving financial mechanisms that are still active after the project's closure (ex-post)".

13. The GEF's application of the terms "direct" and "indirect" GHG emissions is shown in Table A6.2 which was taken from the Transportation Manual (the design of this table reflects the design of the Transportation Manual). It should be noted that the definitions are not exactly the same between the three manuals, but differences are not considered contradictory or erroneous.

Table A6.2: Existing GEF Terms for Direct and Indirect Emission

Evaluation Tool	Direct	Direct post-project	Indirect
Definition of Reduction Type:	Project activities and investments whose outputs and secondary impacts are tracked in the project's logframe	Investments supported by mechanisms (e.g., revolving funds) that continue operating after the end of the project	Project components that encourage replication such as study tours, capacity building, public promotion, etc.
Logframe level	Has a corresponding activity or investment with an output that is tracked in the logframe	Not corresponding to a specific logframe level	Outcome/impact on level of global environmental objective
Quantification method	Use of GEF TEEMP models with default values (or provision of additional data)	Based on assumptions of functioning post-project mechanisms	Based on the replication rate o the project using Bottom-up or Top-down methods
Quality of assessment	Highest level of certainty and accuracy for minimal data inputs (lower than the CDM)	Reasonable level of accuracy, medium level of certainty	Lower levels of accuracy and certainty

Source: Calculating Greenhouse Gas Benefits of GEF Transportation Projects

14. While the application of these terms has been useful for GEF's purposes to date, the terms "direct" and "indirect" are used in the global GHG accounting community in very different ways. For example, the IPCC defines "direct" and "indirect" emissions as follows[58]:

"Direct emissions or 'point of emission' are defined at the point in the energy chain where they are released and are attributed to that point in the energy chain, whether a sector, a technology or an activity. E.g. emissions from coal-fired power plants are considered direct emissions from the energy supply sector. Indirect emissions or emissions "allocated to the end-use sector" refer to the energy use in end-use sectors and account for the emissions associated with the upstream production of the end-use energy. Some emissions associated with electricity generation can be attributed to the buildings sector corresponding to the building sector's use of electricity".

Recommendation 1: Standard Definitions

15. It would be beneficial for the GEF to align its use of the terms "direct" and "indirect" emissions with the broader GHG community. This is so that understanding and communication of the GHG mitigation impacts of its projects and policies are neither misconstrued by the GEF and GEF Agencies nor misinterpreted by those outside of the GEF.

16. It is recommended that the GEF defines GHG mitigation effects that come as a result of projects as "consequential" GHG emission reductions instead of "indirect" GHG emission reductions. Such projects might involve market facilitation and development through project-

[58] www.ipcc.ch/publications_and_data/ar4/wg3/en/annex1-ensglossary-e-i.html

supported policy and institutional frameworks, capacity building, information gathering, and replication effects of demonstration activities. This is reflected in Annex 2 of this document.

Issue 2: Projects Are Not Consistently Described

17. The three existing methodologies (transportation, EE and RE) do not have a standardized list of GHG accounting or project specific definitions. Standardizing terms is the first step towards overall consistency in GHG accounting.

Recommendation 2: Request GEF Agencies to Use Standardized GHG Accounting and Project Definitions

Sources of GHG Accounting Terms and Definitions

18. Identified sources of definitions are provided below:

(a) Very early on in the WRI Standard there are definitions for relevance, completeness, consistency, transparency, accuracy and comparability – along with guidance for using these terms in practice;

(b) UNFCCC – CDM Glossary of Terms[59] is in its 7th revision and contains 23 pages of standard terms used in GHG mitigation projects and accounting; and

(c) Intergovernmental Panel on Change (IPCC).

19. It is recommended that the terms defined in the WRI Standard are used. Then, if a required definition for a project cannot be found in the WRI Standard, the CDM Glossary of Terms should be used. The WRI and UNFCCC draw on IPCC definitions. These sources are recommended because their documents are more focused on projects than IPCC Guidelines, which are broader in scope (e.g. are used for national-level GHG inventories).

Sources of Project-specific Definitions of Terms

20. The UNFCCC gives detailed definitions for the main elements of different project types, which should be used when using its methodologies:

(a) Grid-connected RE projects – the UNFCCC's "Grid-connected electricity generation from renewable sources"[60] defines terms such as installed power capacity, capacity addition, retrofit, rehabilitation, replacement, reservoir, existing reservoir, backup generator, power plant/unit, greenfield power plant and integrated hydropower project;

(b) EE projects – the UNFCCC's "Energy efficiency technologies and fuel switching in new and existing buildings" (e.g. for the building codes module) defines terms such as building unit, gross floor area, residential building unit, commercial building unit, institutional building unit, chilled water system,

[59] http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

[60] https://cdm.unfccc.int/filestorage/0/X/6/0X6IERWMG92J7V3B8OTKFSL1QZH5PA/EB81_repan09_ACM0002_ver16.0_clean.pdf?t=UTJ8bmprdDBmfDC05iSCC5-BlQDfr3_aCgGU

chilled water, heating degree days, cooling degree days, hot water system, B-settings, T-settings, municipality and administrative boundary; and

(c) Transportation projects – the UNFCCC's "Modal shift in transportation of liquid fuels" defines terms such as pipeline, biofuel, fossil fuels, Liquid Production Centers (LPCs), Pipeline Inlet Stations (PISs), Pipeline Outlet Stations (POSs), and point of destination.

21. It is understood that the wholesale use of UNFCCC CDM methodologies is not only onerous, but unsuitable for GEF projects. However, parts of the methodologies can be used without conforming to all requirements.

Issue 3: Identification of Standard Datasets

22. There is a need to provide more standard datasets to GEF Agencies.

Recommendation 3: Standard Datasets Should be Identified, Expanded Upon or Referred to With Greater Clarity

Renewable Electricity Manual

23. With RE, emission reductions are generated principally by replacing fossil-fuel generation from off-grid or on-grid generation sources. Recommendations here are firstly with respect to grid-connected projects emission factors, then off-grid emission factors.

24. For grid-connected projects, the GHG accounting tool accompanying the RE methodology directs users to "Enter the Emissions Factor of the marginal technology or national grid. Refer to IEA documented national emissions factors". The latest International

Figure A6.1: Example of IEA Emission Factors

112 - CO_2 EMISSIONS FROM FUEL COMBUSTION *Highlights* (2013 Edition)

CO_2 emissions per kWh from electricity generation

grammes CO_2 / kilowatt hour

	1990	1995	2000	2004	2005	2006	2007	2008	2009	2010	2011	average 09-11
Bangladesh	554	601	556	546	553	578	593	585	597	604	564	588
Brunei Darussalam	924	880	795	820	800	839	739	791	789	730	717	745
Cambodia	..	805	834	806	793	797	805	820	816	804	793	804
Chinese Taipei	463	533	625	644	649	657	653	648	635	624	601	620
India	812	901	920	931	920	906	916	934	942	913	856	904
Indonesia	679	592	654	708	719	736	768	747	752	716	755	741
DPR of Korea	566	481	584	528	522	533	469	481	498	465	475	480
Malaysia	677	543	495	561	618	598	611	653	597	724	688	669
Mongolia	693	1 273	1 097	872	887	841	953	851	857	947	837	880
Myanmar	510	508	457	436	395	374	357	308	199	262	255	239
Nepal	-	26	12	6	7	5	4	4	4	1	1	2
Pakistan	408	405	479	397	380	413	433	451	458	425	409	431
Philippines	341	463	493	448	491	429	443	483	475	481	492	483
Singapore	908	933	762	561	534	524	521	507	487	498	500	495
Sri Lanka	2	51	448	513	476	335	394	420	429	379	469	426
Thailand	626	605	567	543	535	511	546	529	513	513	522	516
Vietnam	552	301	427	438	447	435	426	406	384	432	429	415
Other Asia	348	264	253	406	411	357	327	311	316	315	315	315
Asia	**664**	**704**	**729**	**725**	**723**	**717**	**730**	**740**	**740**	**730**	**707**	**725**

Energy Agency (IEA) source data[61] are shown in Figure A6.1.

61 www.iea.org/publications/freepublications/publication/CO2EmissionsFromFuelCombustionHighlights2013.pdf

25. These data could be ambiguous to users, leading to questions such as:

(a) What years' data should be used? For example, should the data available from the IEA, which were available at the time of the chief executive officer's (CEO) decision, be used in estimating emission reductions or should the data that were available at Project Identification Form (PIF) stage be used? Also, what data should be used at mid-term and terminal evaluation stages?

(b) The data that the IEA presents shows grid emission factors for the years 1990, 1995, 2000, 2004-11 and an average of 2009-11. Guidance on what years' data should be used is not provided and documentation for the selection of year is not explicitly requested.

26. While comprehensive, IEA data are the result of a series of complex methodological choices over the inclusion of combined heat and power or not. This is summarized in the section "Methodological choices: electricity-only versus combined electricity and heat" of the latest IEA source of national emission factors. The IEA states that "Emissions per kWh should be used with caution due to data quality problems relating to electricity efficiencies for some countries".

27. A greater level of accuracy can be achieved by using the UNFCCC's tool "Tool to calculate the emission factor for an electricity system"[62]. It provides GEF Agencies with definitions and methodologies to calculate operating and build margins (to make a combined margin) for electricity systems – these are grid emission factors that take into account the current composition of the grid and how this would change in the baseline scenario, as the make-up of the grid changes over time (e.g. from coal-fired plants to more gas-fired power plants). There are a number of options to calculate operating margin and the "simple operating margin" requires the use of a number of years' data. Therefore, the tool also takes into account fluctuations in primary fuel prices and generation due to seasonal factors affecting existing RE plants.

28. The use of the tool would introduce a consideration of the composition of the grid in a dynamic way, adding greater accuracy to ex-ante estimations of emission reductions (this is also discussed in the recommendation related to baseline setting). To assist in the task of estimating the latest grid emission factor using the UNFCCC tool, the Institute for Global Environmental Strategies (IGES) has created the "IGES CDM Grid Emission Factor Calculation Sheet"[63]. This "aims at providing a simplified spreadsheet for estimating a grid emission factor from the power system based on the approved methodological tool". It will automatically calculate the grid emission factor for the baseline of a project activity while requiring a user to enter only key data.

29. Where data are not available for the GEF Agency to calculate the latest grid emission factor, IGES also publishes its "List of Grid Emission Factors"[64] that provides a summary for over 80 countries and more in-depth analyses of a selection of others countries' grid emission factors.

[62] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf
[63] http://pub.iges.or.jp/modules/envirolib/view.php?docid=3163
[64] http://pub.iges.or.jp/modules/envirolib/view.php?docid=2136

30. It is not recommended to disregard IEA data. However, the use of the UNFCCC tool would be considered the more reliable source of grid emission factors, with IEA data as a fall back option if necessary. The UNFCCC data could be linked to in the GEF guidance. Upon notification by the UNFCCC/IGES of changes to the latest data, the GEF guidance would be updated.

31. An example of a tiered approach to the use of emission factors (and other types of data in future work carried out by the GEF in improving GHG accounting) may be:

(a) **Highest accuracy**: use of UNFCCC's tool at PIF/CEO endorsement stage in applying for funding. This will ensure the latest data vintage used takes greatest account of how the generation mix of the grid in question is changing;

(b) **Medium accuracy**: use of IGES summary data of grid emission factors derived using the UNFCCC tool; and

(c) **Low accuracy**: IEA default data.

32. With respect to projects that generate power from off-grid activities (e.g. diesel combustion), GEF Agencies are provided with a table (Figure A6.2) that incorporates

Figure A6.2: Example of IPCC Emission Factors

Implied carbon emission factors from electricity generation (CO_2 / kWh) for selected products

Average implied carbon emission factors from electricity generation by product are presented below, for selected products. Those values are given as a complement of the CO_2 emissions per kWh from electricity generation by country presented in the Summary tables. The values below represent the average amount of CO_2 per kWh of electricity produced in OECD member countries between 2009 and 2011. As they are very sensitive to the quality of underlying data, including net calorific values, and of reported input/output efficiencies, they should be taken as indicative; actual values may vary considerably.

Product	gCO_2 / kWh
Anthracite *	965
Coking coal *	785
Other bituminous coal	860
Sub-bituminous coal	925

emission factors for 20 fuel types (not all shown below).

33. For projects involving off-grid investments and interventions, a better source of emission factor data can be provided. The use of IPCC Guidelines (i.e. 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, *Stationary Combustion*) is recommended[65].

34. A point for consideration is that where default factors are readily available, it is possible that users of the methodology may not seek out more robust or accurate factors (e.g. more project-specific or more recent factors). Hence, a tiered approach to the use of emission factors, and other accounting elements may be considered for future development.

35. When revising the RE Manual:

(a) The guidance for estimating emission reductions from EE projects should be removed. This guidance has since been superseded by the March 2013 Manual "Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, v1.0"; and

(b) The title of the Manual should use the term "renewable electricity" and not "renewable energy", as it does not cover renewable heat or biofuels projects. The existing guidelines will be referred to as being "renewable electricity" or "RE" and the "Renewable Electricity Manual" for the remainder of this document.

Energy Efficiency Methodology

36. With the EE methodology, there is scope to increase the level of signposting to, or direct incorporation of default data that could be used in the existing modules' models. For example, with respect to the standards and labeling module, the European Commission has provided publicly available data that can be used by project proponents. Useful data has been published to support the EU's Ecodesign Directive[66] and Energy Labelling Directive[67] for example.

37. How such signposting should be incorporated into the newly revised methodology will need to be taken at the same time as other decisions on harmonization of fonts, graphics etc., This would happen during the next steps of the GEF's process to improve estimation of GHG impacts. Broadly, the option to be decided upon is whether text is referred to, or directly incorporated with a reference to the source. In the next stage of this GHG accounting improvement project, guidelines would be established in association with STAP on minimum criteria for data use. An initial recommendation is to use standards produced by the WRI, IEA, ISO, International Renewable Energy Agency (IRENA), and British and European standards. GEF Agencies still retain the flexibility to use other standards, but these would require a greater level of justification when applying for GEF funding.

38. Along with standards, data used by national governments to make policy as a result of other policy evaluation could be identified as a minimum standard for inclusion in calculations of emission reductions. The WRI Standard is particularly useful when

Figure A6.3: Examples of Data to be Collected by Stage

Stage		ollected
Pre-policy	Informs the baseline scenario	Amount and type of insulation installed prior to the policy
Policy implementation	Indicates ongoing performance of policy	Amount and type of insulation installed during each year of policy implementation
Post-policy	Informs the estimate of the policy impact ex-post	Amount and type of insulation installed over lifetime of the policy

considering data to be collected when looking at policy impacts, offering guidance on types of data that might be collected.

Source: WRI Standard

39. In addition to expanding on the data for existing project types, there is a challenge to provide other datasets for project types that are not yet covered in the existing Manual. As it is impossible to offer default standards for all types of EE measures or establish energy use for all items of equipment, it is recommended that guidance on minimum standards for the collection of data be issued. Appendix A of the WRI Standard offers specific advice on this (e.g. considering the use of primary data or secondary data).

Figure A6.4: Advantages and Disadvantages of Primary Data and Secondary Data

Type of data	Advantages	Disadvantages
Primary data	• Provides better representation of the policy's specific effects • Enables more accurate assessment of policy effectiveness	• May be costly • May be difficult to verify the quality of primary data
Secondary data	• Enables estimation when primary data is unavailable or of insufficient quality • Can be useful for estimating GHG effects for minor sources or effects • Can be more cost-effective and easier to collect • Can be used to estimate the relative magnitude of various effects (for example, when defining the GHG assessment boundary in Chapter 7) and prioritize efforts in primary data collection	• Data may not be representative of the policy or action's specific effects • May limit the ability to accurately quantify and assess policy effectiveness

Source: WRI Standard

40. As the screenshots of the tools associated with the EE Manual are very hard to read, it is recommended they are improved when the Manual is revised.

41. The EE and Transportation Manuals provide guidance on specific project types. While they cover a very good proportion of project types, there is room for extra models and project types to be included. This is expanded upon below.

42. As noted above, it will not be possible to identify in the existing or new GHG manuals what activity data need collecting as the GEF's project portfolio is so diverse. However, by referring users to guidance such as that mentioned above, a more standardized approach will be ensured for future data collection activities.

43. Finally, it is recommended that the text that leads to footnote 12 in the EE Manual be changed. Currently, the text refers to the IPCC 4th Assessment Report, but it should refer to

Figure A6.5: Data Collection Procedures

Procedures	
Data compilation	The processes that have been followed to compile the data should be clearly described. This may include a description of how the data is compiled, who has compiled the data, and where the data is stored.
Data processing	The steps taken to further process the data should be clearly described. This should include details of any modifications or corrections that have been made to the data, including the cleaning of data sets, the removal of outliers and any other adjustments. These changes should be documented, along with a brief justification for any key decisions.
Quality assurance / quality control	For key data sources or data sets, users should provide a judgment on the overall quality of the analysis. This may require a subjective assessment, but the aim is to provide an indication of the overall quality of the data and the main uncertainties. Established QA/QC procedures should be clearly followed.

IPCC 2006 Guidelines (as in the footnote in the EE Manual).

Source: WRI Standard

Transportation Methodology

44. The five models presented in the transport methodology broadly cover the main types of intervention well. However, there are two particular aspects of project types that could be developed further in the existing manuals:

(a) Vehicle EE and fuel switching. Although the GEF methodology provides the formula for estimating the impacts of these interventions, the guidance is limited and there is no TEEMP model with emissions factors, etc. The Inter-American Development Bank (IDB) has several methodologies for these types of project where guidance could be referred to (e.g. Mitigation Strategies and Accounting Methods for Greenhouse Gas Emissions from Transportation). For emissions factors, GEF Agencies can obtain data from a model called COPERT[68] which gets used as an input in SULTAN modeling[69]. There may also be scope to improve emissions factors throughout the guidance by gathering data on "well-to-wheel" uplifts;

(b) Freight-switching projects. Guidance here could be developed further. It is recommended that a TEEMP model be built for this type of intervention. The Emissions Analysis of Freight Transport Comparing Land-Side and Water-Side Short-Sea Routes: Development and Demonstration of a Freight Routing and Emissions Analysis Tool (FREAT)[70] may provide a basis for building a TEEMP. It could provide guidance with respect to the cost considerations driving behavior. It should also be considered whether or not guidance on slow steaming is included; and

(c) Eco driving for electric vehicles. The Eco-driving TEEMP provided along with the Transportation Manual can be expanded to allow for the inclusion of electric vehicles in eco-driving projects. At present, only petrol and diesel vehicles have parameters in this TEEMP specifying their EE and potential for EE savings through eco-driving. The impact of eco driving on the EE of electric vehicles is a nascent area of research. Therefore, there is a limited amount of evidence to draw on at present, but electric passenger cars in particular have been the subject of a few small-sample studies into the impact of driving styles on EE (by academics at the universities of Sunderland[71] and Lincoln[72], and by Cenex[73]). According to the RAC Foundation, the actual impact of the Energy Saving Trust's Smarter Driving courses is to extend the range of electric vehicles by 20% on average[74] (which implies a significant

[68] http://emisia.com/copert
[69] www.eutransportghg2050.eu/cms/illustrative-scenarios-tool/
[70] http://climate.dot.gov/documents/emissions_analysis_of_freight.pdf
[71] www.inderscience.com/info/inarticle.php?artid=50492
[72] http://eprints.lincoln.ac.uk/11164/
[73] www.cenex.co.uk/wp-content/uploads/2013/06/Electric-vehicle-driver-and-duty-variation-performance-study1.pdf
[74] www.racfoundation.org/assets/rac_foundation/content/downloadables/easy_on_the_gas-wengraf-oct2012.pdf

reduction in emissions per vehicle km). Even less research has been conducted on the impacts of eco-driving on low emissions commercial vehicles, buses and two-wheelers. However, an extrapolation could be made on the basis of the differential between conventionally fuelled and electric passenger cars.

45. In addition, two further observations are presented for further consideration:

(a) The bike-sharing TEEMP does not explicitly account for the GHG emissions associated with distribution and redistribution of bikes, which is usually a significant determinant of the overall GHG impacts of the scheme; and

(b) The vehicle emissions factors in the rail TEEMP could be developed further by differentiating between electricity and diesel, different speeds and different vehicle occupancies. The Asian Development Bank has a model for railway projects[75] that might be used to improve this particular GEF TEEMP.

46. When considering the next TEEMPs for development, the following project types are proposed:

(a) Urban access regulation projects, such as setting up congestion charging schemes or low-emissions zones. This is particularly important given the GEF's focus on sustainable cities projects in the GEF-6 replenishment. Probably the most significant part of this model would be a modal shift effect, but effects on trip frequencies and vehicle stock could also feature. To develop the outline of a model, reviews of projects completed to date should take place to quantify typical effects on travel behavior and to derive some initial assumptions;

(b) High-occupancy vehicle lane projects. Further activity should aim to see if this can be built out of components for other models such as for bus rapid transit (BRT) and expressway projects; and

(c) Cable car use. The IDB employs a CDM methodology for this in its transport GHG methodology.

47. Other sources of standard datasets include:

(a) GWPs from the Fourth IPCC Assessment Report, 2007 (AR4)[76];

(b) IEA and IRENA reports on costs of equipment; and

(c) Meta-datasets such as the Climate-Smart Planning Platform can be used. From the provider's webpage:

"Developing-country practitioners, and in particular modelers working to develop climate-resilient, low-carbon analyses and plans, often have difficulty locating

[75] www.adb.org/documents/reducing-carbon-emissions-transport-projects

[76] It is recommended to use GWPs from the AR4 instead of AR5 for two reasons: 1) Countries have agreed to report their 2015 national GHG inventory estimates using the AR4 GWPs; and 2) the IFI Harmonization Initiative is using the AR4 GWPs for the methodologies they are developing. Therefore using AR4 GWPs will be more in keeping with the reporting of others. If either of these circumstances changes then the GEF may reconsider using AR5 GWPs.

appropriate tools, data, knowledge products, technical assistance, and social support that they need to create viable more sustainable alternatives to traditional development trajectories. It can be even harder when they try to tailor these to local conditions, capacities and challenges – especially if they do not have a clear idea of what information is available or where to find it. As a result, existing knowledge products and technical assistance are often under-utilized, particularly where they are most needed. Expert guidance to help locate this information can have far-reaching impacts on their analytical findings. The Climate-Smart Planning Platform was designed to help bridge these gaps"[77]; and

(d) IPCC Fifth Assessment Report: Chapter 8, Transport; Chapter 9: Buildings; Chapter 10: Industry, and Climate Change 2014: Mitigation of Climate Change[78].

[77] https://www.climatesmartplanning.org/
[78] www.ipcc.ch/report/ar5/wg3/

Issue 4: Actual Case Studies for Methodologies

48. Case studies rather than high-level examples would be welcomed by GEF Agencies.

49. The process for estimating direct, direct post-project and "consequential" emissions is described in each methodology. In these project types, examples of each type of emission reduction and how they are calculated is clearly provided.

50. However, in the two example projects, presented for the wind power and photovoltaic projects, there is not an illustrated example of how the GEF Agency would, for example, calculate direct post-project emission reductions.

51. Moreover, the examples are a limited theoretical illustration of the step-by-step process rather than actual case studies. An actual case study or, at least, some more detail to the examples would provide more context to the decision of how to apportion emission reductions between the three types of emission reduction that the GEF wishes to measure.

52. The calculation tools already provided in the EE methodology have project examples for each of the four modules in the methodology. The use of examples in the EE methodology can serve as an example for the other methodologies to incorporate (i.e. the RE Manual or the new frameworks proposed).

53. The project examples are also helpful since they illustrate the types of project that fit into each of the four modules. However, there is room for further clarity regarding the applicability of some project types to the four modules. Additional clarity on treatment of capacity building would also be helpful.

Recommendation 4: Make Available Case Studies of Actual GEF Interventions That Show Best Practice

54. When presenting best practice, it would be helpful to provide extra guidance on categorizing emission reductions between the three types correctly.

Issue 5: Standardized Definition of the Project

55. This builds directly upon the previous recommendation. Before defining a boundary, defining the project is a fundamental step in estimating emission reductions. It sets the scene for later considerations such as:

(a) How the proposed project's boundary should be defined; and

(b) What other projects, policies and national circumstances exist that may affect emission reductions attributable to the project. This aids baseline setting, defining causal chains, and designing monitoring plans and other important GHG accounting elements.

56. GEF projects are more complex than simple capital investment projects and have many components. The limited amount of guidance to define and account for the impact of complex projects (e.g. from entities such as the WRI, the FAO or other GEF Agencies) could be better used by the GEF.

Recommendation 5: To Request GEF Agencies to Provide Project Definitions Identified in Other Guidance

Classification of Project Types

57. Guidance is available from multinational development banks, UNFCCC and the WRI. For example, the International Finance Corporation's (IFC) Definitions and Metrics for Climate-Related Activities[79] provides clear definitions of different project types:

(a) A renewable energy project;

(b) An EE project;

(c) An AFOLU project;

(d) A waste management project;

(e) A transport project;

(f) Other mitigation projects; and

(g) Carbon markets projects.

58. In addition, the GEF may elect to provide definitions of other types of project such as RE or "renewable heat". The latter may include bioenergy, geothermal and solar thermal projects.

59. Projects can also be defined quantitatively (e.g. by setting minimum criteria for projects or components of projects to be considered as a project type). For example, the IFC states (among other criteria) that an "IFC EE project must achieve any of the following minimum thresholds within the project boundary to qualify as EE:

(a) Reduce absolute energy consumption by at least 15%;

(b) Reduce GHG emissions by at least 25,000 tonnes of CO_2e/year, or

(c) Reduce electricity consumption by at least 50 GWh/year".

60. By providing definitions of a common understanding of what, for example, an EE project is, tackles a complex question facing those defining business-as-usual scenarios for EE projects. By setting minimum requirements, such as what level of efficiency savings are required to constitute an EE project, emission reductions can be attributed to the intervention rather than simple equipment replacement or business expansion using new equipment.

Policy Centric Projects

61. Defining capital investment projects can be simpler than defining policy-based projects:

79 www.ifc.org/wps/wcm/connect/534495804a803b32b266fb551f5e606b/IFC+Climate+Definitions_2014.pdf?MOD=AJPERES

(a) Feasibility studies based on tried-and-tested engineering standards can be used for justifying assumptions;

(b) Projects such as hydropower or energy efficient equipment promotion policies have been implemented for decades and benchmark data are available for project proponents; and

(c) Monitoring and reporting on capital projects can be easier (e.g. relying on programmable logic systems to measure activity data).

62. The working agreed that the WRI Standard is the most suitable framework for the GEF Agencies to define their projects. The WRI Standard provides a checklist of standard information that is needed for the type of project the GEF provides funding for – although some of this is already covered sufficiently by the PIF form:

(a) The WRI Standard can complement the requirements of the PIF by adding extra guidance on:

(i) Intended level of mitigation to be achieved and/or target level of other indicators (if applicable);

(ii) Title of establishing legislation, regulations or other founding documents;

(iii) Monitoring and reporting procedures;

(iv) Potential enforcement mechanisms;

(v) Reference to relevant guidance documents;

(vi) The broader context/significance of the policy or action; and

(vii) Outline of non-GHG effects or co-benefits of the policy or action.

(b) Will help users decide whether to assess an individual policy or a package of policies. Guidance is then given on how policy interactions may be considered and documented (e.g. independent policy projects, overlapping policy projects and reinforcing policy projects).

63. Upon initial consideration, this recommendation may appear to go against the GEF's desire to keep GHG accounting requirements simple. However:

(a) While the guidance in the WRI Standard is detailed, it is not considered onerous. The user is very much given the flexibility needed; and

(b) The extent to which the WRI Standard should be integrated to current methodologies remains an open question and one for the GEF to consider going forward.

Issue 6: Identifying Effects and Mapping the Causal Chain

64. Practical guidance on mapping a causal chain can, for example, help the GEF Agencies better identify direct and, particularly, consequential emission reductions at the ex-ante stage.

65. The GEF has its own theory of change, but guidance on how this can be implemented practically is not provided in the existing manuals. The theory of change is outlined in

documents outside of the existing manuals[80] [81], which can make it difficult for GEF Agencies to find, and then relate proposed projects to. This can make it difficult to find the theory of change and then relate proposed projects to it.

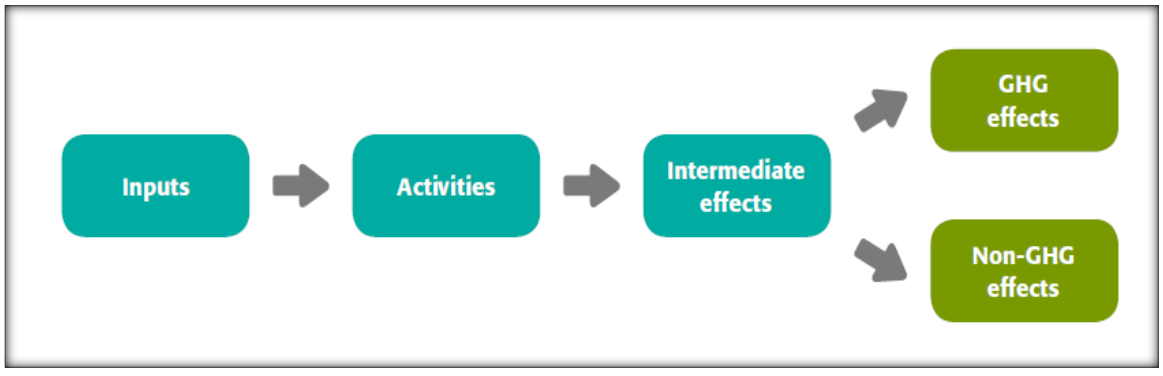
66. Causal chains in policy-making have been discussed in the literature, but estimating GHG emissions as a result of causal links is not so well documented. Mayne (2012)[82] reports:

> "All development interventions endeavor to make a difference and to demonstrate that they are doing so. They undertake activities and produce outputs that are expected to lead through a sequence of events to specific improvements in the wellbeing of beneficiaries. However, as is well known, making the causal link between the activities and outputs and subsequent impacts can be challenging:
>
> - *The causal path between the activities/outputs and the impacts can be quite extended, involving a long causal sequence of immediate and intermediate results and often a long time-scale;*
> - *Events and conditions outside those of the intervention can influence the extent to which the impacts are brought about; and*
> - *There may be a number of causes, including other concurrent interventions, contributing to the realization of the impacts in addition to the influence of the intervention. The intervention is not working alone".*

Recommendation 6: Mapping the Causal Chain

67. In terms of GHG accounting for GEF projects, the WRI Standard is assessed to be the best guidance document available for use. It is recommended that the GEF integrates the guidance contained therein to all three existing methodologies. The WRI's basic concepts on defining the causal chain are well defined and clear. For example, accompanying the procedure illustrated below is a table defining "inputs", "activities", "intermediate effects",

Figure A6.6: Relationship of Inputs, Activities, Intermediate Effects, GHG Effects, and Non-GHG Effects



[80] www.thegef.org/gef/sites/thegef.org/files/documents/Impact%20-%20Climate%20Change%20Mitigation%20IE.pdf
[81] www.thegef.org/gef/sites/thegef.org/files/documents/OPS5-Final-Report-EN.pdf (section 7.3)
[82] www.cgiar-ilac.org/files/publications/mayne_making_causal_claims_ilac_brief_26.pdf

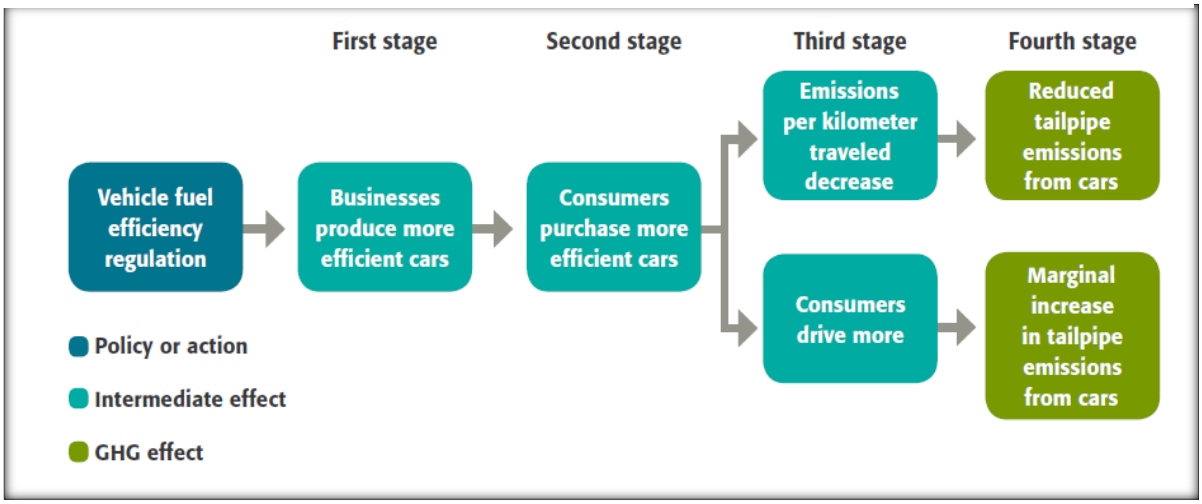
"GHG effects" and "non-GHG effects".

Source: WRI Standard

68. The dedicated chapter in the WRI Standard on mapping a causal chain guides the user on how to identify potential GHG effects of the proposed policy or action, how to identify GHG source/sink categories associated with GHG effects and how to map a causal chain. By requiring methodology users to sketch out simple illustrations of causal chains, it will mean that GHG effects will have to be considered at each stage, and the consequential emissions attributable to the original policy impact can be more accurately estimated.

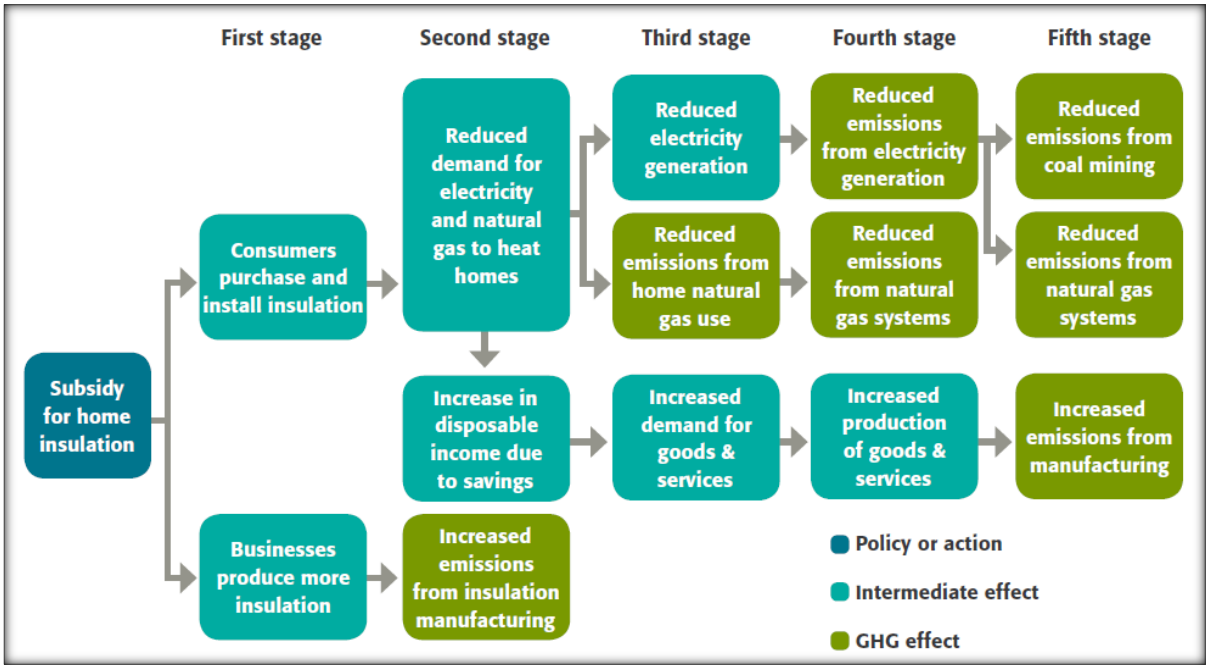
69. Illustrated examples for the introduction of a vehicle fuel efficiency regulation and an EE subsidy policy are shown in Figure A6.7.

Figure A6.7: Example of Multiple Effects Leading to the Same Source (For an Illustrative Vehicle Fuel Efficiency Regulation)



Source: WRI Standard

Figure A6.8: Example of a Causal Chain for an Illustrative Subsidy for Home Insulation



Source: WRI Standard

Issue 7: Definition of Project Boundary

70. Defining project boundaries can be improved in the existing GEF manuals.

71. While, in many cases, project boundaries will be the host nation's borders or a jurisdiction, other considerations include:

(a) Projects implemented in different parts of a country will result in different amounts of emission reductions. For example, Malaysia has three electricity grids, each with a different grid emission factor. A nationwide or sector-wide intervention will, in that case, lead to differing impacts depending on where activities are implemented in the country;

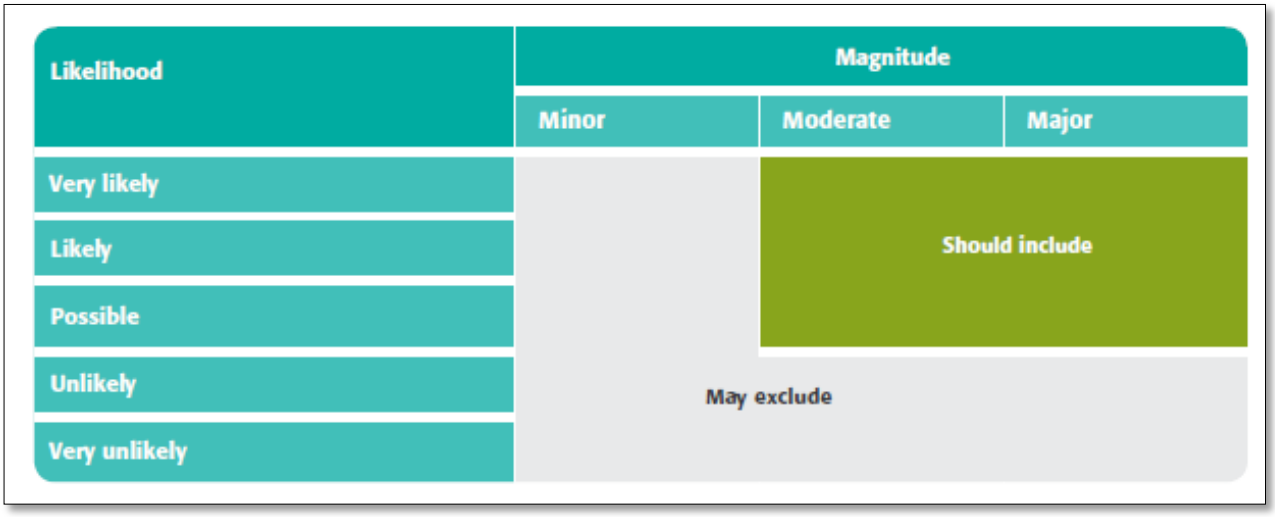
(b) Being more precise about a boundary can help projects hosted in the same country to define which emission reductions are attributable to which project (or project component); and

(c) Questions over where emissions are accounted for can be answered. For example, in the methodological framework for urban projects, a methodology is recommended that answers the following question: "If a car is made in China, but is sold in the UK and used solely in the UK, where should the emissions from its manufacture be considered to have arisen?" It might be sensible in some cases to conclude that the emissions occurred in China as that is where the car was manufactured. However, other approaches would conclude that, as the car is solely intended for use in the UK, the emissions arising from its manufacture should be counted as having arisen in the UK.

Recommendation 7: Request GEF Agencies to Use the WRI Standard to Define a Project Boundary

72. This fundamental step in the process of estimating emissions has a chapter of its own in the WRI Standard and provides good guidance, such as how an assessment of the

Figure A6.9: Approach for Determining Significance Based on Likelihood and Magnitude



significance of potential GHG effects is required for boundary setting.

Source: WRI Standard

73. Further guidance is given on determining which GHG effects, source/sink categories, and GHGs to include in the GHG assessment boundary. This can be very important when considering the causal chain of impacts caused by an intervention and identifying catalytic effects (see Recommendation 5). Finally, the GHG assessment period is also a consideration and the clear documentation of assumptions of project lifetime is critical to boundary setting.

Issue 8: Guidance on Baseline Scenarios and Assumptions

74. Accurate assumptions and estimations of baseline emissions/activity data are the cornerstones of any credible GHG accounting methodology; guidance is currently lacking.

Recommendation 8: Improved Scope and Depth of Baseline Scenarios and Assumptions

75. The three existing methodologies provide guidance on assessing the baseline scenario to greater and lesser extents. If the transport methodology is used as a benchmark example, it can be seen that data gathering to determine the baseline scenario could be improved:

(a) **Activity data gathering:** The GEF methodology notes that "In cases where local travel activity data is weak, its acceptance is subject to GEF approval and could possibly be disallowed. So, a strong effort must be made to collect valid local data in the project preparation phase". Guidance on how to gather good activity data is limited, except for BRT projects. For travel demand management projects and comprehensive transport strategy projects, there is essentially no guidance. An introduction to the basics of gathering activity data could be taken from well-respected transport specific texts such as Luis Willumsen (2011) *Modelling Transport* (although copyright considerations would need to be made as this book's content is not in the public domain); and

(b) **Stated preference surveys:** Stated preference data and analysis is a relatively simple and cheap way of getting area and project-specific data. It allows for more reliable assumptions on people's tendency to choose one mode over another and could probably help very significantly in reducing the uncertainty in infrastructure project forecasts, including BRT or highways. It is not mentioned at all in the GEF methodology and could be introduced as a concept quite easily.

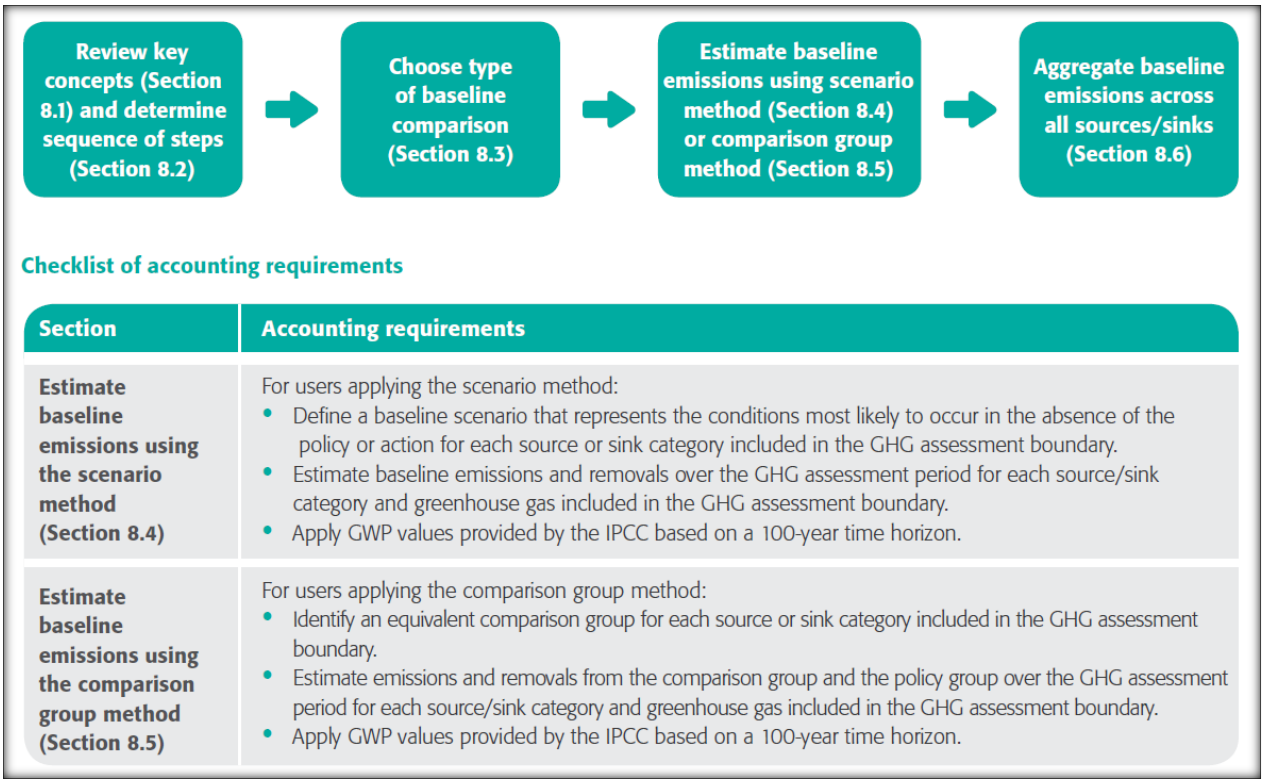
Issue 9: Limited Guidance on Baseline Scenarios and Assumptions

76. Among the most important elements in GHG accounting are the assumptions that go into the baseline scenario. Guidance in this respect can be improved in the existing GEF manuals.

Recommendation 9: Improved Guidance on Baseline Scenarios and Assumptions

77. The WRI Standard offers guidance on collecting data and estimating emissions at a much greater level of detail than all three existing GEF manuals (e.g. identifying two different ways of estimating baseline emissions).

Figure A6.10: Overview of Steps For Estimating Baseline Emissions



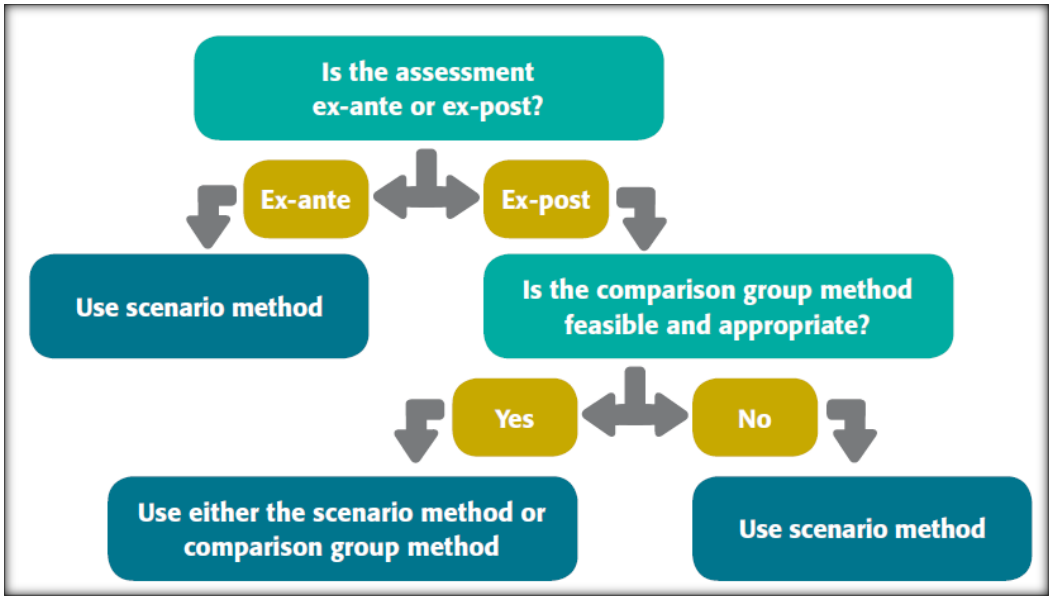
Checklist of accounting requirements

Section	Accounting requirements
Estimate baseline emissions using the scenario method (Section 8.4)	For users applying the scenario method: • Define a baseline scenario that represents the conditions most likely to occur in the absence of the policy or action for each source or sink category included in the GHG assessment boundary. • Estimate baseline emissions and removals over the GHG assessment period for each source/sink category and greenhouse gas included in the GHG assessment boundary. • Apply GWP values provided by the IPCC based on a 100-year time horizon.
Estimate baseline emissions using the comparison group method (Section 8.5)	For users applying the comparison group method: • Identify an equivalent comparison group for each source or sink category included in the GHG assessment boundary. • Estimate emissions and removals from the comparison group and the policy group over the GHG assessment period for each source/sink category and greenhouse gas included in the GHG assessment boundary. • Apply GWP values provided by the IPCC based on a 100-year time horizon.

Source: WRI Standard

78. It should be noted that the referenced WRI Standard is just that – a standard and not a methodology. Hence, it offers guidance, but at the same is flexible and simple enough to apply to a wide variety of applications. All recommendations are made with a consideration not to introduce too much complexity and the WRI Standard does this (e.g. by offering definitions, decision trees and examples of how to apply the guidance). Figure A6.11 is an example of a

Figure A6.11: Decision Tree for Choosing the Type of Baseline Comparison



decision tree for choosing the type of baseline comparison.

Source: WRI Standard

79. Both methods of establishing the baseline are fully explained. Accuracy is also enhanced by disaggregating considerations of what affects baseline emissions into the

- **Other policies or actions:** Policies, actions, and projects—other than the policy or action being assessed—that are expected to affect the emissions sources and sinks included in the GHG assessment boundary
- **Non-policy drivers:** Other conditions such as socioeconomic factors and market forces that are expected to affect the emissions sources and sinks included in the GHG assessment boundary

following two types of driver:

Source: WRI Standard

80. After providing detailed examples of each type of driver and including guidance on non-policy drivers, the WRI Standard goes on to define the range of methodological options available. After defining them, they are arranged in order of accuracy as shown in Figure

Figure A6.12: Range of Methodological Options for Estimating Baseline Emissions Using the Scenario Method

Level of accuracy	Emissions estimation method	Other policies or actions included	Non-policy drivers included	Assumptions about drivers and parameters	Source of data for drivers and parameters
Lower ↓ Higher	Lower accuracy methods (such as Tier 1 methods in the IPCC *Guidelines for National GHG Inventories*)	Few significant policies	Few significant drivers	Most assumed to be static or linear extrapolations of historical trends	International default values
	Intermediate accuracy methods	Most significant policies	Most significant drivers	Combination	National average values
	Higher accuracy methods (such as Tier 3 methods in the IPCC *Guidelines*)	All significant policies	All significant drivers	Most assumed to be dynamic and estimated based on detailed modeling or equations	Jurisdiction- or source-specific data

A6.12.

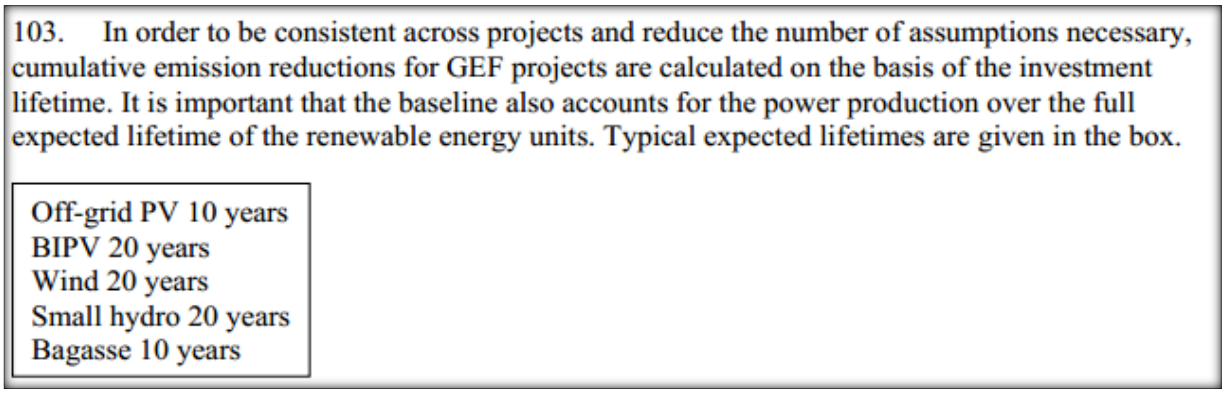
Source: WRI Standard

81. The WRI Standard also provides guidance on assumptions and considerations such as dynamic baselines, potential inclusion of sensitivity analysis and statistical methods for estimating GHG effects. The guidance offered does not contradict the guidance in the GEF's methodologies, but can be used alongside to enhance them.

82. However, it should be recognized that the WRI Standard needs to be complemented by tools and datasets. Taking the case of the transport sector for example, the World Bank's A(S)IF tool could be used in conjunction with the WRI Standard when proposing projects if not covered in enough detail by the existing TEEMPs.

Issue 10: Refine Assumptions on Lifetime of Equipment

83. The current methodology makes very simplistic assumptions. For example in



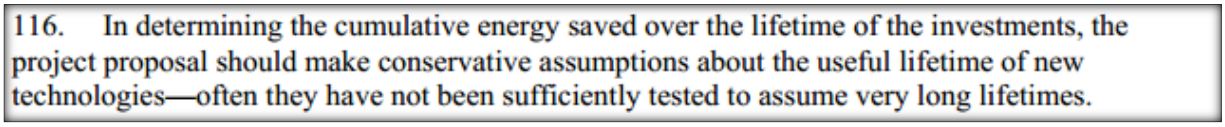
103. In order to be consistent across projects and reduce the number of assumptions necessary, cumulative emission reductions for GEF projects are calculated on the basis of the investment lifetime. It is important that the baseline also accounts for the power production over the full expected lifetime of the renewable energy units. Typical expected lifetimes are given in the box.

Off-grid PV 10 years
BIPV 20 years
Wind 20 years
Small hydro 20 years
Bagasse 10 years

paragraph 103 of the RE methodology as shown below.

Source: Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects

84. As well as being limited to five technology types (although 10 are provided in the accompanying tool), there is no guidance for project implementers on how to approach scenarios where project lifetime is expected to be significantly shorter or longer (e.g. due to local conditions and specialist applications of the technology). The methodology itself points



116. In determining the cumulative energy saved over the lifetime of the investments, the project proposal should make conservative assumptions about the useful lifetime of new technologies—often they have not been sufficiently tested to assume very long lifetimes.

to the need for conservatism when estimating useful lifetimes:

Source: Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects

85. By increasing accuracy here, a more reliable estimation of emission reductions (in all GEF classifications and stages of project implementation) will be achieved.

Recommendation 10: To request GEF Agencies to use the UNFCCC Methodological Tool "Tool to Determine the Remaining Lifetime of Equipment"[83] in all Applications for Project Funding

86. The UNFCCC tool provides guidance on the use of:

(a) Manufacturers' information on the technical lifetime of equipment and how to compare this to the date of first commissioning;

(b) Obtaining expert evaluations;

(c) Default values; and

(d) Definitions are provided for:

(i) Equipment;

(ii) Technical lifetime;

(iii) Operational lifetime; and

(iv) Remaining lifetime.

Issue 11: Lack of Guidance on Plant Load Factors

87. Plant load factor is a key input into the calculation of activity data which, in turn, determines emissions and emission reductions. More guidance on assumptions will increase accuracy.

88. Whether estimating any of the three GEF classifications of emission reductions, the GEF Agency needs to have completed the following formula for direct emission reductions first (as the other two types are based on the initial calculation of direct emission reductions):

Figure A6.13: Formula for Calculating Emission Reductions From Renewable Electricity Projects

$CO_{2\,direct} = E * c = e * l * c$; with
$CO_{2\,direct}$ = direct GHG emission savings of successful project implementation in tonnes of $CO_{2\,eq}$
E = cumulative energy produced by renewable energy, e.g., in MWh; $E = \Sigma_l e$
c = CO2 intensity of the marginal technology, e.g., in t/MWh
e = annual energy replaced, e.g., in MWh
l = average useful lifetime of equipment in years

Source: Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects

89. The equation presented**Error! Reference source not found.** is not incorrect, but uidance on cumulative energy produced ("E" in the equation) and annual energy replaced ("e" in the equation) is very limited in the methodology and needs to be expanded.

[83] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf

Recommendation 11: Request GEF Agencies to use the UNFCCC "Guidelines for the Reporting and Validation of Plant Load Factors"[84]

90. The UNFCCC Guideline provides minimum criteria to estimate ex-ante the plant load factor associated with a proposed project activity.

Issue 12: Project Monitoring

Monitoring Plans are not Described in Detail in the Existing Methodologies

91. The transport manual goes into the most detail, saying:

> "More accurate data can be used to strengthen the baseline developed in the project application phase. It better informs planning and regulation, helps secure wider funding, and is valuable in monitoring and evaluating the project. Better data can help refine the TEEMP models, and, later, makes a successful project easier to replicate. For these reasons, all projects should design tools for monitoring and evaluation, and for the systematic collection of data that relates to the GEF project. Collection tools could include traffic counts, household surveys, global positioning system (GPS) vehicle and personal activity monitoring, local fuel and emissions testing, etc.".

Recommendation 12: Using Standard Monitoring Parameters From UNFCCC Methodologies

92. While it is understood that GEF projects are complex and that specifying monitoring plans in the existing manuals is not possible, more guidance can be provided. GEF Agencies can be directed towards monitoring parameters such as those used in CDM projects. It is generally possible to draw upon standardized lists of datasets and ways of describing a monitoring plan. It would mean taking advantage of the examples in CDM methodologies, without needing to comply with the overall methodology.

93. As well as some of the more detailed monitoring points contained in the project-specific methodologies, there is also the CDM Project Standard. This guides project proponents on, among other matters, monitoring plans. These more general points can be given as guidance to GEF project proponents and will ensure the consistency of results while maintaining a flexible approach. Section 7.2.8.3 specifies that:

> "the monitoring plan shall include the following:
>
> (a) *The operational and management structure to be put in place to implement the monitoring plan;*
>
> (b) *Provisions to ensure that data monitored … be kept and archived electronically for two years after the end of the [project lifetime];*
>
> (c) *Definition of responsibilities and institutional arrangements for data collection and archiving;*
>
> (d) *Quality assurance and quality control (QA/QC) procedures;*

[84] https://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid35.pdf

(e) *Uncertainty levels, methods and the associated accuracy level of measuring instruments to be used for various parameters and variables; and*

(f) *Specifications of the calibration frequency for the measuring equipment either in accordance with the local/national standards, or as per the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used".*

94. If a project does have commonality with a project described in a CDM methodology, then GEF Agencies can use those same monitoring parameters. Examples for the three existing methodologies are illustrated below.

Renewable Electricity

95. UNFCCC Methodology ACM000285 "Grid-connected electricity generation from renewable sources" gives standardized parameters to be continually monitored in this format:

Figure A6.14: Example of a Monitoring Parameter from a CDM Methodology

Data / Parameter:	**$EG_{facility,y}$**
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data:	Electricity meter(s)
Measurement procedures (if any):	This parameter should be either monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid. In case it is calculated then the following parameters shall be measured: (a) The quantity of electricity supplied by the project plant/unit to the grid; and (b) The quantity of electricity delivered to the project plant/unit from the grid
Monitoring frequency:	Continuous measurement and at least monthly recording
QA/QC procedures:	Cross-check measurement results with records for sold electricity
Any comment:	-

Source: UNFCCC

96. Other parameters are defined in the same way and a GEF Agency simply selects those that are applicable to its project, others can be disregarded:

(a) Average mass fraction of CO_2 in the produced steam in year y;

(b) Average mass fraction CO_2 in the produced steam in year y;

(c) Quantity of steam produced in year y;

(d) Quantity of net electricity generation supplied by the project plant/unit to the grid in year y;

(e) Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity;

[85] https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83

(f) Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y;

(g) Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system";

(h) Project emissions from fossil fuel consumption in year y;

(i) Installed capacity of a hydro power plant after the implementation of the project activity; and

(j) Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when a reservoir is full.

Energy Efficiency and Fuel Switching

97. As an example, UNFCCC Methodology AM0091 "Energy efficiency technologies and fuel switching in new and existing buildings"[86] specifies data units, example sources of data, monitoring frequencies, etc. for commonly used parameters (as in the example used in the last paragraph).

Transportation

98. As an example, UNFCCC Methodology AM0110 "Modal shift in transportation of liquid fuels"[87] specifies data units, example sources of data, monitoring frequencies, etc. for the commonly used parameters.

99. Monitoring and reporting around policy impacts is a newer concept with a different set of demands than CDM projects. The WRI Standard can assist GEF Agencies by offering clear guidance, yet still remain flexible.

[86] https://cdm.unfccc.int/methodologies/DB/OHDO0UYZWFH6ZK0U9K98P9NW5WVMJ8
[87] https://cdm.unfccc.int/methodologies/DB/RDI7VG9ZV601J0AZIQOY1KQ570QCRZ

Figure A6.15: Types of Key Performance Indicators for Monitoring Performance

Indicator types	Definitions	Examples for a home insulation subsidy program
Inputs	Resources that go into implementing a policy or action, such as financing	Money spent to implement the subsidy program
Activities	Administrative activities involved in implementing the policy or action (undertaken by the authority or entity that implements the policy or action), such as permitting, licensing, procurement, or compliance and enforcement	Number of energy audits carried out, total subsidies provided
Intermediate effects	Changes in behavior, technology, processes, or practices that result from the policy or action	Amount of insulation purchased and installed by consumers, fraction of homes that have insulation, amount of natural gas and electricity consumed in homes
GHG effects	Changes in greenhouse gas emissions by sources or removals by sinks that result from the intermediate effects of the policy or action	Reduced CO_2, CH_4, and N_2O emissions from reduced natural gas and electricity use
Non-GHG effects	Changes in relevant environmental, social, or economic conditions other than GHG emissions or climate change mitigation that result from the policy or action (see Appendix C for examples)	Household disposable income from energy savings

Source: WRI Standard

Figure A6.15: Examples of Activity Indicators for Various Policies

Examples of policies	Examples of activity indicators
Renewable portfolio standard	Quantity of long-term contracts with renewable energy power generators established, number of renewable energy certificates (RECs) issued
Fuel economy standard	Number of emission certificates issued per year, number of vehicle manufacturers from which information on cars sold is collected by the government
Subsidy for home insulation	Amount of subsidies issued
Energy efficiency standards for appliances	Number of appliance standards and reporting templates published, number of appliance manufacturers from which information on sold appliances is collected
Government buildings retrofit program	Number of retrofit projects procured (for example, number of contractors selected for installation through open bidding process)

Source: WRI Standard

100. A good monitoring plan will help in the implementation of the project. Also, after identifying parameters such as those shown Figure A6.16, assumptions about the baseline scenario may need to be re-assessed to make sure that ex-post emission reductions are calculable.

Figure A6.16: Examples of Bottom-up and Top-down Data by Sector

Sector	Examples of bottom-up data	Examples of top-down data
Transportation	• Distance traveled (vehicle-kilometers traveled) by transport mode and vehicle type • Percentage of trips taken every year by each mode of transportation, length of each trip by mode, number of trips taken by mode per year • Example data source: annual household surveys and/or transportation models	• Total fuel sold in a city, by fuel type • Example data source: city statistics
Waste	• Quantity of waste collected by type, quantity of recyclables collected by type, quantity of compost collected, gross quantity of municipal solid waste, waste diversion rate • Example data source: waste management companies (private) or agencies (public)	• Method of disposal (incineration, landfill) • Landfill: tonnage by depths of landfill • Incineration: incineration rate by type of waste • Location of disposal sites • Example data source: city statistics
Residential and commercial buildings	• Building-level energy use by fuel/energy type • Example data source: annual building surveys or reporting requirements	• Aggregate fuel and electricity consumed by all buildings in a city, by fuel/energy type • Example data source: city statistics from city utilities or energy agencies

Source: WRI Standard

101. The whole chapter that is devoted to monitoring plans for policies and actions covers the following topics:

(a) Definition of key performance indicators;

(b) Definition of parameters needed for ex-post assessment;

(c) Defining the policy monitoring period;

(d) Creating a monitoring plan; and

(e) Monitoring parameters over time.

Issue 13: Improving Guidance on Estimating Ex-post GHG Effects

102. Guidance given to GEF Agencies on how to estimate GHG impacts of a project's ex-post GHG effects can be improved.

Recommendation 13: Estimating Ex-post GHG Effects

103. Accurate ex-post calculations enable the evaluation of project success, communication with donors, and the use of the data to design future policies and projects.

104. The guidelines available in the three existing methodologies do not offer clear enough guidance on estimating emission reductions annually, at the mid-term and project completion stages of GEF project implementation. It is recommended that guidance should be provided in all three existing methodologies that reflects what is considered to be best practice.

105. There is not a process in place for periodically updating the default factors in the calculation tools associated with recommended methodologies. Datasets inevitably change over time, especially in dynamic environments such as in developing countries. A process for this should be considered to ensure the calculation tools remain relevant over time.

106. The use of the WRI Standard for estimating ex-post GHG effects is recommended. It sets out guidance which is simple to follow and covers the following considerations:

(a) Updating the estimate of baseline emissions;

(b) Definition of different types of ex-post assessment methodologies (i.e. top-down or bottom-up approaches);

(c) Estimating emissions under the alternative scenario; and

(d) Additional optional steps to inform decision-making such as:

(i) Normalizing results;

(ii) Harmonizing top-down and bottom-up assessments; and

(iii)Comparing the GHG effects of policies and actions to the GHG inventory.

Issue 14: Lack of Guidance on How to Treat Black Carbon in Greenhouse Gas Accounting Procedures

107. There is a need to improve the guidance given to GEF Agencies on estimating emission reductions from projects involving BC.

108. In addition to the GWP of GHGs (for which emissions mitigation impacts of GEF projects shall be assessed), there is increasing interest in reducing emissions of short-term climate forcers such as BC. BC is a mainly local and regional pollutant that has a strong potential to reduce a rate of global warming in the short-term. However, BC exhibits strong spatial heterogeneity and temporal variability due to its short atmospheric lifetime. Sources include emissions from residential, industrial, agricultural and transportation sectors.

109. Although the GEF – 6 CCM strategy supports actions to reduce BC emissions, the GEF does not account for reductions in BC that can result in climate change mitigation. While current requirements do not mandate reporting of BC emissions or mitigation from the implementation of GEF-funded projects, the GEF recommends and encourages GEF Agencies to undertake assessments of BC emissions and report them as a project co-benefit. The GEF STAP is in the process of developing an information document88 that would assist GEF partners in designing projects addressing BC emissions and provide recommendations for monitoring, accounting and reporting.

[88] Sims, R., V. B. Gorsevski, and S. Anenberg (2015). Black Carbon Mitigation and the Role of the Global Environment Facility: A STAP Advisory Document. Global Environment Facility, Washington, D.C. (in preparation)

Recommendation 14: Addressing Emissions of Black Carbon in GHG Future and Existing Accounting Manuals

110. The STAP's proposed text for specifically addressing emissions of BC in the existing and future GHG accounting manuals is presented below for information purposes only at this stage:

> "Black carbon (BC) is mainly a regional pollutant that exhibits strong spatial heterogeneity and temporal variability due to its short atmospheric lifetime. Its climate effects vary by geographic region, depending on the location and season of emission release, as well as the sensitivity of the nearby region. The GEF – 6 CCM strategy acknowledges that "*... reducing the concentration of SLCFs*[89]*, such as hydrofluorocarbons (HFCs), black carbon, tropospheric ozone, and methane (CH_4), has the potential to slow the rate of global warming over the next two to four decades, as they tend to have much stronger global warming potentials compared to CO_2*" and seeks to support actions to reduce BC emissions from sources such as vehicles, brick-kilns, cook-stoves, and open-field burning. The GEF does not presently account for reductions in BC resulting from climate change mitigation or other projects. GEF STAP is currently in the process of developing information document that would assist GEF partners in designing projects addressing black carbon emissions including recommendations on how to best measure and monitor results. When applicable, STAP recommends that BC emission reductions expected to be generated by GEF projects are considered as *a co-benefit* of GEF investments.
>
> "There is currently no consensus regarding the most appropriate accounting metrics to use for BC and other aerosols emissions, and typical metrics used for GHGs are not easily applied. The *Science Advisory Panel* of the Clean Air and Climate Coalition (CCAC) recommended that it is best to avoid using metrics to compare BC with CO_2 since they influence climate on different time and spatial scales, and through different physical mechanisms[90]. Rather, reducing near-term and long-term climate change pollutants should be considered as separate issues with different mitigation approaches that are complementary, but not interchangeable.
>
> "A range of options exist for measuring BC that requires a range of technology instruments and expertise and with differing levels of uncertainty. Measuring and monitoring the performance of mitigation measures for BC can be done at various points along the "impact chain" (emissions → concentrations → exposure → impacts).
>
> "The STAP Guidance Document will provide information about how to measure BC emissions across sectors for different types of projects and will recommend that specific projects track the impact of a GEF-funded project on levels of BC and organic carbon (OC), the latter of which has a cooling effect and is sometimes co-emitted with BC. One other option would be to track the amounts of BC and total $PM_{2.5}$ emissions reduced, as well as the percentage of total $PM_{2.5}$ that is the BC component. Taking into account recommendations provided in the STAP report, this Manual encourages project

[89] Short-lived climate forcers, here used synonymously with short-lived climate pollutants, or SLCPs.
[90] www.unep.org/ccac/Science/FrequentlyAskedQuestions/tabid/133368/Default.aspx accessed 16 November 2014

proponents to measure and report (using tracking tools) BC emissions from GEF projects."

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