Methodological challenges and potential solutions related to GHG mitigation accounting for renewable energy and energy efficiency projects

Summary of dialogue held on 19 May 2016

Bonn, Germany

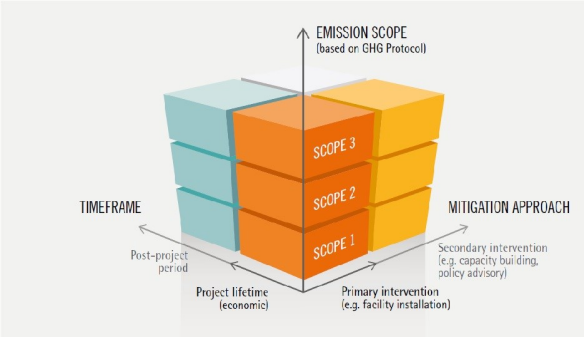
Objective of dialogue

The 1 Gigaton Coalition's first report, which was launched at COP21, was the first effort to assess emissions savings from various renewable energy and energy efficiency initiatives. It found that based on a sample of bilaterally supported projects in the energy sector that these initiatives could save 1.7 GtCO2 per year by 2020. The report found that there is insufficient data and no common methodology to quantify emissions' savings, and that emissions savings to be achieved by 2020 could be higher than this initial estimate if challenges related to data collection and methodology are addressed. The aim of this dialogue was to determine key methodological challenges and potential solutions for measuring and reporting emissions savings resulting from renewable energy and energy efficiency activities. This paper explains the issues and proposed research approaches discussed in our discussion on the 19th of May in Bonn. **The issues discussed together with the points made during discussion** are summarised in this paper.

Primary and secondary intervention

Classifying an activity as either a "primary" or "secondary" intervention is an essential decision for any GHG accounting process. Primary intervention projects directly affect energy production or consumption, GHG emission, mitigation, or carbon **sinks**. The installation of a wind farm is a common example of a primary intervention project.

“Secondary intervention” projects often include capacity building, training, policy support and financial mechanism development. Although the contributions of these secondary intervention projects to GHG mitigation are not always considered, captured, or measured, they are essential for realising a low-carbon economy compatible with the 2/1.5°C goal.



The following approaches were discussed:

* Assess **only primary intervention projects:** only projects with direct mitigation effect, e.g., the installation of a renewable energy (RE) producing facility or energy efficiency installation.
* **Assess both primary and secondary intervention projects:** e.g. also those that potentially induce (large-scale) emission reductions with catalytic and barrier removal effects, e.g. policy support or capacity building.

The following points were made:
* The use of ‘primary’ and ‘secondary’ could imply a ranking (whereas secondary interventions are not necessarily less important), so **terminology should be examined**.
* Primary interventions are easier to calculate, however some secondary projects (e.g., fuel efficiency standards) play critical functions in climate mitigation and can have a large mitigation impact, so **it is still important to consider secondary interventions**.
*The issue of **double counting** needs to considered (e.g. if emissions are factored into a building code’s impacts, and also for a building built under that code later).

Accounting Scope

Emissions accounting scopes vary both within and across institutions that practice GHG accounting at the project level). Many institutions account for scope 1 (direct) and scope 2 (indirect from electricity use) emissions, and several also include scope 3 (other indirect) emissions.

The calculation of emission reductions from primary intervention projects (e.g. an efficient steel plant) typically encompasses Scope 1 emissions (direct emissions from heating) and Scope 2 emissions (from electricity use). For a full assessment, also other indirect emissions can be calculated (Scope 3, e.g. emissions during the mining process), which usually rely more heavily on assumptions and expert judgment.

The accounting of Scope 3 emissions is particularly important for projects related to infrastructure development (e.g., urban transport systems, which could reduce steel and fuel consumption due to the reduced demand for private passenger vehicles). Accurately estimating Scope 3 emissions, however, is very challenging for several reasons. First, the comparability of reported Scope 3 emissions data is especially difficult to verify, as the accounting boundaries and methods used are not always transparent. Second, quantifying the Scope 3 emissions independently involves carrying out an extensive life cycle assessment, a major task. Third, establishing baselines and counterfactual scenarios for assessing Scope 3 emissions is very difficult.

The following approaches were discussed:

* **Include only Scope 1 and 2 emissions**: e.g. for an RE project, account for only the GHG emissions associated with the project's construction and the completed installation's energy output (Scope 1).

* **Also include Scope 3 emissions:** e.g. also include emissions from the supply chain and use of products for EE projects.

The following points were made:
* **Scope 3** is theoretically infinite and difficult to calculate, however it should be **acknowledged for its impacts,** (e.g. for bioenergy projects).
*It is also possible to **merge scope 1 and 2** together.
***Terminology could be reconsidered** to use terms more familiar to a broader audience.

Setting baseline emissions

For each project assessment, calculating emission reductions requires a baseline scenario describing what would have happened without intervention. This baseline is a critical determinant of the finally calculated reductions and at the same time is difficult to verify because it always describes a counterfactual situation ("what would have happened without the project").

There are two project-level baseline-setting methods that are generally used: performance standard and project-specific procedures. The performance standard procedure requires less data on the specific project in question, employing instead a standard measure of the product that a given intervention produces. Considering RE projects, the product of which is electricity, developing a performance standard is relatively straightforward. Grid capacity and emissions factors can be used to create a country-specific performance standard for electricity production and consumption. The project-specific procedure establishes a baseline scenario via a structured analysis of a particular project's activity and the alternatives to the intervention's deployment. The project-specific procedure requires a set of assumptions, which is subject to the analysts' judgments. The following approaches were discussed:

* **Use a performance standard**, e.g. uniform factors for particular types of projects under particular circumstances.
* **Use project-specific baseline,** e.g. develop a baseline scenario/s based on the most likely pathway without the project.

An alternative approach to circumvent the various challenges on the "versus baseline" assessments is to compare RE and EE projects with a menu of technologies and projects that are compatible with the 2/1.5 °C pathway. This approach has its own limitations, such as the need for expert judgment in attributing projects into specific pathways of warming.

The following points were made:

* Project-specific baselines are more prevalent for renewable energy than energy efficiency, so there is scope for **improvement in the energy efficiency baseline** field.
* Energy efficiency is problematic due to **additionality** aspects, appliances are replaced frequently, and you have to **assume that consumers will behave as irrationally** as they did in the past.
* Performance standards baselines are simpler, and applying a system in practice must be workable.

Accounting Timeframe

Another important issue regarding the baseline setting is to define an accounting timeframe. The process entails setting a year up to which a project's emissions reductions are considered "additional" to a "baseline" scenario. Different institutions employ vastly disparate accounting timeframes for estimating GHG emissions reductions from RE and EE projects.

Uncertainty in GHG emission reduction estimates increases as projections extend into the future. After a period of time, either GHG reductions from a given project are assumed to go to zero or a new baseline scenario is established. The chosen length of time will vary according to project-specific considerations.

Among bilateral and international development banks and agencies, it is rare that project-level GHG assessments extend beyond a 20-year time horizon, as uncertainty outweighs potential future emissions reductions after a certain point. At the same time, their accounting periods are longer than those used for CDM projects, which are (i) 7-year crediting period, renewable twice; or (ii) a single 10-year crediting period.

The following approaches were discussed:

Analyse emissions using a single timeframe, in accordance with baseline scenario data and assumptions.
* Full project lifetime depending on project type
* Fixed periods as used for CDM projects

Report results using multiple timeframes (e.g. 10-year, 20-year, and 50-year), assigning a level of uncertainty to each.

The following points were made:

* Multiple **timeframes could be aligned with specific processes** (such as under the Paris Agreement, UNFCCC processes or other global initiatives' assessment periods)
* **Multiple timeframes would be more appropriate**, as situations and technologies evolve over time which change baseline assumptions rapidly.
* Timelines are best chosen in line with **ultimate objective** of an exercise.

Attribution

Assessing RE and EE projects requires careful examination of the overlap among different reporting donors. Some institutions report the entirety of the GHG mitigation delivered by a co-financed project even when they have given a relatively small financial contribution to the project. In addition, it is often difficult to identify co-financed projects in development finance databases because a single project could be registered under different names by different institutions. Previous analyses have addressed this challenge by focusing on bilateral aid – to avoid double-counting contributions.

The following approaches were discussed:

* **Attribute a project's impact fully to a single financing institution,** e.g. the one with the highest financial contribution to the project.

* **Attribute only a part of the reductions achieved by a project to the co-financing institution.** Using this approach, an analyst would attempt to determine the portion of funding each contributor has allocated to a project and apply the corresponding percentage to determine mitigation impacts (i.e., an institution contributing 50% of the financing gets credit for 50% of the project's emissions impacts).

* **Attribute the full impact of the project to each financing institution.** In this approach, it is not possible to sum the results of the different approaches as the overlap and would be double counted.

The following points were made:

* Terminology should **specify the different meanings of 'attribution'** in UNFCCC language and financing language, but need to emphasise that in this context, the use of 'attribution' is more about an institution's 'contribution' and should be explicit that **emissions reductions are owned by the host country.**

The way forward

The outcome of this dialogue has been extremely valuable for understanding the challenges and potential solutions related to methodologies for calculating emissions savings from the energy sector. This will help refine the methodology to be used in the second report of the 1 Gigaton Coalition which will be published ahead of the Marrakesh COP22. Future similar dialogues may be held as the proposed approaches are being tested and more experience gained, including on the possibility of

The 1 Gigaton Coalition would like to thank everyone who attended the workshop, and to its partners for their continued support. This workshop will inform its second report, which aims to measure and report emissions reductions resulting from developing countries' activities and initiatives in the energy sector.

The 1 Gigaton Coalition was initiated and is supported by the Government of Norway, and is coordinated by the United Nations Environment Programme.

For more information on how we can work together, the workshop, or our upcoming report, please contact us at *1gigaton@unep.org*, or via our website *1gigatoncoalition.org*