AMOUNT OF GREENHOUSE GAS EMISSIONS SAVED

Indicator Phrasing

English: total amount of CO2 equivalent (in tonnes) reduced or avoided as a result of using the promoted [specify the measure] during [specify the period]

French: quantité totale d'équivalent CO2 (en tonnes) réduite ou évitée du fait de l'utilisation de la [précisez la mesure] promue pendant [précisez la période]

Spanish: cantidad total de equivalente CO2 (en toneladas) reducida o evitada como resultado del uso de la medida promovida [especifíquese la medida] durante [especifíquese el período].

Portuguese: quantidade total de de CO2 equivalente (em toneladas) reduzida ou evitada como resultado do uso da [especifique a medida promovida] durante [especifique o intervalo de tempo]

Czech: celkové množství ekvivalentu CO2 (v tunách) snížené nebo zamezené v důsledku použití propagovaného [upřesněte opatření] během [upřesněte období]

What is its purpose?

The indicator measures the extent to which an intervention contributed to climate change mitigation by reducing the amount of carbon dioxide equivalent (CO2-eq) within the stated period. This can be achieved through reducing the usage of fossil fuels, reforestation, improved management of organic waste, reducing the use of fertilizers containing nitrogen and other high-impact measures.

How to Collect and Analyse the Required Data

A **carbon dioxide equivalent (CO2-eq)** is a way of expressing all the different greenhouse gases (GHG) as a single number. For any quantity and type of greenhouse gas, CO2-eq shows the amount of CO2, which would have the equivalent global warming impact. A quantity of GHG can be expressed as CO2-eq by multiplying the amount of a given GHG by its global warming potential (GWP). According to IPCC's Fifth Assessment Report, the GWP of methane is 28 (i.e. 1kg of methane has a warming effect that is equivalent to 28kg of CO_2, over a 100-year period) and the GWP of Nitrous oxide is 265 (see IPCC's report attached below, page 87, for the GWP of these and other gases).

In order to measure emissions of CO2-eq, there are **three steps you need to take**:

1) **Quantify how much of the emission-releasing activity was reduced or avoided**: Burning firewood or petrol, applying chemical fertilizers, using electricity, and raising animals are some of the many activities that release GHG. Your task is to quantify the amount of these activities (e.g. tonnes of wood, kWh of electricity) that was reduced or avoided as a result of your project's support. This site provides some basic guidance on measuring the amount of resources saved. Keep in mind that the

amount must be for the entire period stated in your indicator.

2) **Determine the GHG emission factor for the given activity**: GHG emission factor is a coefficient that allows you to convert activity data into GHG emissions. It is the average emission rate of a given activity. For example, an emission factor for electricity can be expressed as X kg of CO2-eq per kWh. The emission factor for concrete can be expressed as X kg of CO2-eq per ton.

Unfortunately, there is not a comprehensive overview of emission factors that could easily be used in the context of international development projects. Among the **most recommended sources** are:

- GHG Protocol's Emission Factors from Cross-Sector Tools (download worksheet)

- IPCC's Emission Factor Database

- high-quality studies that measured GHG emissions from the activity you are interested in, ideally in the same country or at least in the same region (always verify through an online search whether the emission factor the study used is reliable)

Be aware that emission factors for the same activity (e.g. electricity) can differ depending on the nature of the activity (e.g. how electricity is produced in a given country). As much as possible, use **country- or region-specific emission factors**.

Determining the emission factor on your own is discouraged, as it requires a higher level of expertise and equipment.

3) To **calculate the emissions of CO2-eq reduced / avoided**, multiply the total amount of the reduced / avoided emission-releasing activity by the relevant emission factor. If your intervention replaced one activity with another activity that releases fewer emissions (e.g. replacing cooking on charcoal with cooking on biogas), you must **deduct from this amount the CO2-eq that is** (within the same measured period) **emitted by the new activity**.

Important Comments

1) If you promote a technology where it is likely to be more demanding (but still feasible) to determine the net amount of CO2-eq reduced / avoided, **consider budgeting for support from a GHG measurement expert**. It will make your work easier, help you obtain more reliable data and allow you to learn new know-how.

2) Another possibility for lowering the amount of GHG in the atmosphere is the use of **carbon sequestration measures** - processes by which carbon is removed from the atmosphere and stored in the sinks like oceans, forests, crops, and soils. In the agricultural sector, practices that help in sequestering carbon in soil include, for example, zero / reduced tillage, soil rehabilitation, revegetation, green manuring, and crop rotations. Increased use of such practices increases the amount of carbon sequestered in soils and plants. However, calculating the amount of carbon sequestered thanks to using such practices faces a range of methodological challenges and therefore it is not included in the guidance above. If your organization (or its contractors) has the expertise required to measure the amount of sequestered carbon, this indicator can be used also for carbon sequestration projects. If you lack the capacity required for precise measurements, consider using an easier indicator Area with Improved Sequestration Potential.

3) Be aware that the introduction of **certain technologies can paradoxically result in higher GHG emissions**. For example, the introduction of efficient charcoal stoves can make them accessible to people that used to use wood for cooking. Charcoal is a secondary fuel and the conversion from wood to charcoal results in significant losses. Thus, using wood directly in a basic stove is likely to be less GHG intensive compared to an efficient charcoal stove.

Access Additional Guidance

- GGP (2016) Global Warming Potential Values

- IPCC (2015) Climate Change Synthesis Report (see emission factors at page 87)

- ICF (2019) Clean Energy Emission Reduction (CLEER) Protocol

- Emission Factors from Cross-Sector Tools (download Excel)

- CLEER Calculator