

WHAT IS AN OFFSET?

The noun 'offset' comes from the verb 'to offset', which mean to counterbalance or compensate for something. This is exactly what offset credits do. An increase in GHG emissions from a source, such as a power plant, are offset by the purchase of credits representing emissions reduced elsewhere.

The definition of a "greenhouse gas offset" is the reduction or removal of greenhouse gases from the atmosphere due to a specific project activity that is used to compensate for emissions occurring elsewhere.

Offsets are emissions reductions from facilities or activities in economic sectors or geographic locations not covered by an existing GHG emissions cap.

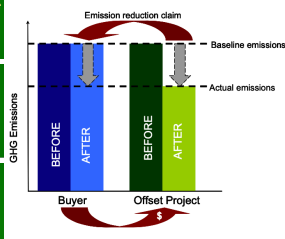
The fundamental distinction between GHG offsets and other project-based emission reductions is that offset projects are implemented specifically to compensate for emissions occurring at another source, which typically is a source under an emission cap.

GHG OFFSET TRANSACTION

Recall the example from Lesson 1 of a company for which it is very expensive to install equipment that would reduce its emissions by 10 tons of CO₂-equivalent per year.

It costs less to equip a landfill in another country with facilities that trap the greenhouse gas methane, preventing hundreds of tons of CO₂-equivalent per year from entering the atmosphere.

If the company invests in the landfill project, then it can achieve the required emissions reductions that it could have achieved at its own facility, only at a much lower price. This is an example of the practice of offsetting, and the units of emission reduction generated by the landfill project (the tons of CO₂e that did not enter the atmosphere as a result of the company's investment) are called offset credits.



GHG OFFSET TRANSACTION +

Greenhouse gas emission offsets, more commonly called "carbon offsets," have become a household phrase over the past few years, with companies offering to "offset" individuals' or corporations' emissions from travel or energy use.

The concept has become so popular that there is now a market for offsets, that are voluntarily purchased by firms and individuals wishing to reduce their "carbon footprint."

The term "carbon footprint" comes out of the concept of an ecological footprint – the amount of resources involved in (and potentially destroyed by) the creation of a certain product or through a certain activity

We will save discussion of the voluntary carbon market for Lesson 11. For now, our aim is to understand the way in which offsets are part of mandatory cap-and-trade systems, and how countries and companies can use offsets to meet emission reduction requirements, such as those under the Kyoto Protocol.

INCENTIVES

Regulated entities will only buy offsets to meet their compliance targets if it is cheaper than reducing their emissions internally or than buying allowances from other capped entities.

For example, imagine a facility that emits eleven hundred tons of CO₂e per year but only has allowances to cover one thousand tons. The cost of reducing emissions internally is very high, let's say 50 dollars per ton. The cost of purchasing allowances from other capped facilities is also 50 dollars per ton. However, imagine the facility can buy offsets at 20 dollars per ton. The firm could save three thousand dollars by buying offsets on the market rather than reducing emissions internally.

Types of offset projects Offset projects can be divided into two main categories:

- ✓ Projects that reduce greenhouse gases at their source, and
- ✓ Projects that absorb greenhouse gases already in the atmosphere.

OFFSET QUALITY

In order to substitute an emissions reduction within a cap-and-trade scheme with an offset credit, it is critically important that each offset represent a real reduction of emissions outside the cap- and-trade program. Specific rules are used to make sure that emissions reduction projects meet strict environmental integrity standards. Offsets should:

- ✓ Be Real :Project-based greenhouse gas emissions reductions should represent actual emission reductions or removal enhancements and not artifacts of incomplete or inaccurate accounting.
- ✓ Be Additional :Because GHG offsets are used to compensate for emissions occurring elsewhere, GHG reduction projects generating offset credit must be shown to be "in addition to" reductions that would have otherwise occurred.
- ✓ Be Based on a Realistic Baseline:A GHG emission baseline must be established in order to quantify an offset project's GHG reductions. The baseline represents the projected emission levels in the absence of an offset project; and is sometimes referred to as the business as usual (BAU) case. The difference between the baseline and actual emissions after the GHG offset project is implemented is the amount credited as an offset. GHG offsets are only as credible as their baselines.

OFFSET QUALITY +

- ✓ Be Measurable and Measured: Emission reductions from GHG offset projects must be accurately quantified. Each project must have a monitoring plan that is specific to it and that defines how, when and by whom the quantification and calculation of emission reductions will be conducted.
- ✓ Be Independently Verified: All GHG reduction projects should be verified to have occurred by an independent, qualified, third party verifier according to approved methodologies and regulations. Ex post monitoring reports should be used as the basis for issuing offset credits.
- ✓ Have Unambiguous Ownership :GHG offset project proponents must demonstrate clear legal title to the GHG offset credits, which represent GHG emission removed or sequestered. Contractual assignment and/or government recognition of ownership rights should be required to establish clear and uncontested title. Furthermore, the transfer of ownership of any and all GHG emission reductions sold as offsets must be unambiguous and documented.
- ✓ Address Leakage :Leakage is defined as a change in GHG emissions outside of the project's emission's boundary that occur as a result of the project activity.

OFFSET QUALITY +

✓Do No Harm: GHG offset projects should not cause or contribute to any adverse effects on human health or the environment, and should instead seek to provide environmental co-benefits whenever possible. Some offset standards even require that a project provide co-benefits, such as jobs for the local population, in order to gain a seal of quality.

✓Address Permanence : Permanence is a term used to note that the emission reductions underlying the offsets generated by certain project types can be reversed. Permanence is a type of project risk most often associated with biological and geologic sequestration of emissions. For example, forestry-based offset projects face a permanence risk: if there is a wildfire, a portion of the carbon sequestered in the forest will be released into the atmosphere and some of the offsets could be negated. You will read about some examples of permanence problems later in this lesson.



CREATING A BASELINE SCENARIO

In order to be real and measurable, the GHG emissions reductions from an offset project must prove that the reduction is a change from what otherwise would have been emitted. To measure this change, project developers must create a hypothetical scenario of what would have occurred without the project. This is known as a "baseline scenario".

Because the choice of GHG emission baselines is critical to the amount of GHG offset credits issued for a project, the assumptions used in creating the baseline estimate must be made according to a reliable methodology and must withstand scrutiny.

Many offset schemes include rulebooks or methodologies or protocols for every single GHG abatement project type to make sure that the process is handled in a reliable and standardized way. This standardization also ensures that the emissions reductions consider other impacts, for instance on the local population in the area where the project is being conducted.



HOW DOES THE CDM WORK?

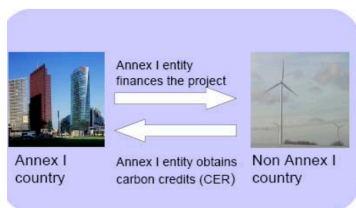
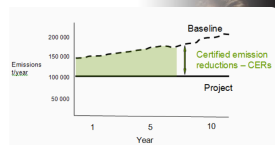
A country like Germany, with a national GHG reduction target under the Kyoto Protocol, can fund projects that reduce emissions in other, developing, countries, like China, which has ratified the Kyoto Protocol but does not have a national target. Germany has an incentive to do this because it is cheaper to build, for example, a wind farm in China than the equivalent project in Germany. So Germany is reducing the same amount of emissions for less money – and China is benefiting by receiving new foreign investments in renewable energy rather than dirty coal-fired infrastructure.

This process takes place when Germany buys Certified Emission Reductions or CERs, the units of greenhouse gas reduction generated by projects under the CDM. Each CER represents the reduction of one metric ton of CO₂-equivalent.

A typical CDM project is the one described in this Project Design Document (PDD) where a Chinese wind farm is made possible by investment, through the selling of CERs, from Germany.



HOW DOES THE CDM WORK?



WHAT IS JOINT IMPLEMENTATION?

The Kyoto Protocol also allows for offsets to be created in Annex I countries – developed countries that have a binding GHG emissions target. This system, called Joint Implementation or JI, is a way for two industrialized countries to take advantage of the fact that it is cheaper to cut emissions in one than the other.

Credits generated by JI projects are called Emission Reduction Units or ERUs.

Much of the JI potential is harbored in countries of the former Soviet Union, where industry and electricity generation continues to be quite inefficient, such that an investment in new infrastructure produces more emissions reductions than it would in western European countries.

A typical JI project is the one described in this Project Design Document (PDD) where a Ukrainian cement manufacturer would use a more energy-efficient production process and sell the resulting ERUs.

Ukraine, however, must subtract these greenhouse gas reductions from its allocation of allowances used to measure compliance with its target under the Kyoto Protocol. Selling ERUs is similar to selling its emissions allowances to another party.

WHAT IS JOINT IMPLEMENTATION? +

CDM and JI project eligibility is determined on a case-by-case basis. Project developers can submit a new methodology to the United Nations detailing baseline calculation and emission monitoring requirements for any type of project. There are currently over 130 different approved JI and CDM methodologies, with more being developed all the time.

JI projects can be approved through a process similar to the CDM process or through a fast track relying exclusively on the host country's authorities.

JI versus CDM

	CDM (CERs)	JI (ERUs)
Parties	Annex B country ↔ Non-Annex B country	Annex B country ↔ Annex B country
Crediting	Start: 2000	Start: 2008
Tracks		JI Track 1: host country chooses. JI Track 2: similar to CDM
Supervisory body	CDM Executive Board (EB)	JI Supervisory Committee (JISC)
Methodologies	E.g. energy efficiency, fuel switching, fugitive emissions, industrial processes, AFOLU, renewable energy, waste	Same as CDM, but can also in theory have own methodologies
Issuance of credits	Done by Executive Board (EB)	Done by host country