THE ESSENTIALS: CARBON MARKETS 101

WHAT ARE GREENHOUSE GASES?

Greenhouse gases (GHGs) are gases which, when released, build up in the atmosphere, absorbing and trapping heat from the sun. This impact has been termed the "greenhouse effect". The increase of these gases in the atmosphere causes global temperatures to rise and the global climate to change.

Common GHGs include:

- Carbon dioxide (CO_2)
- Sulphur hexafluoride (SF_6)
- Methane (CH_4)
- Hydrofluorocarbons (HFCs)
- Nitrous oxide (N_2O)
- Perfluorocarbons (PFCs)

Some GHGs have a greater effect on the climate than others. In order to compare them equally, GHGs can be converted into the standard unit of carbon dioxide equivalent (CO_2e) based on their global warming potential (GWP). When converted into CO_2e, different GHGs can be added together to give total GHG emissions or emission reductions.

WHAT ARE GHG EMISSIONS, REDUCTIONS AND REMOVALS?

GHG emissions occur when GHGs are released into the air through human activities, such as burning fossil fuels like gasoline and diesel, and through biological processes, like the decomposition of organic matter.

GHG emissions can be reduced through actions that reduce or eliminate GHG emitting activities or processes. GHGs can be removed from the atmosphere through natural or engineered capture and storage. For example, plants remove CO_2 from the atmosphere as they grow. Technological processes can also capture GHGs and convert them chemically or physically so they can be stored.

Global Warming Potential (GWP):
Methane has a GWP that is 25 times that of carbon dioxide, which means that 1 tonne of methane has the same effect on the climate as 25 tonnes of carbon dioxide, and 1 tonne of methane can be converted to 25 tonnes CO_2e.

Environment and Climate Change Canada
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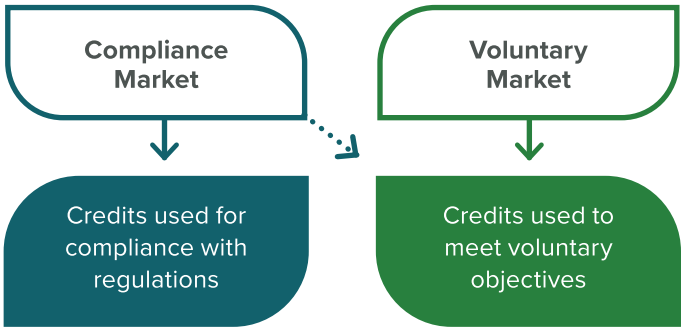
WHAT ARE CARBON MARKETS?

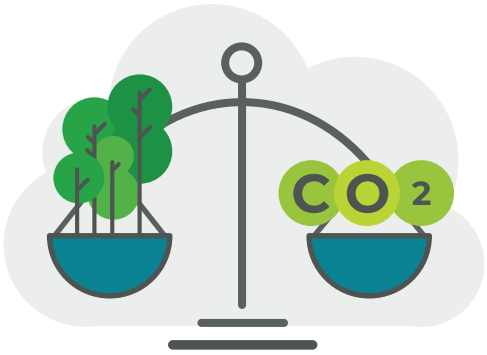
A carbon market refers to the buying and selling of credits (also known as tradeable units) that represent GHG emissions, reductions or removals. Organizations or individuals buy tradeable units in a carbon market in order to meet a GHG emissions limit or objective.

There are two types of carbon markets – voluntary and compliance. The type of market depends on whether the tradeable units are used to meet voluntary or regulatory emissions limits.

Individuals or organizations that voluntarily commit to limit the GHG emissions from their activities can use units from the **voluntary market** to help meet their commitment. For example, some organizations voluntarily commit to be carbon neutral or "net-zero" by a certain year. This means that they commit to reduce their emissions and compensate for any remaining emissions with equivalent GHG removals. Another example is individuals who wish to limit the emissions from their travel or other activities.

Companies that have a **limit on** their GHG emissions that is **set through government regulations** can only use units from a compliance market to meet their limits. Non-regulated individuals and organizations may also be allowed to purchase and use units from the **compliance market** to meet their voluntary emissions reductions goals.





WHAT IS AN OFFSET CREDIT?

A GHG offset credit (also called a carbon credit) is a tradeable unit that represents **one tonne of reduced GHG emissions or GHGs removed from the atmosphere**. Offset credits are issued to project proponents that voluntarily reduce emissions or remove GHGs from the atmosphere if they meet the requirements of a GHG offset system. These credits can be sold in a carbon market and used by others for regulatory compliance or to meet voluntary emission reduction objectives.

WHAT IS A GHG OFFSET SYSTEM?

A GHG offset system (also called a GHG offset program) is a set of rules and processes for how offset credits can be generated. In order to generate offset credits, individuals or organizations undertake voluntary projects that meet the offset system rules set by the offset system administrator. In general, these individuals or organizations – referred to as project proponents – must register their project with the offset system administrator and follow a protocol, approved by the administrator, that provides detailed instructions for projects. The offset system administrator makes sure that the project proponent has met the rules of the system before issuing offset credits.

Offset systems directed towards the voluntary market are usually administered by non-government organizations, which set the rules and issue offset credits to project proponents that meet their rules.

Offset systems geared towards the compliance market are usually established by government administrators, which set the rules for how offset credits are generated and issues credits for eligible reductions or removals.

Offset systems established for the voluntary market may allow a wider range of project types and provide greater flexibility to project proponents, while offset systems directed towards regulatory compliance generally have stricter rules.

WHAT IS AN OFFSET PROJECT?

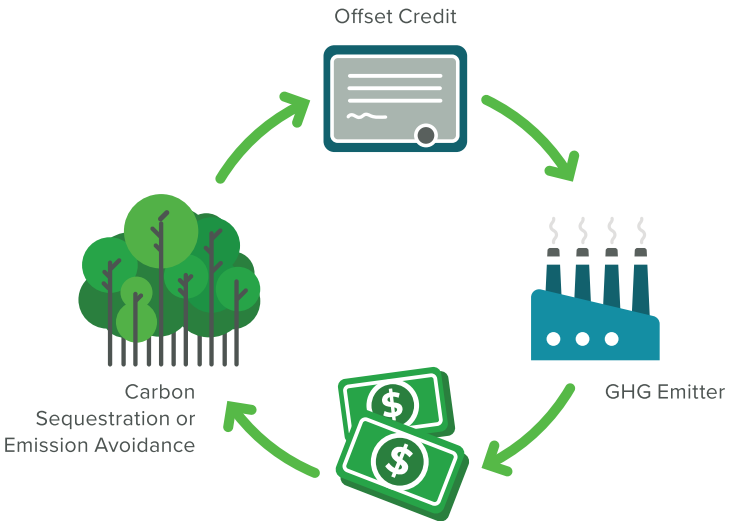
Offset projects are voluntary activities that generate GHG reductions or removals beyond what would have happened without the project (the baseline). Project proponents must register their projects with an offset system administrator, then implement the project, monitor and record project data, and quantify the reductions or removals as required by the offset system rules. They also must have their reduction or removal claims verified by a qualified, independent third party.

Examples of some offset project types include:

- Better management of forests to keep more carbon in trees / soil
- Avoiding releases of methane gas from landfills
- Taking action to protect forests or grasslands from development (so stored carbon is not released)
- Switching to chemicals in refrigeration systems that cause less global warming
- Composting organic waste instead of sending it to the landfill
- Tree planting
- Capturing methane gas generated from livestock manure
- Increasing the amount of carbon stored in agricultural soils through adoption of regenerative practices

WHO CAN BE A PROJECT PROPONENT?

A project proponent (or project developer) implements an offset project in order to generate offset credits. The offset program administrator sets the rules as to who is eligible to generate offset credits within their system. Some offset systems, for example, have requirements that the project proponent live or have a business in the jurisdiction of the offset system.



WHAT IS AN OFFSET PROTOCOL?

Offset protocols can be thought of as the “recipe” for an offset project. The protocol specifies eligible project activities and gives detailed instructions for how to calculate the number of offset credits generated by the project. Protocols have clear rules for how to set the project baseline (the emissions levels before the project, also known as the “business-as-usual” scenario). They also set out rules for data collection and monitoring, as well as assessing and managing project risks. Offset protocols are generally designed so that the quantification of reductions and removals achieved by the offset project is conservative and does not lead to over-estimates.

WHAT IS AN OFFSET CREDIT WORTH?

The value of an offset credit fluctuates over time and depends on several factors:

Supply and demand:

The price of offset credits is primarily influenced by supply and demand. If there are many offset credits available with little demand, prices will be low. If there are few offset credits available and a large demand, prices will be higher. The supply of GHG offset credits will depend on the number of offset projects that are generating credits, which is affected by the availability of offset protocols, the investment in offset projects, and the expected demand for offset credits in the future. Offset projects can also take time to start generating and supplying offset credits – up to several years depending on the project type. Demand in the compliance market is influenced by many factors including the stringency of emission reduction regulations and the cost of other emission reductions. Demand in the voluntary market depends on the number of individuals and businesses making voluntary commitments to reduce emissions and the level of ambition of voluntary commitments. These factors make it challenging to predict offset supply, demand, and prices.

Compliance vs voluntary market:

Offset credits from systems targeted towards the compliance market generally sell at a higher price because they can be used to meet regulations for emissions reductions. Offset credits geared towards the voluntary market generally sell at lower price.

Type of project generating the offset credit:

Some offset credit buyers, particularly in the voluntary market, choose to buy credits from projects that provide other benefits (like biodiversity or community development), are located in a certain area, or have other specific characteristics. These buyers may be willing to pay more for offset credits from certain projects.

Perceived quality of offset credits:

The value of offset credits in the voluntary market depends on whether there is confidence that the offset system has strong rules to ensure the projects and the credits they generate are of high quality.

Rules to replace invalid credits:

Occasionally, an offset credit may be identified as invalid after it is issued. This could happen because the credit was issued based on incorrect information or because the stored carbon was later released. Program administrators generally require that invalid credits be replaced. Offset systems may require the project proponent or whoever owns the invalid credit to replace it. Some offset systems also have a pool of credits that can be used to replace invalid credits in certain circumstances. Offset credits from systems that make the buyer replace invalid credits are usually sold at a lower price because there is more risk for the buyer.

WHAT IS A GHG OFFSET REGISTRY?

Reputable offset systems make key information about registered offset projects and offset credits available to the public. A GHG offset registry helps to track where projects are located, who has registered a project and been issued offset credits, whether the credits have been sold, whether the credits have been used, and who used the credits.

Having this information publicly available helps ensure that GHG offset systems are transparent, accountable, and credible. Potential offset credit buyers can check the registry to see that the offset credits they are interested in purchasing have been issued to the project, and have not already been sold, or used by another buyer.