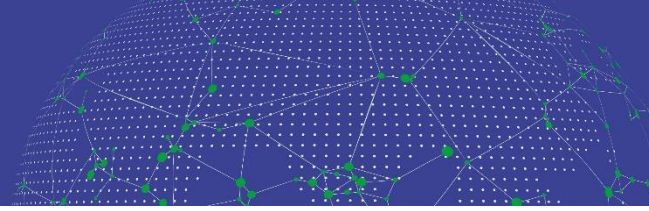




**CARBON
OFFSET
CERTIFICATION**



Carbon Offset Certification

Certification Protocol



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1. Introduction

Emissions of Greenhouse Gases from human activities are known to be the most important driver of Climate Change. There is a recognised urgency to reduce GHG emissions and tackle Climate Change as one of the biggest challenges of our time. This issue requires coordinated action from governments and corporate organizations to move toward a low-carbon economy and achieve sustainable development.

Reaching the 1.5-degree target as defined by the Paris Agreement requires that global GHG emissions are cut by 50 percent of current levels by 2030 and reduced to net zero by 2050. Increasingly, companies and organisations are aligning with this agenda on a voluntary basis. In 2020, the number of companies with net zero pledges more than doubled, and we are convinced that this is only the beginning. More and more companies are setting up sustainable development strategies and actions to tackle climate change and align with this priority but to also turn this risk into an opportunity to rethink and reframe business practices.

Industry faces a growing demand from buyers and financiers for decarbonized commodity supply-chains and logistic solutions. Net zero achievement requires a reduction not only from direct and energy use emissions but also indirect GHG emissions such as related to the purchase of services, goods and commodities (scope 3).

Many logistics companies, commodity producers and traders are joining this global effort by setting net zero emission targets, promoting low carbon solutions along the value chain. We are glad to read announcements from companies signing up to the Paris Agreements targets and communicating about compensation of logistic supply-chains, services, commodity transactions, and products.

The process to measure GHG emissions and to reduce these to (net) zero is complex and can be interpreted and implemented in different ways. There is a need for standardization and verification in this process to ensure comparable and meaningful measurement and mitigation of GHG emissions.

The **Carbon Offset Certification Protocol** establishes transparency and verification in the measurement, reduction and compensation of GHG emissions of specific commodity transactions, from production to delivery (cradle-to-gate) or to end-use (cradle-to-grave), products (cradle-to-shelf/cradle-to-gate), or services based on recognised standards and emissions reduction practices.

Carbon Offset Certification is a certification standard supporting the industry in its transition toward carbon neutrality.

These distinct certification labels have been established to support credible claims for carbon neutrality:

- **Carbon Offset Commodity** for natural resources or raw materials with clear distinction between certification for 'cradle-to-gate' and 'cradle-to-grave' transactions.
- **Carbon Offset Product** for semi-final or final products (cradle-to-shelf).
- **Carbon Offset Service** for services and logistics solutions (e.g. shipping).

Those three certification labels are based on the same requirements for robust accounting, reporting, verification and quality mitigation of all the GHG emissions occurring in commodity, product or service's life-cycle.

The Carbon Offset Certification Protocol has been developed as a set of requirements to provide businesses with a single-source guide to make credible, transparent claims anywhere in the world. As third-party standards are developed, the Carbon Offset Certification Protocol aims to provide a framework which builds upon the best practice in the market and offers a unifying process for internationally recognised claims for a carbon neutral commodity, product or service.

The Carbon Offset Certification Protocol has been established with the following principles:

Transparency: The Carbon Offset Certification Protocol establishes a transparent and reliable framework for the industry to reach carbon neutral targets and implement good practices.

Impact: The Carbon Offset Certification Protocol supports science based GHG impact reduction to address the emergency of climate change as aligned with the Paris Agreement.

Pragmatism: The Carbon Offset Certification Protocol has been developed to assist companies and organisations in reaching climate neutral targets and to help companies to communicate their efforts. It provides a robust basis to develop and explore new business practices (e.g. sustainable financing) and opportunities (e.g. meet the requirements of forward-thinking customers).

Credibility: The Carbon Offset Certification Protocol aims to be recognized as the reference standard in the commodity and logistics industry. Credibility derives from the respect and trust of users and requires accuracy, consistency and independence of the process. The Carbon Offset Certification process is not only audited to ensure consistency in the quality of the certification it provides but is also clear on how certificates and logos are to be communicated.

2. Glossary

Additionality: A criterion often applied to GHG project activities, stipulating that project based GHG reductions should only be quantified if the project activity “would not have happened anyway” i.e., that the project activity (or the same technologies or practices that it employs) would not have been implemented in its baseline scenario.

Assurance: Independent evaluation and assurance provided by an expert third party with demonstrated experience to the requirements of an independent verification standard (such as ISO 14064 or ISAE 3410/3000) to check that the quality of input data, a GHG assessment, or that the use of Carbon Offset Commodity, Carbon Offset Product, or Carbon Offset Service’s certifications meet the requirements of the Carbon Offset Certification Protocol.

The limited assurance level corresponds to a level of confidence that the auditor has in the data. It falls between the truthfulness (verification of procedures only) and reasonable assurance (very high level of confidence). The limited assurance opinion can be issued after an audit that covers both procedures and a sufficiently large sample of data.

Avoided emissions: An assessment of emissions reduced or avoided compared to a reference case or baseline scenario.

Boundary: The physical or spatial extent of the entity, product or activity involved. e.g. the boundary might encompass the sites used for the manufacture, storage and transportation of a commodity.

Calculation: The process of quantifying the GHG emissions for a given subject, using robust and transparent methods that can be replicated.

Carbon credit: A transactable, intangible environmental instrument representing a unit of carbon dioxide equivalent (CO₂e) created either by regulatory schemes promoted by governments or by projects which are validated to a recognised carbon standard. Carbon credits are typically ultimately used to compensate for or neutralise unabated emissions occurring elsewhere by retiring or cancelling them in a registry.

Carbon neutral: A state which is achieved when the GHG emissions associated with an entity, product or activity are reduced and offset to zero for a defined duration.

CN Commodity SA: Swiss registered organisation that developed and manages the Carbon Offset Certification Protocol and awards the Carbon Offset Commodity, Carbon Offset Product and Carbon Offset Service certification (previously called Climate Neutral Commodity and Climate Neutral Services until 12.02.2023). For the sake of clarity, CN Commodity is also called Carbon Offset Certification Management in this protocol.

Carbon Offset Certification Management: CN Commodity SA, Swiss registered organisation that developed and manages the Carbon Offset Certification Protocol and awards the Carbon Offset Commodity, Carbon Offset Product and Carbon Offset Service certification.

CO₂ equivalent (CO₂e): The unit of measurement to indicate the global warming potential (GWP) of each greenhouse gas, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate releasing (or avoiding releasing) different greenhouse gases against a common basis.

Cradle-to-gate / Cradle-to-shelf: A defined boundary for a product/transaction life cycle analysis from extraction and processing of raw materials, manufacturing, storage and distribution to first customer and excludes use of product and end of life stages. For each process phase, all direct emissions (scope 1) and energy use (scope 2) must be accounted and reported.

Cradle-to-grave: A defined boundary for a product/transaction life cycle analysis from extraction and processing of raw materials, manufacturing, storage, distribution to the end use of the material. For each process phase, all direct emissions (scope 1) and energy use (scope 2) must be accounted and reported.

Direct Emissions: Emissions from sources that are owned or controlled by the reporting company (Scope 1).

Double counting: Two or more reporting entities (companies or countries) claiming the same emissions or reductions in the same scope, or a single organization reporting the same emissions in multiple scopes.

Emission factor: A coefficient which enables the conversion of activity data into GHG emissions expressed as tonnes of CO₂ equivalent. Emission factors used for Carbon Offset Commodity, Carbon Offset Product and Carbon Offset Service certification have to be published by reputable and independent sources that are up-to-date and are relevant to the subject.

Energy Attributes Certificates: A category of instruments used in the energy sector to convey information about energy generation to other entities involved in the sale, distribution, consumption, or regulation of electricity. This includes instruments including certificates, tags, credits, etc.

Extrapolated data: Data specific to another process or product that has been adapted or customized to resemble more closely the conditions of the given process in the studied product/transaction's life cycle.

GHG Protocol Corporate Standard: The World Business Council for Sustainable Development (WBCSD) and World Resources Institute's (WRI) Corporate Accounting and Reporting Standard (Corporate Standard). The GHG Protocol Corporate Standard is the most commonly used organisational GHG

accounting methodology. It defines emissions reporting under three scopes (1, 2, 3), ensuring comprehensive and comparable reporting.

GHG Protocol Product Standard: The WBCSD and WRI's Product Life Cycle Accounting and Reporting Standard (Product Standard). This document allows an entity to measure the GHG associated with the full life cycle of products including raw materials, manufacturing, transportation, storage, use and disposal. The GHG Protocol Product Standard is the main standard, for GHG calculation, upon which the Carbon Offset Certification Protocol is established. In case of any doubt, it may be used as a reference.

Global Warming Potential (GWP): A factor describing the radiative forcing impact (degree of harm to the atmosphere) of (GWP) one unit of a given GHG relative to one unit of CO₂.

Greenhouse gases (GHG): The Carbon Offset Certification Protocol is aligned with the GHG Protocol recognising GHGs as the seven gases covered by the UNFCCC: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); sulphur hexafluoride (SF₆), nitrogen trifluoride (NF₃).

Indirect GHG emissions: Emissions that are a consequence of the operations of the reporting company but occur at sources owned or controlled by another company or organisation.

Intergovernmental Panel on Climate Change (IPCC): An international body of climate change scientists developed with the United Nations Environment Program (UNEP). The role of the IPCC is to assess the scientific, technical, and socioeconomic information relevant to the understanding of the risk of human-induced climate change.

Insetting: Application of offsetting carbon reduction projects from within a company or organisation's supply chain and sphere of influence.

ISAE 3410/3000: Assurance Engagements on Greenhouse Gas Statements defined by the International Auditing and Assurance Standards Board (IAASB) and part of the International Standard on Assurance Engagements.

ISO 14025: International Organisation for Standardisation's specification for environmental declaration programmes and environmental declarations for use in business-to-business communication.

ISO 14040: International Organisation for Standardisation's specification for "Environmental management – life cycle assessment – principles and framework." It describes the principles and framework for life cycle assessment (LCA).

ISO 14064: International Organisation for Standardisation’s specification for quantification and reporting of GHG emissions and removal at the organisation level with an approach similar to the GHG Protocol Corporate Standard.

Land Use Change (LUC): A process by which human activities transform the natural landscape, referring to how land has been used. Land use change can be a factor in CO₂ atmospheric concentration and is thus a contributor to global Climate Change and must be accounted for as such.

Life cycle: Consecutive and interlinked stages of a production system from raw material production, acquisition or generation of natural resources to end of life.

Net zero: A concept introduced by the Paris Agreement: “The balance of GHG emission sources and sinks within and across a nation or the global economy such that the global warming impact from anthropogenic activities is zero.” For a company or organisation, the Science Based Targets Initiative (SBTi) organisation states: “To reach a state of net-zero emissions for companies consistent with achieving net-zero emissions at the global level in line with societal climate and sustainability goals implies two conditions: 1) To achieve a scale of value-chain emission reductions consistent with the depth of abatement achieved in pathways that limit warming to 1.5°C with no or limited overshoot and 2) To neutralise the impact of any source of residual emissions that remains unfeasible to be eliminated by permanently removing an equivalent amount of atmospheric carbon dioxide”.

Proxy: Data from a similar activity that is used as a stand-in for the given activity. Proxy data can be extrapolated, scaled up, or customized to represent the given activity.

Offsetting: The act of compensation of unabated GHG emissions by retiring (cancelling) carbon credits.

OGMP 2.0: The Oil and Gas Methane Partnership (OGMP) is a Climate and Clean Air Coalition initiative led by the UN Environment Programme, with the European Commission, the UK Government, the Environmental Defense Fund, and leading oil and gas companies. The OGMP 2.0 is a standard reporting framework of anthropogenic methane emissions in the oil and gas sector.

PAS 2050: British Standards Institution’s (BSI) specification for the assessment of the life cycle GHG emissions of goods and services. The general principles of PAS 2050 are similar to the GHG Protocol Product Standard, both of them are recognised by the Carbon Offset Certification Protocol.

Primary data: Data collected or directly measured which has not been subjected to processing or any other manipulation e.g. direct measurement of the quantity of natural gas burnt in a heating system or metered electricity before the application of conversion factors used to determine CO₂e emissions.

Registry: A database of carbon credits and their transactions used to assign legal title through a unique identifier and trace where credits are retired (cancelled) upon being sold to offset an equivalent amount of GHG emissions.

Retirement (Carbon Credit Retirement): Refers to the permanent cancellation of carbon credits from future use in a third-party registry.

Science Based Targets initiative (SBTi): A collaborative initiative by the Carbon Disclosure Project (CDP), World Resources Institute (WRI), the World Wide Fund for Nature (WWF) and the United Nations Global Compact (UNGC) that supports science-based internal abatement target setting to encourage companies in the transition to net zero emissions targets.

Scope 1 emissions: Emissions from operations that are owned or controlled by the reporting company.

Scope 2 emissions: Indirect emissions from the generation of purchased or acquired electricity, steam, heat or cooling consumed by the reporting company.

Scope 3 emissions: All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company or organisation, including both upstream and downstream emissions.

Secondary data: Secondary data can come from external sources (e.g. life cycle databases, industry associations, etc.) or can be data from another process or activity in the reporting company's or supplier's control that is used as a proxy for a process in the product's life cycle. This data can be adapted to the process or can be used "as-is" in the studied inventory.

Simplified estimation method: Rough, conservative upper bound estimation developed and implemented as necessary and appropriate to a GHG assessment.

Transaction: Commodity, Product or Service transaction as considered in this protocol is the physical exchange of an agreed quantity of a specific commodity or product and its delivery to a buyer or the delivery of a specific service to a client.

UNFCCC: United Nations Framework Convention on Climate Change (UNFCCC) is a multilateral environment agreement to address the issue of climate change. It has been ratified by 197 countries.

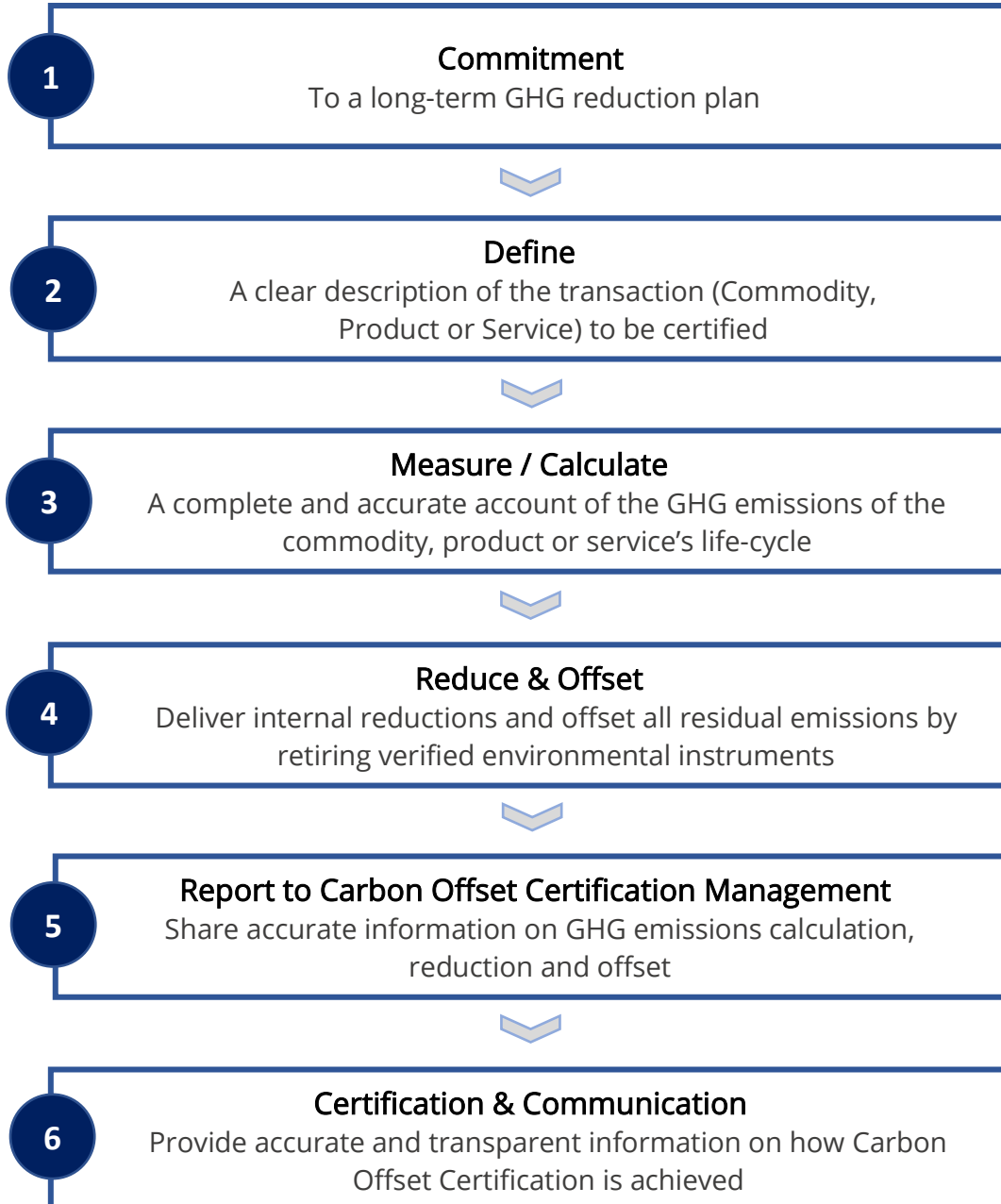
Vintage: The vintage is the calendar year in which the GHG emission reduction occurred corresponding to the carbon credit.

WBCSD: World Business Council for Sustainable Development is a CEO led organisation of over 200 companies working to accelerate the transition to a sustainable world.

WRI: World Resources Institute is a global organization to research, design, and carry out practical solutions that simultaneously improve people’s lives and ensure nature can thrive. WRI's activities are focused on seven areas: food, forests, water, energy, cities, climate and ocean.

3. Steps for Certification

There are 6 steps to achieving a Carbon Offset Certification certificate for a specific product, commodity transaction or service. These steps are mandatory but while these steps are set out sequentially, they may be carried out in parallel.



Step 1: Commitment

Companies wishing to use Carbon Offset Certification are required to be on a meaningful long-term GHG reduction plan for their climate impact from their direct and indirect operations and must have made a public statement of intent to reduce emissions significantly e.g. in line with SBTi commitments.

A long-term reduction plan should include timelines, a list of reduction measures, how they will be implemented, and the estimated reduction volume in terms of absolute or intensity-based reductions. A plan shall include a commitment to public communication. Pursuing science-based targets is strongly recommended, thereby achieving alignment with the Paris Agreement.

For a company to achieve a net zero target all material sources of GHG emissions within its value chain must be identified and residual emissions offset or neutralised. During the transition to net zero, reductions and avoided emissions through offsetting projects continue to play a critical role (“beyond the value chain mitigation” in SBTi language).

Carbon reduction and removal should occur before offsetting residual emissions in line with the accepted mitigation hierarchy - avoid, minimize, restore and offset.

Carbon Offset Certification developed by CN Commodity supports an overall Net Zero ambition:

Defining and measuring carbon footprint and taking action on unabated emissions for Scope 1, 2 and 3 emissions is necessary for companies to achieve net zero emissions targets.

Carbon Offset Certification provides assurance to stakeholders that for commodity transactions, products or services’ life cycle, carbon footprint has been calculated appropriately according to good practice and scientific standards, covers the seven major greenhouse gases and that carbon emissions reduction is being achieved in accordance with most advanced and recognised standards. Carbon Offset Certification enables end-buyers to ensure GHG emissions associated to their scope 3 are accounted, reported and reduced.

Carbon Offset Certification represents that immediate positive impact has been taken on GHG emissions for the specific commodity, product or service’s life cycle. The ultimate goal of each organisation should be to reduce GHG emissions to zero, through the application of energy efficiency, switching to renewable energy and through technological innovation, based on science-based targets. Carbon Offset Certification Management (i.e. CN Commodity) may accompany companies to define a long-term reduction plan to achieve net zero emissions targets, and introduce relevant partners as required.

Step 2: Define

The first operational step in the process to certify a transaction (commodity, product or service) is to clearly define the transaction’s life cycle. This requires a precise description of physical, geographic and industrial processes and boundaries of the commodity cradle-to-gate or cradle-to-grave, product or service’s life cycle in order to develop a detailed calculation of GHG emissions.

Developing a process map to a sufficient level of detail is an important requirement in completing a GHG emissions inventory as the basis for data collection and calculation, as defined in the Carbon Offset Certification Protocol.

Definition of life cycle and certification must be recorded by Carbon Offset Certification Management for the purpose of auditing.

a. Commodity:

The Carbon Offset Commodity certification is available for all commodities.

For example, initial focus is being made on main traded commodities (non-exhaustive list):

Energy	Natural Gas, crude Oil and Oil derivatives, Ethanol, Biofuels, Propane
Metals	Silver, Gold, Platinum, Nickel, Zinc, Copper, Lead, Palladium, Cobalt, Iron ore
Agricultural	Sugar, Cotton, Coffee, Cocoa, Rice, Wheat, Corn, Soybeans

The GHG Protocol Product Life Cycle Accounting and Reporting Standard (referred as the Product Standard) provides requirements and guidance for companies to quantify and report an inventory of GHG emissions and removals associated with a specific product:

<https://ghgprotocol.org/standards/project-protocol>

<https://ghgprotocol.org/product-standard>

Commodity Exclusion:

Carbon Offset Commodity certification will not be issued for thermal coal transactions as thermal coal is not considered an energy transition commodity.

Carbon Offset Certification Management reserves the right to exclude other commodities or companies if they are deemed to be in direct conflict with the values and objectives of this initiative and that are not aligned with the energy transition to meet the Paris convention goal of 1.5 degree global warming.

Commodity transaction process mapping

The first step in calculating the carbon footprint is to develop a clear view of the commodity's transaction life cycle from cradle-to-gate or from cradle-to-grave as per the aimed certification (physical supply chain process).

Typical operational processes related to the transaction:

- Commodity description (specification's, quantity)
- Origin: production location and process
- Transformation and treatment processes, and places of processes
- Logistics: storage, freight and shipping
- Operations (treatment, logistics, operating companies)
- Delivery location
- End-use and commodity consumption operations (for cradle-to-grave certification)
- Date of the transaction and main operations

b. Product

The Carbon Offset Product certification is available for all semi-final or final products.

Following the same principles as for Carbon Offset Commodity certification, the first step in calculating the carbon footprint is to develop a clear view of the product's transaction life cycle from cradle-to-gate (i.e. cradle-to-shelf) as per the aimed certification (physical supply chain process).

c. Service

Calculating the carbon footprint of a service follows exactly the same steps as for the commodity or product approach. However, particular attention should be paid to the definition of the service's boundaries:

- All the direct activities and processes required to provide the services shall be taken in account.
- A conservative upper bound approach shall be developed.

d. Boundaries

A company wishing to measure and reduce/offset GHG emissions of commodity transactions, products or services' life cycle and gain Carbon Offset Certification must account and report emissions for each process phase along the cradle-to-gate or cradle-to-grave commodity, product or service's life cycle:

- All direct (Scope 1) emissions from on-site sources to deliver the activity.

- Energy Use, Electricity Use (Scope 2): Emissions from the consumption of purchased electricity (including transmission and distribution) and/or natural gas use and all fossil fuels used for on-site electricity generation.
- Companies are not required to include non-attributable processes (processes that are not directly connected to the specific commodity, product or service's life cycle) in the boundary, e.g. for a commodity that has a recognised start to its lifecycle as being extraction then the emissions from exploration do not need to be included. If a company wants to include such indirect processes, this can be referenced in the description of the boundaries of the related Carbon Offset Commodity certificate.
- Companies must use data with upper limit assumptions to determine whether, in the most conservative case, the process is insignificant based on either mass, energy, or volume, as well as GHG relevance criteria.
- All emission sources must be included. Emissions from sources that represent less than 2% individually and less than 5% in aggregate may be calculated and reported using simplified estimation methods.

Land Use Change (LUC):

LUC GHG emissions must be included for commodities, products or services that have a significant impact on land use, e.g. agricultural commodities and mining activities. For those supply chains, LUC emissions can be excluded if a sufficient preservation level certification is in place and it can be demonstrated that land-use change emissions are zero (example: Rainforest Alliance, Forestry Stewardship Council) – this needs to be reported to Carbon Offset Certification Management if the company is applying this exclusion.

The Land Use, Land-Use Change, and Forestry (LULUCF) Guidance for GHG Project Accounting (LULUCF Guidance) developed by the World Resources Institute (WRI) to supplement the Protocol for Project Accounting (Project Protocol) provides relevant guidance to quantify and report GHG reductions from LULUCF project activities:

<https://ghgprotocol.org/standards/project-protocol>

e. Accounting and Reporting Guidance

The GHG Product-Life-Cycle Accounting Reporting Standard developed by the WRI and the WBCSD provides requirements and guidance for companies preparing and publicly reporting GHG emission inventories that include direct and indirect emissions resulting from product life cycle.

The Carbon Offset Certification Protocol adopts this framework to identify which emission sources are required and recommended for commodity, product or service's certification. This is to ensure consistency of reporting.

f. Accounting and Reporting Principles

GHG accounting and reporting inventory shall follow the GHG Protocol principles of:

Relevance	Ensure that the commodity, product or service's GHG inventory accounting methodologies and report serves the decision-making needs of the intended user. Present information in the report in a way that is readily understandable by the intended users.
Completeness	Ensure that the inventory report covers all cradle-to-gate or cradle-to-grave commodity, product or service's life cycle GHG emissions within the specified boundaries; disclose and justify any significant GHG emissions and removals that have been excluded.
Consistency	Choose methodologies, data, and assumptions that allow for meaningful comparisons of a GHG inventory.
Transparency	Address and document all relevant issues in a factual and coherent manner leaving a clear audit trail. Document and disclose any relevant assumptions and make appropriate references to the methodologies and data sources used in the inventory report. Clearly explain any estimates and avoid bias so that the report faithfully represents what it purports to represent.
Accuracy	Ensure that reported GHG emissions and removals are not systematically greater than or less than actual emissions and removals and that uncertainties are reduced as far as practicable

g. Greenhouse Gases (GHG)

As a minimum GHG inventories for Carbon Offset Certification shall account for these seven gases:

- carbon dioxide (CO₂)
- methane (CH₄)
- nitrous oxide (N₂O)
- sulphur hexafluoride (SF₆)
- perfluorocarbons (PFCs)
- hydrofluorocarbons (HFCs)
- nitrogen trifluoride (NF₃)

h. GHG Emission factors

Emissions factors for CO₂ equivalence shall be based on the Global Warming Potential Values (100 Years Time Horizon) as defined in the [IPCC](#) most recent Assessment Report (currently: AR6) and presented in the [GHG Protocol GWP Values](#).

However, companies are invited to use more conservative and higher GWP values, (e.g. 20 Years Time Horizon for Methane) and report this choice to Carbon Offset Certification Management.

Step 3: Measure / Calculate

The third step is to measure or calculate the commodity, product or service's GHG Emissions and provide a complete and accurate GHG inventory in accordance with the specifications of the Carbon Offset Certification Protocol.

a. Process requirements and principles

Carbon Offset Certification requires compliance with the following requirements and principles:

Step	Description
1. Define Boundaries	Life cycle process mapping (in particular cradle-to-gate or cradle-to-grave for commodities).
2. Identify Emissions Sources	Inventory of emissions' sources along the transaction's life cycle at an appropriate level of granularity e.g. process and instrumentation (P&ID) level.
3. Identify GHGs to be measured	Include all GHGs recognised under the UN Framework Convention on Climate Change (UNFCCC), which currently include carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulphur-hexafluoride (SF ₆) and nitrogen trifluoride (NF ₃) must be measured or calculated in the assessment, insofar as they apply to the transaction, product life cycle or delivery of the service.
4. Data validity	Primary data shall be used where available. Data should be relevant in space and time. Estimates, extrapolations, emissions factors, models and industry averages may be used where primary data is unavailable. Assumptions must be reported. A description of the uncertainty associated with the client-supplied data should be made.
5. Measure GHG Emissions	GHG emissions must be either measured or quantified using, national, regional, international or other relevant emissions factors. Preference shall be given to emission factors closely related to the emissions source. Emission calculations must be reported in units of CO ₂ e using the current Global Warming Potential factors reported by the Intergovernmental Panel on Climate Change (IPCC). Emission factors used shall be stated in the assessment.
6. Quality Assurance	GHG calculation/measurement must be conducted or assured by an assurance provider approved by Carbon Offset Certification Management.

Reference GHG Accounting Protocols:

Companies can refer to the following GHG accounting protocols to calculate GHG inventories. They are recognised as reference protocols by Carbon Offset Certification:

- GHG Protocol for Product Life Cycle Accounting and Reporting Standard
- PAS 2050
- ISO/TS 14064,

- ISO 14025 Environmental Product Declaration following applicable Product Category Rules (PCR)
- ISO 14040-14044
- OGMP 2.0 framework for methane emissions

b. Data selection

Companies must prioritize the collection of primary or quality secondary data for the processes and process inputs that impact on the GHG inventory, i.e. having applied Global Warming Potentials. Companies must identify and focus data collection on processes that are known to consume or produce large amounts of GHG, e.g. GHG emitting processes or GHG intensive energy or material inputs.

During the data selection process, it is necessary to assess the estimation uncertainty.

Processes that contribute significantly to the total life cycle GHG emissions based on data with high levels of uncertainty should be priority areas for primary data collection:

- Processes that are significant relative to other processes in the commodity, product or service's life cycle.
- Processes with potential emissions reductions that could be undertaken or influenced by the company.
- Processes that are controlled by suppliers with significant contribution to the commodity, product or service's life cycle and related GHG emissions.

Data can be gathered by:

1. Direct measurement,
2. Modelling / Combining activity data and emission factors for a process.

The sources of data used in the inventory should be documented and reported (direct emission measurement data, activity data, and emission factors).

c. Primary & Secondary Data

If available and of sufficient quality, **primary data** should be collected for all processes in the related life cycle. There are several reasons why collecting primary data is beneficial to a company even if the processes are not under the company's ownership or control:

- primary data from suppliers throughout the product's life cycle can expand transparency, accountability, and data management.
- reflect changes in emissions resulting from operational modifications taken to reduce emissions, whereas secondary data sources may not reflect such changes.

- more effectively track and report progress toward overall GHG reduction goals.

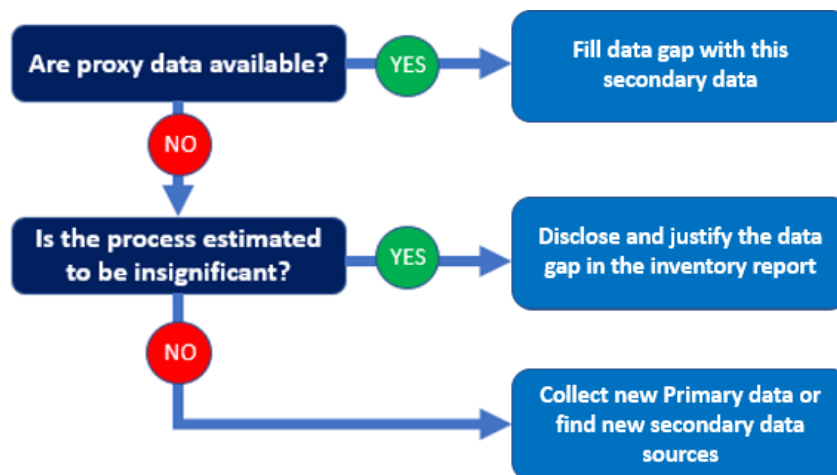
Secondary data is defined as data that is not derived from specific processes in the specific commodity product or service’s life cycle. Emissions data and process activity data that do not meet the definition of primary data is classified as secondary.

Examples of secondary data include:

- Average number of litres of fuel consumed by a process from a life cycle database.
- Kilowatt-hours consumed by another similar process in another company.
- Industry-average GHG emissions from a process’s chemical reaction.
- Specific consumption per process inputs, either specific to the process or a company/industry average.

Secondary data can come from external sources (e.g. life cycle databases, industry associations, etc.) or can be data from another process or activity in the reporting company’s or supplier’s control that is used as a proxy for a process in the inventory product’s life cycle. This data can be adapted to the process or can be used “as-is” in the studied product’s inventory.

Decision tree for closing data gaps:



Data gaps exist when there is no primary or reliable secondary data that is sufficiently representative of the given process in the product’s life cycle. For most processes where data is not available it should be possible to obtain sufficient information to provide a reasonable estimate and the associated degree of uncertainty:

https://ghgprotocol.org/sites/default/files/standards/Product-Life-Cycle-Accounting-Reporting-Standard_041613.pdf

List of recognised databases for Emissions Factors provided in Annex:

Non exhaustive and restrictive list.

Companies are invited to ask Carbon Offset Certification Management for confirmation of eligibility of other Emissions Factors databases.

d. Energy Use: (Scope 2)

Carbon Offset Certification requires the company to measure and report GHG emissions along the commodity (cradle-to-gate or cradle-to-grave), product or service's life cycle. This includes direct emissions related to processes (production, processing, logistics) and indirect emissions from the generation of purchased or acquired electricity, steam, heat, or cooling as defined in the GHG Protocol Scope 2 Guidance:

https://ghgprotocol.org/scope_2_guidance

The data preference hierarchy is for primary data and then to use the most appropriate secondary data that is accurate, precise, and has the highest quality emission factors. Preference should be on location-specific methods e.g. local energy mix and grid data.

e. Calculation quality levels

Carbon Offset Certification requires accurate and measured data for specific processes along the related life cycle where this would be reasonably available considering good practices at the time of certification. It is recognised that companies are at different stages of their GHG footprint calculation, management and reporting journeys.

Carbon Offset Certification Management acknowledges this and requires companies to use secondary data and extrapolated results based on emissions factors only when primary data is not reasonably available at the time of certification.

Companies are required to report to Carbon Offset Certification Management the confidence level for GHG calculations and commit to efforts to improve the confidence of their GHG inventory reporting over time. e.g. Percentage of measured data in the total GHG footprint for the specific commodity, product or service's life cycle (Primary data or secondary data measured on similar processes).

f. Pre-Transaction certification and material change adjustment

Certification can be issued for transactions of commodity, product or service that will occur in the future based on estimates and assumptions. In this case mention for certification issued Pre-Transaction will be notified on Carbon Offset Commodity, Carbon Offset Product or Carbon Offset

Service certificates (whereas mention for Post-Transaction certification will be notified on certificates that are issued after transactions are completed).

For Pre-Transaction certification, in the event of a material change occurring post certification in the operation to proceed to the transaction and leading to a significant change (greater than 5% in total) in the GHG footprint of the transaction, companies will be required to report this change to Carbon Offset Certification Management and adjust carbon mitigation action accordingly by retiring the equal amount of carbon credits to cover the actual GHG footprint within three months after the transaction has been completed.

g. Certification of Portfolios and material change adjustment:

Companies are invited to apply for Carbon Offset Certification for portfolio(s) of transactions for a specific period of time.

As for a single transaction, Carbon Offset Certification can be issued for transaction(s) that will occur in the future (e.g. certification for transactions done during a one year period). GHG footprint calculation will be done on estimates and assumptions e.g. on volume of produced and traded commodity, commodity life cycle's required processes and related GHG emissions, and number of transactions.

Mention of Pre-Transaction certification status will be notified on issued Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certificate.

Companies shall provide periodic adjustment reports on actual GHG emissions and mitigation actions to offset additional significant change in carbon footprint (greater than 5% in total).

If actual emissions are lower than estimated at the beginning of the period (lower than 5%) companies can apply for a downward adjustment with deferral of surplus of retired credits to following certification periods.

Last adjustment report shall be communicated to Carbon Offset Certification Management no later than three months after the end of the certification period or the last completed transaction and at least once a year.

Carbon Offset Certification Management will issue Post-Transaction adjustment certificates for completed transaction(s) or period(s) of certification.

h. Third-party Assurance

Companies applying for Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification are required to calculate the GHG footprint of the particular transaction or portfolio of transactions, as outlined above.

The GHG footprint calculation has to then be assured, by a Carbon Offset Certification Management approved, independent third-party assurance provider, applying a global assurance standard or framework, such as ISAE 3410/3000.

Companies wishing to use different assurance providers are requested to contact Carbon Offset Certification Management on info@offsetcertification.com or through their point of contact.

A minimum of limited assurance shall be obtained per certification.

Carbon Offset Certification Management will verify step 3 – Measure / Calculate and third-party assurance has been conducted.

Carbon Offset Certification Management recognises calculation third-party assurance providers that are:

- Internationally recognised assessment, verification and audit companies, or
- Specialists with competency assessed by Carbon Offset Certification Management.

Companies shall provide a third-party assurance statement with the GHG inventory to Carbon Offset Certification Management.

The third-party assurance statement shall include:

- Who performed the assurance of the GHG calculation.
- The relevant competencies of the assurers.
- That at least a limited assurance level is provided.
- A summary of the assurance process.
- Any potential conflict of interest.

i. On-site Verification:

Third-party assurance provider may require on-site verification of materiality data of commodity, product or service's life cycle processes related to carbon footprint calculation.

Carbon Offset Certification Management reserves also the right to ask for such on-site verification if none has been previously done.

On-site verification report shall be provided by a recognised third-party assurance provider as outlined above.

- **Illustrative example of GHG inventory format for a Liquefied Natural Gas transaction:**

	Process	Emissions sources	kg.CO2e / tLNG	Standards, Methodologies, Calculation tools	Emissions Factors, GWP sources
Cradle-to-Gate	Extraction (Gas processing, flaring)	Production	40	<i>Client specific sources references</i>	
		Processing	40		
		Flaring	10		
		CO2 Venting	13		
		Fugitive Emissions	14		
	Transport pipeline	Energy Use – compression	25		
		Fugitive Emissions	10		
	Liquefaction	Direct Emissions	9		
		Energy Use	265		
		Fugitive Emissions	2		
Storage	Direct Emissions	2			
	Fugitive Emissions	-			
Shipping to customer (Vessel propulsion)	Energy Use	85			
	Fugitive Emissions	18			
Regasification	Direct Emissions	7			
	Energy Use	30			
	Fugitive Emissions	3			
Transport Pipeline	Energy Use – compression	6			
	Fugitive Emissions	3			
End Use	Direct Emissions	1,750			
	TOTAL				
	Cradle-to-gate: kg CO2e/t LNG	544			
	Cradle-to-grave: kg CO2e/t LNG	2,343			
	Transaction Size	75,000 t of LNG			
	cradle-to-gate Transaction	40,00 t CO2e			
	cradle-to-grave Transaction	175,996 t CO2			

Step 4: Reduce & Offset

The fourth step is to take actions that abate the residual emissions for the specific transaction for which the Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification will apply.

a. Reduce emissions

Renewable Electricity:

Renewable electricity purchases in the form of Energy Attribute Certificates (EACs) can be used to reduce reported emissions from electricity consumption. To be eligible for use, EACs must meet the eight quality criteria identified in the GHG Protocol Scope 2 Guidance:

https://ghgprotocol.org/scope_2_guidance

Power Purchase Agreement (PPA) may convey generation attributes if the PPA includes language that confers attribute claims (and retirement rights) to the power recipient.

Emissions from energy supplied can be treated as zero where the energy consumed has been fully offset by the supplier or a third-party using carbon credits complying with the Carbon Offset Certification Protocol.

Energy Attribute Certificate (EAC) standards:

GHG Protocol Scope 2 Guidance defines the key concept for Energy Attribute Certificate claims for energy use reduction.

Companies may purchase and retire EACs to support a zero-emission grid factor for Scope 2 emissions. EAC programmes usually define applicable validity periods. In cases where validity periods are not prescribed, EACs issued within 1 year before the transaction date can be applied.

Eligible Energy Attribute Certificate (EAC) Standards:

Standard	EAC	Geographical Area
APX	Tradable Instruments for Global Renewables (TIGR)	10 countries across Asia and Latin America
Green Power Certification, Green Energy Certification Center, Japan	Green Power Certificates (GPC)	Japan
Green Gas Certificate Standard (GGCS)	Renewable Gas Guarantee of Origin (RGGO)	United Kingdom (UK)
European Energy Certificate System (EECS)	Guarantee of Origin (GO)	27 countries in Europe

International REC (I-REC) Standard	I-REC	39 countries across Asia, Latin America, Middle East and Africa
Ofgem (Office of Gas and Electricity Markets)	Renewable Energy Guarantee of Origin (REGO)	United Kingdom (UK)
North American State and Regional level certificate tracking systems	Renewable Energy Certificates (REC)	North America (U.S. and Canadian territories)
The Renewable Energy Act 2000 – Federal Law Australia	Small-scale Technology Certificates (STC)	Australia

In some markets, a third party may also issue certificates based on established standards that specify what energy is eligible to produce certificates, an audit procedure to verify retail transactions, and other consumer protection features. Some examples of applicable voluntary eligible certification programs include Green-e (North America), EcoLogo (Canada), and GreenPower accreditation (Australia). Electricity labels such as EKOenergy serve a similar function by specifying a set of criteria that can be applied to determine which certificates are eligible to take in account in the certification process (as defined in the GHG Protocol Scope 2).

b. Offset residual emissions

To achieve Carbon Offset Certification for specific transactions of commodities, products or services companies must compensate for the residual emissions of those transactions by retiring an equal amount of eligible carbon credits plus 2% acting as a buffer to compensate any discrepancies between actual emissions and uncertainties in GHG emissions calculation. i.e. **Companies are required to compensate 102% of the calculated and reported residual emissions.**

Residual emissions are defined as the total footprint of the transaction minus any internal emissions abatement measures and emission reductions already achieved via purchases of renewable energy.

All carbon credits used towards the achievement of the Carbon Offset Certification must meet the requirements set out in this protocol.

Carbon credits certified under the standards set out below meet the requirements and therefore are qualified to compensate for the transaction’s residual GHG emissions. These requirements are reviewed by Carbon Offset Certification Management annually to reflect best practice and performance of carbon credit standards.

The company must confirm that a sufficient number of carbon credits have been retired on behalf of the company and must provide assurance that retired credits are being applied to the related transaction(s) and cannot be in any way double counted for other purposes.

Carbon Credit Standards:

There are a number of generally agreed principles that are applied across both regulatory and voluntary offset credit programs to address environmental and social integrity.

These principles hold that offset credit programs should deliver credits that represent emissions reductions, avoidance, or sequestration that:

1. Are additional
2. Are based on a realistic and credible baseline
3. Are quantified, monitored, reported, and verified
4. Have a clear and transparent chain of custody
5. Assess and mitigate potential increases in emissions elsewhere
6. Are only counted once towards a mitigation obligation

Carbon credits certified under the standards set out in the Eligible Carbon Credit Standards below have been determined to meet these requirements and therefore are qualified to offset for the transaction's residual GHG emissions. Carbon Offset Certification Management will review the eligibility criteria with relevant experts as required and as views of eligibility emerge across the industry.

Eligible Carbon Credit Standards:

Eligible Standard	Carbon Credit
American Carbon Registry	Emission Reduction Tonnes (ERT)
Architecture for REDD+ Transactions	Emission Reduction unit (ER)
Australian Emissions Reduction Fund	Australian Carbon Credit Unit (ACCU)
Clean Development Mechanism	Certified Emission Reductions (CERs)
Climate Action Reserve	Climate Reserve Tonnes (CRT)
Gold Standard	Voluntary Emission Reduction (VER)
J-Credit Scheme	J-Credit
UK Woodland Carbon Code	Woodland Carbon Units (WCU)
Verified Carbon Standard (Verra)	Verified Carbon Units (VCU)

This selection is reviewed annually to guarantee it reflects developments in best practices and the performance of carbon credit standards.

Exclusions:

Emission reduction projects can have other sustainability impacts in addition to GHG emission reductions. While many projects have positive co-benefits, some may have negative impacts or do not prove enough additionality.

The following project types are not eligible for use towards the achievement of Carbon Offset Certification:

- HFC-23 (hydrofluorocarbon-23) destruction projects

HFC-23 is a by-product of HCFC-22 production. HFC-23 Global Warming Potential: 12,400 (GWP 100years) (i.e. 1 tHFC-23 has the same GWP of 12,400 tCO₂).

HFC-23 destruction projects do not have sufficient financial additionality.

- N₂O (Nitrous Oxide) destruction projects

N₂O is a by-product of Adipic Acid and Nitric Acid production. N₂O Global Warming Potential: 265 (GWP 100years) (i.e. 1 tN₂O has the same GWP of 265 tCO₂).

N₂O destruction projects do not have sufficient financial additionality.

- Large hydro (above 20MW) projects

Large Hydro power projects do not have sufficient financial additionality. Moreover, they often have negative impacts on ecosystems, displacement of communities and declines in biodiversity.

Carbon credit vintage:

The Carbon Offset Certification Protocol only recognises carbon credits whose vintage is less than 6 years from the date of the transaction. For example, for a transaction occurring in 2023, acceptable vintages of carbon credits would be 2022, 2021, 2020, 2019, 2018, and 2017.

Permanent retirement of carbon credits:

Offsetting of emissions is considered effective after emissions reduction certificates and the respective carbon credits are retired from public registries. Companies must use third party registries for a permanent cancellation of carbon credits thus avoiding future use.

When allowed by the registry the purpose of the credit retirement shall be recorded with a publicly visible retirement reason articulated to avoid the risk of double claims, e.g. 'retired on behalf of XX company for carbon offset transaction YY'.

The Company shall report to Carbon Offset Certification Management:

- Proof of retirement
- Quantity of units retired
- Serial numbers of credits
- Related project descriptions
- Date of retirement

c. Insetting

Insetting is considered when a company invests in the development of an emission reduction project within the perimeter of its supply chain. Projects can be developed by the company itself, suppliers to the company or third-party organisations.

The focus on location-specific mitigation actions enables the corporate to gain multiple benefits, often delivering against both commercial and sustainability objectives. Carbon credits generated from insetting projects may be used for the purpose of Carbon Offset Certification when they are generated, have the chain of custody and retired in accordance with the eligible Carbon Credit Standards outlined above.

Step 5: Report to Carbon Offset Certification Management

To achieve the Carbon Offset Certification process the company shall report to Carbon Offset Certification Management the achievement of the steps:

1. Define
2. Measure / Calculate
3. Reduce & Offset

The report provided by the company must include all data, information and assurance required in this protocol. This report will be recorded by Carbon Offset Certification Management.

Reporting to Carbon Offset Certification Management should include:

General Information and Scope	<ul style="list-style-type: none"> ▪ Contact information ▪ Transaction description: <ul style="list-style-type: none"> • Commodity, Product, Service • Life cycle (cradle-to-gate or to-grave) • Quantity ▪ Transaction date ▪ Pre or Post-Transaction certification status
Boundary Definition	<ul style="list-style-type: none"> ▪ Commodity cradle-to-gate or cradle-to-grave certification ▪ Transaction life cycle definitions and descriptions ▪ Excluded potentially attributable processes and justification for their exclusion ▪ Method used to calculate land-use change impacts, if applicable
Data Collection and Quality	Description of the: <ul style="list-style-type: none"> ▪ Data sources ▪ Data quality, and any efforts taken to improve data quality ▪ Emission factors
Uncertainty	<ul style="list-style-type: none"> ▪ A statement on inventory uncertainty and methodological choices (primary, extrapolated and secondary data) ▪ Calculation models
Carbon footprint	Total residual GHG emission inventory results in tons of CO ₂ e
Assurance	<ul style="list-style-type: none"> ▪ Assurance provider (company and contact) ▪ Assurance opinion ▪ The critical review findings ▪ A summary of the assurance process
Reduction	<ul style="list-style-type: none"> ▪ Reduction activity and tons of CO₂e reduced, if any ▪ Energy Attribute Certificates used, if any <ul style="list-style-type: none"> • EAC type • Country of generation • Year of EAC generation • Proof and date of cancellation • Quantity of EACs retired
Offsetting	Carbon Credits <ul style="list-style-type: none"> • Standard • Serial numbers • Related project description • Proof of retirement • Quantity of units retired • Date of retirement

Step 6: Certification & Communication

a. Certificate Issuance

A Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certificate is issued once a report for (a) specific transaction(s) has been received and verified as complying with the certification steps by Carbon Offset Certification Management.

Carbon Offset Certification Management issues a digitized document confirming the Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification for (a) specific transaction(s) accordingly to this protocol. This document summarises information related to the transaction on the GHG footprint and implemented action to reduce to carbon neutral (offsets).

The certification states:

- date of issuance and certificate's identification number.
- information related to the transaction: Commodity, Product, or Service, Quantity, Production, Origin and Delivery, Date.
- certification boundaries: cradle-to-gate or cradle-to-grave.
- Pre or Post-Transaction certification status.
- carbon footprint (tCO₂e).
- offset program descriptions and relevant certificate, unique identifiers (standard and serial numbers).
- type of carbon credits used: Avoidance & Reduction or Removal

Before issuing the Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certificate, Carbon Offset Certification Management reserves the right:

- to require further explanation on specific points.
- to ask the assurance provider for clarifications.
- to deny certification for a specific transaction if it does not meet the requirements of this protocol.

The Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification is awarded by Carbon Offset Certification Management (i.e. CN Commodity SA, company registered in Geneva, Switzerland). This certification may be issued only under a contractual agreement between CN Commodity and the company. This contract shall include conditions for the company to communicate about the Carbon Offset Certification and permitted use of the Carbon Offset Certification logo.

b. Use of the Carbon Offset Certification's logos and certification

Upon successful completion of a Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification, companies are encouraged to make use of the appropriate Carbon Offset Certification logos in their communications as long as it only refers to the certified transaction(s) and its proper boundaries.

Certificates are issued for specific transactions and cannot be claimed/used for any other purpose. All communication relating to a Carbon Offset Certification's certificate must be clear to avoid any misunderstanding or confusion. Communication must be consistent and the use of the Carbon Offset Certification logos must conform to this protocol and contractual agreement between the Company and Carbon Offset Certification Management (i.e. CN Commodity).

The accuracy and transparency of claims is important to protect and enhance the reputation of the Company. Displaying the Carbon Offset Certification logos clearly demonstrates that a company has set and met a target for carbon neutrality for (a) specific commodity, product or service's transaction(s).

This can be used to demonstrate climate sustainability leadership, differentiate from competitors, meet customers' demand and engage stakeholders.

Requirements:

- To ensure no ambiguity about the transaction's boundaries for which the company has achieved Carbon Offset Certification, the Carbon Offset Certification logos can only be used by the Company in their own communications as long as it refers to the specific related transactions.
- As part of the Carbon Offset Certification quality assurance programme and to ensure consistent and accurate use of certification by all clients, all usage of the Carbon Offset Certification logos needs to be approved by Carbon Offset Certification Management (i.e. CN Commodity) (certificate issuance).
- If a label logo is not used in accordance with these guidelines, Carbon Offset Certification Management (i.e. CN Commodity) has the right to ask the company to amend and remove the logo.

The Carbon Offset Certification Protocol should be applied in conjunction with relevant terms and conditions on the use of logos, marks and trademarks owned by CN Commodity, as specified in contracts with CN Commodity.

c. Data privacy

Data communicated to Carbon Offset Certification Management (i.e. CN Commodity) will be processed and stored for the purpose of certification management and meet legal or regulatory obligations. CN Commodity will only share personal data with others when CN Commodity is legally permitted/required to do so. When CN Commodity shares data with others, it will establish contractual arrangements and security mechanisms to protect the data and to comply with data protection, confidentiality and security standards.

4. Carbon Offset Certification consistency audit

CN Commodity will be audited annually by an independent third-party entity to verify consistency in its service and certification issuance accordingly to the Carbon Offset Certification Protocol.

5. Ongoing update and review

Certification review and learning curve:

The Carbon Offset Certification Protocol will be reviewed once a year to reflect developments in greenhouse gas calculation/measurement, industry standards, changes in regulation and perceptions of best available science and practice. All companies or organizations interested in commenting or participating in the evolution of the Carbon Offset Certification Protocol are invited to contact Carbon Offset Certification Management:

certification@offsetcertification.com

Carbon offset certified transactions will contribute to the improvement of this protocol and the standards set therein.

Company Due Diligence:

Carbon Offset Commodity, Carbon Offset Product or Carbon Offset Service certification is issued for a particular commodity, product or service transaction after the process to measure, report and reduce/offset GHG emissions as required by this protocol and under a contractual agreement between the company and CN Commodity.

Before contracting with a new company Carbon Offset Certification Management (i.e. CN Commodity) reserves the right to conduct Client Due Diligence in order to verify that there is no clear conflict between the company's actions and the Carbon Offset Certification principles and values. CN Commodity reserves the right to refuse a contract to issue a certification with a company that has business conducts in direct conflict with the values of CN Commodity.

ANNEX : Recognised Emissions Factors databases

Database	Provider	Region
<u>IPCC</u>	EFDB	global
<u>ADEME</u>	French agency for energy transition	Global
<u>AusLCI</u>	Australian National Life Cycle Inventory Database	Australia
<u>3EID</u>	3EID (Embodied Energy and Emission Intensity Data – Japan)	Japan
<u>Agribalyse</u>	LCI database for the agriculture and food sector.	Global
<u>BEAT</u>	Biomass Environmental Assessment Tool (BEAT) provided by DEFRA and AEA	Global
<u>Bilan Carbone™</u>	Agence d'Environnement et de la Maîtrise de l'Énergie (ADEME)	France, Global
<u>Building Research Establishment</u>	LCA Raw material extraction, transport and manufacture	Global
<u>BUWAL</u>	Packaging LCA provided by the Swiss Packaging Institute	Global
<u>Canadian Raw Materials Database</u>	LCA database Canadian commodity materials.	Canada
<u>CarbonMinds</u>	LCA Chemicals	Global
<u>CCaLC</u>	Carbon Calculations over the Life Cycle of Industrial Activities	Global
<u>CEDA</u>	CEDA – Comprehensive Environmental Data Archive	US
<u>CPM</u>	Centre for Environmental Assessment of Product and Material Systems	EU, Global
<u>DEFRA</u>	UK Department for Rural Food and Rural Affairs	UK, Global
<u>Ecoinvent</u>	Swiss Centre for Life Cycle Inventories	Global
<u>EEA</u>	European Environment Agency	EU
<u>EIME</u>	Environmental Improvement Made Easy database	EU
<u>ELCD</u>	European Platform on Life Cycle Assessment	Global
<u>EPA</u>	Environment Protection Agency	US
<u>EPD</u>	Environmental Product Declarations	Global
<u>ESU</u>	World Food database	Global
<u>European Aluminium Association</u>	LCA for aluminium production and transformation processes in Europe.	EU
<u>European Copper Institute</u>	Life Cycle Assessments of 3 types of copper products: tubes, sheets, wire	Global
<u>FEFCO</u>	European Federation of Corrugated Board Manufacturers	EU
<u>GaBi Databases</u>	Sphera Data base	EU , US
<u>GEMIS</u>	Global Emission Model for Integrated Systems (GEMIS)	Global
<u>GLEC</u>	Global Logistics Emissions Council (GLEC Framework)	Global
<u>GREET</u>	Greenhouse gases, Regulated Emissions, and Energy use in Transportation	US
<u>ICCT</u>	International Council on Clean Transportation	Global
<u>ICE</u>	Bath Inventory of Carbon and Energy (ICE)	Global
<u>IDEA</u>	Inventory Database for Environmental Analysis	Global
<u>IEA</u>	International Energy Agency (IEA)	Global

<u>IMO</u>	International Maritime Organisation	Global
<u>ITRI</u>	International Tin Research Institute (ITRI)	Global
<u>IZA</u>	International Zinc Association (IZA)	Global
<u>LCA Commons</u>	US LCA	US
<u>NAEI</u>	National Atmospheric Emissions Inventory	UK
<u>NREL</u>	U.S. Life Cycle Inventory (USLCI) Database	US
<u>OPGEE</u>	Oil Production Greenhouse Gas Emissions Estimator	Global
<u>SALCA</u>	Swiss Agricultural Life Cycle Assessment	Global
<u>WSA</u>	World Steel Association	Global