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CARBON AUDITING: PROFESSIONAL CAP EXAM PREPARATION

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Additionality

A criterion often applied to GHG projects, 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 it employs) would not have been implemented in its baseline scenario and/or that project activity emissions are lower than baseline emissions.

Allowances

The basic tradable commodity within GHG emission trading systems. Allowances grant their holder the right to emit a specific quantity of pollution once (e.g., one tonne of CO₂eq). The total quantity of allowances issued by regulators dictates the total quantity of emissions possible under the system. At the end of each compliance period, each regulated entity must surrender sufficient allowances to cover their GHG emissions during that period.

Barriers

Any factor or consideration that would (significantly) discourage a decision to try to implement the project activity or its baseline candidates.

Base Year

A historic datum (a specific year or an average over multiple years) for tracking corporate GHG emissions over time. This term applies only to corporate or entity-wide GHG accounting, not to project-based GHG accounting.

Base Year Emission

GHG emissions in the base year. This term applies only to corporate or entity-wide GHG accounting, not to project-based GHG accounting.

Baseline Candidates

Alternative technologies or practices within a specified geographic area and temporal range that could provide the same product or service as the project activity.

Baseline Emissions

An estimate of GHG emissions, removals, or storage associated with a baseline scenario or derived using a performance standard (see baseline procedures).

Baseline Parameter

Any parameter whose value or status can be monitored in order to validate assumptions about base- line emissions estimates or to help estimate baseline emissions.

Baseline Procedures

Methods used to estimate baseline emissions. The Project Protocol presents two optional procedures: the project-specific procedure and the performance standard procedure.

Baseline Scenario

A hypothetical description of what would have most likely occurred in the absence of any considerations about climate change mitigation.

Cogeneration

sequential production of either electrical or mechanical power and useful thermal energy (heating or cooling) from a single energy form

Cooling load

the difference in temperature between the outdoor mean temperature over a 24-hour period and a given base temperature, used in estimating heating and cooling energy use. For any one day, there are as many degree days (Kelvin-days) as there are degrees Fahrenheit (degrees Celsius) departure of the mean temperature for the day from the base temperature

Density

mass per unit of volume

Global Environmental Issues

Few examples of environmental issues of global significance are:

- Ozone layer depletion
- Global warming
- Loss of biodiversity

Benefits

The benefits that would be expected to accrue to decision-makers involved with the activities in each baseline scenario alternative, excluding all potential benefits resulting from GHG reductions.

Carbon Dioxide Equivalent (CO₂eq)

The universal unit of measurement used to indicate the global warming potential of greenhouse gases. It is used to evaluate the impacts of releasing (or avoiding the release of) different greenhouse gases.

Carbon Stock

The absolute quantity of carbon held within a GHG sink at a specified time (see GHG sink).

Common Practice

The predominant technology(ies) implemented or practice(s) undertaken in a particular region or sector.

Energy use intensity (EUI)

an expression of the annual energy used or calculated to be used by a building or building space per unit of gross floor area. Expressed in MBtu/ft²·yr (watts-hours/m²·yr)

Decision- Makers

ny parties who might be involved in the decision to implement a project activity or one of its baseline candidates. In most cases, the project developer will be the sole “decision-maker” with respect to the project activity. However, other parties could be the “decision-makers” for baseline candidates.

Direct GHG Emissions

Emissions or removals from GHG sources or sinks that are owned or controlled by the project developer.

Dynamic Baseline Emissions

Baseline emission estimates that change over the valid time length of the baseline scenario. Dynamic baseline emissions are often estimated for land-use and forestry projects.

Emission Factor

A factor relating GHG emissions to a level of activity or a certain quantity of inputs or products or services (e.g., tonnes of fuel consumed, or units of a product). For example, an electricity emission factor is commonly expressed as t CO₂eq/megawatt-hour.

Gross floor area

the sum of the floor areas of all the spaces within the building, with no deductions for floor penetrations other than atria. The exterior faces of exterior walls or the centerline of walls separating buildings are used to measure gross floor area. However, covered walkways, open roofed areas, porches, and similar spaces are not included. Neither are pipe trenches, exterior terraces or steps, roof overhangs, parking garages, surface parking, and other similar features.

Heat capacity

1) the amount of heat necessary to raise the temperature of a given mass by one degree; numerically, the mass multiplied by the specific heat. (2) the capacity of a body to store heat

Heat gain (heat uptake)

quantity of heat a system or enclosed space absorbs

Fuel Switching

Using an alternative fuel (usually of lower carbon intensity) to produce required energy.

Geographic Area

A physical area that helps define the final list of baseline candidates. The area can be defined by a number of factors including sociocultural, economic, or legal factors; the availability of necessary physical infrastructure; and/or biophysical characteristics.

GHG Assessment Boundary

Encompasses all primary effects and significant secondary effects associated with the GHG project. Where the GHG project involves more than one project activity, the primary and significant secondary effects from all project activities are included in the GHG assessment boundary.

GHG Emissions

GHGs released into the atmosphere.

GHG Program

A generic term for: (1) any voluntary or mandatory, government or non-government initiative, system, or program that registers, certifies, or regulates GHG emissions; or (2) any authorities responsible for developing or administering such initiatives, systems, or programs.

GHG Project

A specific activity or set of activities intended to reduce GHG emissions, increase the storage of carbon, or enhance GHG removals from the atmosphere. A GHG project may be a stand-alone project, or a component of a larger non-GHG project.

GHG Protocol Initiative (GHG Protocol)

A multi-stakeholder partnership of businesses, nongovernmental organisations, governments, academics, and others convened by the World Business Council for Sustainable Development and the World Resources Institute to design and develop internationally accepted GHG accounting and reporting standards and/or protocols, and to promote their broad adoption.

GHG Reductions

A decrease in GHG emissions or an increase in removal or storage of GHGs from the atmosphere, relative to baseline emissions. Primary effects will result in GHG reductions, as will some secondary effects. A project activity's total GHG reductions are quantified as the sum of its associated primary effect(s) and any significant secondary effects (which may involve decreases or countervailing increases in GHG emissions). A GHG project's total GHG reductions are quantified as the sum of the GHG reductions from each project activity.

GHG Sink

Any process that removes GHG emissions from the atmosphere and stores them.

Life-cycle assessment

the process of evaluating a component, product, assembly, building, etc. and its development from the moment of extraction of raw materials, transportation, processing, manufacturing, use, recyclability, and disposal and assigning a value or assessment of its cumulative and ultimate social, environmental, and economic costs, benefits, and impacts. This is often referred to as a cradle-to-grave or cradle-to-cradle assessment.

Life-cycle cost

cost of equipment over its entire life, including operating, maintenance, and repair/replacement costs. May also include decommissioning costs.

GHG Source

Any process that releases GHG emissions into the atmosphere.

Greenhouse Gases (GHGs)

Greenhouse gases are gases that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. The six main GHGs whose emissions are human-caused are: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF₆).

Indirect GHG Emissions

Emissions or removals that are a consequence of a project activity, but occur at GHG sources or sinks not owned or controlled by the project developer.

Legal Requirements

Any mandatory laws or regulations that directly or indirectly affect GHG emissions associated with a project activity or its baseline candidates, and that require technical, performance, or management actions. Legal requirements may involve the use of a specific technology (e.g., gas turbines instead of diesel generators), meeting a certain standard of performance (e.g., fuel efficiency standards for vehicles), or managing operations according to a certain set of criteria or practices (e.g., forest management practices).

Market Response

The response of alternative providers or users of an input or product to a change in market supply or demand caused by the project activity.

One-Time Effects

Secondary effects related to the construction, installation, and establishment or the decommissioning and termination of the project activity.

Performance Metric

A rate that relates the level of consumption of relevant inputs to the level of production for different baseline candidates, or that relates GHG emissions to the size or capacity of different baseline candidates. Performance metrics are used in developing performance standards.

Performance Standard

A GHG emission rate used to determine baseline emissions for a particular type of project activity. A performance standard may be used to estimate baseline emissions for any number of similar project activities in the same geographic area.

Owner's project requirements (OPR)

a written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. (The term project intent is used by some owners for their commissioning process, Owner's Project Requirements.)

Production- Based Performance Standard

A performance standard defined as a rate of GHG emissions per unit of a product or service produced by all identified baseline candidates. This type of performance standard will generally apply to energy efficiency, energy generation, and industrial process project activities.

Project Activity

A specific action or intervention targeted at changing GHG emissions, removals, or storage. It may include modifications or alterations to existing production, process, consumption, service, or management systems, as well as the introduction of new systems.

Performance Standard Procedure

A baseline procedure that estimates baseline emissions using a GHG emission rate derived from a numerical analysis of the GHG emission rates of all baseline candidates. A performance standard is sometimes referred to as a multi-project baseline or benchmark, because it can be used to estimate baseline emissions for multiple project activities of the same type.

Primary Effect

The intended change caused by a project activity in GHG emissions, removals, or storage associated with a GHG source or sink. Each project activity will generally have only one primary effect.

Project-Specific Procedure

A baseline procedure that estimates baseline emissions through the identification of a baseline scenario specific to the proposed project activity.

Relevant Input

Any kind of material or energy that is: (1) required to produce the product or service common to all baseline candidates, and (2) related to the project activity's primary effect.

Retrofit Project

Any GHG project that involves modifying existing equipment, or replacing existing equipment with new parts, devices, or systems.

Secondary Effect

An unintended change caused by a project activity in GHG emissions, removals, or storage associated with a GHG source or sink. Secondary effects may be “positive” (i.e., resulting in GHG reductions)
or “negative” (i.e., resulting in GHG emissions).

Sequestration

The uptake and storage of CO₂, which can be sequestered by plants or in underground or deep-sea reservoirs.

Static Baseline Emissions

Baseline emission estimates that do not change over the valid time length of the baseline scenario.

Stringency Level

A GHG emission rate that is more restrictive than the average GHG emission rate of all baseline candidates. Stringency levels may be specified as a GHG emission rate corresponding to a certain percentile (better than the 50th percentile) or to the lowest-emitting baseline candidate. Stringency levels are defined in the course of developing a performance standard.

Temporal Range

A contiguous time period that helps define the final list of baseline candidates. The temporal range can be defined by a number of factors, such as the dominance of a single technology for an extended period of time, the diversity of options in a sector or region, and/or a discrete change in an area's or a region's policy, technology, practice, or resource.

Time-Based Performance Standard

A performance standard defined as a rate of GHG emissions per unit of time and unit of size or capacity of the baseline candidates. This type of performance standard will generally apply to project activities involving storage or removals of CO₂ by biological processes, fugitive emissions and waste emissions

Upstream/Dow nstream Effects

Secondary effects associated with the inputs used (upstream) or the products produced (downstream) by a project activity.

Bilan Carbone (carbon balance)

The Bilan Carbone and its database of emission factors provide a comprehensive methodological basis. Since late 2011, the Association Bilan Carbone (Carbon Balance Association) has managed licenses for the tool and the Institut de Formation Carbone (Carbon Training Institute) has organized training in the method.

Cap and trade

A mechanism for limiting emissions in which emission rights are defined and capped, and can then be traded. If a participant does not have enough allowances to match its emissions at the end of the compliance period, the participant must buy additional allowances on the market to make up the shortfall. If the opposite is the case, the participant can sell allowances. This system is sometimes linked to a project mechanism that generates carbon credits that are fungible with quotas if certain conditions are met.

Carbon footprint

A carbon footprint is defined as a measure of total GHG emissions caused directly or indirectly by a person, an organization, a territory, a product or a service.

Carbon leakage

Carbon leakage occurs when a company delocalizes to a country with climate regulations that are more lax or non-existent. This type of situation reduces the emissions of environmentally progressive countries without any environmental benefit at the global level.

Emissions conversion factor

A factor that can be used to convert a unit of energy into a unit of GHG emissions, where GHG emissions are typically expressed in mass units of CO₂e,

Normalization

used in the context of metrics, performance targets, and measured building performance. Metric normalization refers to the process of adjusting metrics to a common scale or unit, such as building floor area. Performance target normalization refers to the process of adjusting the performance targets for a building based on specific factors that may influence its performance, such as weather, occupancy, and high-energy applications, among others.

Performance target

The specific level of performance or performance threshold that buildings are expected to meet as part of the BPS used interchangeably with target.

Policy makers

Representatives of the jurisdiction's governing body that develops and adopts the BPS may include legislators, building department staff, council members, and others, depending on the jurisdiction.

Policy scope

The buildings covered by the standard, i.e., buildings that are required to meet a performance target,

Scope 1 and Scope 2 emissions

In the context of emissions reporting, the scope of emissions is defined in terms of whether the reporting entity owns and controls the asset producing the emissions. Scope 1 emissions are direct GHG emissions resulting from fuel combustion from sources owned by the reporting entity

GHG offsets

GHG offsets are discrete GHG reductions used to compensate for (i.e., offset) GHG emissions elsewhere, for example to meet a voluntary or mandatory carbon cap.

Carbon neutrality

"Carbon neutrality" refers to reducing or offsetting the carbon impact of a given entity, product, or activity so that it results in no net carbon emissions to the atmosphere.

Cradle-to-gate

All emissions that occur in the life cycle of purchased products, up to the point of receipt by the reporting company (excluding emissions from sources that are owned or controlled by the reporting company).

Direct emissions

Emissions from sources that are owned or controlled by the reporting company.

Emissions

The release of greenhouse gases into the atmosphere.

Financial control approach

A consolidation approach whereby a company accounts for 100 percent of the GHG emissions over which it has financial control. It does not account for GHG emissions from operations in which it owns an interest but does not have financial control.

Global warming potential (GWP)

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

Greenhouse gas inventory

A quantified list of an organization's GHG emissions and sources.

Indirect emissions

Emissions that are a consequence of the activities of the reporting company, but occur at sources owned or controlled by another company.

Life cycle

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

Life cycle assessment

Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.

Operational boundaries

The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting company.

Organizational boundaries

The boundaries that determine the operations owned or controlled by the reporting company, depending on the consolidation approach taken (equity or control approach).

Reporting

Presenting data to internal management and external users such as regulators, shareholders, the general public or specific stakeholder groups.

Scope 1 emissions

Emissions from operations that are owned or controlled by the reporting company.

Scope 2 emissions

Emissions from the generation of purchased or acquired electricity, steam, heating 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, including both upstream and downstream emissions.

Material discrepancies”

A material discrepancy is an error (for example from an oversight, omission, or miscalculation) that results in the reported quantity being significantly different to the true value to an extent that will influence performance or decisions. Also known as material misstatement.”

Demand response (DR)

event a specific period of time when the utility or independent service operator calls for a change in the pattern or level of use of grid-based electricity from its program participants. Also known as a curtailment event.

Load shedding

an intentional action by a utility to reduce the load on the system. Load shedding is usually conducted during emergency periods, such as capacity shortages, system instability, or voltage control.

Peak demand

the maximum electricity load at a specific point in time or over a period of time

Permanent peak load shifting

the transfer of energy consumption to off-peak hours, when demand for power is lower and energy is therefore less expensive.

Solar garden

a shared solar array or other renewable energy system with grid-connected subscribers who receive credit for the use of renewables using virtual net metering. Also known as a community renewable energy system. (Adapted from solargardens.org)

Natural refrigerant

a compound that is not manmade and is used for cooling. Such substances generally have a much lower potential for atmospheric damage than manufactured chemical refrigerants. Examples include water, carbon dioxide, and ammonia.

Carbon offset

a unit of carbon dioxide equivalent that is reduced, avoided, or sequestered to compensate for emissions occurring elsewhere (World Resources Institute)

District energy system (DES)

a central energy conversion plant and transmission and distribution system that provide thermal energy to a group of buildings (e.g., a central cooling plant on a university campus). It does not include central energy systems that provide only electricity.

Green power

a subset of renewable energy composed of grid-based electricity produced from renewable energy sources

Scope 1 emissions

direct greenhouse gas emissions from sources owned or controlled by the entity, such as emissions from fossil fuels burned on site. Electricity produced on site through the burning of fossil fuels is measured by the Scope 1 emissions associated with that fossil fuel.

Scope 2 emissions

indirect greenhouse gas emissions associated with the generation of purchased electricity, heating, cooling, or steam on site through a utility provider for the entity's consumption. Transmission and distribution losses related to hot water, chilled water, and steam are included in Scope 2 emissions, but transmission and distribution losses associated with electricity are not included.

Chlorofluorocar- bon (CFC)-based refrigerant

A chlorofluorocarbon (CFC)-based refrigerant is a fluid containing hydrocarbons that absorbs heat from a reservoir at low temperatures and rejects heat at higher temperatures. When emitted into the atmosphere, CFCs cause the depletion of the stratospheric ozone layer.

Carbon neutrality

"Carbon neutrality" refers to reducing or offsetting the carbon impact of a given entity, product, or activity so that it results in no net carbon emissions to the atmosphere.

Global Reporting Initiative

The GRI seeks to harmonize global organizational reporting on economic, environmental, and social performance according to financial reporting. The Reporting Framework facilitates transparency and accountability by organizations – companies, public agencies, non-profits - of all sizes and sectors, across the world.

“Boundaries” in a GHG inventory

Boundaries are imaginary lines encompassing the emissions to be included in a GHG inventory

Uncertainty

parameter associated with the result of quantification which characterizes the dispersion of the values that could be reasonably attributed to the quantified amount

Verifier

competent and independent person,
or persons, with responsibility for
performing and reporting on the
verification process

Verification

systematic, independent and
documented process for the
evaluation of a greenhouse gas
assertion against agreed verification
criteria

Validator

competent and independent person
or persons with responsibility for
performing and reporting on the
results of a validation

Validation statement / verification statement

formal written declaration to the
intended user that provides
assurance on the statements in the
greenhouse gas assertion of the
responsible party

Validation criteria/ verification criteria

policy, procedure or requirement used as a
reference against which evidence is compared

Intended user

individual or organization identified by
those reporting GHG-related information
as being the one who relies on that
information to make decisions

Responsible party

person or persons responsible for the
provision of the greenhouse gas
assertion and the supporting GHG
information

Organization

company, corporation, firm, enterprise,
authority or institution, or part or
combination thereof, whether
incorporated or not, public or private,
that has its own functions and
administration

Greenhouse gas inventory

an organization's greenhouse gas
sources , greenhouse gas sinks , GHG
emissions and removals

Greenhouse gas project

activity or activities that alter the
conditions identified in the baseline
scenario which cause GHG emission
reductions or GHG removal
enhancements

Greenhouse gas report

stand-alone document intended to
communicate an organization's or
project's GHG-related information to
its intended users

Carbon dioxide equivalent CO₂e

unit for comparing the radiative
forcing of a GHG to carbon dioxide

Greenhouse gas reservoir

physical unit or component of the biosphere, geosphere or hydrosphere with the capability to store or accumulate a GHG removed from the atmosphere by a greenhouse gas sink or a GHG captured from a greenhouse gas source

Greenhouse gas source

physical unit or process that releases a GHG into the atmosphere

Greenhouse gas emission

total mass of a GHG released to the
atmosphere over a specified period
of time

Greenhouse gas emission or removal factor

factor relating activity data to GHG
emissions or removals



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Beyond Smart Cities is the world's first marketplace for green technology. It connects millions of sustainability experts, green building experts, energy experts, commissioning experts, carbon accounting experts, fire safety experts, climate change experts, and green product and technology manufacturers with independent talent from all over the world.

Our mission is to build and support a global community of experts with the highest standards of professional practise in sustainability, green building, energy, commissioning, environment, health & safety, fire safety, climate change, GHG accounting, carbon auditing, and managing GHG emissions.

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